12th Annual Meeting of the Society of Urologic Oncology in Conjunction with the World Urological Oncology Federation

Extraordinary Opportunities for Discovery

November 30 – December 2, 2011
Bethesda North Marriott Hotel & Conference Center
Bethesda, Maryland

Program Book & Abstracts
12th Annual Meeting of the Society of Urologic Oncology in Conjunction with the World Urological Oncology Federation

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Bethesda, Maryland

Program Book & Abstracts
BoD, Committees & Faculty

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Young Urologic Oncologists Representative
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Committees

Steering Committee
Eric Klein, MD
W. Marston Linehan, MD
Edward M. Messing, MD

Scientific Program Co-Chairs
Adam S. Kibel, MD
Seth P. Lerner, MD

Prostate Cancer
Daniel W. Lin, MD (Chair)
James A. Eastham, MD
James Gulley, MD, PhD, FACP
Jim Hu, MD, MPH
Adam S. Kibel, MD
Eric A. Klein, MD
David Raben, MD
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Bladder Cancer
Matthew I. Milowsky, MD
(Chair)
Sherri Machele Donat, MD
Jason A. Elshamouti, MD, DPHIL
Ashish M. Kamat, MD
Seth Paul Lerner, MD
David McConkey, PhD
Edward M. Messing, MD
Jonathan Rosenberg, MD
Arthur I. Sagalowsky, MD

Kidney Cancer
W. Marston Linehan, MD
(Chair)
Michael Atkins, MD
Scott E. Eggenger, MD
Jodi Kathleen Maranchie, MD
Allan Jonathan Pantuck, MD
W. Kimryn Rathmell, MD, PhD

Outcomes
David F. Penson, MD, MPH
(Chair)
John L. Gore, MD; Seattle, WA
Brent K. Hollebeek, MD; Ann Arbor, MI
Seth Adam Strope, MD; St. Louis, MO

Penile Cancer
Curtis Alvin Pettaway, MD; Houston, TX (Chair)

SUO-CTC
Colin Dinney, MD
Martin Gleave, MD

YUO
(Young Urologic Oncologists)
Fernando J. Bianco Jr., MD

2011 Faculty Listing
Michael Atkins, MD
Daniel A. Barocas, MD
Sam Chang, MD
Peter Choyke, MD
Juanita Crook, MD
Philipp Dahm, MD, MHSc, FACS
S. Machele Donat, MD
Mark Emberton, MD, FACS
Felix Feng, MD
Neil Fleshner, MD
Andy Futeal
John Gore, MD
Sheldon Greenfield, MD
Donna Hansel, MD, PhD
Paul Hegarty, MD
J. Stephen Jones, MD, FACS, MBA
Paul H. Lange, MD
Daniel W. Lin, MD
W. Marston Linehan, MD
Yair Lotan, MD
David McDermott, Jr., MD
Matthew I. Milowsky, MD
Robert Motzer, MD
Paul L. Nguyen, MD
Peter H. O’Donnell, MD
Lance Pagliaro, MD
Dipen Parekh, MD
David F. Penson, MD, MPH
Curtis Pettaway, MD
Louis L. Pisters, MD
Martin G. Sanda, MD
David B. Solit, MD
Ramaprasad Srinivasan, MD, PhD
Samir Taneja, MD
Clare Tempany, MD, PhD
Dan Theodorescu, MD, PhD
Karim Touijer, MD
John Trachtenberg, MD
Hendrik Van Poppel, MD
Bas van Rhijn, MD, PhD, FEBU
Kevin White, PhD

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Thank You to Our 2011 Exhibitors
(As of 11/16/11)

Platinum Exhibit Level
Janssen Biotech Inc.

Gold Exhibit Level
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Dendreon

Silver Exhibit Level
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Exhibitors
Allergan
Ferring Pharmaceuticals
GE Healthcare
Meviation
Myriad Genetic Laboratories
Prometheus Laboratories

Thank You to Our 2011 Education Grant Supporters

Amgen
Endo Pharmaceuticals
Wednesday November 30, 2011

6:30 p.m. – 7:30 p.m.  CME Accredited Dinner Symposium*
Location: Grand Ballroom Salon B,C
“The Changing Landscape in Castration Resistant Prostate Cancer: Spectrum of Opportunity”
Presenters: Philip Kantoff, MD and Celestia S. Higano, MD

*CME for this dinner symposium was provided by Penn State College of Medicine. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.

Thursday, December 1, 2011

6:45 a.m. – 7:45 a.m.  CME Accredited Breakfast Symposium*
Location: Grand Ballroom Salon C
“Optimizing Integration of Immunotherapy in Prostate Cancer”
Presenters: Philip Kantoff, MD and Celestia S. Higano, MD

*CME for this breakfast symposium was sponsored by an educational grant provided by Dendreon. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.

12:00 p.m. – 1:15 p.m.  Industry Sponsored Lunch Symposium
Location: Grand Ballroom Salon B
“XGEVA®: Identifying Bone Metastases and Preventing Skeletal-Related Events in Prostate Cancer”
Presenter: Neal Shore, MD, FACS

12:00 p.m. – 1:15 p.m.  Industry Sponsored Lunch Symposium
Location: Grand Ballroom Salon C
“Novel Mechanisms of Androgen Regulation and Modulation in Disease Progression”
Presenter: Judd W. Moul, MD, FACS

Friday, December 2, 2011

6:45 a.m. – 7:45 a.m.  CME Accredited Breakfast Symposium*
Location: Grand Ballroom Salon B,C
“An Advanced Simulation Framework for Optimizing Bladder Cancer Treatment Outcomes”
Session Chair: Gary D. Steinberg, MD
Moderator: Michael Toscani, PharmD
Panelists: Cheryl Lee, MD; Ashish Kamat, MD; Tuan Dinh, PhD

*CME for this breakfast symposium was provided by Medical Education Resources (MER). Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.

12:10 p.m. – 1:15 p.m.  Industry Sponsored Lunch Symposium
Location: Grand Ballroom Salon B,C
“Immunotherapy for the Treatment of Advanced Prostate Cancer”
Presenter: Daniel J. George, MD
The 12th annual scientific meeting in urologic oncology will be held November 30 – December 2, 2011 at the Marriott Bethesda North Hotel & Conference Center. The Society of Urologic Oncology and the World Urological Oncology Federation jointly sponsor this interactive meeting where all attendees participate in the discussions. State-of-the-art topics on prostate, kidney and bladder cancer, as well as, strategies in urologic oncology will be discussed.

**Registration/Information Desk Hours**
- **Wednesday, November 30th**: 2:00 p.m. – 6:00 p.m.
- **Thursday, December 1st**: 6:30 a.m. – 5:00 p.m.
- **Friday, December 2nd**: 6:30 a.m. – 5:00 p.m.

**Exhibit Hall Hours**
- **Thursday, December 1st**: 7:00 a.m. – 7:30 p.m.
- **Friday, December 2nd**: 7:00 a.m. – 6:00 p.m.

**Young Urologic Oncologists (YUO) Dinner**
- **Date**: Wednesday, November 30, 2011
- **Time**: 6:00 p.m. – 9:30 p.m.
- **Location**: Grand Ballroom G,H

Membership in the YUO Section of the Society of Urologic Oncology consists of fellows, scientists, and board certified or eligible physicians who are members of the SUO and have some post-residency training in urologic oncology. Membership is limited to the first seven years after completion of fellowship.

**Welcome Reception**
- **Date**: Thursday, December 1, 2011
- **Time**: 6:30 p.m. – 7:30 p.m.
- **Location**: Grand Ballroom A,D
- **Attire**: Business casual attire is appropriate

Enjoy dinner with friends and colleagues at the Marriott Bethesda North. One ticket is included with full meeting registration.

**SUO Dinner**
- **Date**: Thursday, December 1, 2011
- **Time**: 7:30 p.m. – 10:00 p.m.
- **Location**: Grand Ballroom B,C
- **Attire**: Business casual attire is appropriate

Enjoy dinner with friends and colleagues at the Marriott Bethesda North. Registration for this is an additional cost of $70.00 per person ($40.00 for fellows, nurses and residents).

**2011 Young Urologic Oncologists (YUO) Program**
- **Moderator**: Fernando J. Bianco, Jr., MD – Columbia University Division of Urology at Mt. Sinai Medical Center
- **Date**: Friday, December 2, 2011
- **Time**: 8:00 a.m. – 8:30 a.m.
- **Location**: Grand Ballroom E-H

**SUO-CTC Board of Directors Meeting**
- **Date**: Wednesday, November 30, 2011
- **Time**: 3:00 p.m. – 6:00 p.m.
- **Location**: Brookside

**SUO Board of Directors Meeting**
- **Date**: Wednesday, November 30, 2011
- **Time**: 6:00 p.m. – 9:00 p.m.
- **Location**: Forest Glen

**Educational Needs & Objectives**

**Needs**

Bladder cancer is one of the most expensive malignancies to manage as related to the need for continuous monitoring and the treatment of recurrence. The use of clinical practice guidelines relying on evidence based medicine in the management of patients with bladder cancer will help to ensure quality of care and cost containment. Urologists need a thorough understanding of the quality of care and cost issues related to bladder cancer including an examination of levels of evidence, implementation and compliance with clinical practice guidelines, the use of standardized reporting methodologies, and comparative effectiveness research.

The 5-year survival for bladder cancer patients with lymph node involvement at the time of surgery is 20-30% and patients with metastatic disease treated with chemotherapy have a median survival of only 15 months. Urologists need to be familiar with the current state of translational research in bladder cancer as related to both early and late stage disease including novel molecular targets and targeted therapeutics, pharmacogenomics to predict response to therapy, and exploring the role for agents targeting angiogenesis.

Randomized data has demonstrated that cytoreductive nephrectomy followed by immunotherapy provides a survival advantage over immunotherapy alone. With the introduction of targeted therapy such as mTOR inhibitors and Tyrosine Kinase Inhibitors, the treatment algorithm is under evolution. Urologists and medical oncologists manage these patients together and as such, an understanding of the role of cytoreductive nephrectomy in metastatic disease is needed to best treat patients.

There is no effective form of therapy for the treatment of patients with advanced forms of kidney cancer. Recent studies have shown that kidney cancer is not a single disease, it is made up of a number of different types of cancer, each with a different histology, a different
Penile cancer is a rare disease in the United States with most urologists evaluating only a handful of patients throughout their careers. A case based approach will be used to discuss evidence based practices with respect to management of the primary penile tumor and regional lymph nodes to include: Selection of patients for penile preserving strategies versus amputation; Selection of patients with clinically negative inguinal region for inguinal staging procedures; Role of imaging and pathologic factors; Integrating Chemotherapy, Surgery and Radiation in patients with locally advanced penile cancer.

Prostate cancer is the most common non-cutaneous cancer in men in the US, and the second leading cause of male cancer mortality. Intense research has focused on improving primary treatment of prostate cancer, in particular surgical and radiotherapy advances. Still, approximately 20-30% of patients who undergo primary treatment ultimately fail with rising PSA, and patients and physicians continue to struggle with the optimal management of these recurrent patients. An understanding of the treatment options in recurrent prostate cancer and the ideal patients in whom to offer these treatments is important to guide clinical decision-making and patient consultation.

Prostate cancer imaging, in particular for local staging, is not standardized, and imaging guidelines largely are based on imaging for metastatic disease. Recent studies of magnetic resonance imaging (MRI) and nuclear medicine advances in specific radioisotopes have yielded promising results, especially in the detection of low volume disease, including at local, regional, and distant sites. An understanding of the progress in prostate cancer imaging is important, as these imaging modalities may be employed in all stages of the natural history of prostate cancer. In addition, novel techniques to aid in the diagnosis of prostate cancer (e.g. adjuncts to prostate biopsy) may allow for improved detection of primary disease, and an understanding of the evolution of imaging in this area will be crucial to the practicing urologist.

Lastly, it is established that PSA screening has yielded a stage migration with potential overtreatment and over diagnosis. Traditional primary curative therapies (e.g. radical prostatectomy and radiation therapy) can be associated with substantial long-term side effects, and increasing effort worldwide is focused on minimally invasive options, so called “focal therapy”, that may be associated with improved side effect profiles and subsequent decreased impact on health-related quality of life. An overview of the emerging focal therapies will aid clinicians by providing a perspective on available and novel modalities in the focal treatment of clinically localized prostate cancer.

Educational Objectives

1. Review the quality of care and cost issues related to bladder cancer
2. Review the current state of translational research in bladder cancer as related to both early and late stage disease
3. Describe the role of partial nephrectomy versus nephrectomy for patients with localized kidney cancer
4. Report recent advances in the use of immunotherapy for the treatment of patients with advanced kidney cancer
5. Report recent advances in the discovery of new genes that cause cancer of the kidney
6. Report recent advances in systemic therapy for advanced kidney cancer with VEGF inhibitors and with novel agents which target the HIF2, PI3K, mTORC1 and mTORC2 pathway
7. Describe the importance of aerobic glycolysis in cancer and the novel approaches to treatment of cancers characterized by aerobic glycolysis
8. Describe the clinical and surgical management approaches to hereditary forms of kidney cancer
9. Identify the important prognostic factors in the primary penile tumor that allow for organ preserving strategies versus amputation
10. Describe factors within the primary penile tumor, imaging studies and clinical examination that correlate with the risk of inguinal lymph node metastasis
11. Describe the indications for different inguinal surgical staging procedures, their potential benefits and complications.
12. List the indications for multimodal therapy and describe current strategies in the management of locally advanced penile cancer.
13. Describe optimal approach and treatment strategies for recurrent prostate cancer
14. Report recent advances in imaging for prostate carcinoma
15. Assess the role of novel focal therapies for the primary treatment of localized prostate cancer
16. Identify the strengths and weakness of randomized clinical trials in comparative effectiveness research of prostate cancer.
17. Explain the strengths and weaknesses of observational studies in CER of prostate cancer
18. Recognize when it is appropriate to use each study design to address CER questions in prostate cancer

Evaluation of Quality of Activity

The educational quality of the meeting will be assessed with evaluation questionnaires to be filled out by the participants.
ACREDITATION

CME accreditation Statement
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the University of Oklahoma College of Medicine and the Society of Urologic Oncology. The University of Oklahoma College of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

The University of Oklahoma College of Medicine designates this live activity for a maximum of 11.25 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Conflict Resolution Statement
The University of Oklahoma College Of Medicine, Office of Continuing Professional Development has reviewed this activity’s speaker and planner disclosures and resolved all identified conflicts of interest, if applicable.

Equal Opportunity Statement
The University of Oklahoma is an equal opportunity institution.

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Special Assistance
We encourage participation by all individuals. If you have a disability, advance notification of any special needs will help us better serve you. Call (847) 264-5901 if you require special assistance to fully participate in the meeting.
“Extraordinary Opportunities for Discovery”
12th Annual Meeting of the Society of Urologic Oncology in Conjunction with the World Urological Oncology Federation
*All sessions located in Grand Ballroom E-H unless otherwise noted.

WEDNESDAY, NOVEMBER 30, 2011
2:00 p.m. – 6:00 p.m.  Registration/Information Desk Open
Location: Grand Ballroom Foyer

3:00 p.m. – 6:00 p.m.  SUO-CTC Board of Directors Meeting
Location: Brookside

6:00 p.m. – 9:00 p.m.  SUO Board of Directors Meeting
Location: Forest Glen

6:00 p.m. – 9:30 p.m.  Young Urologic Oncologist Dinner
Location: Grand Ballroom G,H
Chair: Fernando J. Bianco, Jr., MD

6:00 p.m.  Hors d’oeuvres

6:20 p.m.  Introduction
Moderator: Dr. Fernando J. Bianco – YUO President

6:30 p.m.  SUO Outreach and Educational Program: An Opportunity for YUO Members
Dr. Cheryl Lee

6:40 p.m.  Top YUO Abstracts Presentations
Podium #1  BLOOD LOSS ASSOCIATED WITH RADICAL CYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY COMPARING IMPACT LIGASURE VERSUS STAPLING DEVICE.
(Presented By: Ian M. Thompson, III)

Podium #2  MICRONRNA PROFILES IN RADICAL PROSTATECTOMY SPECIMENS: DIFFERENTIAL EXPRESSION BY GLEASON GRADE AND PATHOLOGIC STAGE
(Presented By: Soroush Rais-Bahrami)

Podium #3  IDENTIFICATION OF A MULTIPLE PEPTIDE SIGNATURE BY IMAGING MASS SPECTROMETRY WHICH ACCURATELY PREDICTS MORTALITY IN RENAL CELL CARCINOMA
(Presented By: Samuel D. Kaffenberger)

7:00 p.m.  Round Table Panel: Establishing an Urology Oncology Program
Drs. Neal Shore, Raj Pruthi, Douglas Sutherland, John Papadopoulos, Daniel Barocas

• Types of academic environments: the cost of protected time
• Challenges for non-academic environments.
• Negotiating Resources in both environments
• Feasibility of a research program in non academic setting

7:40 p.m.  Round Table Panel: Randomized Clinical Trials
Drs. Leonard Gomella, Dipen Parekh, Eric Castle, Stephen Boorjian

• Recent accomplishments
• Minimal requirements, Structure
• Collaboration and Funding
• Tissue Repository and Biomarkers
• Current Opportunities

8:20 p.m.  Surgical Technique RCTs – Are We Talking Phases, Classes or Something Else?
Dr. Andrew Vickers

8:30 p.m.  Dr. Douglas Sutherland: Proposal for a Surgical Technique RCT
Discussion Panel: Drs. Dipen Parekh, Raj Pruthi, Scott Eggener, Andrew Vickers
### Program Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:55 p.m.</td>
<td>Award to Best RCT presented at YUO</td>
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<tr>
<td></td>
<td>Dr. Fernando J. Bianco</td>
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<tr>
<td>9:00 p.m.</td>
<td>YUO Membership Reception</td>
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<tr>
<td>6:30 p.m.–7:30 p.m.</td>
<td>CME Accredited Dinner Symposium*</td>
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<tr>
<td></td>
<td><strong>Location:</strong> Grand Ballroom Salon B,C</td>
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<td><strong>See Page 3 for Full Details</strong></td>
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<tr>
<td></td>
<td>*CME for this dinner symposium was provided by Penn State College of Medicine. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.</td>
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#### THURSDAY, DECEMBER 1, 2011

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>6:30 a.m.–5:00 p.m.</td>
<td>Registration/Information Desk Open</td>
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<tr>
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<td><strong>Location:</strong> Grand Ballroom Foyer</td>
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<tr>
<td>6:45 a.m.–7:45 a.m.</td>
<td>CME Accredited Breakfast Symposium*</td>
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<tr>
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<td><strong>Location:</strong> Grand Ballroom Salon C</td>
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<td><strong>See Page 3 for Full Details</strong></td>
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<td>*CME for this breakfast symposium was sponsored by an educational grant provided by Dendreon. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.</td>
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<tr>
<td>7:00 a.m.–8:00 a.m.</td>
<td>Breakfast in Exhibit Hall</td>
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<td><strong>Location:</strong> Grand Ballroom A,D</td>
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<tr>
<td>7:00 a.m.–7:30 p.m.</td>
<td>Exhibit Hall Open</td>
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<td><strong>Location:</strong> Grand Ballroom A,D</td>
</tr>
<tr>
<td>7:00 a.m.–4:00 p.m.</td>
<td>Speaker Ready Room Open</td>
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<td><strong>Location:</strong> Timberlawn</td>
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<tr>
<td>8:00 a.m.–8:05 a.m.</td>
<td>Welcome and Introduction</td>
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<td>Program Chairs</td>
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<tr>
<td>8:05 a.m.–9:05 a.m.</td>
<td>Bladder Cancer Session I</td>
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<td><strong>Session Chair:</strong> Matthew I. Milowsky, MD</td>
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<td><strong>Bladder Cancer: Quality of Care at What Cost?</strong></td>
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<td><strong>Moderator:</strong> Sam Chang, MD</td>
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<tr>
<td>8:05 a.m.–8:10 a.m.</td>
<td>Introduction</td>
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<td>Sam Chang, MD</td>
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<tr>
<td>8:10 a.m.–8:18 a.m.</td>
<td>Improved Quality of Care Through Standardization of Reporting Methodology</td>
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<td>S. Machele Donat, MD</td>
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<tr>
<td>8:18 a.m.–8:26 a.m.</td>
<td>Improved Patient Care Through Evidence-Based Clinical Practice Guidelines</td>
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<td>Philipp Dahm, MD, MHSc, FACS</td>
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<td>8:26 a.m.–8:34 a.m.</td>
<td>Improved Quality and Reducing Costs of Bladder Cancer Care</td>
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<td>John Gore, MD</td>
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<td>8:34 a.m.–9:05 a.m.</td>
<td>Panel Discussion</td>
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<td><strong>Panelists:</strong> Philipp Dahm, MD, MHSc, Yair Lotan, MD, Dipen Parekh, MD, S. Machele Donat, MD, John Gore, MD</td>
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<td>Time</td>
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| 9:05 a.m. – 9:25 a.m. | State-of-the-Art Lecture  
Novel Kidney Cancer Genes: PbRM1/Histone Modifiers  
Andy Futreal, MD |                               |
| 9:25 a.m. – 10:25 a.m. | **Prostate Cancer Session I**  
Session Chair: Daniel W. Lin, MD  
Management of Recurrent Prostate Cancer  
Moderator: Peter Carroll, MD |                               |
| 9:25 a.m. – 9.55 a.m. | Salvage Therapies after Radiation Therapy  
9:25 a.m. – 9:40 a.m.  Cryotherapy  
Louis L. Pisters, MD  
9:40 a.m. – 9:55 a.m.  Brachytherapy  
Paul L. Nguyen, MD |                               |
| 9:55 a.m. – 10:10 a.m. | Role of Salvage Surgery  
Karim Touijer, MD |                               |
| 10:10 a.m. – 10:25 a.m. | Case Presentations and Q&A |                               |
| 10:25 a.m. – 10:50 a.m. | Break – Visit Exhibits  
*Location: Grand Ballroom A,D* |                               |
| 10:50 a.m. – 12:00 p.m. | **Kidney Cancer Session I**  
Session Chair: W. Marston Linehan, MD  
Translational Science in Kidney Cancer |                               |
| 10:50 a.m. – 11:05 a.m. | JNK Pathway Factor  
Kevin White, PhD |                               |
| 11:05 a.m. – 11:15 a.m. | Discussion |                               |
| 11:15 a.m. – 11:30 a.m. | Fumarate Hydratase- and Succinate Dehydrogenase-Deficient Kidney Cancer  
W. Marston Linehan, MD |                               |
| 11:30 a.m. – 11:40 a.m. | Discussion |                               |
| 11:40 a.m. – 11:55 a.m. | Novel Kidney Cancer Targets: Targeting Aerobic Glycolysis  
Ramaprasad Srinivasan, MD, PhD |                               |
| 11:55 a.m. – 12:00 p.m. | Discussion |                               |
| 12:00 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
*Location: Grand Ballroom Salon B*  
See Page 3 for Full Details |                               |
| 12:00 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
*Location: Grand Ballroom Salon C*  
See Page 3 for Full Details |                               |
| 1:15 p.m. – 1:25 p.m. | SUO Huggins Medal Presentation  
Edward M. Messing, MD |                               |
| 1:25 p.m. – 1:45 p.m. | Huggins Medal Lecture  
Paul H. Lange, MD |                               |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1:45 p.m. – 2:30 p.m.</td>
<td><strong>Penile Cancer Session I</strong>&lt;br&gt;Session Chair: Curtis Pettaway, MD&lt;br&gt;<strong>Penile Cancer Management 2011: A Case-Based Approach</strong>&lt;br&gt;Moderator: Curtis Pettaway, MD&lt;br&gt;Panelists: Juanita Crook, MD&lt;br&gt;Paul Hegarty, MD&lt;br&gt;Lance Pagliaro, MD</td>
</tr>
<tr>
<td>2:30 p.m. – 2:45 p.m.</td>
<td>Break – Visit Exhibits&lt;br&gt;<em>Location: Grand Ballroom A,D</em></td>
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<tr>
<td>2:45 p.m. – 3:45 p.m.</td>
<td><strong>Prostate Cancer II</strong>&lt;br&gt;Session Chair: Daniel W. Lin, MD&lt;br&gt;<strong>Current Status of Focal Primary Therapy for Prostate Cancer</strong>&lt;br&gt;Moderator: Samir Taneja, MD</td>
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<tr>
<td>2:45 p.m. – 2:55 p.m.</td>
<td>Image-Guided Laser Therapy for Solid Tumors&lt;br&gt;John Trachtenberg, MD</td>
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<td>2:55 p.m. – 3:05 p.m.</td>
<td>Focal Cryotherapy&lt;br&gt;J. Stephen Jones, MD, FACS, MBA</td>
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<td>3:05 p.m. – 3:15 p.m.</td>
<td>Focal Brachytherapy&lt;br&gt;Paul L. Nguyen, MD</td>
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<tr>
<td>3:15 p.m. – 3:25 p.m.</td>
<td>High Intensity Focused Ultrasound&lt;br&gt;Hashim Ahmed, MRCS(Ed), BM, BCh</td>
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<td>3:25 p.m. – 3:45 p.m.</td>
<td>Q&amp;A with Case Presentations</td>
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<tr>
<td>4:00 p.m. – 6:00 p.m.</td>
<td><strong>Poster Session I</strong>&lt;br&gt;<em>Location: Grand Ballroom A,D</em>&lt;br&gt;Poster walks (Not CME accredited)</td>
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<tr>
<td>6:30 p.m. – 7:30 p.m.</td>
<td><strong>Welcome Reception</strong>&lt;br&gt;<em>Location: Grand Ballroom A,D</em></td>
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<tr>
<td>7:30 p.m. – 10:00 p.m.</td>
<td><strong>SUO Dinner</strong>&lt;br&gt;<em>Location: Grand Ballroom B,C</em></td>
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**FRIDAY, DECEMBER 2, 2011**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>7:00 a.m. – 8:00 a.m.</td>
<td><strong>Breakfast in Exhibit Hall</strong>&lt;br&gt;<em>Location: Grand Ballroom A,D</em></td>
</tr>
<tr>
<td>7:00 a.m. – 4:00 p.m.</td>
<td><strong>Speaker Ready Room Open</strong>&lt;br&gt;<em>Location: Timberlawn</em></td>
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<tr>
<td>7:00 a.m. – 6:00 p.m.</td>
<td><strong>Exhibit Hall Open</strong>&lt;br&gt;<em>Location: Grand Ballroom A,D</em></td>
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<tr>
<td>6:30 a.m. – 5:00 p.m.</td>
<td><strong>Registration/Information Desk Open</strong>&lt;br&gt;<em>Location: Grand Ballroom Foyer</em></td>
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</tbody>
</table>
6:45 a.m. – 7:45 a.m.  CME Accredited Breakfast Symposium*
Location: Grand Ballroom Salon B,C
See Page 3 for Full Details
*CME for this breakfast symposium was provided by Medical Education Resources (MER).
Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.

8:00 a.m. – 8:30 a.m.  Young Urologic Oncologists (YUO) Program
Abstracts selected by the YUO
Moderator: Fernando J. Bianco, Jr., MD

8:00 a.m. – 8:09 a.m.  Highlights of YUO Sessions
8:09 a.m.  Podium #4  MR-GUIDED LASER FOCAL THERAPY FOR LOW - INTERMEDIATE RISK LOCALIZED PROSTATE CANCER
(Presented By: Uri Lindner)
8:16 a.m.  Podium #5*  ADRENAL NODULAR HYPERPLASIA AS PART OF THE HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CARCINOMA (HLRCC) PHENOTYPE
(Presented By: Brian Shuch)
8:23 a.m.  Podium #6  HOSPITAL READMISSION AFTER RADICAL CYSTECTOMY FOR BLADDER CANCER: RESULTS OF A POPULATION-BASED ANALYSIS FROM THE CALIFORNIA STATE INPATIENT DATABASE
(Presented By: Kenneth Nepple)
*Not CME Accredited

8:30 a.m. – 9:30 a.m.  Prostate Cancer III
Session Chair: Daniel W. Lin, MD
Progress in Prostate Cancer Imaging
Moderator: Mark Emberton, MD, FACS

8:30 a.m. – 8:33 a.m.  Introduction
Mark Emberton, MD, FACS

8:33 a.m. – 8:46 a.m.  New Magnetic Resonance Technologies in Local Staging
John Kurhanewicz, MD

8:46 a.m. – 8:59 a.m.  Nuclear Medicine Techniques in Prostate Cancer Imaging and Follow-Up
Peter Choyke, MD

8:59 a.m. – 9:12 a.m.  Imaging Adjuncts to Improve Prostate Biopsy
Clare Tempany, MD, PhD

9:12 a.m. – 9:30 a.m.  Q&A and Cases

9:30 a.m. – 10:30 a.m.  Outcomes Session
Session Chair: David F. Penson, MD, MPH

9:30 a.m. – 9:45 a.m.  RCTs to Address CER Issues
Neil Fleshner, MD

9:45 a.m. – 10:00 a.m.  Observational Studies
Martin G. Sanda, MD

10:00 a.m. – 10:15 a.m.  Outsider Perspective
Sheldon Greenfield, MD

10:15 a.m. – 10:30 a.m.  Panel Discussion
Moderator: Daniel A. Barocas, MD
Martin G. Sanda, MD
Sheldon Greenfield, MD
Neil Fleshner, MD
10:30 a.m. – 10:50 a.m.  Break – Visit Exhibits  
Location: Grand Ballroom A,D

10:50 a.m. – 11:50 p.m.  Kidney Cancer Session II  
Session Chair: W. Kimryn Rathmell, MD, PhD

10:50 a.m. – 11:05 a.m.  Recent Advances in Immunotherapy  
David McDermott, Jr., MD

11:05 a.m. – 11:20 a.m.  VEGF Inhibitors (Axitinib, Tivozanib)  
Robert Motzer, MD

11:20 a.m. – 11:35 a.m.  Novel Kidney Cancer Targets: Targeting the HIF2a Pathway  
Michael Atkins, MD

11:35 a.m. – 11:50 a.m.  Partial Nephrectomy Versus Nephrectomy for Low Stage RCC  
Hendrik Van Poppel, MD

11:50 a.m. – 12:10 p.m.  State-of-the-Art Lecture:  
Screening and Prevention in 2011: Where Do We Go from Here?  
Gerald L. Andriole, Jr., MD

12:10 p.m. – 1:15 p.m.  Industry Sponsored Lunch Symposium  
Location: Grand Ballroom Salon B,C  
See Page 3 for Full Details

1:15 p.m. – 2:15 p.m.  Oral Abstract Session (See page 15 for more information)  
Moderator: Michael Cookson, MD

1:15 p.m. Podium 7  
1:25 p.m. Podium 8  
1:35 p.m. Podium 9*  
1:45 p.m. Podium 10  
1:55 p.m. Podium 11  
2:05 p.m. Podium 12*  
*Not CME Accredited

2:15 p.m. – 3:15 p.m.  Bladder Cancer Session II  
Session Chair: Matthew I. Milowsky, MD  
Bladder Cancer: From Bench to Bedside (Translational Science Session)  
Moderator: Colin P.N. Dinney, MD

2:15 p.m. – 2:20 p.m.  Introduction  
Colin P.N. Dinney, MD

2:20 p.m. – 2:28 p.m.  Application of Next Generation Sequencing to Targeted Clinical Trials  
David B. Solit, MD

2:28 p.m. – 2:36 p.m.  Personalizing Peri-Operative Chemotherapy for Bladder Cancer Using Germline Markers to Predict Chemotherapy Outcomes  
Peter H. O’Donnell, MD

2:36 p.m. – 3:06 p.m.  Panel Discussion  
Donna Hansel, MD, PhD  
Felix Feng, MD  
Peter O’Donnell, MD  
David Solit, MD

3:06 p.m. – 3:15 p.m.  Q&A

3:15 p.m. – 4:00 p.m.  SUO-CTC Scientific Session  
Moderator: Colin P.N. Dinney, MD

4:00 p.m. – 6:00 p.m.  Poster Session II / Reception  
Location: Grand Ballroom A,D  
Poster walk (Not CME accredited)
YOUNG UROLOGIC ONCOLOGISTS DINNER PODIUM SESSION

Wednesday, November 30, 2011
6:40 p.m. – 7:00 p.m.

Podium #1

BLOOD LOSS ASSOCIATED WITH RADICAL CYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY COMPARING IMPACT LIGASURE VERSUS STAPLING DEVICE.
Ian M. Thompson, III¹, Daniel A. Barocas¹, Carl J. Bischoff¹, Peter E. Clark¹, Michael S. Cookson¹, Stephen F. Kappa², Todd M. Morgan¹, Matthew J. Resnick¹, Joseph A. Smith¹ and Sam S. Chang¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery; ²Vanderbilt University Medical Center, School of Medicine
(Presented By: Ian M. Thompson, III)

Podium #2

MICRORNA PROFILES IN RADICAL PROSTATECTOMY SPECIMENS: DIFFERENTIAL EXPRESSION BY GLEASON GRADE AND PATHOLOGIC STAGE
Soroush Rais-Bahrami¹, Kevin Smith¹, Nikhil Waingankar¹, Michaela Oswald², Houman Khalili², Annette Lee², Peter Gregersen², Theresa Chan³ and Manish Vira¹
¹The Arthur Smith Institute for Urology, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY; ²The Feinstein Institute for Medical Research, Manhasset, NY; ³Department of Pathology and Laboratory Medicine, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY
(Presented By: Soroush Rais-Bahrami)

Podium #3

IDENTIFICATION OF A MULTIPLE PEPTIDE SIGNATURE BY IMAGING MASS SPECTROMETRY WHICH ACCURATELY PREDICTS MORTALITY IN RENAL CELL CARCINOMA
Samuel D. Kaffenberger¹, Todd M. Morgan¹, Erin H. Seeley², Oluwole Fadare³, Richard M. Caprioli² and Peter E. Clark¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University, Department of Biochemistry, Nashville, TN; ³Vanderbilt University Medical Center, Department of Pathology, Nashville, TN
(Presented By: Samuel D. Kaffenberger)
Young Urologic Oncologists Program Podium Session
Friday, December 2, 2011
8:00 a.m. – 8:30 a.m.

Podium #4
MR-GUIDED LASER FOCAL THERAPY FOR LOW - INTERMEDIATE RISK LOCALIZED PROSTATE CANCER
Uri Lindner, Sean R.H. Davidson, Masoom A. Haider, Eugen Hlasny, Mark R. Gertnre, Walter Kucharczyk and John Trachtenberg
University Health Network, Toronto, ON, Canada
(Presented By: Uri Lindner)

Podium #5*
ADRENAL NODULAR HYPERPLASIA AS PART OF THE HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CARCINOMA (HLRCC) PHENOTYPE
Brian Shuch¹, Cathy Vocke¹, Vladimir Valera², Beatriz Walter Rodriguez², Chris Ricketts¹, Rabindra Gautam¹, Gopal Gupta¹, Peter Pinto¹, Ramaprasad Srinivasan¹, Maria Merino², W. Marston Linehan¹ and Gennady Bratslavsky³
¹NCI Urologic Oncology Branch, Bethesda, MD; ²NCI Translational Surgical Pathology Branch, Bethesda, MD; ³Department of Urology, SUNY Upstate Medical University
(Presented By: Brian Shuch)

Podium #6
HOSPITAL READMISSION AFTER RADICAL CYSTECTOMY FOR BLADDER CANCER: RESULTS OF A POPULATION-BASED ANALYSIS FROM THE CALIFORNIA STATE INPATIENT DATABASE
Kenneth Nepple, Pamela Owens, Seth Strope, Gurdarshan Sanhu, Dorina Kallogjeri and Adam Kibel
Washington University, St. Louis, MO
(Presented By: Kenneth Nepple)

*Not CME Accredited
Oral Abstract Session
Friday, December 2, 2011
1:15 p.m. – 2:15 p.m.

Podium #7
THE IMPACT OF MIXED HISTOLOGICAL FEATURES ON SURVIVAL FOLLOWING RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA
Simon Kim, Igor Frank, John Cheville, R. Houston Thompson, Christopher Weight, Prabin Thapa and Boorjian Stephen
Mayo Clinic, Rochester, MN
(Presented By: Simon Kim)

Podium #8
PROGNOSTIC SIGNIFICANCE OF CANCER STEM CELL MARKERS IN BLADDER CANCER PATIENT SURVIVAL
Philip Ho¹, Jens-Peter Volkmer², Debashis Sahoo², Robert Chin², Guilherme Godoy¹, Seth Lerner¹, Matt van de Rijn², Linda Shortliffe², Irving Weissman² and Keith Chan¹
¹Baylor College of Medicine, Houston, TX; ²Stanford University, Palo Alto, CA
(Presented By: Philip Ho)

Podium #9*
LYCOPENE IN THE PREVENTION OF RENAL CELL CANCER IN THE TSC2 MUTANT EKER RAT MODEL
Brian Cross¹, Kazim Sahin², Nurhan Sahin², Karina Ciccone³, Adeboye Osunkoya³, Viraj Master³, Wayne Harris³, Bradley Carthon³, Ramzi Mohammad³, Birdal Bilir³, Daniel Canter³, Karin Wertz³, Daqing Wu³, Carlos Moreno³, Cheryl Walker⁴ and Omer Kucuk⁴
¹Winship Cancer Institute, Emory University, Atlanta, GA; ²Department of Animal Nutrition, Veterinary Faculty, Firat University, Elazig, Turkey; ³The University of Sydney Medical School, Sydney, Australia; ⁴Karmanos Cancer Institute, Wayne State University, Detroit, MI; ⁵DSM, Basel, Switzerland; ⁶Department of Systems Biology, The University of Texas MD Anderson Cancer Center, Houston, TX
(Presented By: Brian Cross)

Podium #10
NUCLEAR TRANSLOCATION OF HIF-2ALPHA IN HUMAN KIDNEY CANCER CELLS IS DEPENDENT UPON NADP(H) OXIDASE 4 SUPEROXIDE GENERATION
Guimin Chang, Li Chen and Jodi Maranchie
University of Pittsburgh, Pittsburgh, PA
(Presented By: Jodi Maranchie)

Podium #11
IS PERINEURAL INVASION IN PROSTATE BIOPSIES ASSOCIATED WITH ADVERSE PATHOLOGICAL OUTCOME? OLD PARADIGM REVISITED.
Malik Elharram¹, David Margel¹, Antonio Finelli¹, Alexandre Zlotta¹, John Trachtenberg¹, Andrew Evans² and Neil Fleschner²
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Department of Pathology, Princess Margaret Hospital, University Health Network, Toronto, Canada
(Presented By: David Margel)

Podium #12*
PROSTATE CANCER RISK IN MEN WITH PROSTATE AND BREAST CANCER FAMILY HISTORY: RESULTS FROM THE REDUCE STUDY
Jean-Alfred Thomas, Leah Gerber¹, Daniel Moreira², Robert Hamilton², Lionel Bañez², Ramiro Castro-Santamaria², Gerald Andriole³, William Isaacs⁴, Jianfeng Xu² and Stephen Freedland¹
¹Duke Prostate Center, Division of Urological Surgery, Department of Surgery, Duke University School of Medicine, Durham, NC; ²The Author Smith Institute for Urology, New Hyde Park, NY; ³Memorial Sloan-Kettering Cancer Center, New York, NY; ⁴GlaxoSmithKline, Research Triangle Park, North Carolina; ⁵Washington University School of Medicine in St. Louis, St. Louis, Missouri; ⁶Department of Urology, Johns Hopkins Hospital, Baltimore, MD; ⁷Center for Genomics and Personalized Medicine Research, Wake Forest University, Winston-Salem, NC
(Presented By: Jean-Alfred Thomas)

*Not CME Accredited
Poster Session I
Thursday, December 1, 2011
4:00 p.m. – 6:00 p.m.
Poster walks

Poster #1
ANTI-IL10-R1 MONOCLONAL ANTIBODY ENHANCES BACILLUS CALMETTE-GUERIN (BCG) INDUCED TH1 AND ANTI-
BLADDER CANCER IMMUNE RESPONSES IN VITRO AND IN VIVO
Nathan Bockholt¹, Matthew Knudson¹, Jonathan Henning¹, Peter Weady², George Smith², Michael Eisenbraun², James Fraser², Michael
O'Donnell¹ and Yi Luo¹
¹University of Iowa, Iowa City, IA; ²Pfizer, Inc., New York, NY
(Presented By: Nathan Bockholt)

Poster #2
PROGNOSTIC SIGNIFICANCE OF CYSTOSCOPY FINDINGS FOLLOWING NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER
Ahmed M. Mansour, Ahmed Eldefrawy, Mark S. Soloway and Murugesan Manoharan
University of Miami, Miller School of Medicine, Miami, Florida
(Presented By: Ahmed M. Mansour)

Poster #3
COMPLICATIONS OF SALVAGE CYSTECTOMY AFTER FAILED BLADDER-SPARING THERAPY FOR MUSCLE-INVASIVE BLADDER CANCER
Jairam Eswara¹, Jason Efstathiou², Niall Heney¹, Jonathan Paly², Donald Kaufman², W. Scott McDougal¹, Francis McGovern¹ and William
Shipley²
¹Department of Urology, Massachusetts General Hospital, Boston, MA; ²Department of Radiation Oncology, Massachusetts General Hospital
- Boston, MA; ³Division of Hematology/Oncology, Massachusetts General Hospital, Boston, MA
(Presented By: Jairam Eswara)

Poster #4
WHAT IS EVALUATION OF HEMATURIA BY PRIMARY CARE PHYSICIAN’S: USE OF ELECTRONIC MEDICAL RECORDS TO ASSESS PRACTICE PATTERNS?
Casey Seideman¹, Ramy Youssef¹, Anna Buteau¹, Robert Svatko², Gaurab Chakrabarti¹, Gary Reed¹, Deepa Bhat¹ and Yair Lotan¹
¹University of Texas Southwestern Dallas, TX; ²University of Texas Health Science Center at San Antonio, San Antonio, TX
(Presented By: Casey Seideman)

Poster #5
A COMPARATIVE ANALYSIS OF ONCOLOGIC OUTCOMES IN PATIENTS WITH VARIANT HISTOLOGY BLADDER CANCER
Sanjay Patel, Vivek Patel¹, Kirk Keegan², Dan Barocas², David Penson², Michael Cookson², Sam Chang², Peter Clark², Joseph Smith² and Todd
Morgan²
¹Duke University; ²Vanderbilt University Department of Urology
(Presented By: Sanjay Patel)
Poster #6
EXTRANODAL EXTENSION IS A POWERFUL PROGNOSTIC FACTOR IN BLADDER CANCER PATIENTS WITH LYMPH NODE METASTASIS
Eugene Cha¹, Harun Fajkovic¹, Claudio Jeldres², Thomas Chромеcki¹, Brian Robinson¹, Robert Svatek³, Patrick Bastian⁴, Pierre Karakiewicz⁵, Giacomo Novara⁶, Hans-Martin Fritsche⁷, Maximilian Burger⁸, Guru Sonpavde⁹, Siamak Daneshmand⁹, Yair Lotan⁹, Douglas Scherr¹ and Shahrokh Shariat¹
¹Weill Cornell Medical College, New York, NY; ²University of Montreal Health Center, Montreal, Canada; ³University of Texas San Antonio, San Antonio, TX; ⁴Ludwig-Maximilians-Universitat Munchen, Munich, Germany; ⁵University of Padua, Padua, Italy; ⁶University of Regensburg, Regensburg, Germany; ⁷Baylor College of Medicine, Houston, TX; ⁸University of Southern California, Los Angeles, CA; ⁹University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Eugene Cha)

Poster #7
HEAT SHOCK PROTEIN 70 (HSP70) AS A RECURRENCE MARKER FOR PT1 BLADDER CANCER
Oleksandr Stakhovskyi¹, David Margel¹, Theodorus van der Kwast², Bas van Rhijn¹, Peter Bostrom¹, John Thoms², Neil Fleshner¹, Michael Jewett¹, Bapat Bharati² and Alex Zlotta¹
¹Division of Urology, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada.; ²Department of Pathology, University Health Network, Toronto, ON, Canada.; ³Department of Radiation Oncology, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada.
(Presented By: Oleksandr Stakhovskyi)

Poster #8
OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY USING THE NEW AJCC PATHOLOGIC CLASSIFICATION FOR SUBEPITHELIAL PROSTATIC INVASION
Amit Patel, Joshua Cohn, Sandip Prasad, Mike Large, Norm Smith, Gladell Paner and Gary Steinberg
University of Chicago Medical Center, Chicago, IL
(Presented By: Amit Patel)

Poster #9
PSYCHOMETRIC CHARACTERISTICS OF A CONDITION-SPECIFIC HEALTH-RELATED QUALITY OF LIFE SURVEY: THE FACT-VANDERBILT CYSTECTOMY INDEX
Christopher Anderson¹, Irene Feurer², Michael Large³, Gary Steinberg³, Daniel Barocas⁴, Michael Cookson¹ and David Penson¹
¹Department of Urologic Surgery, Vanderbilt University Medical Center, Nashville, TN; ²Departments of Surgery and Biostatistics, Vanderbilt University Medical Center, Nashville, TN; ³Section of Urology, University of Chicago Medical Center, Chicago, IL; ⁴Department of Urologic Surgery and the Center for Surgical Quality and Outcomes Research, Vanderbilt University Medical Center, Nashville, TN
(Presented By: Christopher Anderson)

Poster #10
VOLUME-OUTCOMES IN CYSTECTOMY: IS IT THE SURGEON OR THE SETTING?
Todd M. Morgan, Daniel A. Barocas, Kirk A. Keegan, Michael S. Cookson, Sam S. Chang, Peter E. Clark, Shenghua Ni, Joseph A. Smith, Jr. and David F. Penson
Vanderbilt University
(Presented By: Todd M. Morgan)

Poster #11
THE IMPACT OF ACCURATE STAGING ON BLADDER CANCER SURVIVAL: A PROCESS-OUTCOMES LINK.
Karim Chamie¹, Jeffrey C. Basset¹, Timothy J. Daskivich¹, Meryl Leventhal², Dennis Deapen² and Mark S. Litwin¹
¹UCLA, Los Angeles, CA; ²Cancer Surveillance Program, Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, CA
(Presented By: Karim Chamie)
Poster #12
IMPACT OF PARTNER STATUS AND DIVERSION TYPE ON SEXUALITY IN WOMEN UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER: A PILOT SURVEY
Tullika Garg¹, Jeanne Carter¹, Peter Langenstroer², William See² and Margarita Kressin³
¹MSKCC, New York, NY; ²Medical College of Wisconsin, Milwaukee, WI; ³Medical and Surgical Associates of Corsicana, Corsicana, TX
(Presented By: Tullika Garg)

Poster #13
DOES PATIENT AGE IMPACT SURVIVAL AFTER RADICAL CYSTECTOMY?
David Horovitz¹, Polat Turker¹, Peter J. Bostrom¹, David Marge¹, Tuomas Mirtti², Martti Nurmi², Neil E. Fleshner¹, Antonio Finelli¹, Michael A. Jewett¹ and Alexandre R. Zlotta¹,4
¹University Health Network, Princess Margaret Hospital, Toronto, ON; ²Turku University Hospital, Turku, Finland; ³Helsinki University Hospital, Helsinki, Finland; ⁴Mount Sinai Hospital, Toronto, ON
(Presented By: David Margel)

Poster #14
EXTERNAL VALIDATION OF A BIOMARKER BASED PRE-CYSTECTOMY ALGORITHM TO PREDICT NON-ORGAN CONFINED UROTHELIAL CANCERS
David Margel¹, Peter Bostrom¹, Jack Baniel², Ofer Yossepowitch², Alexandre Zlotta¹ and Neil Fleshner¹
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Institute of Urology, Rabin Medical Center- Beilinson, Petach Tikva, Israel
(Presented By: David Margel)

Poster #15
TREATMENT PATTERNS AND SURVIVAL OUTCOMES OF PATIENTS 50 YEARS OLD AND YOUNGER DEFINITIVE TREATMENT FOR BLADDER UROTHELIAL CELL CARCINOMA
Sanjay Patel, Vivek Patel¹, Kirk Keegan², Daniel Barocas², David Penson², Michael Cookson², Sam Chang², Peter Clark², Joseph Smith² and Todd Morgan²
¹Duke University, Durham NC; ²Vanderbilt Department of Urologic Surgery
(Presented By: Sanjay Patel)

Poster #16
OBESITY IS ASSOCIATED WITH WORSE ONCOLOGICAL OUTCOMES IN PATIENTS TREATED WITH RADICAL CYSTECTOMY
Thomas Chronecki¹, Michael Rink¹, Eugene Cha¹, Harun Fajkovich¹, Behfar Ehdai¹, Robert Svatek², Pierre Karakiewicz¹, Yair Lotan⁴, Derya Tilki⁵, Patrick Bastian⁶, Siham Daneshmand⁶, Wassim Kassouf⁷, Giacomo Novara⁸, Hans-Martin Fritsche⁹, Maximilian Burger⁹, Jonathan Izawa¹⁰, Yves Fradet¹¹, Marek Babjuk¹² and Shahrokh F. Shariat¹
¹Weill Medical College of Cornell University, New York, NY, USA; ²University of Texas Health Science Center San Antonio, San Antonio, TX, USA; ³University of Montréal, Montréal, Quebec, Canada; ⁴University of Texas Southwestern Medical Center, Dallas, TX, USA; ⁵Ludwig-Maximilians-University Munich, Klinikum Grosshadern, Munich, Germany; ⁶University of Southern California Keck School of Medicine and Norris Comprehensive Cancer Center, Los Angeles, CA, USA; ⁷McGill University Health Centre, Montréal, Quebec, Canada; ⁸University of Padua, Padua, Italy; ⁹Caritas St. Josef Medical Center, University of Regensburg, Regensburg, Germany; ¹⁰University of Western Ontario, London, Ontario, Canada; ¹¹Laval University, Québec City, Québec, Canada; ¹²Charles University, Praha, Czech Republic
(Presented By: Michael Rink)
Poster #17
THE IMPACT OF SERUM ALBUMIN ON EARLY COMPLICATION AND SURVIVAL RATE OF PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER
Hooman Djaladat¹, Adrian Fairey¹, Gus Miranda², Jie Cai², Anne Schuckman³, Eila Skinner⁴ and Siamak Daneshmand⁵
¹Urologic Oncology Fellow, Norris Cancer Center, USC, Los Angeles, CA; ²Urology department, USC, Los Angeles, CA; ³Assistant professor of Urology, Urology department, USC, Los Angeles, CA; ⁴Professor of Urology, Urology department, USC, Los Angeles, CA; ⁵Associate professor of Urology, Urology department, USC, Los Angeles, CA
(Presented By: Hooman Djaladat)

Poster #18
CLINICAL UTILITY OF NMP22 FOR THE SURVEILLANCE OF PATIENTS WITH RECURRENT BLADDER CANCER: A MULTI-CENTER CROSS-SECTIONAL STUDY
Eugene Cha¹, Christopher Barbieri¹, Thomas Chromecki¹, Allison Dunning¹, Yair Lotan², Michael Rink¹, Douglas Scherr¹, Pierre Karakiewicz³, Madhu Mazumdar¹ and Shahrokh Shariat¹
¹Weill Cornell Medical College, New York, NY; ²University of Texas Southwestern Medical Center, Dallas, TX; ³University of Montreal, Montreal, Canada
(Presented By: Eugene Cha)

Poster #19
URINARY AMINOPEPTIDASE ACTIVITIES AS FUNCTIONAL BIOMARKERS OF BLADDER CANCER
Jennifer Taylor¹, Mariana Yaneva², Kevin Velasco², Hediye Erdjument-Bromage², John Philip², Yongbiao Li², Hans Lilja¹, Bernard Bochner¹ and Paul Tempst²
¹Urology Service, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Protein Center, MSKCC, New York NY; ³Urology Service, MSKCC, New York, NY
(Presented By: Jennifer Taylor)

Poster #20
VALIDATION OF NEW STAGING SYSTEM FOR PATIENTS WITH INVASIVE UROTHELIAL CARCINOMA OF THE PROSTATE
Ahmed Abd El Latif¹, Ranko Miocinovic¹, Hosni Salem², Amr Massoud², Andrew J. Stephenson¹ and Donna Hansel¹
¹Cleveland Clinic, Cleveland, Ohio; ²Cairo University, Cairo, Egypt
(Presented By: Ahmed Abd El Latif)

Poster #21
MICRORNA 200C EXPRESSION LEVEL PREDICTS OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY
Neema Navai, Matthew Wszolek, David McConkey, Adam Liana and Colin Dinney
MD Anderson Cancer Center Houston, TX
(Presented By: Neema Navai)

Poster #22
PROGNOSTIC VALUE OF APOPTOTIC MARKERS IN SQUAMOUS CELL CARCINOMA OF THE BLADDER
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The University of Texas M.D. Anderson Cancer Center, Houston, TX

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University of North Carolina, Chapel Hill, NC

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Moffitt Cancer Center, Tampa, FL

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Hofstra North Shore LIJ School of Medicine

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Seth Cohen¹, Sean Stroup², Ryan Kopp¹, Kerrin Palazzi-Churas², James L’Esperance¹ and Ithaar Derweesh²

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UT Southwestern, Dallas, TX
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Jay Simhan¹, Marc Smaldone¹, Daniel Canter¹, Jose Reyes¹, Fang Zhu¹, Russell Starkey¹, Karyn Stitzenberg², Robert Uzzo¹ and Alexander Kutikov¹
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National Cancer Institute, Bethesda, Maryland
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Steven Stone¹, Jack Cuzick², Julia Reid¹, David Mesher², Henrik Møller³, Gabrielle Fisher², Jerry Lanchbury¹, Alexander Gutin¹ and Greg Swanson⁴
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Elizabeth Singer¹, Jennifer Linehan², Ashraf Imam³, David Smith¹, Sofia Loera¹, Timothy Wilson¹ and Steven Smith¹
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Jennifer Linehan¹, Nora Ruel², David Smith², Steven Smith² and Timothy Wilson²
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¹Durham, North Carolina; ²Palo Alto, California; ³Portland, Oregon; ⁴Augusta, Georgia; ⁵Los Angeles, California; ⁶San Diego, California; ⁷San Francisco, California
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Suzanne Biehn Stewart¹, John Madden², Leah Gerber¹, Thomas Polascik¹, Cary Robertson¹, Philip Walther¹, Stephen Freedland¹, Judd Moul¹ and Lionel Banez¹
¹Division of Urology, Duke University Medical Center, Durham, NC; ²Department of Pathology, Duke University Medical Center, Durham, NC
(Presented By: Suzanne Biehn Stewart)

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Danielle Brooks, Prasanna Sooriakumaran, Daniel Sagalovich, Adam Calaway, David Flomenbaum, Samarpit Rai, Shahroksh Shariat, Matthieu Durand, Abhishek Srivastava and Ashutosh Tewari
Weill Cornell Medical College, Department of Urology, New York, NY
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William Rogers, Daniel Rothschild, Jason Bylund, Ramakrishna Venkatesh, John Demos, Stephen Strup, David Preston and Paul Crispen
Veterans Affairs Medical Center and University of Kentucky, Lexington KY
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Mayo Clinic
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Abhinav Khanna¹, Jim C. Hu², Xiangmei Gu³ and Ganesh Palapattu⁴
¹Baylor College of Medicine, Houston TX; ²Division of Urologic Surgery, Brigham and Women’s Hospital, Boston MA; ³Center for Surgery and Public Health, Brigham and Women’s Hospital, Boston MA; ⁴Department of Urology, Methodist Hospital, Houston TX
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Eric Klein¹, Mike Kiefer², Michael Crager², Cristina Magi-Galuzzi¹, Sara Falzarano¹, Robert Pelham², Diana Cherlavaz², Joffre Baker², Steven Shak² and Mark Lee²
¹Cleveland Clinic, Cleveland, OH; ²Genomic Health, Inc., Redwood City, CA
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Stephen Poon¹, Christopher Kloss², Jason Plotkin² and Michel Sadelain²
¹Urology Service, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Center for Cell Engineering, Molecular Pharmacology and Chemistry Program, Memorial Sloan-Kettering Cancer Center, New York, NY
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Nitin Yerram¹, Dmitry Volkin¹, Jeffery Nix¹, Anthony Hoang¹, Faisal Ahmed¹, Gopal Gupta¹, Ardeshir Rastinehad¹, Jochen Kruecker², Samuel Kadoury², Julia Locklin¹, Stacey Gates¹, Sheng Xu¹, Maria Merino³, W. Marston Linehan¹, Baris Turkbey², Peter Choyke², Bradford Wood¹ and Peter Pinto²
¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Philips Research North America, Briarcliff Manor, NY; ³Department of Interventional Oncology, National Institutes of Health, Bethesda, MD; ⁴Laboratory of Pathology, National Institutes of Health, Bethesda, MD; ⁵Molecular Imaging Program, National Institutes of Health, Bethesda, MD
(Presented By: Nitin Yerram)

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Anup Vora¹, Heinric Williams², Douglass Chinn³, Baris Turkbey², Peter Choyke², Sam Khadoury⁴, Jochen Kreuker¹, Bradford Wood², Gennady Bratslavsky² and Peter Pinto²
¹Georgetown University Hospital, Washington DC; ²National Institutes of Health, Bethesda, MD; ³Chinn & Chinn Associates, Arcadia, CA; ⁴Phillips Engineering, Briarcliff Manor, NY
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Massachusetts General Hospital, Boston, MA
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Prasanna Sooriakumaran, Abhishek Srivastava, Matthieu Durand, Danielle Brooks, Daniel Sagalovich, Adam Calaway, Samarpit Rai, Shahrokh Shariat and Ashutosh Tewari
Weill Cornell Medical College, Department of Urology, New York, NY
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Cleveland Clinic, Cleveland, OH
(Presented By: Bethany Kerr)

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Jeffrey Mullins, Toby Cornish, Adam Reese, Joel Fradin, Lynda Mettee, Frederic Askin, Angelo DeMarzo, Jonathan Epstein and Christian Pavlovich
Johns Hopkins Medical Institutions, Brady Urological Institute, Baltimore, MD
(Presented By: Jeffrey Mullins)

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THE QUALITY OF PROSTATE CRYOTHERAPY INFORMATION ON THE INTERNET
Ankur Manvar¹, Raj Kurpad², Ian Udell², Angela Smith², Michael Woods², Matt Raynor², Eric Wallen², Matthew Nielsen² and Raj Pruthi²
¹Medical College of Georgia, Augusta, GA; ²University of North Carolina, Chapel Hill, NC
(Presented By: Raj Kurpad)

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A LOWER PSA AT THE TIME OF TREATMENT WITH SALVAGE CRYOABLATION OF THE PROSTATE RESULTS IN IMPROVED FREEDOM FROM BIOCHEMICAL FAILURE
Brooke Edwards¹, Louis Pisters², Steve Jones³ and Robert Given⁴
¹Eastern Virginia Medical School, Norfolk, VA; ²MD Anderson Cancer Center, Houston, TX; ³Cleveland Clinic, Cleveland, OH; ⁴Urology of Virginia, Norfolk, VA
(Presented By: Brooke Edwards)

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LOCAL FAILURE AFTER WHOLE-GLAND SALVAGE THERAPY WITH SONABLATE HIGH INTENSITY FOCUSED ULTRASOUND IN RADIO-RECURRENT PROSTATE CANCER
Ana Maria Autran-Gomez¹, Alejandro Lazo-Langner², Ali Alzaharani¹, Jonathan Izawa¹ and Joseph Chin¹
¹Division of Urology and Surgical Oncology University of Western Ontario, London ON. Canada; ²Division of Hematology and Epidemiology and Biostatistics, University of Western Ontario, London ON. Canada
(Presented By: Ana Maria Autran-Gomez)

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SALVAGE ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY: A SINGLE INSTITUTION FIVE-YEAR EXPERIENCE
Samuel D. Kaffenberger¹, Kirk A. Keegan¹, Todd M. Morgan¹, Dominic H. Tang¹, Neil K. Bansal², Daniel A. Barocas³, David F. Penson³, Rodney Davis¹, Peter E. Clark¹, Sam S. Chang¹, Michael S. Cookson¹, S. Duke Herrell¹ and Joseph A. Smith¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University School of Medicine, Nashville, TN
(Presented By: Samuel D. Kaffenberger)

Poster #93
WAITING TILL THEY COME TO US; THE IMPACT OF VOIDING COMPLAINTS ON CANCER DETECTION RATES IN THE INNER CITY
Clifford Georges, Nicholas Karanikolas, Llewelyn Hyacinthe, Fernado Cabrera-Piquer and Semyon Gurgov
SUNY Downstate Department of Urology
(Presented By: Clifford Georges)
Poster #94
COST-EFFECTIVENESS OF STANDARD VERSUS INTENSIVE ANTIBIOTIC REGIMENS FOR TRANS-RECTAL ULTRASOUND GUIDED PROSTATE BIOPSY PROPHYLAXIS
Mehrad Adibi, Margaret Pearle and Yair Lotan
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

Poster #95
DOES INTRAOPERATIVE SHEDDING OF PROSTATE CANCER CIRCULATING TUMOR CELLS OCCUR DURING ROBOTIC PROSTATECTOMY?
Eric Kauffman¹, Min Jung Lee², Sylvia Alarcon², Sunmin Lee², Jane Trepel² and Peter Pinto¹
¹Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Medical Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Eric Kauffman)

Poster #96
RISK OF PROSTATE CANCER ON THIRD PROSTATE BIOPSY FOLLOWING DIAGNOSIS OF ATYPICAL GLANDS SUSPICIOUS FOR CARCINOMA ON REPEAT BIOPSY
Brandon Isariyawongse, Ahmed El-Shafei and J. Stephen Jones
Glickman Urological and Kidney Institute, Cleveland Clinic Foundation, Cleveland, OH
(Presented By: Brandon Isariyawongse)

Poster #97
HISTOPATHOLOGICAL FEATURES IN LOCAL RADIO-RECURRENT PROSTATE CANCER FOLLOWING HIGH INTENSITY FOCUS ULTRASOUND AS WHOLE-GLAND SALVAGE THERAPY
Ana Maria Autran-Gomez¹, Susanne Chan², Jose Gomez-Lemus², Linda Lee¹, Jonathan Izawa¹ and Joseph Chin¹
¹Division of Urology and Surgical Oncology University of Western Ontario, London ON, Canada; ²Department of Pathology University of Western Ontario London ON, Canada
(Presented By: Ana Maria Autran-Gomez)

Poster #98
INCREASED NUMBER OF NODES REMOVED AT RETROPERITONEAL LYMPH NODE DISSECTION IMPROVES OVER-ALL- AND CANCER-SPECIFIC SURVIVAL IN PATIENTS WITH TESTICULAR CANCER
Dan Lewinshtein, Sandra Koo and Christopher Porter
Virginia Mason Medical Center, Seattle, WA
(Presented By: Dan Lewinshtein)

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A DESCRIPTIVE ANALYSIS OF SEX CORD STROMAL TUMORS USING A NATIONAL DATABASE
Kunj Sheth, John Cashy and Shilajit Kundu
Northwestern University Feinberg School of Medicine, Department of Urology, Chicago, IL
(Presented By: Kunj Sheth)

Poster #100
THE IMPACT OF SURGICAL OR SYSTEMIC THERAPY FOR TESTICULAR GERM CELL MALIGNANCY ON RENAL FUNCTION
Nicholas Cost, Mehrad Adibi, Jessica Lubahn, Adam Romman, Ganesh Raj, Arthur Sagalowsky and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, Texas
(Presented By: Nicholas Cost)
Poster Session II

Friday, December 2, 2011
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RECURRENT AND TREATMENT PATTERNS IN PATIENTS WITH NON-MUSCLE-INVASIVE BLADDER CANCER
Karim Chamie¹, Mark S. Litwin¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Julie Lai², Jan M. Hanley², Badrinath R. Konety³, Christopher S. Saigal¹ and the Urologic Diseases in America Project²
¹UCLA, Los Angeles, CA; ²RAND, Santa Monica, CA; ³University of Minnesota, Minneapolis, MN
(Presented By: Karim Chamie)

Poster #102
USING GEOGRAPHIC INFORMATION SYSTEMS TO IDENTIFY CHANGES IN BLADDER CANCER MORTALITY “HOT SPOTS” IN THE UNITED STATES
Sandip Prasad, Amit Patel, Aria Razmaria, Kyle Kiriluk, Alexandre Rosen, Todd Schuble, Chieko Maene, Brandon Pierce, Gary Steinberg and Norm Smith
University of Chicago, Chicago, IL
(Presented By: Sandip Prasad)

Poster #103
THE HISTOPATHOLOGIC CHARACTERISTICS OF BLADDER CANCER AFTER PROSTATE RADIOTHERAPY
Michael Abern¹, Ann Dude² and Christopher Coogan³
¹Duke University Medical Center, Urology, Durham, NC; ²Duke University Medical Center Durham, NC; ³Rush University Medical Center Chicago, IL
(Presented By: Michael Abern)

Poster #104
NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER AT THE UNIVERSITY OF SOUTHERN CALIFORNIA
Adrian Fairey, Siamak Daneshmand, Tanya Dorff, Ryan Dorin, Gary Lieskovsky, David Quinn, Anne Schuckman, Jie Cai, Gus Miranda and Eila Skinner
University of Southern California, Los Angeles, CA
(Presented By: Adrian Fairey)

Poster #105
COST ANALYSIS OF ROBOTIC-ASSISTED RADICAL CYSTECTOMY VERSUS OPEN RADICAL CYSTECTOMY UTILIZING A PROSPECTIVE, RANDOMIZED COHORT
Raj Kurpad, Jed Ferguson, Ian Udell, Angela Smith, Michael Woods, Matt Raynor, Eric Wallen, Matthew Nielsen and Raj Pruthi
University of North Carolina, Chapel Hill, NC
(Presented By: Raj Kurpad)

Poster #106
QUALITY OF DIAGNOSTIC CARE IN PATIENTS WITH BLADDER CANCER: A POPULATION-LEVEL ANALYSIS.
Karim Chamie¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Meryl Leventhal², Dennis Deapen² and Mark S. Litwin¹
¹UCLA, Los Angeles, CA; ²Cancer Surveillance Program, Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, CA
(Presented By: Karim Chamie)
POSTER SESSION II

Poster #107
UTILIZATION OF IMMEDIATE POSTOPERATIVE INSTILLATION OF INTRAVESICAL CHEMOTHERAPY (IPOIC): A QUALITY OF CARE CONCERN IN OLDER PATIENTS WITH NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)
Daniel A. Barocas¹, Jack Gallagher², Danielle Colayco³, Brent Schwartz³, Kylee Heap² and Denise Globe³
¹Vanderbilt University Medical School; ²Clarity Pharma Research, Spartanburg, SC; ³Allergan, LLC, Irvine, CA
(Presented By: Daniel A. Barocas)

Poster #108
THE IMPACT OF POSTOPERATIVE TRANSFUSION ON SURVIVAL CHARACTERISTICS IN SURGICALLY TREATED MEN WITH TRANSITIONAL CELL CARCINOMA OF THE BLADDER
Andrew Feifer¹, Jennifer M. Taylor², Annalisa Piccorelli³, Changhong Yu³, Michael Kattan³ and Bernard Bochner²
¹Memorial Sloan Kettering Cancer Center, NY, NY; ²Department of Surgery, Urology Service, Memorial Sloan Kettering Cancer Center; ³Department of Quantitative Health Sciences, Cleveland Clinic, Cleveland, OH
(Presented By: Andrew Feifer)

Poster #109
PROGNOSTIC SIGNIFICANCE OF HER2 ONCOGEN OVEREXPRESSION IN PRIMARY UROTHELIAL CARCINOMA OF THE BLADDER
Sepehr Salem¹, Abdolrasoul Mehrsai², Farid Kosari¹ and Gholamreza Pourmand³
¹Department of Urology, University Hospitals of Case Medical Center, Case Western Reserve University, Cleveland, Ohio, USA; ²Urology Research Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran; ³Department of Pathology, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran
(Presented By: Sepehr Salem)

Poster #110
ADHERENCE WITH SURVEILLANCE GUIDELINES AFTER RADICAL CYSTECTOMY: A POPULATION-BASED ANALYSIS
Behfar Ehdaie¹, Coral Atoria², William Lowrance¹, Andrew Feifer³, Dean Bajorin¹, Bernard Bochner³, S. Machele Donat¹, Guido Dalbagni³ and Elena Elkin²
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY; ³Urology Service, Department of Surgery, Memorial Sloan-Kettering Cancer Center, New York, NY; ⁴Genitourinary Oncology Service, Department of Medicine, Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Behfar Ehdaie)

Poster #111
NEOADJUVANT AND ADJUVANT CHEMOTHERAPY FOR MUSCLE INVASIVE BLADDER CANCER: THE LIKELIHOOD OF INITIATION AND COMPLETION
Murugesan Manoharan, Ahmed Eldefrawy, Devendant Katkoori, Ahmed M. Mansour, Rakish Singal and Mark Soloway
University of Miami, Miller School of Medicine, Miami, Florida
(Presented By: Ahmed M. Mansour)

Poster #112
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Tatum Tarin¹,², Nicholas Power¹,², Behfar Ehdaie¹,², John Sfakianos¹,², Jonathon Silberstein¹,², Daniel Sjoberg³, Guido Dalbagni¹,² and Bernard Bochner¹,²
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Urology Service, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan-Kettering Cancer Center, New York, NY, USA; ³Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Tatum Tarin)
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VALUE OF URETHRAL FROZEN SECTION AT RADICAL CYSTECTOMY AND IMPACT ON INTRAOPERATIVE DECISION MAKING
Glen Yang¹, Jared Whitson¹, Anobel Odisho¹, Peter Carroll¹ and Badrinath Konety²
¹University of California, San Francisco; ²University of Minnesota
(Presented By: Glen Yang)

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Joan Delto, Takashi Kobayashi, James McKiernan, Mitchell Benson and Cory Abate-Shen
Columbia University, New York, NY
(Presented By: Joan Delto)

Poster #115
PRELIMINARY RESULTS OF PERIOPERATIVE OUTCOMES AND ONCOLOGIC EFFICACY FROM A SINGLE INSTITUTION RANDOMIZED CONTROLLED TRIAL OF OPEN VERSUS ROBOTIC ASSISTED RADICAL CYSTECTOMY
Jamie Messer, John Fitzgerald, Barbara Ercole, Robert Svaték, Marty Hilton and Dipen Parekh
University of Texas Health Sciences Center San Antonio, TX
(Presented By: Jamie Messer)

Poster #116
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Julian Mauermann¹, Yves Fradet¹, Wassim Kassouf², Ricardo Rendon¹, Niels Jacobsen³, Adrian Fairey⁴, Jonathan Izawa⁵, Anil Kapoor⁷, Peter Black⁷, Simon Tanguay⁵, Joe Chin⁵, Alan So⁵, Jean-Baptiste Lattouf³, David Bell³, Fred Saad⁶, Ed Matsumoto⁶, Darrel Drachenberg⁶, Ilia Gianninos¹⁰ and Louis Lacombe¹
¹Department of Urology, Laval University, Quebec City, QC, Canada; ²Department of Urology, Dalhousie University, Halifax, NS, Canada; ³Division of Urology, University of Alberta, Edmonton, AB, Canada; ⁴Division of Urologic Surgery, University of Western Ontario, London, ON, Canada; ⁵Division of Urology, McMaster University, Hamilton, ON, Canada; ⁶Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; ⁷Department of Urology, University of Montreal, Montreal, QC, Canada; ⁸Section of Urology, University of Manitoba, Winnipeg, MB, Canada; ¹⁰Division of Urology, University of Ottawa, Ottawa, ON, Canada
(Presented By: Julian Mauermann)

Poster #117
UTILITY OF PET/CT IN IDENTIFYING BONE METASTASIS IN PATIENTS WITH UROTHELIAL CARCINOMA
Phillip Abbosh, Robert Grubb, III, Kenneth Neppe, Aleksandra Klim, Barry Siegel, Farrokh Dehdashti, Seth Strope and Adam Kibel
Washington University, St. Louis, MO
(Presented By: Phillip Abbosh)

Poster #118
USE OF NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER: 10-YEAR EXPERIENCE AT A SINGLE INSTITUTION
Stephen F. Kappa¹, Todd M. Morgan², Roxelyn G. Baumgartner², Sam S. Chang², Michael S. Cookson², Peter E. Clark², Rodney Davis², David F. Pensión², Joseph A. Smith², Chaochen You² and Daniel A. Barocas²
¹Vanderbilt University Medical Center, School of Medicine; ²Vanderbilt University Medical Center, Department of Urologic Surgery
(Presented By: Stephen F Kappa)
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RISK FACTORS FOR UPPER URINARY TRACT AND URETHRAL RECURRENTS FOLLOWING RADICAL CYSTECTOMY
Nathan Perlis¹, Polat Turker¹, David Margel¹, Peter J. Bostrom¹, Marcelo Wroclawski¹, Tuomas Mirtti²³, Martti Nurmi², Neil E. Fleshner¹, Antonio Finelli¹, Michael A. Jewett¹ and Alexandre R. Zlotta¹⁴
¹University Health Network, Princess Margaret Hospital, Toronto, ON; ²Turku University Hospital, Turku, Finland; ³Helsinki University Hospital, Helsinki, Finland; ⁴Mount Sinai Hospital, Toronto, ON
(Presented By: David Margel)

Poster #120
TREATMENT PATTERNS AND COSTS OF TREATING NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)
Cheryl Lee¹, Stephen Gruschus², Danielle Colayco³, Tommy Bramley² and Denise Globe³
¹University of Michigan Comprehensive Cancer Center, Ann Arbor, MI; ²Xcenda, Palm Harbor, FL; ³Allergan, LLC, Irvine, CA
(Presented By: Danielle Colayco)

Poster #121
LENALIDOMIDE AUGMENTS THE RESPONSE OF BLADDER CANCER TO BCG IMMUNOTHERAPY IN AN IN VIVO MURINE MODEL
Eugene Lee, Jinesh Gerald and Ashish Kamat
MD Anderson, Houston, TX
(Presented By: Eugene Lee)

Poster #122
EVALUATION OF SELENIUM SUPPLEMENTATION ON THE PREVENTION OF BLADDER CANCER IN SWOG-COORDINATED SELECT
Yair Lotan¹, Phyllis Goodman², Ramy Youssef³, Robert Svatik³, Shahrokh Shariat³, Catherine Tangen², Ian Thompson³ and Eric Klein⁵
¹University of Texas Southwestern Medical Center, Dallas, TX; ²SWOG Statistical Center, Fred Hutchinson Cancer Research Center, Seattle, WA; ³University of Texas Health Science Center, San Antonio, TX; ⁴Weill Medical College of Cornell University, New York, NY; ⁵Glickman Urological and Kidney Institute and Taussig Cancer Institute, Cleveland Clinic, Cleveland, OH
(Presented By: Yair Lotan)

Poster #123
ROLE OF ESTROGEN, PROGESTERONE AND ANDROGEN RECEPTORS ON FORMATION AND PROGRESSION OF UROTHELIAL CARCINOMA OF THE BLADDER
Sepehr Salem¹, Farid Kosari², Abdolrasoul Mehrsai³ and Gholamreza Pourmand³
¹Department of Urology, University Hospitals of Case Medical Center, Case Western Reserve University, Cleveland, Ohio, USA; ²Department of Pathology, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran; ³Urology Research Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran
(Presented By: Sepehr Salem)

Poster #124
OUTCOMES OF RADICAL CYSTECTOMY FOR MICROPAPILLARY UROTHELIAL CARCINOMA AT THE UNIVERSITY OF SOUTHERN CALIFORNIA
Adrian Fairey, Siyamak Daneshmand, Anne Schuckman, Gary Lieskovsky, Hooman Djaladat, Jie Cai, Gus Miranda and Eila Skinner
University of Southern California, Los Angeles, CA
(Presented By: Adrian Fairey)
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INCIDENCE AND PROGNOSTIC IMPLICATIONS OF PERINEURAL INVASION AFTER RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA
Manoj Rao, Robert Flanigan and Marcus Quek
Loyola University Medical Center, Maywood, IL
(Presented By: Manoj Rao)

Poster #126
COMPARATIVE ANALYSIS OF EXISTING SURGICAL RISK ASSESSMENT TOOLS TO PREDICT POST-OPERATIVE MORTALITY RATES AFTER RADICAL CYSTECTOMY
Stephanie Mai, Luke Hillman, E. Jason Abel and Tracy Downs
University of Wisconsin, Madison, WI
(Presented By: Tracy Downs)

Poster #127
NON-CLEAR CELL HISTOLOGY IS INDEPENDENTLY ASSOCIATED WITH POOR OUTCOMES IN THE TARGETED THERAPY ERA.
Edward Rampersaud¹, Frederic Birkhaeuser¹, Joshua Logan¹, Geoffrey Sonn¹, Yvonne Chan², Christine Anterasian¹, David Li¹, Frederic Pouliot², Fairooz Kabbinavar¹, Allan Pantuck¹ and Arie Belldegrun¹
¹Institute of Urologic Oncology, Los Angeles, CA; ²David Geffen School of Medicine at UCLA
(Presented By: Edward Rampersaud)

Poster #128
A PROSPECTIVE TRIAL ASSESSING THE EFFECTS OF CLAMP ISCHEMIA DURING PARTIAL NEPHRECTOMY ON RENAL FUNCTION, BIOMARKERS, AND STRUCTURE
Barbara Ercole¹, Kathleen Torkko², William Hilton³, Prasad Devarajan⁴, Manjeri A Venkatachalam⁵, Joel M Weinberg⁶ and Dipen J Parekh⁷
¹Cleveland Clinic Florida, FL; ²University of Colorado, CO; ³University of Texas HSC San Antonio, TX; ⁴Cincinnati Childrens Hospital Medical Center, OH; ⁵University of Michigan, MI
(Presented By: Barbara Ercole)

Poster #129
SEQUENTIAL THERAPY OF CAREFULLY SELECTED PATIENTS WITH IMMUNOTHERAPY FOLLOWED, UPON PROGRESSION, BY TARGETED CANCER THERAPY FOR METASTATIC RCC CAN ACHIEVE OUTSTANDING SURVIVAL: THE UCLA EXPERIENCE
Frederic Birkhaeuser¹, Edward Rampersaud¹, Xiaoyan Wang², Nils Kroeger¹, Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Nazy Zomorodian¹, Joseph Riss¹, Gang Li², Fairooz Kabbinavar¹, Allan Pantuck¹ and Arie Belldegrun¹
¹Institute of Urologic Oncology, David Geffen School of Medicine at the University of California, Los Angeles, CA; ²Department of Biostatistics, School of Public Health at the University of California, Los Angeles, CA
(Presented By: Frederic Birkhaeuser)

Poster #130
DOES CYTOREDUCTIVE NEPHRECTOMY IMPROVE SURVIVAL IN NON-CLEAR CELL RENAL CELL CARCINOMA?
Patrick Kenney¹, Brian Chapin¹, Stephen Culp², Stephen Richey¹, Graciela Nogueras-González³, Pheroze Tamboli¹, Nizar Tannir¹ and Christopher Wood¹
¹M.D. Anderson Cancer Center, Houston, TX; ²University of Virginia, Charlottesville, VA; ³Texas Oncology, Fort Worth, TX
(Presented By: Patrick Kenney)
**Poster #131**
FUNCTIONAL RECOVERY AFTER PARTIAL NEPHRECTOMY: EFFECTS OF VOLUME LOSS AND ISCHEMIC INJURY  
Matthew Simmons, Shahab Hillyer, Byron Lee, Amr Fergany, Jihad Kaouk and Steven Campbell  
Cleveland Clinic, Cleveland, OH  
(Presented By: Matthew Simmons)

**Poster #132**
COMPARING OUTCOMES AFTER LAPAROSCOPIC NEPHRECTOMY, PARTIAL NEPHRECTOMY AND CRYOABLATION FOR RENAL MASSES  
Jack Lambert, Stephen Riggs, Thomas Fuller, Ryan Barrette and Bethany Barone  
Eastern Virginia Medical School, Norfolk, VA  
(Presented By: Jack Lambert)

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¹Mayo Clinic, Rochester, MN; ²Michigan State; ³Cleveland Clinic, Cleveland, OH  
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¹Fox Chase Cancer Center, Temple University School of Medicine, Philadelphia, Pennsylvania; ²Memorial Sloan-Kettering Cancer Center, New York, New York; ³Wilex AG, Munich, Germany; ⁴IBA Molecular, Dulles, Virginia; ⁵Kreitchman PET Center, Columbia University Medical Center, New York, New York
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¹Fox Chase Cancer Center, Philadelphia, PA; ²Emory University, Atlanta, GA; ³Thomas Jefferson University, Philadelphia, PA; ⁴University of North Carolina, Chapel Hill, NC
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¹Naval Medical Center San Diego; ²University of California San Diego
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¹Fox Chase Cancer Center, Philadelphia, PA; ²National Cancer Data Base, American College of Surgeons, Chicago, IL; ³SUNY Upstate Medical University, Syracuse, New York
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¹MD Anderson Cancer Center, Orlando; ²Veritas Heath Economics; ³Avalere Health; ⁴Vanderbilt University; ⁵Cornell University
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¹Baylor College of Medicine; ²Center of Cell and Gene Therapy, Baylor College of Medicine, Houston, TX; ³Department of Urology, The Methodist Hospital, Houston, TX
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¹Duke University School of Medicine; ²University of California - San Diego, San Diego, CA; ³Georgia Health Sciences University, Augusta, GA; ⁴Oregon Health and Sciences University, Portland, OR; ⁵University of California - Los Angeles, Los Angeles, CA; ⁶Stanford University - Palo Alto, CA
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Mehrdad Alemozaffar¹, Martin Sanda¹, Derek Yecies², Meir Stumpfer² and Stacey Kenfield³
¹Beth Israel Deaconess Medical Center, Boston, MA; ²Boston University Medical School, Boston, MA; ³Harvard School of Public Health, Boston, MA
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Adrian Fairey¹, Niels-Erik Jacobsen², Don Voaklander² and Eric Estey²
¹University of Southern California, Los Angeles, CA; ²University of Alberta, Edmonton, AB
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Abhay Singh¹, Jodi Antonelli¹, Lee Jones¹, Leah Gerber¹,², Elizabeth Calloway¹,², Kathleen Shuler¹,², Cathrine Hoyt¹, Delores Grant¹, Stephen Freedland¹,² and Lionel Banez¹,²
¹Division of Urology, Duke University School of Medicine, DUMC, Durham, NC; ²Durham Veterans Affairs Medical Center, Durham, NC; ³North Carolina Central University, Durham, NC
(Presented By: Abhay Singh)

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Nikhil Waingankar, Eric Ghiraldi, Helen Levey, Manish Vira and Lee Richstone
The Arthur Smith Institute for Urology, North Shore-LIJ Health System, New Hyde Park, NY
(Presented By: Nikhil Waingankar)

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Gregory Wirth¹, Jian Lu¹, Shulin Wu², Douglas Dahl¹, Aria Olumi¹, Robert Young², Scott McDougal¹ and Chin-Lee Wu²
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(Presented By: Gregory Wirth)

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Scott Eggener¹, Michael Large², Glenn Gerber¹, Joseph Pettus¹, John Smith¹, Ofer Yossypowitch¹, Norm Smith¹, Shilajit Kundu⁶ and Jay Raman⁷
¹University of Chicago Chicago, IL; ²University of Chicago Hospitals Chicago, IL; ³Wake Forest University Winston-Salem, NC; ⁴Forsyth Medical Center Winston-Salem, NC; ⁵Tel Aviv University Tel Aviv, Israel; ⁶Northwestern University Chicago, IL; ⁷Penn State Milton S. Hershey Medical Center
(Presented By: Michael Large)

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Sean Stroup¹, Kerrin Palazzi-Churas², J. Kellogg Parsons³ and Christopher Kane²
¹Naval Medical Center San Diego; ²University of California San Diego
(Presented By: Sean Stroup)
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Ekaterina Olkhov¹,², Theodorus van der Kwast¹, Vaiju Pethe¹, Hilmi Ozcelik¹,², Laurent Briollais¹, Neil E. Fleshner⁴, Eleftherios P. Diamandis¹,², Bharati Bapat¹,² and Alexandre R. Zlotta³,⁵
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¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Department of Radiology and Imaging Sciences
(Presented By: Nitin Yerram)

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UC Irvine Orange, CA
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Jessica Lubahn, Nicholas Cost, Mehrad Adibi, Adam Romman and Vitaly Margulis
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Mehrad Adibi, Nicholas Cost, Jessica Lubahn, Adam Romman and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

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MINIMALLY INVASIVE VERSUS OPEN RETROPERITONEAL LYMPH NODE DISSECTION FOR RESIDUAL MASSES AFTER CHEMOTHERAPY IN NONSEMINOMATOUS GERM CELL TESTIS CANCER.
Sandhya R. Rao, Mayer N. Fishman, Wade J. Sexton, Philippe E. Spiess and Julio M. Pow-Sang
Genitourinary Oncology Program, Moffitt Cancer Center, Tampa, FL
(Presented By: Sandhya R. Rao)
Podium #1

BLOOD LOSS ASSOCIATED WITH RADICAL CYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY COMPARING IMPACT LIGASURE VERSUS STAPLING DEVICE.
Ian M. Thompson, III¹, Daniel A. Barocas¹, Carl J. Bischoff¹, Peter E. Clark¹, Michael S. Cookson¹, Stephen F. Kappa², Todd M. Morgan¹, Matthew J. Resnick¹, Joseph A. Smith¹ and Sam S. Chang¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery; ²Vanderbilt University Medical Center, School of Medicine
(Presented By: Ian M. Thompson, III)

Introduction and Objectives: To compare blood loss associated with two different devices (GIA Stapler versus Impact Ligasure) used to provide hemostasis during radical cystectomy (RC) for bladder cancer.

Methods: Eighty (80) patients undergoing RC for bladder cancer were randomized to either use of a GIA Stapler or Impact Ligasure device. Operative parameters, outcomes and costs were compared. Data were analyzed with Wilcoxon rank sum test and Welch two sample t−test.

Results: There were no significant demographic or preoperative clinical differences between the groups. Mean estimated blood loss was not significantly different between the Ligasure and GIA Stapler arms (687 mL vs. 708 mL, p=0.85). There were no significant differences between groups when comparing operative times and transfusion requirement. There was a significant increase in the mean number of adjunctive suture ligatures used in the stapling device arm (3.0 vs. 1.5, p=0.047). Total device cost was significantly lower with the Ligasure compared to the GIA Stapler ($665.10 vs. $1464.60, p<0.01). There were no complications attributable to either device.

Conclusions: This prospective randomized study demonstrates no significant difference in blood loss, transfusion requirement or safety between the Ligasure and GIA Stapler. The Ligasure device, however, is significantly cheaper than the GIA Stapler and required fewer additional measures for hemostasis.

Podium #2

MICRORNA PROFILES IN RADICAL PROSTATECTOMY SPECIMENS: DIFFERENTIAL EXPRESSION BY GLEASON GRADE AND PATHOLOGIC STAGE
Soroush Rais-Bahrami¹, Kevin Smith¹, Nikhil Waingankar¹, Michaela Oswald², Houman Khalili², Annette Lee², Peter Gregersen², Theresa Chan³ and Manish Vira¹
¹The Arthur Smith Institute for Urology, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY; ²The Feinstein Institute for Medical Research, Manhasset, NY; ³Department of Pathology and Laboratory Medicine, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY
(Presented By: Soroush Rais-Bahrami)

Objectives: MicroRNA (miRNA) have been implicated in cell proliferation, differentiation, and carcinogenesis via their role in regulating gene expression. In prostate cancer, miRNA expression is under investigation to elucidate potential as biomarkers of aggressive disease and risk of metastatic progression.

Methods: RNA was extracted from foci of prostate cancer as well as areas of benign glandular architecture from paraffin embedded radical prostatectomy specimens from 47 patients. Foci of prostate cancer were outlined during secondary review by a uropathologist. Subsequently, miRNA expression profiles for 675 miRNA were analyzed using Taqman OpenArray which employs quantitative PCR methodology. Data analysis was performed using the limma package for “R,” and p−values were corrected for multiple hypothesis testing using the Benjamini−Hochman method, and considered significant if p<0.05.
Results: 307 miRNAs were present in at least 50% of benign and cancer foci. Of these, 57 miRNA demonstrated significantly different expression profiles in cancer areas: 23 up-regulated and 13 down-regulated with a minimum 2-fold change. Figure#1 displays the fold change in miRNA expression for the 36 miRNA of interest. Furthermore, analysis of miRNA expression based upon pathologic Gleason grade demonstrated mir-885-5p levels to be significantly higher (p=0.02) by over 179 fold-change (FC) in specimens with primary Gleason pattern 4 compared to primary Gleason score 3. Evaluation of pathologic stage revealed multiple miRNA expression profiles differing between organ−confined, pT2 disease compared to pT3a or pT3b disease, most dramatically mir-519b−3p (FC>100,000, p<0.0001) and mir−520h (FC>143, p<0.001).

Conclusions: We have identified 36 specific miRNAs for which expression varies greater than 2−fold from areas of cancerous glands compared to benign glands in patients with prostate cancer. Of these miRNA, expression of some are significantly elevated in higher grade and staged disease by over a hundred fold. Further investigation of these miRNA may uncover both role as a biomarker of aggressive disease and more importantly, role in molecular pathophysiology of progression.

Podium #3

IDENTIFICATION OF A MULTIPLE PEPTIDE SIGNATURE BY IMAGING MASS SPECTROMETRY WHICH ACCURATELY PREDICTS MORTALITY IN RENAL CELL CARCINOMA

Samuel D. Kaffenberger¹, Todd M. Morgan¹, Erin H. Seeley², Oluwole Fadare³, Richard M. Caprioli² and Peter E. Clark¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University, Department of Biochemistry, Nashville, TN; ³Vanderbilt University Medical Center, Department of Pathology, Nashville, TN
(Presented By: Samuel D. Kaffenberger)

Introduction: Imaging mass spectrometry (IMS) offers substantial promise for biomarker identification given its ability to obtain detailed peptide expression data while retaining spatial information in situ. Here, we sought to determine whether IMS could be used to identify peptide signatures associated with increased mortality risk after nephrectomy for renal cell carcinoma (RCC).

Methods: We constructed a tissue microarray with 2 matched tumor and normal cores from nephrectomy specimens of 35 patients with clear cell RCC. After deparaffinization and antigen retrieval, trypsin digestion was performed directly on the tissue. Samples were analyzed utilizing an AutoFlex Speed matrix assisted laser desorption ionization (MALDI) time−of−flight mass spectrometer. For this study, only the tumor cores were analyzed. Additionally, this approach requires dichotomous survival analysis, and patients were categorized as short (overall survival <24 months; n=14 patients) or long survivors (>24 months; n=21 patients). Data analysis was performed with ClinProTools 2.2 and FlexImaging 2.1 software. Peptide peaks differentially expressed in short vs long survivors were used to develop a peptide signature associated with mortality risk after nephrectomy.

Results: A signature consisting of 22 peptides was developed that accurately discriminated between short and long−term survivors. An average of 11 different spots were assayed within each core, and when classifying each core in its entirety, the peptide signature predicted survival (short vs long) with an accuracy of 88.5% (Figure).
Conclusions: MALDI IMS was able to identify and map specific peptides that accurately stratified patients with RCC by survival. While there are currently no prognostic biomarkers utilized in the care of patients with RCC, this approach offers substantial promise by simultaneously assessing and localizing a vast range of protein expression patterns while maintaining the spatial orientation within tissue. Further work is required to validate the accuracy of this pattern of peptide expression and to characterize these differentially expressed peptides.

Funding: Award Number K08 CA113452 (PEC) from the NIH, Vanderbilt CTSA grant UL1 RR024975 from NCRR/NIH

Podium #4

MR-GUIDED LASER FOCAL THERAPY FOR LOW-INTERMEDIATE RISK LOCALIZED PROSTATE CANCER
Uri Lindner, Sean R.H. Davidson, Masoom A. Haider, Eugen Hlasny, Mark R. Gertnre, Walter Kucharczyk and John Trachtenberg
University Health Network, Toronto, ON, Canada
(Presented By: Uri Lindner)

Focal therapy is a promising prospective therapy for localized prostate cancer (PCa). New technologies are being investigated and require evaluation. Magnetic Resonance Imaging (MRI) guided laser focal therapy for the targeted ablation of PCa has been developed at our institution. This is the largest cohort description of this technique.

Purpose: To ascertain the feasibility and safety of MRI−guided targeted laser focal therapy for localized PCa.

Methods: Twenty three patients with biopsy proven low−intermediate risk PCa underwent MR−guided interstitial laser ablation of the cancer. The area of interest was confirmed and targeted using MRI. All the procedures were performed in a 1.5T GE system. The patients were placed in a low lithotomy, MR was used to guide 1−4 laser fibers. Fiber position was chosen using in house developed planning and guidance software. Thermal ablation was monitored using MR thermal mapping sequence and real time ablation size was calculated using Visulase Inc. workstation. Questionnaires were used to assess the effect on voiding symptoms and erectile function. Adverse events were recorded.

Results: MR−guided focal laser ablation was technically feasible to perform on an outpatient basis. We have progressed from 1−2 fiber insertion to 3−4 fiber insertion. The average burn created during the first ten patients was 2.4 cc whereas for the last ten patients it was 7.3 cc, without greater morbidity. The treatment created an identifiable hypovascular defect immediately post−treatment which coincided with the targeted prostatic lesion.. Mean targeted volume was 0.77 cc and mean ablated volume was 5.5 cc. There were no peri-operative complications and minimal morbidity. All patients that were potent prior to the procedure maintained potency following the procedure. Continence levels were not compromised. Procedure time has gone down even though we have increased the number of fibers inserted and lesion size ablated. We are awaiting oncological results.

Conclusions: MR−guided focal laser ablation of low−intermediate risk PCa is feasible as an outpatient procedure. Early clinical response suggest that the targeted region can be ablated with minimal adverse effects and that larger volumes can be ablated without incurring side effects. It may represent an alternate treatment approach in carefully selected patients. Oncological results are pending and further trials are required to demonstrate the effectiveness of this treatment concept.
Podium #5

ADRENAL NODULAR HYPERPLASIA AS PART OF THE HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CARCINOMA (HLRCC) PHENOTYPE
Brian Shuch¹, Cathy Vocke¹, Vladimir Valera², Beatriz Walter Rodriguez², Chris Ricketts¹, Rabindra Gautam¹, Gopal Gupta¹, Peter Pinto¹, Ramprasad Srinivasan¹, Maria Merino², W. Marston Linehan¹ and Gennady Bratslavsky³
¹NCI Urologic Oncology Branch, Bethesda, MD; ²NCI Translational Surgical Pathology Branch, Bethesda, MD; ³Department of Urology, SUNY Upstate Medical University
(Presented By: Brian Shuch)

Purpose: Hereditary leiomyomatosis and renal cell carcinoma (HLRCC) is characterized by cutaneous leiomyomas, uterine fibroids, and aggressive papillary renal cell carcinoma (RCC). We have also observed that some HLRCC patients had adrenal nodules and sought to characterize this finding as a possible new part of the HLRCC phenotype.

Methods: A prospectively collected database of all HLRCC patients was reviewed for patients with adrenal masses on radiographic imaging. Patient data, imaging studies, endocrine manifestations, management, and pathologic findings were reviewed. Available cases were further studied to look for a loss of heterozygocity (LOH) in the fumarate hydratase gene (FH) by floroscence in situ hybridization (FISH) and polymerase chain reaction (PCR).

Results: Twenty of 255 HLRCC patients (7.8%) were identified as having a primary adrenal pathology. Among these, three had bilateral adrenal lesions and four demonstrated multiple nodules. Two patients had hypercortisolism on endocrine workup. Radiographic findings of 27 adrenal lesions were reviewed. Eight (29.6%) of these lesions were not characterized as an adenoma or hyperplasia by non−contrast CT criteria. PET imaging was performed in 10 cases and was positive in 7 (70%). Due to concern for possible malignancy, ten adrenal glands were resected and pathology demonstrated macronodular adrenal hyperplasia in all specimens. PCR and FISH demonstrated that the majority of cases did not demonstrate LOH of FH.

Conclusions: Unilateral and bilateral adrenal micro and macronodular hyperplasia appears to be part of the HLRCC phenotype, currently believed related to haploinsufficiency due to germline loss of FH. A functional endocrine workup should be performed as patients can have hypercortisolism. Imaging frequently demonstrates lesions that are not typical of adenomas or hyperplasia on non−contrast CT and can be positive on PET imaging. To date, no patient has demonstrated malignancy and close adrenal surveillance may be feasible in select patients.

Podium #6

HOSPITAL READMISSION AFTER RADICAL CYSTECTOMY FOR BLADDER CANCER: RESULTS OF A POPULATION-BASED ANALYSIS FROM THE CALIFORNIA STATE INPATIENT DATABASE
Kenneth Nepple, Pamela Owens, Seth Strope, Gurdarshan Sanhu, Dorina Kallogjeri and Adam Kibel
Washington University, St. Louis, MO
(Presented By: Kenneth Nepple)

Introduction: Hospital readmission is a potential marker of surgical quality. However, single institution reports do not capture readmission at other institutions nor assess the outcomes at low volume hospitals. We sought to report the incidence and predictors of hospital readmission after radical cystectomy (RC) using a data source which captures all readmissions to any hospital within the state.

Methods: The study cohort was drawn from the California State Inpatient Database, a statewide discharge−based administrative database that includes all payers and age ranges. Revisit files allow single patients to be tracked across multiple admissions within the state. For the years 2005 to 2009, patients were identified who underwent RC for the diagnosis of bladder cancer with known type of urinary diversion. Hospital readmission rates were evaluated using Kaplan Meier analysis. Risk adjusted hazard ratios (HR) for readmission were assessed with multivariable logistic regression.
Results: 3000 patients were identified who underwent extirpative surgery for bladder cancer, of which urinary diversion was ileal conduit in 2669 (89.0%) and continent diversion in 331 (11.0%). Patients with continent diversion were more likely to be male, white, and from higher income areas compared with ileal conduit (all p<0.02). Medical comorbidity was more common in patients with ileal conduit diversion (p<0.05 for deficiency anemia, COPD, and renal insufficiency). Median hospital stay was 9 days for each type of urinary diversion. Mortality during the surgical admission for ileal conduit (2.3%) and continent diversion (3.0%) were not statistically different (p=0.38). The overall hospital admission rate was 27.1% at 30 days and 38.0% at 90 days (Figure). On multivariable analysis, predictors (p<0.05) of readmission were age (HR 1.01 per year), CHF (HR 1.41), depression (HR 1.60), diabetes (HR 1.34), psychoses (HR 1.82), renal insufficiency (HR 1.36), and continent diversion (HR 1.30).

Conclusions: In a large comprehensive state inpatient database, 38.0% of patients were readmitted to the hospital within 90 days after RC. Predictors of hospital readmission included increased age, medical comorbidity, and continent urinary diversion.
Podium #7

THE IMPACT OF MIXED HISTOLOGICAL FEATURES ON SURVIVAL FOLLOWING RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA

Simon Kim, Igor Frank, John Cheville, R. Houston Thompson, Christopher Weight, Prabin Thapa and Boorjian Stephen
Mayo Clinic, Rochester, MN
(Presented By: Simon Kim)

Introduction and Objective: The presence of mixed histological features (MH) in patients with urothelial carcinoma (UC) of the bladder has been associated with locally-advanced disease at radical cystectomy (RC), and has been suggested to predict response to neoadjuvant chemotherapy. The impact of MH on survival, however, remains to be defined. Here, then, we investigated comparative clinical and pathologic outcomes of patients undergoing RC for pure UC versus those with UC and MH.

Methods: We identified 1,150 patients who underwent RC at Mayo Clinic between 1980–2007, including 827 (72%) with pure UC and 323 (28%) with UC and MH. MH patients included those with squamous differentiation (n=132), glandular differentiation (n=41), or both (n=13); micropapillary features (n=67); nested variant of UC (n=49); and UC with sarcomatoid histology (n=21). All specimens were re-reviewed by a single genitourinary pathologist. Cancer specific survival (CSS) was estimated using the Kaplan–Meier method and compared with the log-rank test. The association of MH with death from UC was evaluated using multivariable Cox proportional hazard regression analysis.

Results: Median follow-up after RC was 8.4 years (interquartile range 3.0, 13.5). Patients with UC and MH were more likely to have pT3–T4 tumors (69.3% vs 38.7%; p<0.0001) and pN+ disease (26.3% vs 15.4%; p<0.0001) compared to patients with pure UC. However, postoperative 10-year CSS did not significantly differ between patients with UC and MH and patients with pure UC (47% vs 51%; p=0.18). Moreover, after adjusting for clinicopathologic features (Table), the presence of MH was associated with a decreased risk of death from UC (HR 0.82; p=0.05). Additionally, postoperative 10-year CSS did not significantly differ between patients with UC and MH and patients with pure UC (47% vs 51%; p=0.18). Moreover, after adjusting for clinicopathologic features (Table), the presence of MH was associated with a decreased risk of death from UC (HR 0.82; p=0.05).

Conclusions: Patients with UC and MH at RC were more likely to have extravesical tumors and node-positive disease. Nevertheless, we found that these patients did not have adverse CSS compared to patients with pure UC. In fact, the presence of MH was associated with a nearly 20% lower risk of death from UC on multivariate analysis. Additional studies are needed to confirm these findings and further define prognostic factors for bladder tumors with MH.

Funding: None

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Multivariate analysis of clinicopathologic variables associated with death from UC after RC.
PROGNOSTIC SIGNIFICANCE OF CANCER STEM CELL MARKERS IN BLADDER CANCER PATIENT SURVIVAL

Philip Ho¹, Jens-Peter Volkmer², Debashis Sahoo², Robert Chin², Guilherme Godoy¹, Seth Lerner¹, Matt van de Rijn², Linda Shortliffe², Irving Weissman² and Keith Chan¹

¹Baylor College of Medicine, Houston, TX; ²Stanford University, Palo Alto, CA

(Presented By: Philip Ho)

Introduction/Objective: Prognosis in bladder cancer currently relies primarily on pathologic stage and grade. Recently, we and others have isolated cancer stem cells (CSCs) from bladder cancer and demonstrated their functional role in driving tumor initiation. A biologically supervised computational approach was employed to better define keratin markers representing early (Keratin 14, K14 → Keratin 5, K5) to late differentiation stages (Keratin 20) in bladder cancer. However, the clinical impact of CSC frequency in bladder cancer has not been explored. We therefore investigated whether the presence of CSCs was associated with survival and other clinicopathologic variables.

Methods: K14 is a primitive marker for bladder CSCs. Three independent published bladder cancer gene expression datasets (n= 667 patients) were used to determine possible associations between K14 expression and patient survival. These results were further evaluated at the protein level by immunohistochemistry using formalin fixed paraffin−embedded specimens of urothelial carcinoma in two independent cohorts from Baylor College of Medicine (117 patients) and Stanford University (159 patients). Survival probability was determined by Kaplan−Meier analysis, and univariate and multivariate Cox regression analyses were performed using R software.

Results: Expression levels of K14 were strongly associated with worse survival in all three gene expression datasets. Furthermore, in one dataset, K14 expression was independently associated with survival by multivariate analysis (p=0.0077) when controlled for stage, grade, gender and age. Similarly, K14 protein expression by immunohistochemistry was associated with worse overall survival by univariate and multivariate analysis in both datasets (p=0.012 and p=0.015). K14 gene expression was also associated with worse overall survival (p=0.035), recurrence−free survival (p=0.019) and progression−free survival (p=0.034) probabilities in patients with pTa urothelial tumors.

Conclusion: The expression of the primitive CSC marker K14 identifies a subpopulation of high−risk bladder cancer patients with poor clinical outcomes. This may help identify patients who would benefit from early definitive therapy.

LYCOPENE IN THE PREVENTION OF RENAL CELL CANCER IN THE TSC2 MUTANT EKER RAT MODEL

Brian Cross¹, Kazim Sahin², Nurhan Sahin², Karina Ciccone³, Adeboye Osunkoya⁴, Viraj Master¹, Wayne Harris¹, Bradley Carthon¹, Ramzi Mohammad⁴, Birdal Bilir¹, Daniel Canter¹, Karin Wertz⁴, Daqing Wu¹, Carlos Moreno⁵, Cheryl Walker⁶ and Omer Kucuk¹

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(Presented By: Brian Cross)
**Introduction and Objectives:** Dietary lycopene has been associated with a decreased risk of developing renal cell carcinoma (RCC). This preventive activity is thought to be due to its anti−oxidant and anti−inflammatory effects. Eker rats represent a unique animal model to study RCC, as these rats develop spontaneous renal tumors, which may be due to tuberous sclerosis 2 (TSC2) mutation resulting in the activation of the mammalian target of rapamycin (mTOR) pathway. This study examines the role of lycopene in the development of RCC in the TSC2 mutant Eker rat model.

**Methods:** Ten−week old female Eker rats (n=90) were assigned in equal numbers to receive 200 mg/kg (group A), 100 mg/kg (group B) or 0 mg/kg (group C) of lycopene with their daily diet. After 18 months the rats were sacrificed and the kidneys were removed. Immunohistochemical staining with antibodies against mTOR, phospho−S6 and epidermal growth factor receptor (EGFR) were performed, as well as hematoxylin−eosin staining for histologic examination of the tumors. Spontaneously developing tumors were counted and measured in individual kidneys. The presence and number of tumors were subjected to cross−tabulation with level of dietary lycopene for Chi−square analysis. The mean size and length of tumors were analyzed using one−way ANOVA. Contrast options were built to evaluate the effect of lycopene (0 vs. average of 100 and 200 mg/kg) as well as dose−response relationship.

**Results:** In group A 13 of 20 (65%) rats, in group B 15 of 20 (75%) rats, and in group C 15 of 16 (94%) rats had tumors. Group A had a mean number of 2.85 tumors (± 2.99) per rat, compared to 3.65 (± 2.62) in group B and 6.71 (± 6.13) in group C, with a linear effect of lycopene (p<0.003). Average tumor size was 3.45 mm, 3.31 mm and 3.44 mm in groups A, B and C, respectively. Total tumor size per rat was 11.29 mm (± 13.36 mm) in group A, compared to 10.00 mm (± 10.04 mm) in group B and 26.14 mm (± 24.27 mm) in group C, with a linear effect of lycopene (p<0.03). All tumors showed strong staining against mTOR, phospho−S6 and EGFR.

**Conclusions:** Dietary lycopene attenuates the development of renal cell cancers in the TSC2 mutant Eker rat model. These results suggest that lycopene may play a role in the prevention of RCC.

**Acknowledgement:** Supported in part by funds from DSM, Basel, Switzerland, and Georgia Cancer Coalition Carpenter Fellowship (Karina Ciccone). Dr. Omer Kucuk is a Georgia Cancer Coalition Distinguished Cancer Scholar.
Podium #11

IS PERINEURAL INVASION IN PROSTATE BIOPSIES ASSOCIATED WITH ADVERSE PATHOLOGICAL OUTCOME? OLD PARADIGM REVISITED.
Malik Elharram¹, David Margel¹, Antonio Finelli¹, Alexandre Zlotta¹, John Trachtenberg¹, Andrew Evans² and Neil Fleshner¹
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Department of Pathology, Princess Margaret Hospital, University Health Network, Toronto, Canada
(Presented By: David Margel)

Purpose: The prognostic significance of perineural invasion is uncertain. We aim to explore the role of PNI on prostate biopsy in predicting adverse findings at radical prostatectomy in a recent cohort of screen detected prostate cancer.

Methods: From September 2008 to January 2010, 1041 consecutive patients were available from our prospective database for analysis. 470 patients were diagnosed with prostate cancer on needle biopsy, and 138 of these patients underwent radical prostatectomy. Pathological specimens were examined, and perineural invasion was identified as carcinoma tracking along or around a nerve in the perineural space. We investigated the predictive value of PNI on biopsy with PNI on radical prostatectomy as well as the ability of PNI on prostate biopsy to predict adverse findings at radical prostatectomy.

Results: Perineural invasion was present in 124 (26%) of biopsy specimens diagnosed with prostate cancer and 38 (27%) of those who chose radical prostatectomy. Perineural invasion on prostate needle biopsy was not predictive of radical prostatectomy Gleason score (p = .377), pathological stage (p = .852), extraprostatic extension (p = .258), surgical margin (p = .079), lymphovascular invasion (p = .499), and upgrading (p = .514) or downgrading (p = .208) at radical prostatectomy. The sensitivity, specificity, positive predictive value, and negative predictive value of PNI on biopsy for PNI on radical prostatectomy were 32%, 82%, 79%, and 37% respectively. The Cohen’s Kappa correlation coefficient was .11.

Conclusions: Perineural invasion on prostate needle biopsy is not predictive of radical prostatectomy outcome. Furthermore, perineural invasion on biopsy has limited predictive value for perineural invasion at radical prostatectomy.

Podium #12 (*Not CME Accredited)

PROSTATE CANCER RISK IN MEN WITH PROSTATE AND BREAST CANCER FAMILY HISTORY: RESULTS FROM THE REDUCE STUDY
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(Presented By: Jean-Alfred Thomas)

Background: To what degree the associations between PCa risk and family history of prostate cancer (PCa) and/or breast cancer (BCa) are attributable to screening biases is unclear. We examined these questions within the REDUCE study, where biopsies were largely independent of PSA minimizing screening biases.

Methods: Data were from REDUCE, which tested dutasteride 0.5 mg daily for PCa risk reduction in men with PSA 2.5−10.0 ng/mL and a negative pre-study biopsy. Among men undergoing at least one on-study biopsy with complete data (n=6415; 78.1%), the association between family history and PCa risk was tested using multivariate logistic regression adjusting for clinicodemographic characteristics.
Results: A family history of PCa alone was associated with increased PCa diagnosis (OR 1.47, 95%CI:1.22−1.77). In North America, PCa family history was not related to PCa diagnosis (OR: 1.02 95%CI:0.73−1.44), whereas outside North America, PCa family history was significantly related to diagnosis (OR: 1.72, 95%CI:1.38−2.15) (p−interaction=0.01). A family history of both PCa and BCa (OR 2.54, 95%CI:1.72−3.75) but not BCa alone (OR 1.04, 95%CI:0.84−1.29) was associated with increased PCa risk versus no family history and irrespective of geographical region.

Conclusions: In REDUCE, PCa family history was significantly related with PCa diagnosis, though only for men outside North America. The presence of both PCa and BCa family history significantly increased risk versus PCa family history alone, irrespective of geographical region. Ultimately, our observations may support the need for changes in how we address family history in terms of both risk of PCa diagnosis and general risk stratification.
**Poster #1**

**ANTI-IL10-R1 MONOCLONAL ANTIBODY ENHANCES BACILLUS CALMETTE-GUERIN (BCG) INDUCED TH1 AND ANTI-BLADDER CANCER IMMUNE RESPONSES IN VITRO AND IN VIVO**

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¹University of Iowa, Iowa City, IA; ²Pfizer, Inc., New York, NY

(Presented By: Nathan Bockholt)

**Introduction:** Proper induction of Th1 immunity is required for effective BCG immunotherapy of bladder cancer. IL−10 down−regulates the Th1 response and is associated with BCG failure. We propose that blocking IL−10 receptor (IL−10R) can inhibit IL−10 signaling, thus enhancing BCG−induced antitumor response.

**Methods:** Splenocytes were incubated with BCG alone or in combination with control IgG, anti−IL−10R1 mAb, or anti−IL−10 neutralizing mAb for 24 hours, followed by ELISA analysis of IFN−γ production. Bladder RNAs were extracted after intravesical (i.b.) BCG plus intraperitoneal (i.p.) control IgG or anti−IL−10R1 mAb and analyzed by qPCR. Urine was collected and analyzed by ELISA. Mice bearing luciferase−expressing MB49 orthotopic tumor were treated with i.b. BCG plus i.p. control IgG or anti−IL−10R1 mAb. Tumor response was assessed using bioluminescence imaging.

**Results:** BCG plus anti−IL−10R1 mAb induced significantly higher IFN−γ than BCG plus anti−IL−10 neutralizing mAb (5.9−17.5 vs. 0.95−6.9 fold increases at 0.004−1 μg/ml). BCG plus anti−IL−10R1 mAb also induced substantially higher IFN−γ in both urine and bladder than BCG plus control IgG. Mice treated with PBS, BCG plus control IgG, or BCG plus anti−IL−10R1 mAb showed 0% tumor free with a 20% death rate, 20% tumor free with a 20% death rate, and 40% tumor free with a 0% death rate, respectively.

**Conclusions:** Anti−IL−10R1 mAb is more potent than anti−IL−10 neutralizing mAb for enhancing BCG−induced IFN−γ production in vitro. Anti−IL−10R1 mAb also enhances BCG−induced Th1 and antitumor immunity in vivo. This mAb could serve as an effective agent for treating bladder cancer when combined with BCG.

**Poster #2**

**PROGNOSTIC SIGNIFICANCE OF CYSTOSCOPY FINDINGS FOLLOWING NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER**

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(Presented By: Ahmed M. Mansour)

**Aim:** To evaluate the potential significance of cystoscopy findings following neoadjuvant chemotherapy (NAC) as prognostic indicator in patients undergoing radical cystectomy for muscle−invasive bladder cancer (MIBC).

**Patients and Methods:** We analyzed our prospectively maintained database for patients who received neoadjuvant chemotherapy (NAC) prior to radical cystectomy for MIBC. Patients were divided into two groups according to cystoscopy performed after 2 cycles of NAC: Respondents (patients who had no evidence of tumor or decreased tumor volume) and Non respondents (patients who had tumor volume progression). We investigated the prognostic significance of the cystoscopy findings and its correlation with the final pathological and survival outcomes. Univariate analysis with the Pearson chi−square was done to analyze associations between observed response to chemotherapy on follow up cystoscopy and pT stage, pT stage downgrading (pathological response) and pN stage (N0 and greater than N0). A Kaplan−Meier estimator curve with the log rank test and a Cox proportional hazard model were used to test whether observed response to chemotherapy predicted overall survival.

**Results:** 101 patients received NAC for MIBC. 60 (59%) patients were identified as respondents to NAC based upon cystoscopy. There was no significant difference in patient demographics between the 2 groups. Univariate analysis showed statistically significant association between observed cystoscopic response to chemotherapy and pTstage, T stage downgrading and pN stage (each <0.001) Furthermore, multivariate regression modeling revealed that non−response to NAC was an independent predictor of extravesical extension.
There was a distinct survival benefit in NAC respondent group (p < 0.001). Figure 1. On multivariate analysis, response to NAC was an independent predictor of survival in patients with MIBC (p < 0.001), HR 0.298 (0.162−0.549).

**Conclusion:** Observed response to NAC on follow up cystoscopy is associated with favourable pathological and survival outcomes in patients undergoing radical cystectomy for MIBC. This correlation may have implications for preoperative patient counseling and should be incorporated in prognostic nomograms.

**Poster #3**

**COMPLICATIONS OF SALVAGE CYSTECTOMY AFTER FAILED BLADDER-SPARING THERAPY FOR MUSCLE-INVASIVE BLADDER CANCER**

Jairam Eswara¹, Jason Efstathiou², Niall Heney¹, Jonathan Paly², Donald Kaufman³, W. Scott McDougal¹, Francis McGovern¹ and William Shipley²

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(Presented By: Jairam Eswara)

**Introduction:** Radical cystectomy has been the standard for muscle-invasive bladder cancer. Combined-modality-therapy (CMT) involving transurethral resection of bladder tumor (TURBT), external-beam radiation, and chemotherapy is an effective alternative to cystectomy in selected patients. Salvage cystectomy is reserved for those failing CMT. We characterized complications associated with salvage cystectomy.

**Methods:** From 1986–2007 of 348 patients undergoing bladder-sparing therapy, 102 patients (29%) underwent salvage cystectomy, 91 performed at Massachusetts General Hospital following CMT for T2–T4aNxM0 bladder cancer. Patients underwent TURBT followed by chemoradiation (40Gy). Early assessment was performed by cystoscopy/rebiopsy. Patients with complete response continued with consolidation chemoradiation (total dose 64Gy). Immediate salvage cystectomy (50/91) was performed for persistent disease, while delayed salvage cystectomy (41/91) was performed for an invasive recurrence. Medical records were reviewed classifying complications using the Clavien system.

**Results:** Median age was 69.4yrs (27.5–88.9); median living-patient follow-up was 12 years (0–23). 99% (90/91) underwent ileal diversion. 69% (63/91) had complications of any grade <90 days. 16% (15/91) experienced major complications <90 days. 21% (19/91) required readmission <90 days. 90-day mortality was 2.2% (2/91). Significant cardiovascular/hematologic complications [PE, MI, DVT, transfusion] <90 days were more common in the immediate cystectomy group (37% vs. 15%, p=0.02). Tissue-healing complications [fascial dehiscence, wound infection, ureteral stricture, anastamotic stricture, stoma/loop revisions] were more common in the delayed group (35% vs. 12%, p=0.05).

**Conclusions:** Salvage cystectomy is associated with acceptable morbidity, though complication rates are slightly higher than for other cystectomy series. Immediate cystectomies have more cardiovascular/hematologic complications, while delayed cystectomies have more tissue-healing complications.
WHAT IS EVALUATION OF HEMATURIA BY PRIMARY CARE PHYSICIAN’S: USE OF ELECTRONIC MEDICAL RECORDS TO ASSESS PRACTICE PATTERNS?

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(Presented By: Casey Seideman)

**Background:** To determine whether patients found to have hematuria by their primary care physicians are evaluated according to best practice policy.

**Methods:** The University of Texas Southwestern Medical Center has an institutional outpatient EMR that is used by all providers in all specialties. We conducted an IRB approved chart review of patients who were found to have more than 5 red blood cells/high power field between 3/09 and 2/10.

**Results:** There were 448 patients of which the majority were female (82%), caucasian (39%) with microscopic hematuria (MH) (85%), 57% were initially symptomatic, 29% had history of smoking and 29% had documented UTI. Evaluation was limited including imaging (36%), cystoscopy (9%) and cytology (4%). A UTI was found in 50% and 26% of patients with gross and MH, respectively (p <0.001) and 39% of patients with MH did not have a repeat urinalysis (UA). Only 18% of patients were referred to urologists and tumors were diagnosed in 16 patients (3.6%). No abnormality was found in 25% and 48% of patients with gross hematuria and MH, respectively (p=0.002). There was no impact of age, smoking history, type of provider, symptoms on referral rates which were higher among males and patients with gross hematuria (p <0.05).

**Conclusions:** While urinalysis remains a common routine diagnostic tool, the majority of cases of microscopic hematuria are not fully evaluated according to guidelines. Use of cystoscopy, cytology and upper tract imaging is limited. Further studies will be needed to determine the extent of the problem and impact on survival.

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A COMPARATIVE ANALYSIS OF ONCOLOGIC OUTCOMES IN PATIENTS WITH V ARIANT HISTOLOGY BLADDER CANCER

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(Presented By: Sanjay Patel)

**Introduction:** Nonurothelial bladder cancer accounts for approximately 5–10% of all bladder malignancies. While a number of these variant histologies have been studied individually, there have been no comparative analyses assessing the multiple variant histologies and their impact on oncologic outcomes. We sought to evaluate the relative prognostic impact of the most common variant histologies on long–term survival in patients undergoing radical cystectomy (RC).

**Methods:** The SEER database was used to identify patients who underwent RC for bladder cancer from 1990–2007. Histologic subtype was obtained from ICD–O–3 codes, and patients with urothelial cell carcinoma (UCC), squamous cell carcinoma (SCC), adenocarcinoma (AC), sarcoma (Src), small cell carcinoma (SmC), signet ring carcinoma (SgRn), and spindle–cell carcinoma (SpnC) were included in the study. The primary outcome was disease–specific survival (DSS), and covariates included age, race, year of diagnosis, pT stage, pN stage, and marital status. Multivariable analysis was performed using Cox proportional hazards model. Mortality rates were estimated using the Kaplan–Meier product limit method.

**Results:** A total of 14,130 patients met inclusion criteria with the following histologies: UCC (90.1%), SCC (4.6%), AC (2.3%), Src (0.8%), SmC (0.8%), SgRn (0.5%), and SpnC (0.9%). Three–year DSS was most favorable in patients with UCC (63.7%; 95%CI [62.9%–64.8%]) and AC (65.3% [59.3%–70.6%]) while 3–year DSS was the least favorable for SmC (41.6% [31.3%–51.6%]) and Src (45.4% [35.1%–55.1%]). In the multivariable analysis, independent predictors of DSS were age, marital status, grade, T stage, N stage, and variant histology (Table). With respect to UCC, there was an increased risk of disease–specific death associated with all variants except AC. Src and SpnC were associated with the highest risk of death.
Conclusions: With the exception of AC, the most common variant bladder cancer histologies are all independently associated with worse DSS relative to UCC in patients undergoing RC. Further research is needed to identify more effective neoadjuvant and/or adjuvant treatment measures to improve the long−term outcomes in patients with variant bladder cancer histologies.

Poster #6

EXTRANODAL EXTENSION IS A POWERFUL PROGNOSTIC FACTOR IN BLADDER CANCER PATIENTS WITH LYMPH NODE METASTASIS

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(Presented By: Eugene Cha)

Background: The prognosis of patients with invasive urothelial carcinoma of the bladder (UCB) treated with radical cystectomy is closely related to the pathologic stage of the primary tumor and the presence of lymph node metastasis (LNM). The aim of the current study was to assess the prognostic value of extranodal extension (ENE) and to test whether it improves the performance of predictive models constructed without ENE.

Methods: We performed a retrospective analysis of 748 patients with LNM treated with radical cystectomy (RC) and lymphadenectomy for UCB without neoadjuvant therapy at 12 centers in the US and Europe. Microscopically, each LNM was evaluated for the presence or absence of ENE, which was defined as a clear−cut perforation of lymph node capsule by tumor.
**Results:** Overall, 375 patients (50.1%) had ENE. The median number of lymph nodes removed, number of positive lymph nodes, and lymph node density were 15, 2, and 15%, respectively. The rate of ENE increased with advancing pT stage (p<0.001). Within a median follow-up of 27 months (mean 39.8 ± 41.8; IQR 44), disease recurrence occurred in 420 patients (56.1%), and 353 died of UCB (47.2%). Addition of ENE to multivariable models for prediction of disease recurrence and cancer-specific mortality increased their predictive accuracies from 70.3 to 77.8% (p<0.001) and 71.8 to 77.8% (p=0.007), respectively.

**Conclusions:** ENE is an independent predictor of both cancer recurrence and cancer-specific mortality in RC patients with LNM. Incorporation of ENE into multivariable predictive models increases accuracy of prediction of clinical outcomes.

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**HEAT SHOCK PROTEIN 70 (HSP70) AS A RECURRENCE MARKER FOR PT1 BLADDER CANCER**

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(Presented By: Oleksandr Stakhovskyi)

**Introduction:** Heat shock proteins (HSPs) expression is increased when cells are exposed to stress conditions such as high or low temperature, hypoxia or irradiation. HSPs are overexpressed in a wide range of human cancers and are implicated in tumor cell proliferation, differentiation, invasion, metastasis, death, and recognition by the immune system. Several HSPs are implicated with the prognosis of specific cancers. HSPs, and especially HSP60 and HSP90, have been proposed as prognostic factors for bladder cancer (BC). Because HSPs proteins are among the most immunogenic reported molecules and BCG therapy is immune dependent, the role of HSPs in patients with BC treated with BCG warrants investigation. Previously our group showed that in primary T1 BC treated with BCG, FGRF3 mutation and protein overexpression were associated with a decreased risk of tumor progression. In this project we evaluated HSP70 expression levels and their relationship to pathological and clinical parameters in the same selected group of previously untreated primary T1 BC treated with BCG.
**Materials and Methods:** 69 patients with newly diagnosed primary T1 BC treated at the University Health Network, Toronto were included in the study. Microarrays were built and HSP70 protein expression was determined by standard immunohistochemistry. Slides were co-reviewed with an uro-pathologist with staining scores dependent on the expression and intensity of the marker. HSPs expression was correlated with pathological, clinical outcomes and with the expression of FGFR3. FGFR3 mutation status was examined by multiplex PCR–SNaPshot analysis. Kaplan–Meier method and multivariate Cox–regression analysis were used for data analysis.

**Results:** Mean age of patients was 71.1 years (±8.5). HSP70 was found to be expressed in 29/53 (55%) high-grade tumors and in 9/14 (64%) low-grade tumors. Kaplan–Meier survival analysis demonstrated that the lack of HSP70 expression was a significant predictor for disease recurrence (p<0.05) but did not affect progression. In a multivariate model adjusting for grade, size and concomitant CIS, lack of HSP70 expression remained a significant predictor for recurrence (HR of 1.952, 95% CI 1.02–3.75; p = 0.045). HSP70 was shown to correlate with FGFR3 expression and mutation (p<0.05).

**Conclusion:** HSP70 is a promising marker in T1 BC treated with BCG. Both HSP70 and FGFR3 may play an important prognostic role in T1 BC identifying a group at lower risk of recurrence.

**Poster #8**

**OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY USING THE NEW AJCC PATHOLOGIC CLASSIFICATION FOR SUBEPITHELIAL PROSTATIC INVASION**

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(Presented By: Amit Patel)

**Introduction and Objectives:** In 2010, the AJCC reclassified primary staging for bladder cancer to exclude subepithelial invasion of the prostatic urethra and prostatic stroma as T4 staging status. We sought to determine whether the changes were reflective of overall survival between T4 disease and the newly classified T2 prostatic stromal invasion.

**Methods:** We retrospectively extracted patients in our institutional cystectomy database with T4 disease. Additionally, we queried the pathology database for all cystectomy specimens with prostatic urethral involvement. We systematically reclassified patients according to the new AJCC staging guidelines and divided the cohort into 2 groups: T4 and reclassified T2. Our primary endpoint was overall survival. We examined demographic factors and pathologic factors for each group.

**Results Obtained:** The two groups did not differ with respect to age, race, Charlson comorbidity index, or tumor size. However, the reclassified T2 group compared to the T4 group had a lower rate of lymph node involvement (15% vs 55%, p = 0.002) and positive margins (30% vs 62%, p = 0.008). Median overall survival for reclassified T2 versus T4 was 18 months versus 8.6 months, p = 0.026 (Figure).

**Conclusions:** The new AJCC staging for urothelial carcinoma prostatic stromal invasion corresponds to a difference in pathologic outcomes as well as in overall survival for our population. Our results support continued use of the new AJCC staging system for bladder cancer.
Objective: Radical cystectomy (RC) for bladder cancer can be associated with significant morbidity and alterations in health−related quality of life (HRQOL). The FACT−VCI is a condition−specific HRQOL survey for patients undergoing RC and urinary diversion (UD) for bladder cancer. This study evaluates the reliability, validity and responsiveness of the VCI.

Methods: The FACT−VCI was administered to patients with bladder cancer undergoing RC and UD (n=190) at two major cancer centers. Statistical methods included principal components analysis, Cronbach’s coefficient alpha and non−parametric correlation coefficients. The FACT−G was used to test criterion−related validity and a linear mixed model tested the effects of time and diversion type on longitudinal VCI scores.

Results obtained: A single summary score of 15 gender−neutral items (VCI−15) represented the optimum solution for post−operative data, which was internally consistent (α=0.85), had strong re−test reliability (rho=0.891) and was associated with all FACT−G scales and total score (rho≥0.38, p<0.001). Pre−operatively, the VCI−15 was internally consistent (α=0.77) and was associated with the FACT−G physical and functional scales and total score (rho≥0.41, p<0.001). While VCI−15 scores at post−operative year one did not differ from pre−operative values overall (p=0.145), they did differ by diversion type (p=0.027) with no substantive change after orthotopic neobladder (40±9 vs. 39±10) but a clinically significant improvement after an ileal conduit (39±11 vs. 44±11).

Conclusion: The VCI−15 is a reliable and valid condition−specific HRQOL survey for patients with bladder cancer undergoing RC and UD. Future studies of RC patients should measure HRQOL using validated, condition−specific forms such as the FACT−VCI.
Poster #10

VOLUME-OUTCOMES IN CYSTECTOMY: IS IT THE SURGEON OR THE SETTING?
Todd M. Morgan, Daniel A. Barocas, Kirk A. Keegan, Michael S. Cookson, Sam S. Chang, Peter E. Clark, Shenghua Ni, Joseph A. Smith, Jr. and David F. Penson
Vanderbilt University
(Presented By: Todd M. Morgan)

Background: Hospital and surgeon volumes (HV and SV) predict important outcomes after radical cystectomy (RC). These quality indicators may be surrogates for one another or for other structural factors and processes of care. Thus, we sought to characterize the relationship between SV, HV, and mortality, while accounting for quantifiable processes of care, such as use of chemotherapy and extent of lymphadenectomy.

Methods: The Surveillance, Epidemiology, and End Results–Medicare linked database was used to identify 5,676 patients with urothelial bladder carcinoma who underwent RC from 1992–2006. HV and SV were ascertained and categorized by tertiles. The primary outcome was overall survival, and we tested the effect of HV, SV, lymph node count and chemotherapy in an iterative series of Cox regression analyses, controlling for age, Charlson comorbidity index, stage, grade node density, number of positive nodes, urinary diversion, and year of surgery.

Results: There were 74% men and 26% women, with a mean age of 75 and a median follow up of 31 months. When either SV or HV was included in the multivariate model, a significant volume–survival relationship was observed (Table). However, when both HV and SV were included in the model, the SV–survival relationship was attenuated and not statistically significant while the HV–survival relationship persisted (HR 1.23, 95%CI 1.12–1.35 for low vs. high volume). In the full model, which also included node count, low HV continued to be associated with increased mortality (HR 1.21, 95%CI 1.10–1.33) while the SV–outcome was further attenuated (HR 1.01, 95%CI 0.92–1.12, low vs. high volume).

Conclusions: When controlling for patient and disease characteristics, the relationship between SV and survival after RC may be accounted for by HV and by processes of care, such as extent of lymphadenectomy. This suggests that evidence–based care and HV may have a greater impact than surgeon case volume. In contrast, the HV–survival relationship remained significant, suggesting that perioperative processes of care at high volume hospitals can impact long–term outcomes post–RC.
**THE IMPACT OF ACCURATE STAGING ON BLADDER CANCER SURVIVAL: A PROCESS-OUTCOMES LINK.**

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(Presented By: Karim Chamie)

**Introduction and Objectives:** Detrusor muscle at diagnostic TURBT is often used as a surrogate of resection quality. We examined the association of surgical and pathology quality in reference to the initial diagnostic resection with survival among subjects diagnosed with non-muscle-invasive bladder cancer.

**Methods:** We retrospectively reviewed the medical records of all individuals age 18 or older with an incident diagnosis of urothelial non-muscle-invasive bladder cancer between 2004 and 2005 within the confines of the Los Angeles SEER Registry. We recorded patient age, gender, race, marital status, socioeconomic and insurance status, tumor histology, grade, and stage, operating urologist and reporting pathologist volume, institution type, the presence/mention of detrusor muscle in the initial resection specimen, and vital status. After adjusting for confounding using a propensity score-weighted approach competing-risks regression analysis, we determined whether surgical and pathology quality were associated with cancer-specific survival.

**Results:** We identified 1,865 individuals, 335 urologists, and 278 pathologists. The cohort was comprised of 1,180 (63.3%) individuals with low-grade and 685 (36.7%) with high-grade disease. We identified 33 (2.8%) bladder cancer-related deaths among those with low-grade and 94 (13.7%) among those with high-grade disease. Muscle was reported as present in 972 (52.1%), reported as absent in 564 (30.2%), and not mentioned in 329 (17.7%) of the initial pathology reports. The incidence of detrusor muscle sampling did not differ according to grade or stage. Among subjects with high-grade disease, a higher hazard of cancer-specific mortality was found with advancing age (76–85), stage (Tis and T1), and among those where detrusor muscle was absent (HR 1.65; 95% CI 1.05–2.59) or not mentioned (HR 2.87: 95% CI 1.44–5.72) in the initial diagnostic pathology report. The 5-year cancer-specific mortality was 8.0%, 13.0%, and 21.5% among those where muscle present, absent, and not mentioned, respectively.

**Conclusion:** Inadequate staging and poor pathology reporting are associated with a higher risk of bladder cancer-related deaths among those with high-grade disease. Since urologists were unable to discern between high or low grade, we contend that all patients with bladder cancer should undergo a complete endoscopic resection with detrusor muscle sampling (and appropriate pathology reporting) at diagnosis.

**IMPACT OF PARTNER STATUS AND DIVERSION TYPE ON SEXUALITY IN WOMEN UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER: A PILOT SURVEY**

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(Presented By: Tullika Garg)

**Introduction:** The mainstay of treatment for invasive bladder cancer is neoadjuvant chemotherapy and radical cystectomy (RC), which, in women, is an exirpative procedure involving removal of gynecologic organs. Though counseling practices and sexual function are well-studied in men, little is known about the impact of surgery on women. The objective of this study was to assess sexual counseling practices, sexual function, and sexual distress in women who have undergone RC.

**Patients and Methods:** After IRB approval, we identified all surviving female patients who received RC for bladder cancer at our institution from 2002–2007. Surveys consisted of a general medical questionnaire, the Female Sexual Function Index (FSFI), and Sexual Distress Scale (SDS). Surveys were returned de-identified. Subjects were stratified by partner status and diversion type.

**Results:** Twenty-two patients were identified and 14 returned surveys (response rate 64%). Subjects with ileal conduits (IC) and without partners had more comorbidities. IC and subjects without partners received less sexual counseling, but had a high demand for counseling. Those with partners and those with IC felt that sexual function changed after surgery. Continent diversions and presence of a partner were associated with higher FSFI scores in every domain. Subjects with a partner who was unable to engage in sexual activity had the highest mean SDS scores (21.8). Subjects with IC also had mean SDS scores in the distressed range (16).

**Conclusion:** RC is associated with sexual dysfunction and distress in women, particularly those with IC and lack of partner. Sexual counseling is underutilized in this cohort. More research is needed to improve sexual quality of life in female bladder cancer survivors.
DOES PATIENT AGE IMPACT SURVIVAL AFTER RADICAL CYSTECTOMY?
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¹University Health Network, Princess Margaret Hospital, Toronto, ON; ²Turku University Hospital, Turku, Finland; ³Helsinki University Hospital, Helsinki, Finland; ⁴Mount Sinai Hospital, Toronto, ON

Objective: To analyze the impact of patient age on survival after radical cystectomy (RC).

Patients and Methods: Advanced age is a known risk factor for the development of bladder cancer (BC) and with the increased longevity seen in the population, urologists now treat an increasing number of senior patients with this disease. Two ethics approved databases of BC patients undergoing RC at University Health Network, Toronto, Canada (1992–2008) and University of Turku, Turku, Finland (1986–2005) were retrospectively analysed. Six hundred thirty five patients who underwent this procedure between June 1985 and March 2010 were included. Patients were categorically divided into four age groups: ≤59, 60–69, 70–79, ≥80. Demographic, clinical and pathological data were compared, as well as recurrence-free survival (RFS), disease-specific survival (DSS) and overall survival (OAS).

Results: Compared to younger patients (age ≤79 years), elderly patients (age ≥80 years) had higher ASA scores (p=0.002), lower pathological N stage (p=<0.0001), a greater number of lymph nodes removed during surgical dissection (p=0.01), and they underwent less adjuvant treatment (p=0.01). Choice of urinary diversion differed between groups with ileal conduit being used for all patients ≥80 years (p<0.0001). No differences were noted between age groups with respect to RFS (p=0.59) or DSS (p=0.23). OAS decreased with increasing age (p<0.0001).

Conclusion: Although RC is an operation with significant morbidity, it is a viable treatment option for carefully selected elderly patients. Senior patients (≥80 years) should not be denied RC if they are deemed fit to undergo surgery. Senior adults do not suffer from adverse histopathological features as compared to younger patients either.

EXTERNAL VALIDATION OF A BIOMARKER BASED PRE-CYSTECTOMY ALGORITHM TO PREDICT NON-ORGAN CONFINED UROTHELIAL CANCERS
David Margel¹, Peter Bostrom¹, Jack Baniel², Ofer Yossepowitch², Alexandre Zlotta¹ and Neil Fleshner¹
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Institute of Urology, Rabin Medical Center- Beilinson, Petach Tikva, Israel

Background: The role of neoadjuvant chemotherapy prior to surgery in patients with muscle invasive bladder cancer remains debated. The need for tools to identify patients who would benefit from chemotherapy is pertinent. We have previously published a preoperative algorithm to predict non–organ confined disease. This algorithm included tumor markers (CEA CA−125 and CA 19 9) as well as clinical parameters. Our aim was to validate the accuracy of this algorithm in an independent, external cohort.

Patients and Methods: We used the Toronto, Bio-bank to measure preoperative serum levels of CEA, CA 125 and CA 19−9 in 76 consecutive patients with clinically organ confined bladder cancer (cT2 or less) that underwent radical cystectomy. Clinical parameters were retrieved from our prospective bladder information system database and incorporated into our marker–based algorithm. A numeric score was generated for each patient and a previously published cut-off was used to predict the presence non–organ confined disease. The accuracy of the model was quantified with the area under the curve (AUC) and the positive and negative predictive values were calculated.

Results: On pathologic evaluation, 38 patients (50%) were found to have non organ–confined tumors. The AUC of the algorithm was 0.79 (95% CI, 0.69–0.89). The positive and negative predictive values were 79% (95% CI, 71%–87%) and 74% (95% CI, 66%–82%), respectively.

Conclusions: We have externally validated a pre-cystectomy model to predict pathological stage. The algorithm may possibly aid in selecting patients who would benefit from neoadjuvant chemotherapy prior to cystectomy.
TREATMENT PATTERNS AND SURVIVAL OUTCOMES OF PATIENTS 50 YEARS OLD AND YOUNGER DEFINITIVE TREATMENT FOR BLADDER UROTHELIAL CELL CARCINOMA
Sanjay Patel, Vivek Patel¹, Kirk Keegan², Daniel Barocas², David Penson², Michael Cookson², Sam Chang², Peter Clark², Joseph Smith² and Todd Morgan²
¹Duke University, Durham NC; ²Vanderbilt Department of Urologic Surgery
(Presented By: Sanjay Patel)

Introduction: Urothelial cell carcinoma (UCC) of the bladder is a disease that most commonly afflicts those in the 7th and 8th decades of life. To this end, the majority of research has focused on this older age group and may be less applicable to younger individuals with bladder UCC. In particular, few series have addressed the ≤50 age group. We sought to evaluate the treatment patterns in patients ≤50 years old undergoing definitive treatment for bladder UCC and to assess the oncologic outcomes in those undergoing radical cystectomy (RC).

Methods: The Surveillance, Epidemiology, and End Results database was used to identify patients ≤50 years old who underwent definitive treatment for bladder UCC from 1990–2007. Patients were categorized by treatment type as bladder–sparing (radiation therapy or partial cystectomy) or non–bladder sparing (RC). Univariate and multivariate analysis was performed to identify risk factors for treatment type. Univariate and multivariate survival analysis for disease–specific survival (DSS) was performed for the RC group.

Results: A total of 1191 patients met inclusion criteria (9.6% radiation, 12.0% partial cystectomy, 78.4% RC) with a mean age of 45 years (SD 4.6 yrs). When controlling for age, sex, marital status, and race, multivariate predictors of radical surgery included increasing year of diagnosis (HR 1.09 per year, 95%CI [1.05–1.12], p<0.001) and location (referent Northeast; Central: HR 2.13 [1.27–3.58], p=0.004; West: HR 1.75 [1.16–2.65], p=0.008). Among patients undergoing RC, while also controlling for age and grade, independent predictors of DSS were T stage, N stage, and year of diagnosis (HR 0.96 [0.93–0.99] (Table). Marital status (HR 0.78 [0.60–1.00] for married vs. unmarried) also approached statistical significance.

Conclusions: We found substantial differences by region in the utilization of RC in patients ≤50 with bladder UCC and determined that radical surgery was more likely with each successive year of diagnosis. Interestingly, year of diagnosis was also an independent predictor of DSS in RC patients. Further work is needed to understand whether the increasing use of radical surgery in this young population has played a role in the observed improvement in long–term survival.

Table: Multivariate Survival Analysis

<table>
<thead>
<tr>
<th>Factor</th>
<th>Hazard Ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at Diagnosis</td>
<td>1.03</td>
<td>1.00–1.06</td>
<td>0.067</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td>0.78</td>
<td>0.60–1.00</td>
<td>0.055</td>
</tr>
<tr>
<td>Married</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year of Diagnosis</td>
<td>0.96</td>
<td>0.85–1.00</td>
<td>0.025</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Grade</td>
<td>1.45</td>
<td>1.43–1.45</td>
<td>0.17</td>
</tr>
<tr>
<td>High Grade</td>
<td>&lt;T2</td>
<td>Reference</td>
<td>-</td>
</tr>
<tr>
<td>pStage</td>
<td>T1</td>
<td>1.02</td>
<td>0.65–1.67</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>1.04</td>
<td>1.06–1.08</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>1.01</td>
<td>1.00–1.02</td>
</tr>
<tr>
<td></td>
<td>T4</td>
<td>1.03</td>
<td>1.00–1.06</td>
</tr>
<tr>
<td>pN</td>
<td>N0</td>
<td>1.51</td>
<td>1.39–1.65</td>
</tr>
<tr>
<td></td>
<td>N1</td>
<td>2.53</td>
<td>1.03–2.78</td>
</tr>
</tbody>
</table>

Poster Session I
OBESITY IS ASSOCIATED WITH WORSE ONCOLOGICAL OUTCOMES IN PATIENTS TREATED WITH RADICAL CYSTECTOMY

Thomas Chromecki¹, Michael Rink¹, Eugene Cha¹, Harun Fajkovich¹, Behfar Ehdie¹, Robert Svatk², Pierre Karakiewicz³, Yair Lotan¹, Derya Tilki¹, Patrick Bastian¹, Siamad Daneshmand⁴, Wassim Kassouf⁵, Giacomo Novara⁸, Hans-Martin Frische⁹, Maximilian Burger⁹, Jonathan Izawa¹⁰, Yves Fradet¹¹, Marek Babjuk¹² and Shahrokh F. Shariat¹

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(Presented By: Michael Rink)

**Introduction:** Obesity has been associated with carcinogenesis and progression in various malignancies. We investigated the association between body mass index (BMI) and oncological outcomes in patients following radical cystectomy (RC) for urothelial carcinoma of the bladder (UCB) in a large multi-institutional series.

**Material and Methods:** Data were collected from 4,118 patients treated with RC and pelvic lymphadenectomy for UCB. No patient received preoperative chemotherapy and/or radiotherapy. Cox regression analysis tested the effect of BMI on disease recurrence, cancer-specific mortality, and overall mortality. BMI was analyzed as a continuous and categorical variable (less than 25 versus 25 to 29 versus 30 and higher kg/m²).

**Results:** Median BMI was 28.8 kg/m² (IQR 7.9); 25.3% had a BMI <25 kg/m², 32.5% between 25–29.9 kg/m², and 42.2% ≥30 kg/m². Patients with a higher BMI were older (p<0.001), had higher tumor grade (p<0.001), and were more likely to have positive soft tissue surgical margins (p=0.006) compared to patients with lower BMI. In multivariable analyses that adjusted for the effects of standard clinicopathologic features, BMI over 30 was associated with higher risk of disease recurrence (HR 1.67, 95% CI 1.46–1.91, p<0.001), cancer-specific mortality (HR 1.43, 95% CI 1.24–1.66, p<0.001), and overall mortality (HR 1.81, CI 1.60–2.05, p<0.001). The main limitation is the retrospective design of the study.

**Conclusions:** Obesity is associated with worse cancer-specific outcomes in patients treated with RC for UCB. Focusing on patient modifiable factors such as BMI may have significant individual and public health implications in patients with invasive UCB.

THE IMPACT OF SERUM ALBUMIN ON EARLY COMPLICATION AND SURVIVAL RATE OF PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER

Hooman Djaladat¹, Adrian Fairey¹, Gus Miranda², Jie Cai², Anne Schuckman³, Eila Skinner⁴ and Siamak Daneshmand⁵

¹Urologic Oncology Fellow, Norris Cancer Center, USC, Los Angeles, CA; ²Urology department, USC, Los Angeles, CA; ³Assistant professor of Urology, Urology department, USC, Los Angeles, CA; ⁴Professor of Urology, Urology department, USC, Los Angeles, CA; ⁵Associate professor of Urology, Urology department, USC, Los Angeles, CA

(Presented By: Hooman Djaladat)

**Introduction and Objective:** Serum albumin is a well-known marker of nutritional status. We evaluated the impact of preoperative serum albumin level on early complication rate and survival of patients who underwent radical cystectomy and urinary diversion for bladder cancer.

**Methods:** 1964 patients with primary bladder cancer underwent radical cystectomy and urinary diversion between 1971 and 2008 at the University of Southern California. Preoperative serum albumin level was available in 1471 patients; low albumin was defined as <3.4 g/dL. Post cystectomy early complication was defined as any surgery related/unrelated event leading to lengthening hospital stay or patient readmission within 90 days of surgery. Recurrence free survival (RFS) and overall survival (OS) of this cohort were reviewed and compared with normal serum albumin patient group using a Kaplan–Meier and Cox proportional hazards models.
Results: 137 patients (9%) had low serum albumin level. Their demographic data is presented in table 1. The median follow up was 12.4 years (0 – 36.6 yrs). Low serum albumin level was associated with higher early complication rate (43% vs. 33%) (P= 0.03). In multivariable analysis, serum albumin level was an independent predictor of RFS (HR 1.35, 95% CI 1.00−1.81) and OS (HR 1.62, 95% CI 1.29−2.04).

Conclusion: Low serum albumin is independently predictive of post cystectomy recurrence and decreased overall survival. It potentially could be used in nomograms to predict postoperative prognosis in patients undergoing radical cystectomy.

<table>
<thead>
<tr>
<th>Patients</th>
<th>No</th>
<th>Male</th>
<th>Sex</th>
<th>Median age (range)</th>
<th>LVI</th>
<th>Multilocally</th>
<th>High grade</th>
<th>Stage ≥ pT3</th>
<th>Orthotopic diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alb &lt; 3.4</td>
<td>137</td>
<td>92</td>
<td>67%</td>
<td>61−90</td>
<td>62</td>
<td>46%</td>
<td>46</td>
<td>93%</td>
<td>87</td>
</tr>
<tr>
<td>Alb &gt; 3.4</td>
<td>133</td>
<td>105</td>
<td>79%</td>
<td>50−93</td>
<td>87</td>
<td>28%</td>
<td>113</td>
<td>82%</td>
<td>86</td>
</tr>
</tbody>
</table>

Table 1. Demographic data in 1471 patients who underwent cystectomy for bladder cancer based on serum albumin level

Poster #18

CLINICAL UTILITY OF NMP22 FOR THE SURVEILLANCE OF PATIENTS WITH RECURRENT BLADDER CANCER: A MULTI-CENTER CROSS-SECTIONAL STUDY
Eugene Cha¹, Christopher Barbieri¹, Thomas Chromecki¹, Allison Dunning¹, Yair Lotan², Michael Rink¹, Douglas Scherr¹, Pierre Karakiewicz³, Madhu Mazumdar¹ and Shahrokh Shariat¹
¹Weill Cornell Medical College, New York, NY; ²University of Texas Southwestern Medical Center, Dallas, TX; ³University of Montreal, Montreal, Canada
(Presented By: Eugene Cha)

Objective: To employ decision curve analysis to determine the impact of NMP22 on clinical decision-making for the surveillance of bladder cancer patients using data from a prospective trial.

Methods: The study included 668 patients with a history of non–muscle–invasive bladder cancer who underwent cystoscopy, urine cytology, and measurement of urinary NMP22 levels. We constructed several prediction models to estimate risk of bladder cancer. The base model was generated using patient characteristics (age, gender, race, and history of intravesical therapy); cytology and NMP22 were added to the base model to determine effects on predictive accuracy. Clinical net benefit was calculated by summing the benefits and subtracting the harms and weighting these by the threshold probability at which a patient or clinician would opt for cystoscopy.

Results: Ninety–seven patients were found to have recurrence of bladder cancer (14.5%). In univariable analyses, NMP22 was the strongest predictor of bladder cancer presence (predictive accuracy 66.0%), followed by cytology (56.5%) and history of intravesical therapy (56.4%). In multivariable prediction models, NMP22 improved the predictive accuracy of the base model by 11.5% (AUC 59.2% to 70.7%, p<0.0001) and that of the base model plus cytology by 6.4% (AUC 64.3% to 70.7%, p=0.036). Decision curve analysis revealed that adding NMP22 to other models increased clinical benefit, particularly at higher threshold probabilities.

Conclusions: NMP22 is a strong, independent predictor of bladder cancer in patients undergoing surveillance. Addition of NMP22 improves the accuracy of standard predictors by a statistically and clinically significant margin. Decision curve analysis suggests that integration of NMP22 into clinical decision–making helps spare unnecessary cystoscopies, with minimal increased risk of missing a bladder cancer recurrence.
Poster #19

URINARY AMINOPEPTIDASE ACTIVITIES AS FUNCTIONAL BIOMARKERS OF BLADDER CANCER
Jennifer Taylor¹, Mariana Yaneva², Kevin Velasco³, Hediye Erdjument-Bromage², John Philip², Yongbiao Li², Hans Lilja³, Bernard Bochner³ and Paul Tempst²
¹Urology Service, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Protein Center, MSKCC, New York NY; ³Urology Service, MSKCC, New York, NY
(Presented By: Jennifer Taylor)

Introduction: Proteases have been implicated in cancer progression and invasiveness. Differential panels of blood−based exopeptidase activities have been observed in cancer patients, providing a distinction based on enzymatic function. We investigated the activities of urinary aminopeptidases as potential biomarkers for bladder cancer.

Methods: The unique urinary proteomes of males and females were profiled by LC−MS/MS from pooled specimens of healthy subjects, establishing the presence of a set of aminopeptidases in urine. Samples were collected from patients with bladder cancer and healthy control subjects. We developed aminopeptidase activity assays through studies with recombinant enzymes, establishing enzyme specificity through substrate and inhibitor selection; the assay employs substrates with fluorogenic groups susceptible to cleavage by specific target enzymes. The activities of five aminopeptidases—ANPEP, ENPEP, DPP4, DPP7, and CTSC—were assayed in pooled samples. We then screened urine samples from 16 healthy men and 16 men with muscle−invasive (stage T2−T4) bladder cancer. The activity profiles of each individual were compared using support vector machine (SVM) modeling to predict presence of malignancy. Multiple SVM models were considered, varying the number of candidate enzymes, SVM kernel and its corresponding parameters.

Results: Following immunodepletion of highly abundant proteins, analysis of the pooled urine samples by MS identified ~700 unique proteins, including 19 exopeptidases. In our preliminary screen of pooled samples from 9 bladder cancer patients and 5 gender−matched control subjects, specific activities in pooled samples were found to be consistently higher for ENPEP (p=0.0002) and DPP7 (p=0.0006); lower for ANPEP (p<0.0001) and CTSC (p=0.001) and unchanged for DPP4 (p=0.153) in cancer samples as compared to controls. When optimized for total accuracy, SVM modeling with a linear kernel, using a combination of ANPEP, ENPEP, and DPP7, classified samples well, achieving 87.5% sensitivity and 87.5% specificity, for an overall accuracy of 87.5%.

Conclusion: This investigation established a reliable urinary protein inventory, for men and women separately. We developed a novel functional assay which characterizes aminopeptidase activities in urine specimens, with high technical reproducibility. With further testing, it may yield a valuable biomarker test for bladder cancer detection or prognostication.

Poster #20

VALIDATION OF NEW STAGING SYSTEM FOR PATIENTS WITH INVASIVE UROTHELIAL CARCINOMA OF THE PROSTATE
Ahmed Abd El Latif¹, Ranko Miocinovic¹, Hosni Salem², Amr Massoud², Andrew J. Stephenson¹ and Donna Hansel¹
¹Cleveland Clinic, Cleveland, Ohio; ²Cairo University, Cairo, Egypt
(Presented By: Ahmed Abd El Latif)

Introduction: To investigate whether the outcome of patients undergoing radical cystectomy (RC) with contiguous involvement of the prostatic urethra by urothelial cancer of the bladder (UCB) varies by the extent of ductal/stromal invasion, and to verify the changes in the new staging system.

Materials and Methods: A retrospective review identified 103 consecutive patients who underwent RC at two high−volume hospitals who were found to have contiguous involvement of the prostatic urethral ducts +/- stroma with UCB. Patients were divided into two groups according to extent of prostatic invasion: 1) superficial N=48 (ductal involvement [N=6], glandular invasion [N=7] or focal stromal invasion [N=35]), and 2) deep N=55 (deep stromal invasion [N=32], extra capsular invasion or seminal vesicles invasion [N=23]). Multivariable Cox proportional hazards model was used to determine the association of extent of prostatic involvement with mortality after controlling for age, institution, pathological stage, surgical margin status, and lymph node status.
Results: The median follow-up was 18 months (IQR: 8–37). Lymph node metastasis was observed in 27% and 40% of patients in groups 1 and 2, respectively. The 5-year overall survival for groups 1 and 2 was 63% and 40%, respectively (p=0.02). In multivariable analysis, patients with deep stromal invasion had a significantly worse mortality than those with superficial involvement of the prostatic urethra/stroma (HR: 2.6; 95% CI: 1.2–5.9).

Conclusion: Patients with superficial involvement of the prostate by contiguous UCB have a significantly improved survival in comparison to deep invasion. This supports the recent changes in staging system in which patients with ductal and focal stromal invasion are classified as pT2 stage.

Poster #21

MICRORNA 200C EXPRESSION LEVEL PREDICTS OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY
Neema Navai, Matthew Wszolek, David McConkey, Adam Liana and Colin Dinney
MD Anderson Cancer Center Houston, TX
(Presented By: Neema Navai)

Introduction and Objectives: Bladder cancer is the 4th most common non–cutaneous malignancy in men and is the most costly cancer from diagnosis to death. It is often a chemoresistant cancer with poor clinical outcome. Frequently clinical staging fails to recognize patients who ultimately succumb to disease and may benefit from neoadjuvant chemotherapy. microRNAs (miRNA), short non–coding nucleic acids with function analogous to known RNA–interference pathways have shown promise in both prognostication and treatment of numerous cancers. We hypothesize that miRNA–200c can be used to predict clinical outcome in patients who undergo radical cystectomy.

Methods: From a prospectively maintain institutional database of all cystectomy patients we identified 89 who received radical cystectomy from 2000 – 2010 and had tumor specimens available for RNA analysis. Salient pre–surgical and oncologic variables were retrospectively obtained from patient charts. miRNA analysis was done by quantitative RT–PCR. miR200c expression was normalized to the lowest expressing sample. Survival was analyzed with the Kaplan–Meier method and significance was determined by the Log–rank test or, when appropriate, the Gehan–Breslow–Wilcoxon test.

Results Obtained: 89 patients were identified from an institutional tumor bank with specimens available for RNA analysis. For the purpose of survival analysis invasive was defined as T2 or greater. Average age was 67 years with average follow up of 35 months. Fig. 1 demonstrates overall survival in the total cohort. Patient with low miR200c showed a non–significant trend towards longer survival. In subgroup analysis of non–invasive patients high miR200c was significantly associated with longer survival (p < 0.05, HR 4.9). A non significant trend was also seen in the invasive patients with low miR200c being associated with longer survival.

Conclusion: miRNA 200c can be used to predict post radical cystectomy overall survival. It appears that miRNA 200c is most useful in patients with clinically T1 or less disease at time of diagnosis.
PROGNOSTIC VALUE OF APOPTOTIC MARKERS IN SQUAMOUS CELL CARCINOMA OF THE BLADDER

Ramy Youssef¹, Payal Kapur¹, Tyler Arendt¹, Ahmed Mosbah², Hassan Abol-Enein², Mohamed Ghoniem² and Yair Lotan¹
¹UT Southwestern medical center, Dallas, TX; ²Urology and Nephrology center, Mansoura University, Mansoura, Egypt

(Presented By: Ramy Youssef)

Objectives: We evaluated the association of Cleaved Caspase−3, Bax, COX−2, and p53 expression with pathologic features and clinical outcomes in patients with squamous cell carcinoma (SCC) of the urinary bladder.

Methods: Immunohistochemistry for Cleaved Caspase−3, Bax, COX−2, and p53 was performed on tissue microarray sections of radical cystectomy specimens with pure SCC from 1997–2003. The relationship between the expression of these markers and pathological features was assessed. A prognostic marker score (PS) was defined as favorable if ≤2 biomarkers were altered; unfavorable if >2 biomarkers were altered and was correlated to oncological outcomes.

Results: The study included 151 patients (98 men and 53 women, mean age 52 years, 122 (81%) associated with bilharziasis). The pathological stage was T2 in 50%, T3 in 38%, T1 and T4 in 6% each; low grade in 53%; lymph node metastasis in 30.5% and lymphovascular invasion in 16% of patients. Median follow up was 63.2 months. Advanced stage was associated with COX−2, p53, Cleaved Caspase−3 alterations and high grade was associated with COX−2 alterations (p < 0.05). The total number of altered markers and unfavorable PS were associated with both disease recurrence and bladder cancer−specific mortality in Kaplan Meier analyses (P < 0.05). Unfavorable PS was an independent predictor of disease recurrence (HR 2.694, 95% CI 1.386–5.235, p=0. 003) and bladder cancer−specific mortality (HR 2.868, 95% CI 1.209–6.802, p=0. 017) in multivariable Cox regression analysis.

Conclusions: Markers of apoptosis pathways may play an important role in the prognosis of bladder SCC. An increased number of altered markers and an unfavorable prognostic score may identify patients who might benefit from multimodal therapies.
REGIONAL DIFFERENCES IN PRACTICE PATTERNS AND OUTCOMES FOR UPPER TRACT UROTHELIAL CARCINOMA IN CANADA: OUTCOMES FROM THE CANADIAN UPPER TRACT COLLABORATION

Michael Metcalfe¹, Wassim Kassouf², Ricardo Rendon³, David Bell³, Jonathon Izawa¹, Joseph Chin⁴, Anil Kapoor⁵, Edward Matsumoto⁶, Jean-Baptiste Lattouf⁷, Fred Saad⁸, Louis Lacombe⁹, Yves Fрадet¹⁰, Niels-Erik Jascobsen⁵, Darrel Drachenberg⁹, Ilias Caggianos¹⁰, Simon Tanguay², Alan So¹ and Peter Black¹

¹University of British Columbia, Vancouver, BC, Canada; ²McGill University, Montreal, QC, Canada; ³Dalhousie University, Halifax, NS, Canada; ⁴University of Western Ontario, London, ON, Canada; ⁵McMaster University, Hamilton, ON, Canada; ⁶University of Montreal, Montreal, QC, Canada; ⁷Laval University, Laval, QC, Canada; ⁸University of Alberta, Edmonton, AB, Canada; ⁹University of Manitoba, Winnipeg, MB, Canada; ¹⁰University of Ottawa, Ottawa, ON, Canada

(Presented By: Michael Metcalfe)

Introduction: Upper tract urothelial carcinoma (UTUC) is a potentially aggressive malignancy that is associated with a poor prognosis. Diagnosis and management of UTUC is poorly defined in Canada and elsewhere. Nephroureterectomy is recognized as the gold standard for localized disease; however, there is considerable variance in how this is performed. We aim to delineate regional differences in practice patterns in Canada and relate these to patient outcomes.

Materials and Methods: Ten institutional radical nephroureterectomy databases containing information on UTUC patients treated between 1994 and 2009 were obtained from academic centers in Canada. Data were collected on 1029 patients and combined into a relational database formatted with demographic, clinical and pathologic characteristics, recurrence status, and survival status. The centers were divided as being from 1. the West, 2. Ontario, and 3. the East. Outcome measures were overall survival (OS), disease-specific survival (DSS), and recurrence-free survival (RFS). Multivariate linear regression analysis was used to determine the association between regional differences in practice patterns and clinical outcomes.

Results: There was a significant difference between the three regions within Canada for multiple parameters including time from diagnosis to surgery date (p=0.001), type of surgery (open vs. laparoscopic; p<0.01), and management of distal ureter (0.001). Five-year DSS (p=0.0053) and OS (p=0.0006), but not RFS (0.98) were different between the three regions. Multivariate linear regression analysis demonstrated that smoking, tumor location, stage and grade, and the use of salvage radiation therapy were significant in association with overall survival, but region of treatment was not an independent predictor of outcome.

Conclusion: In the treatment of UTUC, there is a significant disparity between practice patterns as well as survival between regions within Canada. However, there is no association between the disparities seen in practice patterns and overall survival when demographic, clinical and pathological data are considered.

CLINICAL NODAL STAGING SCORES FOR BLADDER CANCER: A PROPOSAL FOR PREOPERATIVE RISK ASSESSMENT

Michael Rink¹, Shahrokh Shariat¹, Eugene Cha¹, Behfar Ehdai², Robert Svatek³, Thomas Chremecki¹, Giacomo Novara⁴, Siamak Daneshmand⁵, Yves Fрадet⁶, Yair Lotan⁷, Arthur Sagalowsky⁸, Patrick Bastian⁹, Wassim Kassouf⁵, Hans-Martin Fritsche⁶, Maximilian Burger⁶, Jonathan Izawa¹⁰, Derya Tilki¹², Firas Abdollah¹¹, Felix Chun¹², Guru Sonpavde¹³, Pierre Karakiewicz¹¹, Douglas Scherr² and Mithat Gonen¹⁴

¹Weill Cornell Medical College, New York, NY; ²University of Texas San Antonio, San Antonio, TX; ³University of Padua, Padua, Italy; ⁴University of Southern California, Los Angeles, CA; ⁵Laval University, Quebec, Canada; ⁶University of Texas Southwestern Medical Center, Dallas, TX; ⁷Ludwig-Maximilians-Universitat Munchen, Munich, Germany; ⁸McGill University Health Center, Montreal, Quebec; ⁹University of Regensburg, Regensburg, Germany; ¹⁰University of Western Ontario, London, Canada; ¹¹University of Montreal, Montreal, Canada; ¹²University Medical Center Hamburg-Eppendorf, Hamburg, Germany; ¹³Baylor College of Medicine, Houston, TX; ¹⁴Memorial Sloan-Kettering Cancer Center

(Presented By: Michael Rink)
Background: Radical cystectomy (RC) with pelvic lymph node dissection (LND) is the standard of care for refractory non–muscle−invasive and muscle−invasive bladder cancer. Although a consensus exists on the need for LND, its extent is still debated. We sought to develop a model that allows preoperative determination of the number of nodes needed to be removed at RC.

Methods: Data from 4,335 patients treated with RC and pelvic LND without neoadjuvant chemotherapy at 12 academic centers located in the US, Canada, and Europe were collected. We estimated the sensitivity of pathologic nodal staging using a beta–binomial model and developed clinical (preoperative) nodal staging scores (cNSS), which represent the probability that a patient has tumor metastasis to lymph nodes as a function of the number of examined nodes.

Results: Overall, the probability of missing a positive lymph node decreases with an increasing number of nodes examined (52% if three nodes examined, 40% if five examined, and 26% if ten examined). A cNSS of 90% can be achieved by examining six nodes for clinical Ta−Tis tumors, nine nodes for cT1 tumors, and 25 nodes for cT2 tumors. In contrast, examination of 25 nodes provides only 77% cNSS for cT3−T4 tumors.

Conclusions: The minimum number of examined lymph nodes for adequate staging depends preoperatively on the clinical T stage. Predictive tools can give a preoperative estimation of the likelihood of nodal metastasis and thereby allow tailored decision−making regarding the extent of LND at RC.

Poster #25

USE OF PELVIC LYMPHADENECTOMY IN RADICAL CYSTECTOMY FOR BLADDER CANCER: 10-YEAR EXPERIENCE AT A SINGLE-INSTITUTION

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(Presented By: Stephen F Kappa)

Introduction and Objectives: Increasing evidence supports a positive association between extent of pelvic lymph node dissection (PLND) and survival after radical cystectomy (RC) for bladder cancer. We sought to determine the utilization and yield of PLND at a high−volume tertiary care center and to identify predictors of the performance of PLND and lymph node yield in patients undergoing RC for bladder cancer.

Methods: We studied 1040 consecutive patients who underwent RC for urothelial bladder cancer from January 2001 to December 2010. Use of PLND and node count ≥10 were both determined by year of surgery. Baseline characteristics (age, race, sex, Charlson comorbidity index [CCI], body mass index [BMI], albumin level, clinical stage, surgeon and year of surgery) were compared between those who received PLND and/or node count ≥10 and those who did not. A multivariable model was fit for predictors of PLND and node count ≥10, controlling for factors that were significant on univariate analysis.
Results: Mean age was 67.9 years and 20.1% were female. Overall, 955 (92.9%) patients underwent PLND, and 515 (49.5%) patients had ≥10 nodes counted. Use of PLND increased from 80 (87.9%) patients in 2002 to 109 (95.6%) patients in 2010 (Figure). On univariate analysis, age, CCI, year of surgery, and surgeon were associated with both PLND and node count ≥10. Additionally, BMI was associated with node count ≥10. Multivariate analysis revealed that CCI (OR 0.72, 95%CI 0.62–0.84), year of surgery (OR 1.13, 95%CI 1.03–1.26), and surgeon predict PLND. CCI (OR 0.79, 95%CI 0.71–0.88), year of surgery (OR 1.25, 95%CI 1.17–1.34), and surgeon also predicted node count ≥10.

Conclusions: Over the past 10 years, the proportion of patients undergoing PLND and lymph node yield have steadily risen. These results provide a benchmark for our institutional performance and demonstrate that both patient and provider factors predict the performance and yield of PLND in individuals undergoing RC. Continued efforts aimed at implementation of evidence–based processes of care and identification of barriers to their implementation may facilitate improvements in the care of bladder cancer patients.

Poster #26

BLADDER CANCER PREDICTIVE NOMOGRAM FOR OVERALL SURVIVAL FOLLOWING RADICAL CYSTECTOMY
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(Presented By: Ahmed Abd El Latif)

Introduction and Objectives: Nomograms provide individualized risk predictions for patients as opposed to staging–based group risk predictions. The goal of the present study is to build a prediction model for bladder cancer patient survival after radical cystectomy (RC).

Methods: From 2004 until 2008 we retrospectively identified 482 patients who underwent RC for urothelial carcinoma of the bladder (UBC). The pool of predictors identified includes: age at RC, gender, time between diagnosis and RC, smoking, American Society of Anesthesia (ASA) Score, chemotherapy (neoadjuvant, adjuvant), initial treatment 3 categories (RC or intravesical BCG or intravesical chemotherapy), path T, path N, surgical margins (SM), lymphovascular invasion (LVI), lymph node density (LND = percentage of positive to total LN), path carcinoma in situ (CIS), total LN, total positive LN, LN dissection Type (standard or extended), path subtypes. We compared models with different predictors from a pool of predictors of interest by their prediction performance, and then chose the model with the highest concordance index (the best prediction performance). Restricted cubic splines were used for all continuous predictors to account for possible non–linear effect of the predictors.
Results: The outcome is all−cause mortality after RC for urothelial carcinoma of the bladder (UBC). The final model with the highest concordance index includes: age at RC, smoking, initial treatment 3 categories, path T, pathology subtypes, SM, LND, LVI. This was internally validated by bootstrap and cross−validation. The concordance index of the final model is 0.74. The nomogram for the final model is shown in (FIG1).

Conclusions: We believe that this nomogram is the first to use initial treatment and pathological subtypes. They had substantial effects on the survival of patients with UBC who underwent RC. External validation of the nomogram would be helpful.

Poster #27

EVALUATION OF ANTICIPATORY FISH POSITIVE ASSAYS IN BLADDER CANCER SURVEILLANCE PATIENTS
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(Presented By: Casey Seideman)

Background: Previous reports have suggested that patients undergoing bladder cancer surveillance who have a positive Urovysion assay are more likely to recur then patients with a negative FISH assay. This has been termed an “anticipatory positive” test. The goal of this study was to determine the clinical significance of a positive Urovysion FISH assay in bladder cancer surveillance.

Methods: An IRB approved, retrospective chart review was performed to identify all patients undergoing surveillance for urothelial carcinoma at a single institution between December 2005−2010. A reflex Urovysion FISH assay was performed in patients with atypical cytology. Patients with cystoscopic evidence of tumor were excluded, as well as any tumors diagnosed within 3 months. Pathology, follow−up cystoscopy, cytology, and FISH data were analyzed. Our endpoint was cancer recurrence, defined by biopsies and pathology. Statistical analyses were performed using Fisher’s exact test as a 1−tailed test, and chi−square test with significance at 0.05.

Results: 141 patients were included for analysis. Of these 109 were male (77%), mean age was 67.8 (range 23−92 years). 75 (53%) patients were followed for Ta UCC, 39 (27%) for T1, 21(15%) for CIS, and 6 (5%) patients without reports from outside facilities. 48 (34%) had low grade UCC, 86 (61%) high grade UCC, and 7 (5%) unknown. Average follow−up was 25 months (range 1−69 mo).

The FISH assay was negative in 104 (73.8%), positive in 22 (15.6%) and indeterminate in 15 (10.6%) patients. Cystoscopy was normal in 107 (76%) and 37 (24%) had an erythematous lesion. Biopsy proven recurrences occurred in 41 (29%) patients, 1 was treated for recurrence based on positive cytology and FISH. Mean time to recurrence was 17.5 months. Of the patients with a recurrence, 15 (36%) had an erythematous lesion on cystoscopy, and 12 (27%) had a positive FISH. FISH had a positive predictive value of 54.5%, negative predictive value of 74%.
Univariate analysis identified cystoscopy findings of an erythematous patch, and positive FISH analysis to be associated with recurrence (p<0.05). No association was found between stage, grade, intravesical therapy and likelihood of recurrence. No variable was an independent predictor of recurrence on multivariate analysis.

Conclusions: The role of FISH studies in bladder cancer surveillance remains poorly understood. It is unclear whether patients with a positive Urovysion assay need a different surveillance strategy.

Poster #28

EFFICACY OF COMBINED BEVACIZUMAB AND EGFR INHIBITION IN METASTATIC PAPILLARY RENAL CELL CARCINOMA (RCC) ASSOCIATED WITH HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER (HLRCC)

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(Presented By: Eric A. Singer)

Introduction and Objectives: The evaluation of families with inherited forms of RCC has allowed the identification of genetic changes associated with papillary RCC. HLRCC is a familial condition resulting from germline alterations in the gene for the Krebs cycle enzyme fumarate hydratase (FH) and is characterized by a propensity for the development of an aggressive form of papillary RCC. Loss of FH leads to upregulation of hypoxia inducible factors (HIF) and their downstream transcriptional targets such as vascular endothelial growth factor (VEGF) and transforming growth factor–alpha / epidermal growth factor receptor (EGFR). As a result of an impaired Krebs cycle, FH −/− kidney cancer cell lines rely on aerobic glycolysis for energy production (Warburg effect) and exhibit increased glucose dependence. We hypothesized that combined VEGF and EGFR–pathway blockade would constrain glucose delivery to tumors and inhibit critical HIF−driven downstream targets.

Methods: We queried a prospectively maintained kidney cancer database to identify patients with advanced HLRCC−associated RCC treated at our institution on IRB−approved protocols. Demographic, clinical, pathologic, and treatment data were collected by chart review. Response to combined VEGF/EGFR blockade was determined by RECIST. Responses to other therapies were based on the clinical assessment of the referring oncologist. This study was funded by the NCI Intramural Research Program.

Results Obtained: Twenty patients with advanced RCC were treated between 1998 and 2008; 7/20 pts received combined VEGF/EGFR blockade (bevacizumab 10mg/Kg IV every two weeks plus either erlotinib [N=6] or gefitinib [N=1]). The remaining patients received a variety of agents including VEGFR targeted tyrosine kinase inhibitors, IL−2, and cytotoxic chemotherapy. Patients receiving VEGF/EGFR blockade had an overall response rate of 71% (5/7), including one patient with a complete response (14%) and 4 patients with a partial response (57%). Responses were durable, with one patient remaining disease free 57 months after treatment initiation. Combined VEGF/EGFR blockade resulted in significantly improved overall survival (median 51 months vs. 14 months; P=0.004) compared to other treatment regimens.

Conclusions: Combined VEGF/EGFR blockade has significant activity in metastatic papillary RCC associated with HLRCC. A phase II trial using this combination (NCT01130519) is ongoing at the NCI to further examine the efficacy of this regimen.
Poster #29

**PHASE I TRIAL OF THE HDAC INHIBITOR LBH589 IN COMBINATION WITH SORAFENIB IN PATIENTS WITH RENAL CELL CARCINOMA, NON SMALL CELL LUNG CANCER AND SOFT TISSUE SARCOMAS.**

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(Presented By: Lydia Laboccetta)

**Introduction:** LBH589 is a novel histone deacetylase inhibitor (HDACi) that induces apoptosis of tumor cells. In RCC and NSCLC cell lines, the combination of sorafenib and HDACi was found to have synergistic inhibition, which correlated with the induction of an ER stress response. In this phase I study, we evaluated the combination of LBH589 and sorafenib in previously treated patients with renal cell carcinomas (RCC) (9pts), soft tissue sarcomas (1pt), and non−squamous−non small−cell lung cancers (6pts). The trial was designed to determine the safety profile and maximum tolerated dose of LBH589 and sorafenib when administered concurrently.

**Methods:** Patients were dosed with either i.v. (Days 1, 8, and 15) or oral LBH 589 (three times per week, continuously) every twenty eight days in combination with standard daily dose sorafenib (400 mg bid). The dose escalation was based on a “3+3” algorithmic design. LBH was initially administered at an i.v. dose of 5 mg/m2 with escalation to 10 mg/m2. Due to the manufacturer’s phase−out of the i.v. formulation, this was then changed to an oral formulation administered three times a week (doses 15 mg, 20 mg, and 25 mg). Patients on the 5 mg/m2 and 10 mg/m2 i.v. dose were transitioned to the 15 mg and 20 mg, respectively, of the oral preparation.

**Results:** Sixteen patients, median age 57 years, have been treated. Dose limiting toxicities were observed with grade 4 thrombocytopenia in two patients at the oral dose of 25 mg. There were no other grade 4 events. Grade 3 events included fatigue (2 pts), hypophosphatemia (2 pts), hypertension (1 pts), anemia (1 pt), rash (1 pt) and hand−foot erythroderma (1 pt). Common toxicities for the combination were fatigue (81%), weight loss (62%), loss of appetite (56%), diarrhea (56%), rash (50%), thrombocytopenia (31%), and hand−foot erythroderma (25%). No patients had significant QT prolongation. There was 1 partial response in a patient with lung cancer (31 weeks). Stable disease was noted in seven patients with RCC (78+, 48, 47, 31, 21, 17, and 10+ weeks). Stable disease was noted in the patient with sarcoma, but was taken off of trial as patient preference because of side effects. Seven patients had progressive disease.

**Conclusions:** The administration of oral LBH589 at a dose of 20 mg was found to be well tolerated and will be used in the expansion phase of the trial. Prolonged stable disease was observed in patients previously treated with sorafenib alone, sunitinib and axitinib.

Poster #30

**UISS RISK STRATIFICATION MAY BE USEFUL TO IDENTIFY PATIENTS LESS LIKELY TO BENEFIT FROM CYTOREDUCTIVE NEPHRECTOMY IN THE TARGETED THERAPY ERA.**

Edward Rampersaud¹, Frederic Birkhaeuser¹, Joshua Logan¹, Geoffrey Sonn¹, Yvonne Chan², Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Nazy Zomorodian¹, Fairooz Kabbinavar¹, Allan Pantuck¹ and Arie Belldegrun¹
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(Presented By: Edward Rampersaud)

**Objective:** The role of cytoreductive nephrectomy (CRN) in the targeted therapy (TT) era is ill−defined. We sought to examine the factors associated with survival outcomes in patients presenting with metastatic renal cell carcinoma (mRCC) in the TT era.

**Methods:** The UCLA Kidney Cancer Program database containing records of over 2000 patients, including 232 patients treated with TT since 2003, was queried. Of 154 patients treated with FDA−approved TT agents, 71 presented with synchronous metastatic disease. 60 underwent CRN followed by TT (CRN group), while 11 received TT only (No CRN group). We compared the clinicopathologic factors and survival outcomes between these two groups.
Results: The two groups were balanced for baseline demographic variables including gender, race, BMI, tumor size, T−stage, ECOG performance status, and UCLA Integrated Staging System (UISS) risk category. Median DSS for No CRN vs CRN was 15.0 vs 27.0 months, p=0.079. Of the 60 CRN patients, 12 received a regimen comprised of IL−2 based immunotherapy followed by TT upon progression (IMT/TT), whereas 48 were treated with TT−only. Among patients receiving TT−only, median DSS for No CRN vs CRN was 8.0 vs 21.0 months, p=0.02. The subset of patients treated sequentially with IMT followed by TT had a median survival of 82.0 months. Median DSS based on UISS risk stratification (high, intermediate, low) was 11.0, 25.0, and 63.0 months, p<0.004. Survival of UISS high−risk patients undergoing CRN was no better than patients treated with primary tumor in place (p=0.383).

Conclusion: CRN remains a standard of care for appropriately selected mRCC patients presenting with primary in place. However, patients in high−risk groups do not appear to demonstrate a survival benefit from CRN compared to those treated by immediate systemic therapy without surgery. When these high−risk patients are identified preoperatively, treatment consideration should be directed at upfront TT.

Poster #31

COMPARISON OF RATES AND RISK FACTORS FOR DEVELOPMENT OF HYPERLIPIDEMIA AFTER RADICAL OR PARTIAL NEPHRECTOMY
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(Presented By: Ryan Kopp)

Introduction and objectives: Nephron Sparing Surgery (NSS) has emerged as a preferred option for the management of small renal masses, comparing favorably with radical nephrectomy (RN) from the standpoint of long−term oncologic efficacy and conferring superior renal functional preservation. Lipid metabolism may be affected by nephron loss and resultant renal endocrine dysfunction. We examined the incidence and risk factors for development of hyperlipidemia (HL) in patients who underwent RN and NSS.

Methods: Multi−center retrospective review of 905 patients (610 RN/295 NSS, mean age 57.5 years, mean follow−up 5.8 years) who underwent RN or NSS for renal tumors at two institutions from 7/1987 to 6/2007. Demographics and disease characteristics, renal function and metabolic parameters [Body mass index (BMI), estimated Glomerular Filtration Rate (mL/min/1.73m2, GFR), serum creatinine] and history of preoperative and postoperative HL were recorded. De novo HL was defined as diagnosis of hyperlipoproteinemia, hypercholesterolemia, or hypertriglyceridemia at least 6 months after surgery with laboratory values meeting National Cholesterol Education Program ATP III definitions. Data were analyzed within subgroups based on treatment (RN vs. NSS). Multivariate analysis (MVA) was conducted to elucidate risk factors for development of HL following surgery.

Results obtained: There were no significant differences with respect to mean follow−up, age, race, sex, or BMI. Tumor size (cm) was significantly larger for RN (RN 7.0 vs. NSS 3.7, p<0.001). Preoperative GFR<60 mL/min/1.73m2 (p=0.123) and HL (p=0.144) was similar between groups. Significantly greater postoperative GFR<60 mL/min/1.73m2 for RN vs. NSS cohort (45.7% vs. 18%, p <0.001) was noted. Postoperatively, significantly more de novo HL developed in RN vs. NSS (23% vs. 6.4%, p<0.001). MVA demonstrated RN (OR 2.93, p=0.0107), preoperative (OR 1.98, p=0.037) and postoperative (OR 7.89, p<0.001) GFR <60 mL/min/1.73m2 as significantly associated with HL development after surgery.

Conclusions: Patients who underwent RN had significantly higher incidence of de novo HL compared to a contemporary, well−matched cohort that underwent NSS. In addition to RN, preoperative and postoperative eGFR<60 were also significantly associated with development of HL. Further investigation on effects of nephron loss on lipid metabolism is requisite.
COMPLICATIONS OF RENAL RADIOFREQUENCY ABLATION WITH PYELOPERFUSION

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(Presented By: Jairam Eswara)

Introduction: Radiofrequency ablation (RFA) is an effective means of renal tumor ablation. The ablation of masses adjacent to the ureter risks ureteral injury and stricture, however, placement of a ureteral catheter and retrograde pyeloperfusion with dextrose 5% in water (DSW) has been used to reduce ureteral injury.

Methods: From 2005–2010, 46 patients (52 ablations) required pyeloperfusion to protect the ureter. Patients were selected for pyeloperfusion during RFA if the tumor was located within 1.5cm of the ureter. Pyeloperfusion was performed by insertion of a 5Fr ureteral catheter and instillation of DSW. Tumors were classified as central, exophytic, or mixed according to the Gervais classification system.

Results: 52 ablations with pyeloperfusion were performed in 46 patients with an effectiveness rate of 87%. Median tumor diameter was 3.3 cm. 14/46 (30%) patients had major complications, but only 2 patients (4%) developed ureteral stricture managed with ureteral stenting. 5 patients (10%) had significant hematuria, 2 (4%) had urinomas requiring IR drainage, and 1 had a pseudoaneurysm requiring angioembolization. Notably, 2 patients (4%) had delayed abscesses: 1 patient underwent IR drainage of the abscess, and 1 underwent nephrectomy for what was thought to be recurrent tumor, but was found on pathology to be a delayed abscess with no evidence of malignancy.

Conclusions: RFA for renal masses is generally well–tolerated. Pyeloperfusion for ablations adjacent to the ureter led to only 2 ureteral strictures but also 2 delayed abscesses. Our complication rate is slightly higher than that of other contemporary RFA series.

SPECKLE-TYPE POZ PROTEIN CYTOPLASMIC MISLOCALIZATION AND OVEREXPRESSION PROMOTE TUMOR GROWTH IN AN ORTHOTOPIC MURINE RENAL CELL CANCER MODEL

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(Presented By: Sandip Prasad)

Introduction and objectives: Effective diagnosis and management of kidney cancer remain elusive goals for clinicians as renal tumors are radiographically indistinct, typically insensitive to radiotherapy and chemotherapy, and are not associated with any known serum tumor markers. In this study, we tested whether mislocalization of Speckle–type POZ protein (SPOP), an ubiquitin E3 ligase complex factor overexpressed in renal cell carcinomas, can promote tumorigenesis in an orthotopic murine model.

Methods: Human embryonic kidney (HEK293) cells transfected with a cytoplasmic SPOP–variant (SPOP–NN) created by deleting the nuclear localization signal were implanted subcutaneously and into the renal capsule of BALB/c nude mice. Control injections were performed using HEK293 cells and HEK293 cells transfected with an empty pcDNA3 vector (pcDNA3). In vivo tumor growth was monitored weekly using micro–ultrasound.

Results obtained: Tumor formation occurred in 17/20 (85%) SPOP–NN implantation sites compared with 1/20 (5%) HEK293 and 0/20 (0%) pcDNA3 sites (p<0.001). Tumor mass 6 week post–injection was a median of 3.03±1.54g, and histopathologic analysis displayed carcinoma. Downregulation of Daxx, DUSP6, DUSP7 and PTEN were observed by immunohistochemical staining, while upregulation of Gli–2, VEGF, SPOP and HIF–α were seen in the SPOP–NN group.

Conclusions: Cytoplasmic mislocalization of SPOP is a potent promoter of tumorigenesis in HEK293 cells. SPOP appears to generate these oncogenic phenotypes by mediating the ubiquitination and degradation of the anti–proliferative phosphatases PTEN, DUSP6 and DUSP7, as well as pro–apoptotic protein Daxx and the transcription factor Gli–2. This process upregulates the biological function of VEGF in vivo and supports further clinical development of SPOP as a therapeutic target for renal cell cancer.
Poster #34

LONG-TERM DURABLE ONCOLOGIC OUTCOMES AFTER RADIOFREQUENCY ABLATION FOR T1 RENAL CELL CARCINOMA
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(Presented By: Sarah Psutka)

Introduction: Long−term oncologic outcomes for radiofrequency ablation (RFA) of renal cell carcinoma (RCC) are limited. The objective of this study was to assess the long−term oncological efficacy of RFA for treatment of renal cell carcinoma.

Methods: Between 1998 and 2008, 311 biopsy−proven RCC were treated with RFA in 274 patients. Exclusion criteria included history of prior RCC or known metastatic RCC at time of RFA (n=92). 26 patients were lost to follow−up prior to their 6−month imaging study. We retrospectively reviewed the long−term oncologic outcomes for 193 patients. Mean follow−up was 4.6 yrs (range 1−12, SD 2.3).

Results: Median age was 71 years (IQR: 63 – 79 years). Median Charlson Score was 5.46 (IQR: 5−6). Median size of tumor treated was 3 cm (IQR: 2−3.9 cm, range 1−7.1cm) and 64 of these tumors (33%) were endophytic. Tumor breakdown by stage was T1a: n=153 (79%), T1b: n=37 (19%), and T2: n=3 (2%). Initial treatment success rate was 89%. There were 6 local recurrences (3%) in 4 patients with T1b disease and 2 patients with T2 disease with an average time−to−recurrence of 2.9 years (SD 0.7). 95% of patients with T1a RCC were disease free at last follow−up, in comparison to 81% of those with T1b and 33% of those with T2 disease (p=0.008). At last follow−up 178 (92%) patients were disease−free. 16 (8.2%) developed metastatic disease and 4 patients (2%) died of RCC. Mean disease−free survival was 4.3 years (SD 2.4).

Conclusions: In patients who are poor surgical candidates, RFA results in durable local control and a low risk of disease recurrence in T1 RCC. Higher stage, however, correlates with a decreased disease free survival and alternate treatments should be considered when counseling these patients.

Poster #35

A COMPARISON OF KU0063794, A DUAL MTORC1 AND MTORC2 INHIBITOR, AND TEMSIROLIMUS IN PRECLINICAL RENAL CELL CARCINOMA MODELS
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Cedars-Sinai Medical Center
(Presented By: Hyung Kim)

Introduction: Rapamycin analogs, temsirolimus and everolimus, are approved for the treatment of advance renal cell carcinoma (RCC). Currently approved agents inhibit mammalian target of rapamycin (mTOR) complex 1 (mTORC1). However, the mTOR kinase exists in two distinct multiprotein complexes, mTORC1 and mTORC2, and both complexes may be critical regulators of cell metabolism, growth and proliferation. Furthermore, it has been proposed that drug resistance develops due to compensatory activation of mTORC2 signaling during treatment with temsirolimus or everolimus.

Methods: We evaluated Ku0063794, which is a small molecule that inhibits both mTOR complexes. Ku0063794 was compared to temsirolimus in preclinical models for renal cell carcinoma.

Results: Ku0063794 was effective in inhibiting the phosphorylation of signaling proteins downstream of both mTORC1 and mTORC2, including p70 S6K, 4E−BP1 and Akt. Ku0063794 was more effective than temsirolimus in decreasing the viability and growth of RCC cell lines, Caki−1 and 786−O, in vitro by inducing cell cycle arrest and autophagy, but not apoptosis. However, in a xenograft model there was no difference in the inhibition of tumor growth by Ku0063794 or temsirolimus. A potential explanation is that temsirolimus has additional effects on the tumor microenvironment. Consistent with this possibility, temsirolimus but not Ku0063794 decreased tumor angiogenesis in vivo and decreased the viability of HUVEC cells in vitro at pharmacologically relevant concentrations.

Conclusion: Ku0063794 was effective in targeting both mTORC1 and mTORC2 in RCC cell lines. When compared with temsirolimus, Ku0063794 was more effective in inhibiting tumor growth in vitro but not in a xenograft model. A possible explanation is that temsirolimus has a greater antiangiogenic effect than Ku0063794.
CLEAR CELL RENAL CELL CARCINOMA: CAN TISSUE BIOMARKERS PREDICT PROGNOSIS?
Oussama Darwish, Ramy Youssef, Payal Kapur, Aditya Bagrodia, Michael Belsante, Feras Alhalabi, Yair Lotan and Vitaly Margulis
UT Southwestern Dallas TX
(Presented By: Oussama Darwish)

Introduction and Objectives: Mammalian target of rapamycin (mTOR) and hypoxia induced factor (HIF) pathways play an important role in ccRCC tumorgenesis. We investigated the prognostic role of pmTOR (phosphorylated mTOR), HIF and pTEN in nonmetastaic ccRCC.

Methods: Tissue microarray immunohistochemistry of pmTOR, HIF and pTEN was performed on ccRCCs of patients treated with radical or partial nephrectomy from 1997 to 2010. The relationship between these markers (separately or in combination) and aggressive pathological features as well as disease recurrence was assessed.

Results: The study included 409 non− metastatic ccRCC patients, 240 males (59%) and 169 females (39%), with mean age 57 years (range, 17−85). Median follow up was 25 months (Range 0−150). The tumors were non−confined (pT3−T4) in 78 (19%) patients and high grade (3−4) in 125 (31%) patients. Both HIF and pTEN were associated with high grade (p =0.001), while HIF alone was associated with advanced stage (p =0.001) and tumor necrosis (p= 0.017). Presence of multiple marker alteration (2 or 3) versus no or single marker alteration was associated with disease recurrence (Fig.1) in Kaplan−Meier univariate analysis (p=0.009) and was independent predictor of disease recurrence in multivariate Cox regression analysis (Hazard ratio=2.1 and p=0.05).

Conclusions: Multiple alterations among pmTOR, HIF and pTEN are associated with aggressive pathological features of ccRCC and worse oncological outcome. Alteration of biomarkers should be considered among prognostic tools used in treatment decision−making of high risk patients.

Funding: None
LAPAROSCOPIC PARTIAL NEPHRECTOMY VERSUS IMAGE-GUIDED PERCUTANEOUS RENAL CRYOABLATION FOR SMALL (<4CM) RENAL MASSES: FUNCTIONAL AND ONCOLOGIC OUTCOMES.
Zhamshid Okhunov, Soroush Rais-Bahrami, Michael Blute, Arvin George, Manish Vira, Lee Richstone and Louis Kavoussi
Hofstra North Shore LIJ School of Medicine
(Presented By: Zhamshid Okhunov)

Introduction: We compared perioperative, short-term functional and oncologic outcomes of laparoscopic partial nephrectomy (LPN) and percutaneous renal cryoablation (PCA) in patients with small (<4cm) renal masses (SRM).

Methods: A retrospective analysis was performed of all patients undergoing PCA and LPN from July 2005 to February 2010. Demographic, radiographic, peri- and postoperative complications and outcomes were analyzed. Local recurrence was defined as a progression in tumor size and/or contrast enhancement beyond 6 months after the procedure. Follow up computed tomography scans with contrast were performed 3, 6, 12 months after surgery and annually thereafter.

Results: Patient demographics, operative data are demonstrated in table 1. A total of 526 patients were included in the study. In the LPN group, there were 2 (0.9%) recurrences. Both patients are under active surveillance with no evidence of disease progression. In the PCA cohort, there were 10 (7%) patients with recurrences. All were managed with repeated ablation or extirpative surgery. No cancer-specific deaths recorded in either group. There was a significant difference in immediate post-operative creatinine between PCA and clamped LPN patients, as well as between clamped and unclamped LPN patients. Clamped LPN patients (mean 1.17, 95% CI: 1.12 to 1.23) had significantly higher immediate post-operative creatinine levels than PCA patients (mean 1.03, 95% CI: 0.98 to 1.10) (P < 0.0009). Clamped LPN patients had higher immediate post-operative creatinine levels than unclamped LPN patients (mean 1.03, 95% CI: 0.97 to 1.09) (P < 0.0006). There was no significant difference in immediate post-operative creatinine between PCA and unclamped LPN patients. No other significant functional differences between the three groups at 3 and 6 months.

Conclusions: LPN and PCA represent effective minimally invasive treatment options for SRMs. LPN offers superior oncologic results with fewer local recurrences. In the immediate post-procedural period, PCA is associated with lower serum creatinine compared with on-clamp, but not off-clamp, LPN. Although statistically significant, long term follow up is necessary to determine if this is clinically significant.
***Poster Session I***

**Poster #38**

**INCIDENCE AND MORTALITY OF KIDNEY CANCER IN DEVELOPING AND DEVELOPED COUNTRIES**

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(Presented By: Amit Patel)

**Introduction and objectives:** Global incidence and mortality rates for various genitourinary malignancies have been described, but similar data on kidney cancer are lacking. Our goal was to describe worldwide contemporary age−standardized incidence and mortality rates for kidney cancer and their association with social and economic development metrics.

**Methods:** We obtained gender−specific, age−standardized incidence (ASIR) and mortality (ASMR) rates for 172 countries and 16 major world regions from the GLOBOCAN 2008 database. We compared incidence and mortality rates on a regional level in males and females. The mortality−to−incidence ratio (MIR) was calculated and the United Nations’ Human Development Index (HDI) was used to estimate each country’s level of development. MIR was calculated for each country. Linear regression modeling was used to describe the relationship of MIR to HDI.

**Results obtained:** ASIR varied 20−fold worldwide, with highest ASIR in North America (11.8 per 100,000) and lowest in Africa (1.2) and South−Central Asia (1.0). Geographic distribution of ASMR was similar to ASIR, with the highest rates in Europe (3.1 per 100,000) and North America (2.6) and lowest rates in Asian and African regions (0.6 – 1.5). ASIR and ASMR were 4.5 and 2.8 times higher, respectively, in more developed countries compared to developing countries. However, MIR was highest in Africa and Asia (0.6 – 0.8) and lowest in North America (0.2). There was a strong inverse relationship between HDI and MIR (R2 = 0.59). Results are constrained by inherent limitations from the GLOBOCAN dataset and HDI data.

**Conclusions:** Kidney cancer incidence and mortality rates vary widely throughout the world. Mortality−to−incidence ratios are highest in less developed nations. These observations suggest significant health care disparities and may reflect differences in risk factors, health care access, quality of care, diagnostic modalities used, and treatment options available.

**Poster #39**

**RESPONSE OF THE HUMAN KIDNEY TO CLAMP ISCHEMIA**

Barbara Ercole¹, Kathleen Torkko², William Hilton³, Manjeri A Venkatachalam³, Joel M Weinberg⁴ and Dipen J Parekh⁵
¹Cleveland Clinic Florida, Weston, FL; ²University of Colorado, CO; ³University of Texas HSC San Antonio, TX; ⁴University of Michigan, MI
(Presented By: Barbara Ercole)

**Introduction:** Structural changes in tubule cells during clamp ischemia are well characterized for animal models, but their timing and extent in the human kidney has not been established and may differ significantly. To better define the human response, we biopsied uninvolved areas of kidney in patients undergoing open partial nephrectomy (PN) for renal masses.

**Material and Methods:** Biopsies of 40 patients undergoing PN were obtained at specified time intervals: before renal artery clamping, then during periods ranging from 15 to 60 min. of warm and cold ischemia (80% >30 min.), and then after 5 minutes of reflow. These biopsies were assessed for ultrastructure (N=39) and for immunofluorescence and rhodamine phalloidin staining (N=22).

**Results:** During the clamp period, apical membrane structure was remarkably well preserved with only patchy brush border clubbing, fragmentation, desquamation and blebbing and not in all patients. Mitochondria developed progressive swelling, which paradoxically was more prominent in distal than proximal tubule cells. This resolved during the 5 minutes of reflow in most cells in most patients, but persistence of swelling and development of matrix condensation occurred occasionally. Using a composite 0−5 scale covering the full spectrum of ultrastructural changes, average scores were: Preclamp 1.02±0.07, End clamp 2.18±0.07, Post clamp 1.86±0.09. Consistent with the ultrastructure, staining for F−actin with rhodamine phalloidin was well preserved. Immunsotaining for phosphotyrosine, which reflects cellular ATP content was decreased in 68.4% of the clamp biopsies and 52.6% of the postclamp biopsies with larger changes in proximal tubules, however B1 integrin was decreased in only one post clamp biopsy. ICAM−1 expression in peritubular capillaries was increased in 46.7% of the clamp biopsies and 66.7% of post clamp biopsies. None of the patients developed acute kidney injury.

**Conclusion:** These data provide the first detailed analysis of the structural response of the human kidney to clamp ischemia and document many of the expected structural alterations based on prior animal work, but indicate a greater than expected resistance to injury in this commonly used clinical application of clamp ischemia.
NOVEL RENAL CELL CARCINOMA BIOMARKER IDENTIFICATION FROM URINARY EXOSOMES
Todd M. Morgan, Kevin L. Schey, David L. Hachey, Salisha Hill and Peter E. Clark
Vanderbilt University
(Presented By: Todd M. Morgan)

Introduction: Proteomic technologies have shown great promise in the identification of biomarkers, however these efforts in renal cell carcinoma (RCC) have been hampered by technical limitations. We have developed a novel approach utilizing lipid microvesicles, termed exosomes, to circumvent many of the obstacles to urinary biomarker identification. We sought to test whether shotgun proteomics of urinary exosomes can be utilized to identify candidate biomarkers of RCC.

Methods: Urine was obtained from 8 patients with clear cell RCC prior to nephrectomy and from 12 patients without malignancy undergoing non−urologic surgery. Exosomes were isolated by ultracentrifugation and proteins were analyzed by multidimensional protein identification technology (MudPIT). Differentially expressed peptides were identified by quasi−likelihood Poisson regression modeling using a false discovery rate <0.05. As an exploratory and validation measure, angiotensin converting enzyme (ACE) immunohistochemistry (IHC) was performed on a tissue microarray containing 139 matched RCC and normal cores.

Results: An average of ~1,500 proteins were identified in each of the 22 patient samples. There were 14 differentially expressed proteins identified with a p<0.05 between RCC and control samples, as well as 2 additional proteins that approached statistical significance. Six were upregulated in RCC and 10 were downregulated compared to controls. In order to validate our approach, we focused our attention on those that have been previously proposed as cancer biomarkers (Table). Since ACE has been associated with RCC in a prior study, we tested this by IHC. Consistent with the results by MudPIT, we found no expression in 69/70 RCC cores and high expression in 69/69 matched normal cores.

Conclusions: Rich in cell−specific protein signatures, exosomes are upregulated in several cancers and provide a unique source for urinary biomarkers. We utilized a novel proteomic approach to evaluate urinary exosomes and identified a number of putative biomarkers, suggesting this novel approach may be an effective approach to biomarker discovery in RCC. Further work is ongoing to evaluate the urinary expression of these candidate markers in patients with RCC.

Table: Putative RCC biomarkers with prior evidence of differential expression in human malignancies

<table>
<thead>
<tr>
<th>Protein</th>
<th>Gene</th>
<th>Description</th>
<th>Ratio (RCC/Control)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMOT</td>
<td>PTEN</td>
<td>Phosphatase, non−receptor type 11 (PTEN)</td>
<td>0.15</td>
<td>0.006</td>
</tr>
<tr>
<td>ENPP3</td>
<td>ENPP</td>
<td>Enzyme−linked phosphatase family member 3</td>
<td>0.04</td>
<td>0.029</td>
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<tr>
<td>B2R0D6</td>
<td>B2R0D6</td>
<td>Decapentaplegic</td>
<td>3.50</td>
<td>0.038</td>
</tr>
<tr>
<td>HAFAR</td>
<td>HAFAR</td>
<td>Habilidade−related protein</td>
<td>0.60</td>
<td>0.006</td>
</tr>
<tr>
<td>GCC7</td>
<td>GCS7</td>
<td>Gallamine 7c type 2, O−glycosylase</td>
<td>10.20</td>
<td>0.045</td>
</tr>
<tr>
<td>B2R0V5</td>
<td>B2R0V5</td>
<td>Dual−specificity protein−Tyr phosphatase</td>
<td>0.037</td>
<td>0.044</td>
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<td>B2R0V5</td>
<td>B2R0V5</td>
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<td>Inter−alpha−trypsin inhibitor heavy chain inhibitor</td>
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<td>0.045</td>
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<tr>
<td>ACE</td>
<td>ACE</td>
<td>Angiotensin−converting enzyme</td>
<td>0.23</td>
<td>0.073</td>
</tr>
</tbody>
</table>
Comparator 1

**COMPARISON OF RATES AND RISK FACTORS FOR DEVELOPMENT OF ERECTILE DYSFUNCTION AFTER RADICAL OR PARTIAL NEPHRECTOMY**

Ryan Kopp¹, Jonathan Silberstein², Reza Mehrzarin¹, Aditya Bagrodia³, Robert Wake¹, Anthony Patterson³, Jim Wan³ and Ithaar Derweesh¹

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(Presented By: Ryan Kopp)

**Objectives:** Nephron Sparing Surgery (NSS) has emerged as a preferred treatment option for small renal masses, comparing favorably with radical nephrectomy (RN) from the standpoint of oncologic efficacy and conferring superior renal functional preservation. Erectile function may be affected by declining renal function. We examined the incidence of and risk factors for development of erectile dysfunction (ED) in patients who underwent RN and NSS.

**Methods:** Retrospective review of 432 patients (264 RN/168 NSS, mean age 58 years, mean follow-up 5.8 years) who underwent RN or NSS for renal tumors at two institutions from 1/1998 to 12/2007. Demographics and disease characteristics, metabolic parameters [estimated GFR, serum creatinine, hyperlipidemia, diabetes mellitus (DM)], pre- and postoperative ED (Sexual Health Inventory for Men score <22) and response rate to 5−phosphodiesterase inhibitor therapy (5−PDEi) were recorded in sexually active men. Data were analyzed within subgroups based on treatment (RN vs. NSS). Multivariate analysis (MVA) was conducted to elucidate risk factors for development of de novo ED.

**Results obtained:** RN and NSS groups had similar demographics and comorbidities. Tumor size (cm) was significantly larger for RN (RN 7.0 vs. NSS 3.7, p<0.001). No significant differences were observed for preoperative eGFR, hypertension, and DM. Significantly more preoperative ED existed in NSS vs. RN (p=0.042). Postoperatively, significantly higher rates of de novo DM (11.4% vs. 4.2%, p=0.015), eGFR<60 mL/min/1.73m² (33.0% vs. 9.8%, p<0.001), and ED (29.5% vs. 9.5%, p<0.001) developed in RN vs. NSS cohorts, respectively. Overall response rate to 5−PDEi was 63% without significant difference between the two groups (p=0.896). MVA demonstrated RN (OR 3.56, p<0.001), hypertension (OR 2.32 p = 0.028), postoperative DM (OR 2.93, p<0.001), preoperative (OR 8.77, p<0.001) and postoperative (OR 2.64, p<0.001) eGFR <60 mL/min/1.73m² were significantly associated with de novo ED.

**Conclusions:** Patients undergoing RN had significantly higher de novo ED compared to a contemporary, well−matched cohort undergoing NSS. RN, DM, and eGFR<60 were associated with development of ED. Further investigation on effects of nephron loss on ED is requisite.

**Poster #42**

**THE ASSOCIATION BETWEEN RENAL TUMOR SCORING SYSTEMS AND ISCHEMIA TIME**

Luke T. Lavallée¹, Darren Desantis¹, Fadi Kamal¹, Brian Blew¹, James Watterson¹, Ranjeeta Mallick², Dean Ferguson², Christopher Morash¹, Ilias Cagiannos¹ and Rodney H. Breau¹

¹Division of Urology, University of Ottawa; ²Ottawa Hospital Research Institute

(Presented By: Luke T. Lavallée)

**Introduction and Objective:** To evaluate the association between renal tumour scoring systems and partial nephrectomy ischemia time.

**Methods:** A historical cohort of partial nephrectomy patients at The Ottawa Hospital between 2002−2009. Pre−operative patient characteristics (age, gender, pre−operative renal function, diabetes, hypertension, smoking history, heart disease) and ischemia time were abstracted from the medical record. Pre−operative computed tomography (CT) images were reviewed, and tumour characteristics determined for all components of each scoring model. Linear regression was used to determine the association between scoring systems and ischemia time.

**Obtained Results:** 94 patients were included in the study. Median R.E.N.A.L. score was 7 (IQR 5−8), median PADUA score was 8 (IQR 7−9.8) and mean C index was 3.9 (SD 2.10). Mean ischemia time was 24 (SD 10.5) minutes. Individual tumour characteristics (diameter, nearness to collecting system, anterior/posterior location, and medial/lateral location) were strongly associated with ischemia time (p<0.05). Adjusting for potential confounders, C index (~1.2 minutes per c−index unit 95%CI −2.3, −0.13, p=0.03) and PADUA score (1.8 minutes per PADUA unit 95%CI 0.2, 3.4, p=0.03) were significantly associated with ischemia time. R.E.N.A.L. Nephrometry score was associated with ischemia time, but this association was not statistically significant (0.9min per R.E.N.A.L. unit 95%CI −0.4, 2.2, p=0.2).

**Conclusions:** Renal tumour characteristics are associated with ischemia time. The proposed scoring systems are useful descriptors of surgical complexity and should be used when describing partial nephrectomy patients. Prospective evaluation of scoring systems are indicated to clarify which of the scoring system should be universally applied.
NATURAL HISTORY OF UNTREATED RENAL CELL CARCINOMA WITH VENOUS TUMOR THROMBUS
Adam Reese¹, Jared Whitson² and Maxwell Meng³
¹James Buchanan Brady Urological Institute, The Johns Hopkins Medical Institution, Baltimore, MD; ²Kaiser Permanente, Sacramento, CA; ³UCSF Hellen Diller Family Comprehensive Cancer Center
(Presented By: Adam Reese)

Introduction and Objectives:
Nearly 20% of patients with renal cell carcinoma (RCC) and venous tumor thrombus (VTT) are unfit for surgery or elect to be managed nonoperatively. As there are no published multiinstitutional series in the literature investigating untreated RCC with VTT, the natural history of this disease is poorly characterized. In the current study, we describe the natural history of RCC with VTT in the largest and only multiinstitutional series reported to date, and identify prognostic factors associated with disease-specific survival in this patient group.

Methods: We identified patients in the Surveillance, Epidemiology, and End Results (SEER) database with untreated renal cell carcinoma and venous tumor thrombi. Disease-specific median and one-year survival rates were determined, and disease-free survival curves were plotted using the Kaplan-Meier method. Multivariable Cox regression analyses were performed to identify factors associated with disease-specific and overall survival in this patient group.

Results: Of 2,265 patients with RCC and VTT in the SEER database, 390 (17%) underwent no treatment. 278 (71%) patients died during follow-up in whom 243 deaths (87%) were due to RCC. Median and 1-year disease specific survival for this group was 5 months and 29%, respectively. A Kaplan-Meier curve of DSS with patients stratified by tumor stage and the presence or absence of distant metastases is shown in the figure. On multivariable analysis, the extent of tumor thrombus (HR 1.7 for T3c vs. T3b, 95% CI 1.0 – 2.7) and the presence of metastases (HR 3.1 for M+ vs. M0, 95% CI 1.7 – 5.5) were most strongly associated with disease specific mortality.

Conclusions: Prognosis is poor for the majority of untreated patients with RCC and VTT. Supradiaphragmatic thrombi and distant metastases are adverse prognostic factors in this patient group. This information is important when counseling patients as to the risk and benefits of surgical versus nonoperative management of RCC and VTT.
**Poster #44**

**METHODOLOGY FOR EVALUATING URINE NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN (UNGAL) LEVELS IN PATIENTS UNDERGOING PARTIAL NEPHRECTOMY, RADICAL NEPHRECTOMY, AND NON-RENAL SURGICAL PROCEDURES.**

Preston Sprenkle, Sun Cho, Martin Fleisher, Andrew Feifer, Tarek Ghoneim, Guido Dalbagni, Jonathan Coleman, Karim Touijer and Paul Russo

Memorial Sloan-Kettering Cancer Center, NY, NY
(Presented By: Preston Sprenkle)

**Objectives:** Develop a reproducible methodology for measuring uNGAL in clinical patients to determine effect of partial nephrectomy on uNGAL levels.

**Introduction:** NGAL is a biomarker for acute kidney injury (AKI) that has been demonstrated to increase proportionally to severity and duration of renal injury. uNGAL has not previously been studied as a marker of acute kidney injury AKI in renal surgery patients. Partial nephrectomy, with direct and ischemic injury to the kidney, should demonstrate higher levels of uNGAL than radical nephrectomy or non-renal surgery controls.

**Methods:** The uNGAL ELISA assay was internally evaluated and validated in our clinical laboratory. After IRB approval was attained, a prospective observational study was initiated with interim accrual of 227 patients. At least six timed specimens are required for each patient to be included in analysis: (1) preop, (2) arrival to the post anesthesia care unit (PACU), (3−5) every four hours until 12hrs after arrival to PACU, and (6) POD #1. Specimens are immediately sent to the clinical laboratory, centrifuged, aliquoted and frozen at −80°C for future analysis. Specimens require freezing within 24hrs for reliable results. In the initial pilot study 144 patients were enrolled but only 60 (42%) had six complete specimens. To improve specimen collection rates a computer based orders system was utilized to prompt timed specimen collection; this change resulted in complete specimen collection for 54 of 73 patients (74%).

**Results:** uNGAL/uCr ratio is elevated upon arrival to PACU in patients who underwent partial nephrectomy compared to patients who underwent radical nephrectomy or thoracic surgery. Detailed analysis of clinical characteristics associated with higher post operative NGAL levels is ongoing, including but not limited to duration of ischemia, nephrometry score, cold or warm ischemia, ebl, patient age, pre-existing hypertension and/or diabetes.

**Conclusion:** A reproducible and streamlined methodology for specimen collection and evaluation with an internally validated uNGAL assay has been developed. Preliminary analysis suggests that uNGAL may be a very early marker of renal injury in patients undergoing renal surgery evident upon patient arrival to PACU.

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**Poster #45**

**RENAL FUNCTIONAL PRESERVATION: A BENEFIT OF ACTIVE SURVEILLANCE OF THE SRM**

Jose Reyes¹, Daniel Canter², Marc Smaldone², Jay Simhan¹, Alexander Kutikov², Rosalia Viterbo², David Y.T. Chen², Richard E. Greenberg² and Robert G. Uzzo³

¹Temple University School of Medicine, Department of Urology, Philadelphia, PA; ²Division of Urologic Oncology, Department of Surgical Oncology, Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Jose Reyes)

**Introduction:** Active surveillance (AS) of the incidental, localized, enhancing small renal mass (SRM) is an option in select patients including the elderly, infirmed and/or those with chronic kidney disease (CKD). Here we compare the renal functional kinetics of patients with renal tumors under AS with those undergoing delayed intervention.

**Materials and Methods:** We identified patients with localized renal masses managed with an initial course of AS from our prospective kidney cancer database. Demographic and clinical characteristics were compared between patients managed with continued AS for a minimum of 12 months versus those undergoing delayed intervention (DI) using descriptive statistics. Renal function at baseline and at the time of last follow up was assessed using estimated glomerular filtration rate (eGFR) calculated by MDRD.
Poster Session I

Results: 162 patients (77 AS; 85 DI) with 195 masses (84 AS; 111 DI) met study inclusion criteria. While median patient age was significantly younger in patients undergoing definitive therapy (64 vs. 75 years; p<0.0001), there were no significant differences between groups with respect to Nephrometry score, baseline eGFR, or comorbidity measured by Charlson Comorbidity Index. CKD III (eGFR <60 ml/min) or higher was present in 40% and 41% of the AS and DI group, respectively. For patients undergoing DI, nephron sparing surgery was performed for 72% of lesions (28% MIS), while 19% and 9% of SRMs were managed with nephrectomy and ablation respectively. Comparing eGFR at baseline and at the conclusion of AS, there was a statistically significant decrease in patients who progressed to treatment (66.3 vs. 61.7 ml/min, p=0.02), while no significant change was demonstrated in patients managed expectantly (62.4 vs. 65.0 ml/min, p=0.3).

Conclusion: The long−term negative health effects of diminished renal function have increasingly become a quality of care issue in patients with enhancing renal masses. While the short term oncologic safety of AS is being documented, our data confirms AS is associated with preservation of renal function in the absence of primary renal disease. This finding may underscore the use of AS in older and/or co−morbid patients in whom preservation of renal function is important.

Poster #46

FACTORs AFFECTING RENAL FUNCTIONAL DEGENERATION AFTER OPEN NEPHRON SPARING SURGERY: A COMPARISON OF COLD, WARM, AND NON-ISCHEMIC APPROACHES

Seth Cohen¹, Samuel Park¹, Reza Mehrazinr, Ryan Kopp¹, Caroline Colangelo¹, Anthony Patterson², Kerrin Palazzi-Churas¹ and Ithaar Derweesh¹

¹Division of Urology, University of California San Diego School of Medicine, La Jolla, California; ²Department of Urology, University of Tennessee Health Science Center, Memphis, Tennessee

(Presented By: Seth Cohen)

Introduction: Renal functional recovery after nephron sparing surgery may be impacted by a variety of different factors. We examined renal functional recovery after open partial nephrectomy performed using warm, cold, and non−ischemic technique.

Methods: Multicenter analysis of 352 open partial nephrectomies performed between 1988 and 2011 (216 men/136 women); patient demographics, nephrometry scores, pathologic, and perioperative outcomes were analyzed. Patients were divided into three groups: warm ischemia (n=248), cold ischemia (n=32), and no−ischemia (n=72). Independent t−test, Chi2, ANOVA, Mann−Whitney U, Kruskal−Wallis tests were utilized for comparative analysis. Primary outcome variable was development of de novo Stage III CKD, defined as eGFR < 60 ml/min/1.73 m2, as estimated by the MDRD equation, with median follow up 17 months (IQR 3.9−39.7). Multivariate analysis was performed to determine significant predictors of post−operative renal function.

Results: Cohorts were similar in age (p=0.230), gender (p=0.187), BMI (p=0.330), smoking history (p=0.315), diabetes (p=0.462), clinical stage (T1 versus T2+, p=0.276), and pathology (malignant versus benign, p=0.184). The cold ischemia cohort (median 45 minutes (min), IQR 38−60) had longer ischemia times than warm ischemia (median 25 min, IQR 21−27, p<0.001). Mean nephrometry scores for cold (8.1, ±1.8) were higher than warm ischemia (6.9, ±1.7, p=0.012) and no−ischemia (6.4 ±1.6, p=0.001). There were no significant differences in percentage of patients with de novo post−operative eGFR< 60 (warm 15.5%, cold 23.1%, and no−ischemia 6.1%, p=0.061). Multivariate analysis found advancing age (OR 1.06, CI 1.02−1.09, p=0.002), ischemia time ≥30 min (OR 3.12, CI 1.14−8.46, p=0.026), and increasing nephrometry score (OR 1.86, CI 1.38−2.51, p value<0.001) to be significant predictors of postoperative de novo eGFR<60. Subset multivariate analysis performed separately on those patients with ischemia times of <30 versus ≥30 minutes did not find mode of ischemia to be a significant predictor of de novo eGFR<60.

Conclusion: In this evolving analysis of renal functional recovery, a combination of demographic, tumor based, and technical factors impacted renal functional recovery after open nephron sparing surgery. Further investigation is requisite to identify differential impact of these factors.
Poster #47

RELATIONSHIP OF BMI AND GENDER TO SURGICAL COMPLEXITY OF PARTIAL NEPHRECTOMY
Manger Jules, Jennifer Davila-Aponte, Lorna Herbert, Noah Schenkman and Tracey Krupski
University of Virginia Department of Urology
(Presented By: Manger Jules)

Introduction: Americans are increasingly obese and increased patient adiposity has been shown to affect outcomes following abdominal surgery. We tested the hypothesis that higher BMI correlates with surgical difficulty in partial nephrectomy. Further, we postulated that this correlation would be stronger in women as opposed to men due to gender−specific patterns of fat deposition.

Methods: In this retrospective study, we employed an institutional review board approved database of partial nephrectomy performed for oncologic indications at a single institution from 2005−2010. We performed univariate and multivariate logistic regression analysis to assess the relationship between BMI and surgical difficulty. We used operating room time (ORT), estimated blood loss (EBL), and clamp time (Tc) as indicators of surgical complexity.

Results: Of 139 patients undergoing partial nephrectomy, 43% were female. The mean age was 53 years−old and 32.3 kg/sq m was the mean BMI. In univariate and multivariate analysis, BMI was significantly associated with EBL (p= 0.037 and p=0.011, respectively). BMI was not significantly associated with ORT or Tc. Among the independent variables, female sex was associated with increased blood loss (OR 1.99, 95% CI 1.01−3.96, p= 0.048).

Conclusions: BMI was significantly correlated with some, but not all of the examined indicators of surgical difficulty, showing a small but significant association with EBL. Interestingly, gender was more strongly associated with EBL irrespective of BMI. This finding may reflect the differing patterns of abdominal fat distribution in women and men.

Poster #48

ABO BLOOD TYPE IS AN INDEPENDENT PREDICTOR OF OVERALL SURVIVAL IN PATIENTS WITH RENAL CELL CARCINOMA
Samuel Kaffenberger¹, Todd Morgan¹, Kelly Stratton¹, Adu Boachie², Daniel Barocas¹, Sam Chang¹, Michael Cookson¹, Duke Herrell¹, Joseph Smith, Jr.¹ and Peter Clark¹
¹Department of Urology, Vanderbilt University Medical Center, Nashville, TN; ²Meharry Medical College, Nashville, TN
(Presented By: Kelly Stratton)

Introduction: Evidence from non–urologic malignancies suggests that ABO blood type may be a risk factor for both cancer incidence and mortality. For example, breast cancer patients with O blood type appear to have significantly better overall survival than those with non−O blood types. We sought to determine whether ABO blood type is associated with overall survival in patients undergoing nephrectomy for renal cell carcinoma (RCC).

Methods: Analysis of a prospectively collected RCC database identified 923 consecutive patients who underwent radical or partial nephrectomy for locoregional RCC from 1997−2008. The primary outcome measure was overall survival (OS). Covariates included age, gender, race, ASA classification, tumor stage, Fuhrman grade, lymph node status, pre−operative anemia, transfusion status, hypoalbuminemia, and blood type (O vs. non−O). Univariate analysis found age, ASA classification, tumor stage, grade, nodal disease, anemia, hypoalbuminemia, and blood group met inclusion for multivariate analysis (p<0.1). In the multivariate analysis, non−O blood type was independently associated with worse overall survival (HR 1.68, 95%CI 1.18−2.39, p=0.04) after correcting for other covariates.

Conclusion: This study suggests that ABO blood type is a predictor of overall survival in patients undergoing partial or radical nephrectomy for RCC. In particular, patients with non−O blood type have worse overall survival. This is the first report of a relationship between blood type and RCC survival. A number of potential molecular mechanisms may explain this relationship and further studies will be needed to understand the biology behind this association.
ASSESSMENT OF THE INCIDENCE OF BENIGN VERSUS MALIGNANT RENAL TUMORS IN SELECTED STUDIES
Paul Russo¹, Robert Uzzo², William Lowrance³, Aviva Asnis-Alibozek⁴, Norman LaFrance⁴, John Libertino⁵, Daniel Pryma⁶ and Chaitanya Divgi⁷
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Fox Chase Cancer Center, Temple University School of Medicine, Philadelphia, PA; ³University of Utah, Huntsman Cancer Institute; ⁴IBA Molecular, Dulles, VA; ⁵Lahey Clinic, Burlington, MA; ⁶University of Pennsylvania, Philadelphia, PA; ⁷Kreitchman PET Center, Columbia University Medical Center, New York, NY
(Presented By: William Lowrance)

Introduction and Objectives: Advances in cross-sectional imaging have increased the frequency with which small renal tumors are discovered, leading to the presentation of more patients with early-stage renal cell carcinoma (RCC) as well as incidental benign or indolent renal neoplasms. Histopathology after surgical resection is the definitive method for characterizing renal tumors. Stage migration of renal masses creates uncertainty about the percentage of resected masses that will be benign versus malignant. Our objective was to better define these proportions through an in-depth review of the contemporary medical literature.

Methods: PubMed and select oncology congresses were searched for publications that identify the histologic classification of resected renal masses in a representative sample from the contemporary literature: [search] incidence AND (renal cell carcinoma AND benign); incidence AND (renal tumor AND benign); percentage AND (renal cell carcinoma AND benign); limit: 2003–2011.

Results: The representative studies were published in the past 10 years (Table) and most included procedures conducted in the mid-1990s through the mid-to-late 2000s. Studies were conducted in the United States (n=8), Korea (n=3), China, Japan, Germany, Austria, Australia, multisite (Israel/France/US) (all n=1). Only 8 studies had n≥500 (range, n=70–10,404). The proportion of benign masses ranged from 7.1% to 33%, with nearly half of the studies reporting values between 16% and 17%. The majority found that benign tumors were more likely to be smaller in size (<4 or <7 cm, depending on study) than malignant tumors. 11 studies reported the percentage of RCC subtype (indolent vs ccRCC) diagnosed from patients with malignant tumors (range in ccRCC diagnosis, 45.7%–83%).

Conclusions: Benign tumors are relatively common (~15% of resected renal tumors) and are more prevalent among small masses. Further, nearly a quarter of resected lesions are benign or indolent and may not require surgery. Preoperative differentiation between aggressive and less aggressive renal masses would be an important clinical advance that could allow clinicians greater diagnostic confidence and guide patient management.

Funding: Wilex AG/IBA Molecular
Poster #50

NODAL DISEASE IN THE SETTING OF METASTATIC RENAL CELL CARCINOMA: CAN A LYMPH NODE DISSECTION POTENTIALLY ALTER PATIENT OUTCOMES?

Brian F. Chapin, Scott E. Delacroix, Jr, Patrick A. Kenney, Graciela M. Nogueras-Gonzalez, Pheroze Tamboli and Christopher G. Wood
The University of Texas M.D. Anderson Cancer Center, Houston, TX
(Presented By: Brian F. Chapin)

Introduction: The impact of lymph node dissection (LND) in patients with metastatic renal cell carcinoma (mRCC) undergoing cytoreductive nephrectomy (CN) is unclear. The aims of this study were to determine if clinical node status is an independent predictor of overall survival (OS) in patients treated with CN in the targeted therapy era, and if LND increases the morbidity of CN.

Methods: We performed a retrospective review of all patients with mRCC treated with CN at a single institution between 2004−2010. Patients participating in open or unpublished trials were excluded leaving 173 patients for analysis. Lymph nodes >1cm by long axis diameter were considered clinically positive (cN+). OS was calculated using COX proportional hazard regression. Complications were classified using the modified Clavien system.

Results: Sixty−five (37.6%) patients were clinically node positive (cN+). Median OS was significantly worse for the cN+ patients compared to cN0 patients [17.45 vs 29.1 months (HR 1.84;(1.28−2.63)]. Clinical node status remained an independent predictor of OS on multivariate analysis [HR 1.74;CI 1.14−2.65]. LND was performed in 61/65 (93.4%) cN+ patients and in 56/108 (52%) of cN0 patients. Patients undergoing concomitant LND were more likely to have Grade 4 tumors, symptoms, cT−stage >2 and less likely to have >1 metastatic site. Confirmed pathologic node positive disease (pN+) was more common in cN+ compared to cN0 patients (75% vs. 23%,p <0.001). pN+ patients had worse median OS than pN0 patients [16.0 v 35.5 mos;HR 2.34(1.51−3.63)]. Among pN+ patients (n=54), complete resection of all identifiable nodal disease was associated with an improved OS compared to patients with unresectable nodal disease (n=4) [16.0 v 5.6 months;HR 2.92(1.02−8.33)].

On univariate analysis LND patients were significantly more likely to have any post−operative complication (64% vs 43%,p=0.008) and more specifically chylous ascites (12 v 0,p=0.01). Despite this association, LND did not reach statistical significance when multivariate analysis was performed [OR 1.9;(0.94−3.81)].

Conclusions: Among patients undergoing CN, the presence of clinically positive nodes is associated with worse OS. Likewise, pN+ patients have worse OS than pN0 patients. LND is associated with higher morbidity than CN alone. Further efforts are needed to determine removal of pathologic nodes alters the natural history of the disease, and if the benefit offsets the increased morbidity.

Poster #51

ROBOTIC PARTIAL NEPHRECTOMY AND THE INTERNET: IS THE INFORMATION EVIDENCED-BASED?

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(Presented By: Raj Kurpad)

Introduction and Objectives: It is becoming more common for patients to refer to the Internet to supplement information from their physicians concerning their healthcare. In fact, it has been estimated that over 80% patients utilize the Internet as a primary source of oncology−related information. We sought to evaluate the current web−based information regarding robotic partial nephrectomy.

Methods: Two common search engines (Google and Yahoo) were used to search the term “robotic nephrectomy.” The top 50 sites from each search engine were analyzed in regards to type of site and information regarding robotic nephrectomy (surgical outcomes, oncologic outcomes, kidney function outcomes, and recovery outcomes). In addition, the use of information from the Intuitive site, references, information regarding cost, and if the site mentioned laparoscopic partial nephrectomy as an alternative were evaluated.

Results: Of the 100 sites, 64 were surgeon/provider sites, 20 links to publications, 5 medical news sites, 3 patient support sites, 1 meeting program, 5 were other, and 2 were the Intuitive site. Analysis of all 64 surgeon/provider sites showed that a significant number of sites made non−evidence−based claims regarding surgical outcomes (44%), oncologic outcomes (11%), kidney function outcomes (9%), and recovery (41%). Laparoscopic partial nephrectomy was not mentioned in 44% of surgeon/provider sites. In regards to information from Intuitive used by provider sites, 3% had links, 6% verbatim information, and 6% information with similar wording. Only 8% of provider sites had listed any references. Zero surgical/provider sites and only one site (medical news) made any comparison of cost between the different surgical options.

Conclusions: These findings suggest that surgeons provide the majority of Internet information, but often do not use evidence−based information. The claims regarding robotic surgery are often over−stated. Other surgical options and cost are frequently omitted. This highlights the need for providers to provide evidenced−based information to the public.
**Poster #52**

**R.E.N.A.L. NEPHROMETRY SCORING SYSTEM IS NOT PREDICTIVE OF THE FUNCTIONAL EFFICACY OF NEPHRON-SPARING SURGERY IN THE SOLITARY KIDNEY.**

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(Presented By: David Buethe)

**Introduction:** Recently, the R.E.N.A.L. nephrometry scoring system was introduced to objectively describe renal masses with respect to size, the degree to which they are exo/endophytic, the nearness to the collecting system, whether they are anterior or posterior and the location relative to polar lines. However, it is unknown whether the novel scoring system is predictive of renal function loss after nephron–sparing surgery (NSS).

**Objective:** To evaluate the R.E.N.A.L. nephrometry scoring system as a predictor of the functional efficacy of NSS in the solitary kidney.

**Methods:** We evaluated 42 patients presenting with either an anatomic (32) or functionally solitary (10) kidney undergoing partial nephrectomy. Each renal unit was assigned a R.E.N.A.L. nephrometry score utilizing pre-operative cross-sectional imaging. The CKD–EPI equation was applied to serum creatinine levels to generate the corresponding estimated glomerular filtration rate (eGFR). The difference between the eGFR at baseline and at post-operative time points served as a measurement of renal function loss attributed to partial nephrectomy.

**Results:** Forty-two patients underwent open (41) or robotic (1) partial nephrectomy with mean pre-operative eGFR of 61.5 mL/min/1.73m2. The median total nephrometry score was 8, ranging from 4–10. Twenty-eight (66.7%) of the renal lesions were ≤ 4 cm, 13 (31%) were between 4 and 7 cm, and 1 (2.4%) was >7 cm in diameter. The majority (54.8%) of the patients had tumors with more than 50% of tumor burden lying outside the expected renal border whereas 3 patients (7.1%) had tumors considered to be completely endophytic. Twenty-seven (64.3%) were within 4 mm of the collecting system. Tumor locations defined as: completely polar, interpolar, and completely central were assigned to 11, 15, and 16 lesions respectively. Two patients required temporary hemodialysis and there was one perioperative death attributed to gastrointestinal related sepsis. By post-operative month 6, the overall average eGFR of 53.9 mL/min/1.73m2 was significantly less ($p = 0.0293$) than the pre-operative value. However, we were unable to correlate change in post-operative eGFR with pre-operative total or individual R.E.N.A.L. scoring parameters.

**Conclusions:** Neither the individual components of the R.E.N.A.L.nephrometry scoring system nor the total nephrometry score correlated with realized functional loss as assessed by eGFR in patients with a solitary kidney undergoing NSS.

**Poster #53**

**PERCUTANEOUS CT-GUIDED RENAL RADIOFREQUENCY ABLATION: 3 YEAR FOLLOW**

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(Presented By: Zhamshid Okhunov)

**Introduction:** The aim of our study was to evaluate the efficacy of percutaneous radiofrequency ablation (RFA) for renal masses.

**Methods:** We retrospectively evaluated our database for patients undergoing percutaneous RFA from April 2004 to September 2010. Incomplete ablation was defined as the absence of contrast enhancement in the ablation area within 6 months of the procedure. Local recurrence was defined as a local progression in size and/or contrast enhancement after 6 months of the procedure. Follow up consisted of computed tomography scans with contrast at 3, 6, 12 months after ablation and annually thereafter.

**Results:** A total of 30 patients were included in the study. There were 21 (70%) males and 9 (30%) females with the mean age of 69 years (range 47–87). Mean ASA was 2.5 (1–3). Mean tumor size was 2.5 cm (1–4). There were 12 right side and 18 left side tumors. There were 2 (6%) complications, including postoperative hemorrhage that required transfusion and perinephric hematoma with no intervention. With the mean follow up 36 months, there were 5 (16.7%) recurrences. All patients successfully underwent percutaneous cryoablation. In following imaging studies there were no evidence of disease. Overall and cancer–specific was 98% and 100% respectively.
**Conclusions:** Radiofrequency provided successful treatment of renal masses with low recurrence rate at mean follow up of 3 years. Durable follow up required in order to determine long term efficacy.

**Poster #54**

**RENAI N Nephrometry Score is Associated with Operative Modality for Partial Nephrectomy**

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(Presented By: Seth Cohen)

**Introduction:** The RENAI nephrometry score seeks to quantify anatomical characteristics of renal tumors. Although preliminary studies have shown this system to be relatively reproducible, data is lacking regarding its clinical utility for surgical planning. We sought to identify if an association exists between nephrometry score and selected partial nephrectomy (PN) modality.

**Methods:** Multicenter, retrospective cohort analysis of patients who underwent PN for cT1 renal masses from 3/2000 for 6/2010. Partial nephrectomy modalities included open (OPN), laparoscopic (LPN), and robotic (RPN). Demographic, operative, and clinicopathological characteristics were compared between groups. Nephrometry sum was compared between groups by category (simple 4−6, intermediate 7−9, complex ≥10; and <8 vs. ≥8). Factors associated with treatment modality selection were entered into a multivariate model.

**Results:** Of 153 OPN, 100 LPN and 26 RPN patients evaluated, there were no significant differences with respect to demographic factors. Median tumor size (cm) was significantly larger in the open group (OPN 4.2 vs. LPN 2.4 vs. RPN 2.0, p<0.001). Warm ischemia time (min) were shorter in the open group (OPN 190 and 25 vs. LPN 200 and 29 vs. RPN 196 and 30, p=0.027 and p<0.001). High-grade Clavien complications occurred more often in the open surgery group (OPN 22% vs. LPN 7% vs. RPN 8%, p=0.004). Mean RENAI nephrometry score was highest in the open group (OPN 8+2 vs. LPN 6.3+1.8 vs. RPN 6.7+1.7, p<0.001). Complex lesions including those with Radius ≥7 cm, Nearness to the collecting system <4 mm, Posterior location, Location spanning polar line, and Hilar involvement were more likely to undergo OPN (p<0.001 in all). On multivariate analysis, there was no difference in the odds of undergoing laparoscopic or robotic surgery based on nephrometry score. Simple and intermediate lesions were more likely to be treated with LPN and RPN vs. OPN (OR 13.6 and 3.5, p<0.005), whereas complex lesions were more likely treated with open surgery.

**Conclusions:** RENAI score is useful in quantifying anatomical features of renal tumors and helps standardize terminology. Nephrometry score correlated with complexity of surgical excision and renorrhaphy of kidney tumors and was associated with the type of surgical approach (open vs. laparoscopic/robotic). RENAI score may offer clinical utility as a decision making instrument for treatment approach.

**Poster #55**

**Does Near Infrared Fluorescence Real Time Imaging Using Indocyanine Green Impact Perioperative Outcomes During Surgeon Controlled Robotic Partial Nephrectomy: Initial Clinical Experience of 31 Cases**

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(Presented By: L. Spencer Krane)

**Purpose:** Surgeon controlled robotic partial nephrectomy (SCRPN) is gaining acceptance as an alternative to laparoscopic or open surgery for T1 renal tumors, due to technical ease in dissection, intracorporeal suturing and possible decrease in warm ischemia time. We evaluated the utility of near infrared fluorescence (NIRF) of intravenously injected indocyanine green (ICG) in performing SCRPN.

**Methods:** The fluorescence–capable da Vinci Si HD vision system is used white light and near infrared fluorescence imaging. Prior to hilar clamping or dissection 2mL of ICG was injected intravenously. Subsequently near infrared imaging was used to assess the renal vasculature in selective clamping of renal vessel and excision of the renal tumor in 31 patients. We used surgeon controlled bulldog clamps. Multilayer primary suture closure was used for hemostasis and renorrhaphy.
Results: Thirty-one patients underwent SCRPN, utilizing a single dose of 2 mL ICG injection for NIRF imaging to demonstrate the vascular anatomy in all cases. Nephrometry scores were low (6/7) in 24 (77%) patients and moderate (8−10) in 7 (23%) patients. Mean warm ischemia time was 10 minutes with 10 (32%) of patients completing the procedure with zero ischemia time. The median hospital stay was 2 days. Mean radiologic tumor size was 2.9 cm. Pathology revealed clear cell renal cell carcinoma in 17, papillary renal cell carcinoma in 4, chromophobe in 3, and benign lesions in 7 patients. All surgical margins were negative on final pathology except for 1 patient with a pT1a Furham grade 2 clear cell tumor. Follow-up ranged from 1 – 4 months.

Conclusions: SCRPN utilizing NIRF imaging with ICG is a safe, feasible and effective method to delineate the renal vasculature and to differentiate renal tumors from surrounding normal parenchyma. In this study, this technique helped in only two steps of the procedure: identifying renal vessels, and maintaining normal renal parenchyma all around the tumor in order to decrease the positive margins. These advantages must be weighed against its cost.

Poster #56

PROSPECTIVE EVALUATION OF CELL CYCLE BIOMARKERS FOR PREDICTION OF CANCER-SPECIFIC MORTALITY IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA

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(Presented By: Aditya Bagrodia)

Introduction and Objection: There is a paucity of information regarding patient and pathological characteristics that accurately predict clinical outcomes for patients with upper tract urothelial carcinoma (UTUC). The purpose of the present study is to prospectively evaluate whether a biomarker panel of cell−cycle regulators can be used for prediction of cancer−specific mortality (CSM) in patients with UTUC.

Methods: Between 1/2007 and 6/2011, 71 patients underwent nephroureterectomy for biopsy−proven high grade UTUC. Patient and tumor characteristics were recorded, and primary tumors were prospectively evaluated for immunohistochemical expression of a panel including 4 biomarkers: p21, p27, p53, Ki−67/pRb. Unfavorable biomarker profile was defined as >2 altered markers. Multivariate Cox regression analysis (MVA) integrating the following pathologic features was performed: 1) non−organ confined disease (>T2 and/or N+), 2) lymphovascular invasion (LVI), 3) unfavorable biomarker panel. CSM was evaluated using the Kaplan−Meier method.

Results: Mean age and follow−up were 69 years (range 38−89) and 12.4 months (range 1−42), respectively. p21, p27, p53, and Ki−67/pRb were altered in 14 (20%), 35 (49%), 32 (45%), and 62 (87%) patients, respectively. 51% (n=36) of tumors were organ confined (T stage <2, N=0), 31% (n=22) had LVI, and 32% (n=23) had an unfavorable panel. At the time of analysis, 18 (25%) patients had disease progression and 14 (20%) died from UTUC. On MVA, non−organ confined disease (HR=14.26, p<0.05) and unfavorable marker profile (HR= 3.1, p<0.05) were significantly associated with CSM. Patients with a favorable marker profile demonstrated improved CSM, compared to those with unfavorable score (73% vs 47%, p=0.03, Figure 1).

Conclusions: The urothelial carcinoma biomarker panel is a promising clinical tool for accurate identification of patients at high risk of adverse oncologic outcomes from UTUC. Incorporating this panel into clinical practice may allow for enhanced patient counseling, individualized (neo)adjuvant chemotherapy recommendations, and patient−specific surveillance regimens.
Objectives: The natural history of urothelial carcinoma arising at the uretero-enteric junction (UEJ) is poorly defined, and the data guiding clinical management of these patients is limited. Therefore, we evaluated oncological outcomes of patients treated for urothelial carcinoma at the UEJ.

Methods: Utilizing a multi-institutional database of patients treated with radical nephroureterectomy (RNU), we assessed the clinico-pathological parameters and oncologic outcomes of UEJ tumors compared to other upper tract urothelial carcinomas (UTUC). Survival analyses were performed to determine independent predictors of disease recurrence and cancer-specific mortality after RNU.

Results: The study included 1363 patients, 921 men and 442 women with 36 months median follow up after RNU. Compared to UTUC in the kidney or ureter, UEJ tumors (n=22) were more likely to demonstrate features of advanced disease which were proved to be independent predictors of disease recurrence and cancer specific mortality after RNU. The 5 year disease free survival (DFS) and cancer specific survival (CSS) rates were 25% and 39% in those with UEJ tumors versus 69% and 73% in those with UTUC in the kidney or ureter (P=0.001 and P=0.008, respectively).

Conclusions: UEJ tumors harbor features of locally advanced disease, associated with high risk of systemic recurrence and death from cancer after RNU. Our findings suggest the need for integration of systemic therapy into the management paradigm of these patients.
CENTRALIZATION OF ADRENAL SURGERY TO HIGH VOLUME HOSPITALS

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(Presented By: Jay Simhan)

Introduction: Although centralization of surgical procedures to high volume centers has been described previously, patterns of care for adrenal surgery are unknown. We investigated trends in regionalization of care for patients undergoing adrenalectomy using hospital discharge data from 3 Northeastern states.

Materials and Methods: Using 1996−2009 hospital discharge data from NY, NJ and PA, all patients ≥ 18 years undergoing adrenalectomy were identified. Hospital volume status was assigned by quintiles based on number of procedures performed on a per hospital basis in 1996 and divided as very low volume hospital (VLVH), low (LVH), moderate (MVH), high (HVH) and very high (VHVH). Outcome variables were examined by hospital volume status over time using logistic regression models.

Results: From 1996 to 2009, 8,338 patients underwent adrenalectomy with a significant shift towards regionalization to VHVHs (17 to 42%, p<0.001). For each successive year, odds of having surgery performed at a VHVH increased by 9% (OR 1.09 [CI 1.08−1.10]). There were significant differences in patient age, race, geographic location, and payer group (p<0.0001) comparing VLVHs to VHVHs. Patients at VHVHs were less likely to be ≥55 years (OR 0.76 [CI 0.72−0.80]), insured through Medicaid (OR 0.59 [CI 0.40−0.85]), or be uninsured (OR 0.30 [CI 0.21−0.43]). Controlling for year treated, patients were less likely to die in the hospital if treated at a VHVH (OR 0.38 [CI 0.19−0.75]).

Conclusions: These data demonstrates centralization of adrenalectomy to VHVHs since 1996 with improved clinical outcomes. Inequities in access to care to higher volume centers appear to exist and require further investigation.


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(Presented By: Isuru Jayaratna)

Introduction: Penile squamous cell carcinoma (PSCC) is a disfiguring and deadly disease. USC data has shown an increased incidence in specific US minority communities.

Objectives: We sought to determine the characteristics of our patient population at USC, and evaluate any correlation of these factors with stage and grade.

Methods: After IRB approval, a retrospective review of patients treated for PSCC at LAC−USC Medical Center, USC University Hospital, and Norris Comprehensive Cancer Center from 1991 − 2011 was completed. Patient characteristics were evaluated with descriptive statistics and contingency analyses.

Results: Of 69 patients identified with PSCC, 64 had surgical staging information available. Median follow up was 18 months (range 0 – 161). Median age at diagnosis was 50 (range 23−86), with 50.7% of patients ≥50 and 49.3% <50 at diagnosis. Hispanic patients represented 71% (n=44) of our cohort. 44 patients underwent partial penectomy, 10 total penectomy and 8 had a diagnostic biopsy. T stage distribution was Tis: 7.8% (n=5), T1: 39.1% (n=25), T2: 29.7% (n=19), T3: 18.8% (n=12), T4: 1.6% (n=1) and unknown: 3.1% (n=2). 38 groins were surgically evaluated, and 14 pelvic lymph node dissections were performed. Of the 24 patients who underwent a surgical lymph node evaluation. The N stage distribution was N1: 41.7% (n=10), N2: 12.5% (n=3) and N3: 45.8% (n=11). Median lymph node yield in groin dissections was 11, with a lymph node positivity rate of 49%. 30.8% (n=20), 41.5% (n=27), 12.3% (n=8) and 15.4% (n=10) of patients had well, moderately, poorly differentiated PSCC or unknown grade, respectively. There was no association of age (p=0.16) or race (p=0.24) with clinical stage. Stage was significantly associated with grade (p=0.049), with 75% of poorly differentiated tumors being Stage 4, compared with 21.4% of well−moderately differentiated tumors.
Conclusions: In our cohort, we found a primarily Hispanic ethnic prevalence, which is reflective of our patient population, as well as a markedly younger age at diagnosis in contrast to previously published reports. We observed a higher average stage in both T and N stages in our population compared with national averages. It is noted that the small sample size limits our power to draw conclusions, however this initial description of our population suggests variation in the disease process that may be related to demographic factors.

Poster #60

PROGNOSTIC VALUE OF EXTRANODAL EXTENSION IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA
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(Presented By: Eugene Cha)

Background: The aim of the current study was to assess the prognostic value of extranodal extension (ENE) and other lymph node (LN) parameters in a large multicenter cohort of patients with LN metastasis (LNM) following radical nephroureterectomy (RNU).

Methods: We performed a retrospective analysis of 222 patients with LNM treated with RNU for upper tract urothelial carcinoma (UTUC) without neoadjuvant therapy. Microscopically, each LN metastasis was evaluated for presence of ENE.

Results: The median number of LNs removed, number of positive LNs, and LN density were 4 (IQR: 8), 2 (IQR: 2), and 51.3% (IQR: 71.7%), respectively. Overall, 110 patients (49.5%) had ENE. Presence of ENE was associated with more advanced pT stage (p=0.026) and presence of necrosis in the primary tumor (p=0.023). In multivariable analyses, ENE was associated with disease recurrence (p=0.01) and cancer-specific mortality (p=0.013). LN density, when stratified by 30% cutoff, was associated with disease recurrence and cancer-specific mortality. (p=0.048 and p=0.049) in univariable, but not in multivariable analyses. Addition of ENE to a multivariable model including pT stage and tumor architecture improved predictive accuracy for disease recurrence from 70.3% to 74.5% (p<0.001). Addition of ENE to a multivariable model including age, pT stage, and tumor architecture improved predictive accuracy for cancer-specific mortality from 70.6% to 74.4%. (p<0.001)

Conclusions: ENE is a powerful predictor of clinical outcomes in UTUC patients with LNM. While other LN parameters seem to have limited clinical value, ENE could help risk stratify UTUC patients with LNM for better counseling and clinical trial design.
Poster #61

HPV STATUS IN RELATION TO CLINICOPATHOLOGICAL CHARACTERISTICS IN PENILE CANCER PATIENTS AT LOS ANGELES COUNTY-USC (LAC-USC) MEDICAL CENTER

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(Presented By: Anne K. Schuckman)

Introduction: Penile squamous cell carcinoma (PSCC) is a disfiguring and deadly disease. US cancer registry reports an increased incidence in certain US minority communities including those over—represented at LAC-USC. Human papilloma virus (HPV) infection is strongly associated with PSCC. This study examined correlations of HPV presence and subtype with PSCC patient clinicopathological characteristics at a tertiary referral center.

Methods: A retrospective review of PSCC patients at LAC—USC Medical Center between 1996—2010 was performed. Presence and genotype of HPV was detected from primary tumors of 33 PSCC patients by genomic DNA PCR amplification followed by reverse line blot hybridization. Associations with patient and tumor characteristics were examined by contingency analyses. Funding from USC Institute of Urology.

Results: 20 (60.6%) patients were HPV+, and 85% of all HPV+ cases harbored at least one high−risk viral strain (80% of all positive cases had HPV 16, 5% HPV 31, 10% HPV 66). 20% of all positive cases harbored low−risk HPV 11; HPV strains 6 or 35 were not detected in any specimen. 3 patients were positive for multiple strains. Overall median age at diagnosis was 53 (range: 24−77) yrs. Median age was 56 yrs and 49 yrs for HPV+ and HPV− patients, respectively. HPV infection trended towards being more prevalent in patients beyond the fifth decade of life, although this did not reach statistical significance (p=0.10). 22 (66.7%) patients were Hispanic; this ethnicity comprised 60% and 77% of HPV+ and HPV− cases, respectively (p=0.31). This cohort included Stage 0 (n= 1, n= 0), Stage 1 (n= 4, n=2), Stage 2 (n=4, n= 4), Stage 3 (n=5, n= 1), and Stage 4 (n= 4, n= 5) HPV+ and HPV− patients, respectively. Neither HPV status nor presence of nodal metastasis was significantly associated with stage (p=0.50, p=0.52 respectively). Tumor grade was available for 30 (90.9%) cases; while HPV+ cases tended to have higher proportion of moderately−poorly differentiated tumors than HPV− cases (77.8% vs. 58.3%), this was not statistically significant (p=0.32).

Conclusions: This cohort’s median age was considerably lower than prior reports. An overwhelming majority of HPV+ cases harbored at least one high−risk viral strain. Several interesting associations of HPV status with age and grade were noted, although the study was underpowered to note any significant differences. Further analysis will examine correlations of survival and therapy response with HPV status.

Poster #62

A PHASE I STUDY OF TRC105 (ANTI-CD105 [ENDOGLIN] ANTIBODY) IN METASTATIC CASTRATION RESISTANT PROSTATE CANCER (MCRPC).

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(Presented By: Fatima Karzai)

Introduction: Pre−clinical and clinical evidence demonstrates an important role for angiogenesis in mCRPC biology. CD105 (endoglin) is a transmembrane protein expressed on the surface of proliferating vascular endothelial cells. The expression of CD105 is required for the formation of new blood vessels. CD105 expression is increased during hypoxia and protects hypoxic endothelial cells from apoptosis. TRC105 is a human/murine chimeric IgG1 kappa monoclonal antibody that binds to human CD105 (endoglin). It inhibits angiogenesis and tumor growth through inhibition of endothelial cell proliferation, antibody−dependent cellular cytotoxicity, and induction of apoptosis. CD105, acting as an accessory protein, modulates the effects of TGF−β.

Objectives: The primary objective is to evaluate safety and identify the maximum tolerable dose (MTD) of TRC105. Secondary objectives include the assessment of TRC105 pharmacokinetics, PSA response rate, evaluation of progression free survival (PFS), overall response rate (ORR) and overall survival (OS).
**Methods:** Patients with an ECOG performance status (PS) ≤ 2, progressive mCRPC and either chemotherapy-naïve or post-docetaxel treatment were eligible. Five cohorts of patients, on escalating dose levels, receive TRC105 intravenously at doses of 1, 3, 10 or 15 mg/kg IV every 2 weeks (cohorts 1, 2, 3, and 5) or 10 mg/kg IV weekly (cohort 4) on a 4 week cycle. Response is assessed with imaging studies every 2 months for the first four months and then every 3 months thereafter.

**Results:** Sixteen patients are enrolled in cohorts 1−5. Median age is 65 (range 48−87), median ECOG PS is 1 (range 0−2), median Gleason score is 8 (range 6−10), median on−study PSA is 147.5 (range 0.1−3373), and median number of prior (non−hormonal) therapies is 3 (range 0−6). Median time on study is 16 weeks (range 8−28 weeks). One patient experienced a dose limiting toxicity (grade 4 vasovagal episode) in cohort 5. PSA declines were seen in 6 patients ranging from 20% to 57% from baseline. Ten out of 12 patients with measurable soft tissue disease achieved stable disease for at least two cycles. Four patients remain on study (one in cohort 4 and three in cohort 5).

**Conclusion:** TRC105 is tolerated up to 15 mg/kg every two weeks with early evidence of clinical activity in mCRPC. Accrual is ongoing to evaluate ORR, PFS, and OS in the phase II portion of this study.

**Funding:** Provided by the National Cancer Institute and TRACON pharmaceuticals.

**Poster #63**

**CELL CYCLE PROGRESSION GENES DIFFERENTIATE INDOLENT FROM AGGRESSIVE PROSTATE CANCER**

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(Presented By: Steven Stone)

**Background:** The natural history of prostate cancer is highly variable and difficult to predict accurately. Improved tools are needed to match treatment more appropriately to a patient’s risk of progression. Therefore, we developed an expression signature composed of genes involved in cell cycle progression (CCP) and tested its utility in prostate cancer.

**Methods:** Using publically available expression data, we developed an expression signature composed of 31 CCP genes and 15 housekeepers. An expression score was derived as the mean of all CCP genes. The signature was tested in a retrospective cohort of 366 patients from the U.S. who had undergone radical prostatectomy; and in two retrospective UK cohorts of 337 men diagnosed by a transurethral resection (TURP) and 349 men diagnosed by needle biopsy both with clinically localized prostate cancer and managed conservatively.

**Results:** The cell cycle progression signature was a highly significant predictor of outcome in all three cohorts. After prostatectomy, the CCP score predicted biochemical recurrence in univariate ($\chi^2 = 34.0$, 1df, $p = 5.6 \times 10^{-9}$) and multivariate analysis ($\chi^2 = 21.65$, 1df, $p = 3.3 \times 10^{-6}$). The CCP score and PSA were the dominant variables in the best predictive model and were much more significant than any other clinical measure. In the TURP cohort, the CCP score was the dominant variable for predicting death from prostate cancer in both univariate ($\chi^2 = 92.7$, 1df, $p = 6.1 \times 10^{-22}$) and multivariate analyses ($\chi^2 = 42.2$, $p = 8.2 \times 10^{-11}$), where it was much stronger than all other prognostic factors. Finally, in the needle cohort CCP score was a better univariate predictor of prostate cancer death than any other variable ($\chi^2 = 37.6$, 1df, $p = 8.6 \times 10^{-10}$) and in a final multivariate analysis, which included Gleason and PSA, CCP dominated (HR for one unit increase = 1.65, 95% CI (1.31, 2.09) $\chi^2=17.7$, $p = 2.6 \times 10^{-5}$) with Gleason score ($\chi^2=12.1$, $p = 5 \times 10^{-4}$) and baseline PSA ($\chi^2=5.7$, $p = 0.017$) providing significant, but smaller additional contributions.

**Conclusions:** A CCP expression signature predicts prostate cancer outcome in multiple patient cohorts and diverse clinical settings. In all cases, it provides information beyond clinical and pathological variables to help differentiate aggressive from indolent disease.
DISTINGUISHING BENIGN PROSTATE HYPERPLASIA FROM PROSTATE CANCER BASED ON REACTIVE STROMA RESPONSE BY NANODEVICE THAT IDENTIFIES FUNCTIONAL PROTEIN BIOMARKERS

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(Presented By: Jennifer Linehan)

Introduction and Objective: Reactive stroma has been shown to be a predictor of biochemical free recurrence in prostate cancer (Ayala et al. 2003; 9:2003), however molecular markers of the stromal response have not yet been successfully applied in prognosis. We recently demonstrated that a thioredoxin−targeted nanodevice selectively binds to reactive stroma in frozen tumor sections (Singer et al. Nanomedicine 2011; 6:659). Thioredoxin was used as the targeting ligand because it is involved in numerous reductive pathways associated with the wound response mounted by the stroma. Our objective was to compare the stromal binding of the Thioredoxin−targeted nanodevice in (BPH) versus PCa to determine whether or not they could be distinguished using a stromal marker.

Methods: The nanodevice is a self−assembling system composed of DNA methyltransferase−thioredoxin fusion proteins covalently linked to a three−arm DNA scaffold. Robotic−Assisted radical prostatectomy tissue for frozen sections was obtained from 29 patients. Serial sections were incubated with varying concentrations of nanodevice in PBS and 1% BSA. Binding fluorescence was observed at 100x with a Zeiss Observer microscope and images of the entire tumor section were obtained by raster−tiling of individual pictures. A numerical grading system was given as the level of nanodevice fluorescence in the stroma. 1− was a lightly visible signal, 2− was a moderately intense visible signal and 3− was a bright and intense signal within the reactive stroma. Slides where then reviewed by a blinded pathologist for histology and diagnosis.

Results: Fluorescent images of frozen exposed to the nanodevice were collected and graded. Although the specimens originated from 29 different patients with Gleason sums ranging from 6−to−10, seventeen of the slides analyzed were found to contain BPH only. Twelve slides contained PCa. We found a correlation between the intensity of Nanodevice binding to the stroma and the presence of PCa (Figure 1).

Conclusion: Thioredoxin−linked reductive pathways associated with the wound response may provide useful biomarkers of prostate cancer.
PERCENT CARCINOMA DEMONSTRATES BETTER PREDICTIVE VALUE THAN SURGICAL MARGINS FOR BIOCHEMICAL RECURRENCE AFTER ROBOTIC ASSISTED RADICAL PROSTATECTOMY

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(Presented By: Jennifer Linehan)

Introduction and Objectives: The impact of positive surgical margins (PMs) on biochemical recurrence after robot-assisted laparoscopic radical prostatectomy (RARP) is largely debated. Several nomograms and studies have focused on the prognostic value of tumor volume or tumor size in predicting biochemical recurrence (BCR). We demonstrated correlation between tumor size as percent carcinoma (%TI) in the prostate specimen with PMs and their link to predicting BCR after RARP.

Methods: We reviewed over 3,000 robotic-assisted radical prostatectomies for pathologic variables, PMs, %TI, and BCR. Two matched cohorts were created and adjusted for clinicopathologic variables differing only on %TI. Median follow-up was 18 months. To test the hypothesis, we analyzed the prognostic utility of both PMs and %TI on BCR. The probability of recurrence was estimated as a time-to-event endpoint with the Kaplan-Meier method and tested using the log-rank test. The predictive utility of our regressions on surgical margins by constructing ROC curves and estimating the area under the curve (AUC) resulting from each analysis.

Results and Limitations: 3,006 total patients of which 727 patients had PMs and 2,279 had negative margins (NMs). Percent tumor in RARP specimens was shown to be a significant single predictor of PMs as the AUC was 0.71 (95% CI: 0.69-0.73). In our matched analysis, we found that %TI was a predictor of PMs and BCR. Biochemical free survival (BFS) was predicted in patients with varying amounts of %TI: <5% was 93%, <10% was 85% and when > 30% dropped to 58% (95% CI: 91%-95%). This is a retrospective study with limited follow-up and biochemical recurrence may have not yet occurred.

Conclusion: There is a relationship between PMs and %TI of the prostate. Both can function as predictors of BCR but given their relationship, %TI is a much stronger predictor of BCR and should be considered when discussing adjuvant therapy post prostatectomy.
Poster Session I

Poster #66

PATHOLOGICAL AND ONCOLOGIC OUTCOMES FOR MEN WITH POSITIVE LYMPH NODES AT RADICAL PROSTATECTOMY: 30-YEAR EXPERIENCE FROM A SINGLE
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(Presented By: Ashley Ross)

Introduction: Lymph node (LN) metastases at radical prostatectomy (RP) are a poor prognostic indicator with regards to oncologic outcomes. We report the 30−year experience of single institution with regard to LN metastases in men with clinically localized prostate cancer.

Methods: The Johns Hopkins Radical Prostatectomy Database (1982−2011) was queried for men with node−positive adenocarcinoma of the prostate (N+PC). 505 (2.5%) of 19,633 men were identified. Survival analysis was completed using the Kaplan−Meier method and proportional hazard regression models were created to identify predictors of outcome in this cohort.

Results: Median age was 59.5 years (range 38−76) and the majority of patients were Caucasian (452, 89.5%). Median PSA was 10.1 ng/mL (0.4−129), only 153 (30.3%) and 79 (15.6%) had clinical stage T2b and T2c/T3 respectively; 56 (11.1%), 38 (7.7%) and 4 (0.8%) men had Gleason 8, 9 and 10 at biopsy. At pathologic evaluation, 85 (16.9%), 115 (22.9%) and 2 (0.4%) had Gleason 8, 9 and 10 respectively. Median total and positive nodes were 13.2 (1−41) and 1.7 (1−12) respectively. 135 patients had a dominant nodule localized to one side of the prostate; in these patients 80 (59.3%) demonstrated positive LN on the ipsilateral side, 28 (20.7%) had contralateral positive LN and 15 (11.1%) had bilateral positive LN. 15−year biochemical−recurrence free, metastases−free and cancer−specific survival were 7.1%, 41.5% and 57.5% respectively. Predictors of biochemical−recurrence, metastases and death from prostate cancer in multivariable analysis included Gleason sum at RP and percent of positive LN; notably total LN dissected did not predict outcome.

Conclusions: In this highly−selected RP cohort, men with N+PC at RP can experience a durable long−term metastases−free and cancer−specific survival. Predictors of survival include Gleason sum and percentage of positive LN. While total number of LN dissected did not predict outcome, upwards of 30% of men with N+PC will have positive LN contralateral to the primary prostatic lesion highlighting the importance of a thorough, bilateral pelvic LN dissection.

Poster #67

IMPACT OF PROSTATE MRI ON DISEASE RECLASSIFICATION AMONG ACTIVE SURVEILLANCE CANDIDATES - A PROSPECTIVE COHORT STUDY
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(Presented By: David Margel)

Purpose: To report MRI findings among unselected men with low−risk prostate cancer (PCa) prior to active surveillance (AS).

Patients and methods: We prospectively enrolled men with low−grade, low risk, localized PCa. All patients underwent multiparametric endorectal coil MRI scanning and offered a confirmatory biopsy within one year of MRI. The primary outcome was the accuracy of MRI in identifying patients reclassified as no longer fulfilling AS criteria by a confirmatory biopsy. We further aimed to identify clinical parameters associated with reclassification. Cohort was stratified as follows: normal MRI; cancer on MRI concordant with initial biopsy (less than 1 cm); cancer on MRI larger than 1 cm or larger lesion in 13 patients (22%). The positive and negative predictive values for MRI predicating reclassification were 83% (95% CI, 73%−93%) and 81% (95% CI, 71%−91%), respectively. PSA density was elevated among patients with larger than 1 cm MRI lesions compared to those with no cancer on MRI (medians of 0.15 vs 0.07 ng/ml/cc, respectively p=0.016).

Conclusions: MRI appears to have a high accuracy in predicting reclassification among men choosing AS. Upon confirmation of our results MRI may be used to better select and guide patients before AS.
Poster #68

SPURIOUS ELEVATION OF SERUM PROSTATE-SPECIFIC ANTIGEN AFTER CURATIVE TREATMENT FOR PROSTATE CANCER: CLINICAL CONSEQUENCES AND THE ROLE OF HETEROPHILIC ANTIBODIES
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(Presented By: Christopher Anderson)

Objectives: Various interferences can cause spurious results for common laboratory tests. Although rare, heterophilic antibodies may produce false elevations in PSA that could prompt unnecessary treatment. The aim of our study was to determine the prevalence of small, spurious PSA elevations after curative treatment for prostate cancer and determine the role of heterophilic antibodies.

Methods: Phase I: All PSA tests drawn between 10/27/08 and 10/26/10 at our institution were analyzed (n=17,133). Patients who had been treated for prostate cancer with PSA values that changed from undetectable to detectable were then selected. Phase II: Patients who had a PSA <0.5 ng/mL measured between 10/24/2010 and 1/19/2011 were studied prospectively (n=1,288). If any patient had a previously undetectable value, their PSA test was subjected to analysis for heterophilic antibody interference.

Results obtained: Phase I: Eleven men had a spuriously elevated PSA after curative treatment for prostate cancer (0.3%). Mean time to PSA elevation was 3.4±5.5 years and mean elevation in PSA was 0.33±0.28 ng/mL. Each patient’s PSA was undetectable after being repeated and no patient went on to unnecessary treatment. Phase II: Twelve men with a history of prostate cancer and a newly detectable PSA had their test repeated with heterophilic antibody blocking reagent and each patient tested negative for interfering heterophilic antibodies.

Conclusions: In a large cohort, we estimate the prevalence of spuriously elevated PSA values after curative therapy for prostate cancer to be 0.3%. No patient was subjected to unnecessary diagnostic evaluation or treatment. On prospective evaluation of PSA conversion to low detectable levels, no patient had evidence of interfering heterophilic antibodies. When using PSA for post-treatment surveillance, it is crucial to confirm all concerning values and to consider the presence of laboratory error if the PSA value does not correlate with the clinical scenario.

Poster #69

PCA3 TEST AS AN ADJUNCT IN DIAGNOSIS OF PROSTATE CANCER
Vladimir Yutkin¹, Ali Al-zaharni³, Andrew Williams¹, Guy Hidas², Carlos Martinez¹, Jonathan Izawa¹, Dov Pode² and Joseph Chin¹
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(Presented By: Vladimir Yutkin)

Introduction: Early diagnosis of prostate cancer is conventionally done with serum prostate specific antigen (PSA) test and digital rectal examination, but these tests lack specificity. Many men worldwide undergo repeated, sometimes unnecessary prostate biopsies due to suspicious or rising PSA levels. A urine test PCA3 is gaining popularity, predominantly in the field of managing patients with suspicious PSA and previous benign biopsies.

Methods and Patients: In this multi-national study we assessed the performance of the PCA3 urine test in patients who were candidates for prostate biopsies due to high or rising PSA’s. The PCA3 scores were determined in urine samples in these men. A PCA3 scores of 35 or higher were considered higher probability of cancer. Subsequent biopsy was performed as per current best practice and at the discretion of the urologist in concert with the patient. To retrospectively assess the performance of PCA3, we used multiple logistic regression analysis and ROC curves were constructed to evaluate PCA3 as a prognostic factor compared with PSA and evaluated the influence of PCA3 testing on the decision making.
Results: 401 patients had PCA3 score available. The most common indication was rising or high PSA after previous negative biopsies—in 256 patients (63.8%), followed by the finding of high grade prostatic intraepithelial neoplasia (HGPIN) or atypical small acinar proliferation (ASAP) on previous biopsy—in 101 patients (25.2%). Forty-four subjects (11%) did not undergo prostate biopsy prior to PCA3 testing. PCA3 scores were significantly lower in patients without malignancy using a cutoff score of 35 (OR 2.99 (95%CI) (1.42, 6.30), p=0.004). On Receiver Operating Curve analysis PCA3 AUC of 0.722 was significantly greater than PSA (0.4837). Sensitivity and specificity of PCA3 score using the 35 cutoff were 63.6% and 63.0%, respectively. When a cutoff score of 20 was used, the sensitivity and specificity of PCA3 score were 86.4% and 41.3%, respectively. The PCA3 test influenced the clinical course of the patient in 73.5% of cases.

Conclusion: in this multinational study we demonstrate that urine PCA3 score test outperforms PSA in decision making in men facing possibility of repeat prostate biopsy. We recommend that the PCA3 results should be integrated with other relevant data and rather be used in continuous fashion, and not with certain cutoff value.

Poster #70

POST-PROGRESSION TREATMENT WITH APC8015F MAY HAVE PROLONGED SURVIVAL OF SUBJECTS IN THE CONTROL ARM OF SIPULEUCEL-T PHASE 3 STUDIES

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Introduction and Objectives: Sipuleucel−T is an autologous cellular immunotherapy approved by the FDA for the treatment of asymptomatic or minimally symptomatic metastatic castrate resistant (hormone refractory) prostate cancer.

Methods: After disease progression, subjects in the control arms of 3 randomized controlled trials (RCT) of sipuleucel−T were offered 3 infusions of APC8015F, an autologous immunotherapy made from cells cryopreserved at the time of control generation.

Results Obtained: 165/249 (66.3%) of the control group received APC8015F. Median time from randomization to first APC8015F infusion was 5.2 months (range 1.8 to 33.1), and from objective disease progression to first infusion was 2.2 months (range 0.5 to 14.6). 145 subjects (87.9%) received all 3 infusions. APC8015F−treated subjects had improved post−progression survival relative to untreated controls (HR = 0.52 [95% CI: 0.37, 0.73]; unadjusted Cox regression; P = 0.0001, log rank test), with median survival times of 20.0 and 9.8 months, respectively. APC8015F−treated subjects had more favorable prognostic features than untreated controls. To account for these differences, a Cox regression model was fit using backward selection, and included the following independent predictors of post−progression survival: lactate dehydrogenase, alkaline phosphatase, ECOG status, age, number of bone metastases, and hemoglobin. In addition, the model included post−randomization salvage treatment and docetaxel use as time dependent covariates. This analysis revealed a positive docetaxel effect (HR = 0.86 [95% CI: 0.60, 1.22]; P = 0.40), and a positive APCF8015F treatment effect (HR = 0.78 [95% CI: 0.54, 1.11]; P = 0.17). In subjects who received at least one infusion of APC8015F, the cumulative product lot release characteristics of CD54 upregulation and total nucleated cell counts were correlated with survival after salvage treatment (p=0.03 and p=0.04, respectively).

Conclusions: Post−progression treatment with APC8015F may have extended survival of subjects, potentially reducing the magnitude of survival difference observed between sipuleucel−T and controls in RCT.

This abstract was previously presented at ASCO 2011 Annual Congress in Chicago, IL. Updated analyses will be presented.
MULTINSTITUTIONAL VALIDATION OF UCSF CANCER OF THE PROSTATE RISK ASSESSMENT-POSTSURGICAL SCORE FOR PREDICTION OF RECURRENCE POST RADICAL PROSTATECTOMY

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(Presented By: Sanoj Punnen)

Introduction: The UCSF cancer of the prostate risk assessment – postsurgical (CAPRA-S) is a novel risk assessment tool that uses postoperative pathological data to predict the risk of recurrence post radical prostatectomy. The objective of this study was to validate its use in a large external database.

Methods and Materials: The Shared Equal Access Regional Cancer Hospital (SEARCH) database is a registry of men who underwent radical prostatectomy at 4 Veterans Affairs and 1 active military medical center. Of the 2,211 men in the SEARCH database, 2078 (94%) had full data available to calculate a CAPRA-S score. The CAPRA-S is determined by adding up to 3 points each for PSA and pathological Gleason score, 2 points each for positive surgical margins and seminal vesicle invasion and 1 point each for extra-capsular extension and lymph node involvement. Performance of the CAPRA-S score was assessed and compared to the Stephenson nomogram using proportional hazards regression, the concordance (c) index, calibration plots and decision curves analysis.

Results: Among this cohort, the mean age was 62 (SD 6.3) years and 33.3% of the men recurred. The median follow up time of men who did not recur was 60.7 months. The hazard ratio (HR) for each one-point increase in the CAPRA-S score was 1.42 (95%CI 1.37–1.46). The 5-year recurrence free survival for those patients with a CAPRA-S score of 0–2, 3–6 and 7–10 were 74%, 45%, and 18%, respectively. The CAPRA-S c-index was 0.74 in this validation set, compared to a c-index of 0.77 for the original development set and 0.73 for the Stephenson nomogram. The CAPRA-S score performed better than the Stephenson nomogram on both calibration plots and decision curves analysis (FIG 1).

Conclusion: The CAPRA-S score accurately predicted recurrence after radical prostatectomy in this large cohort of men. This validates its use as an effective prognostic tool to stratify men with prostate cancer for risk of recurrence post surgery.

Figure 1: Calibration plots comparing the CAPRA-S prognostic score to the Stephenson nomogram for patients in the SEARCH database.

Poster #71

Poster Session I
CAN PROSTATE MRI ESTIMATE INDEX TUMOR VOLUME AT HISTOLOGY?

Baris Turkbey¹, Haresh Mani², Omer Aras¹, Ardeshir Rastinehad³, Vijay Shah⁴, Marcelino Bernardo¹, Thomas Pohida¹, Dagane Daar⁵, Compton Benjamin⁶, Yolanda McKinney¹, Marston Linehan³, Bradford Wood⁷, Maria Merino², Peter Choyke¹ and Peter Pinto³

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(Presented By: Baris Turkbey)

**Purpose:** The biology of prostate cancer may be influenced by the index lesion. Definition of index lesion’s volume is important for appropriate decision making, especially for image guided focal treatment. The purpose of this study was to determine accuracy of MRI for determining index tumor volume (ITV) compared with volumes derived from histopathology.

**Material and method:** We evaluated 135 patients (mean age 59.3 years) with a mean PSA of 6.74ng/dL, who had multi-parametric 3T endorectal coil MRI of prostate, subsequent radical prostatectomy. ITV was determined prospectively, independently by MRI, histopathology. Ellipsoid formula was applied to determine histopathology tumor volume (HTV), whereas manual tumor segmentation was used to determine magnetic resonance tumor volume (MRTV). HTV was correlated with age, PSA, MRTV by Pearson correlation, linear regression (LR) methods. Additionally, predictive power of MRTV, PSA, age for estimating HTV (>0.5cm³) was assessed by ROC analysis.

**Results:** There was a positive correlation between HTV, MRTV (Pearson coefficient=0.633, p<0.0001) but a weak correlation between PSA, HTV (Pearson coefficient=0.237, p=0.003). At LR analysis, HTV and MRTV were correlated (R²=0.401, p<0.00001). At ROC analysis, area-under-curve values for MRTV, PSA, age in estimating tumors >0.5cm³ at histopathology were 0.949 (p<0.00000001), 0.685 (p=0.001), 0.627 (p=0.02), respectively.

**Conclusion:** MRI can accurately estimate ITV as determined by histology. MRI has better accuracy in predicting HTV in tumors >0.5cm³ than PSA, age. ITVs as determined by MRI may be helpful in treatment planning, specifically in identifying tumor margins for image guided focal therapy, possibly selecting better active surveillance candidates.
**Poster #73**

**PSA NADIR DURING ANDROGEN DEPRIVATION THERAPY PREDICTS ADVERSE PROSTATE CANCER SPECIFIC OUTCOMES: RESULTS FROM THE SEARCH DATABASE**

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(Presented By: Christopher Keto)

**Introduction and Objective:** Traditionally, a PSA nadir on androgen deprivation therapy (ADT) >4 ng/ml has been correlated with poor outcome. More recently, a PSA nadir >0.2 ng/ml has been associated with prostate cancer (PC) specific mortality (PCSM). However, whether all men with nadir values <0.2 ng/ml have similar outcomes is untested. We examined the predictive value of PSA nadir including small but detectable nadir values during ADT on PC specific outcomes in men treated with early ADT for PSA–only recurrence after radical prostatectomy (RP) within the Shared Equal Access Regional Cancer Hospital (SEARCH) cohort.

**Methods:** We retrospectively reviewed data from 2892 men treated with RP between 1988 and 2010 within the SEARCH database to identify men treated with early ADT, defined as no evidence of metastatic disease at the start of ADT. PSA nadir on ADT was defined as the lowest PSA value during continuous ADT. PSA nadir was analyzed as a continuous variable and was also categorized to three groups: 0, 0.01–0.2, and >0.2ng/mL. Cox proportional hazards models were used to examine the link between PSA nadir and castrate resistant PC (CRPC), metastatic disease, and PCSM with the date of PSA nadir on ADT as time zero.

**Results:** During a median follow–up of 73 months after RP, 405 men (14%) were treated with early ADT. Of these men, 322 had complete data for analysis with a median follow–up after ADT nadir of 51 months. When examined as a continuous variable, higher PSA nadir on ADT was associated with progression to CRPC (HR=2.5, p<0.0001), development of metastatic disease (HR=2.1, p=0.001) and PCSM (HR=1.8, p=0.020). Men with a PSA nadir between 0.01–0.2 ng/mL were more likely to progress to CRPC (HR=4.1, p=0.001), develop metastases (HR=3.3, p=0.027) and ultimately die of prostate cancer (HR=4.5, p=0.011) than men with an undetectable nadir. Finally, relative to men with an undetectable nadir, those with a nadir >0.2ng/mL were at the greatest risk of progression to CRPC (HR=29.0, p=0.001), development of metastases (HR=13.1, p=0.001) and PCSM (HR=9.3, p<0.0001).

**Conclusions:** A detectable PSA nadir on ADT of any level is associated with increased risk for CRPC, metastases, and PCSM. Men who do not achieve an undetectable PSA nadir during ADT are at a dramatically increased risk of disease progression and therefore, should be considered for clinical trials.

**Poster #74**

**APICAL UNDERSAMPLING OF THE PROSTATE ON TWELVE CORE TRANSRECTAL ULTRASOUND (TRUS) BIOPSY DETECTED BY MRI-GUIDED ELECTROMAGNETIC MAPPED FUSION BIOPSY**

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(Presented By: Anup Vora)

**Introduction:** Transrectal ultrasound plays a central role in the diagnosis of prostate cancer, however, false negative rates have been reported as high as 30%. Mapping of radical prostatectomy specimens have shown undersampling of the peripheral zone with standard TRUS biopsy techniques, including the apical lateral horns. With development of a 3D–image fusion model which tracks biopsy location in real–time, we report our apical prostate sampling rate during standard twelve core TRUS biopsy.
Materials & Methods: Twenty patients underwent 3T endorectal coil multiparametric prostate MRI prior to biopsy and 3D TRUS images were obtained. An electromagnetic positioning device was attached to the TRUS probe in order to track the position of each needle pass. The 3D–TRUS image documenting the location of each biopsy was recorded and compared to its intended site.

Results: Twenty patients (median age 66) with a median PSA of 5.63 ng/ml and median prostatic volume of 43 cc underwent MRI fusion biopsy with electromagnetic tracking. Out of eighty total intended apical biopsies, the prostatic apex was successfully biopsied only 71% of the time with 29% of biopsies incorrectly targeting the prostatic mid–gland.

Conclusions: In our series, standard TRUS biopsy led to a significant undersampling of the apical prostate. Approximately 30% of the identified biopsies of the prostatic apex on transrectal ultrasound incorrectly sampled the prostate mid gland. The large false negative rate of TRUS should be considered as alternative imaging and diagnostic modalities, such as MRI, are being developed and may provide more reliable sampling of the prostate.

Poster #75

CLINICAL AND HISTOLOGICAL PROSTATITIS IN PATIENT UNDERGOING RADICAL PROSTATECTOMY FOR LOCALIZED PROSTATE CANCER
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(Presented By: Muhammad Bulbul)

Introduction: Few patients (pts) with prostate cancer (CaP) report past history of prostatitis, yet the association between them is gaining more interest. Whether prostatitis is a precursor for or protector against CaP is unclear. We examined the relationship between prostatitis and cancer and the effect on tumor parameters in pts with localized prostate cancer treated with radical prostatectomy.

Methods: 104 pts with localized CaP underwent radical retropubic prostatectomy. PSA ranged between 2.0 and 35 ng/ml. only three pts reported history consistent with chronic prostatitis in the past and five pts developed acute prostatitis following the needle biopsy at time of diagnosis. Pathological evaluation of the specimen focused on Gleason score, tumor volume (as a percentage of total gland volume), resection margins and presence of inflammation – focal or diffuse. The inflammation was labeled as focal when the acute and/or chronic inflammation constituted up to 10% of total prostatic volume and lacked any secondary architectural changes. Diffuse inflammation included more prostatic volume or showed evidence of glandular invasion or parenchymal destruction.

Results: 68/104 pts (66%) had concomitant inflammation (Group 1–GI); 35 focal (GIa), they include the 3 pts with history of chronic prostatitis and 33 diffuse (GIb), they include the 5 pts with post biopsy infection. In 36/104 pts (34%) inflammation with cancer was not seen (Group 2–GII). Median preoperative PSA for GI was 7.16 ng/ml (range: 1.76 to 35.0) with medians of 6.74 ng/ml for Gla and 7.16 ng/ml for Glb while median PSA for GII was 5.26 ng/ml (range: 2.3 to 19.3) (p = 0.13). Median Gleason score was 7 in both groups (range: GI 4–9, GII 5–9). Median percent tumor volume was 8% in GI (Gla 10%, Glb 5%) and 15% in GII. 18/68 pts (26%) of GI had positive surgical margins (11/35 pts in Gla and 7/33 pts in Glb) compared to 12/36 pts (34%) of GII.

Conclusion: History of clinical prostatitis is not common in pts with localized CaP but concomitant histologic prostatitis is common (Up to 66%). The presence of inflammation does not affect tumor grade but there is tendency for lower tumor volume. Organ confined disease is seen more in patients with inflammation. Possible explanation is that high PSA of patients with inflammation contributes to diagnosis of cancer at a lower volume and more confined disease.
DOES THE EXTENT OF POSITIVE SURGICAL MARGINS INFLUENCE BIOCHEMICAL RECURRENCE FOLLOWING RADICAL PROSTATECTOMY? – RESULTS FROM THE DUKE PROSTATE CENTER

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(Presented By: Suzanne Biehn Stewart)

Introduction and Objective: Postoperative radiotherapy improves outcomes in patients with high−risk pathological features following radical prostatectomy (RP). However, both the timing and the strict indication to administer this therapy, specifically for those patients with positive surgical margins (PSM), remain uncertain. Although there is agreement that PSMs portends worse risk of biochemical recurrence (BCR), the impact of the number of sites or specific location of PSMs remains variable in the literature. In addition, the degree of PSM severity and its consequent impact on disease progression has not been established. We therefore sought to better define the influence of PSM on BCR using actual measurements of tumor extension at surgical margins obtained during pathological assessment of RP specimens.

Methods: We retrospectively analyzed data from 1453 RP cases from the Duke Prostate Center from 2005 to 2009. PSM extension was analyzed both as a continuous and categorical variable using a priori defined ranges: <5mm, 5−10mm, >10mm. The impact of PSM extent on risk of BCR was evaluated using crude and adjusted Cox regression models.

Results: PSMs were identified in 445 (31%) patients following RP. After adjustment for clinicopathological covariates, greater PSM extension was significantly associated with increased BCR risk in all RP patients (HR 1.8, 95%CI 1.6−2.1, p<0.001) as well as among only those with positive margins (HR 1.4, 95%CI 1.1−1.7, p=0.005). Specifically, men with PSM extension >10mm experienced a shorter time to BCR compared to lower PSM extension groups (Figure 1). After controlling for potential confounders, a PSM extension >10mm continued to show an increased risk of BCR compared to men with PSM extension < 10mm (HR 2.5, 95%CI 1.4−4.4, p=0.002). There was no difference in BCR risk among men with PSM extension of 5−10mm and <5 mm (all p>0.115).

Conclusion: A greater extent of PSM does increase the likelihood of BCR among men who underwent RP. Specifically, a PSM >10mm was found to carry the greatest risk of recurrence. Use of PSM >10mm may serve as part of a more explicit criterion by which to identify high−risk patients who are likely to benefit from adjuvant radiotherapy.

![Risk of BCR among PSM Extension Groups](Image)
**Poster #77**

**BIOCHEMICAL FAILURE IN D’AMICO LOW RISK PATIENTS WITH GLEASON SUM UPGRADING FOLLOWING RADICAL PROSTATECTOMY IN A MULTI-NATIONAL, MULTI-INSTITUTIONAL DATABASE**

Danielle Brooks, Prasanna Sooriakumaran, Daniel Sagalovich, Adam Calaway, David Flomenbaum, Samarprit Rai, Shahrokh Shariat, Matthieu Durand, Abhishek Srivastava and Ashutosh Tewari

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(Presented By: Danielle Brooks)

**Objectives:** We investigated the risk of BCR in DAmico low risk patients with differing extents of upgrading as well as other clinicopathologic factors that might be independent predictors.

**Methods:** 7080 out of 22,403 men who underwent radical prostatectomy at more than 15 institutions were categorized as DAmico low risk patients. Kaplan–Meier survival analysis was performed to compare BCR rates in patients with different extents of upgrading. Cox proportional hazard analysis was done to identify independent predictors of BCR. The median follow-up period for the selected patients was 30.6 months (IQR: 14.5–51.5).

**Results:** GS upgrading to 3+4, 4+3, and ≥8 was present in 35.6%, 8.5%, and 1.6% of patients on final histopathology, respectively. 96.8% of men with no GS upgrading remained free of BCR, while the percentages of patients who remained free of BCR with GS upgrading to 3+4, 4+3, and ≥8 were 95.8%, 90.1%, and 84.4%, respectively. Cox proportional hazard regression modeling identified preoperative PSA (OR=1.18; p<0.001), upgrading to Gleason 4+3 (OR=2.21; p<0.001), upgrading to GS≥8 (OR=3.60; p<0.001), positive margins (OR=3.29; p<0.001), EPE (OR=1.61; p=0.004), and SVI (OR=3.17; p=0.001) as significant independent predictors of BCR.

**Conclusions:** Patients classified as DAmico low-risk upgraded to GS≥8 and 4+3 are at increased risk of BCR. Patients upgraded to 3+4 are not at higher risk of BCR. Preop PSA, positive margins, ECE, and SVI are also important independent predictors of BCR in this cohort.

**Poster #78**

**IMPACT OF STATIN THERAPY ON PSA KINETICS DURING ACTIVE SURVEILLANCE OF PROSTATE CANCER**

William Rogers, Daniel Rothschild, Jason Bylund, Ramakrishna Venkatesh, John Demos, Stephen Strup, David Preston and Paul Crispen

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(Presented By: William Rogers)

**Introduction and Objectives:** Statin therapy has been associated with decreased serum PSA levels in men undergoing prostate cancer screening, lower rate of adverse pathologic features in radical prostatectomy specimens and decreased risk of biochemical recurrence following prostatectomy. Here we evaluate the impact of statin therapy on PSA kinetics during active surveillance of prostate cancer.

**Methods:** A retrospective review of patients diagnosed with prostate cancer at our institution between the years 2000 and 2009 was performed. Patients undergoing at least 12 months of active surveillance were identified. PSA velocity and percentage change in PSA per year were compared between patients receiving and not receiving statin therapy during active surveillance. Subgroup analysis was performed on low risk patients (prebiopsy PSA 10 or less, Gleason score 6 or less, cT2 or less).

**Results Obtained:** We identified 81 patients meeting our inclusion criteria, 43% (35/81) were on statin therapy during active surveillance. Prebiopsy PSA was significantly lower in patients receiving statin therapy (6.0 ng/ml) compared to controls (8.3 ng/ml), p = 0.005. There was no difference in duration of active surveillance, PSA velocity, and percentage change in PSA per year based on statin use in all patients. When evaluating the 41 low risk patients, 54% (22/41) were on statin therapy. Duration of active surveillance was similar between low risk patients receiving statin therapy (35 months) and controls (41 months), p=0.13. Prebiopsy PSA was lower in low risk patients receiving statin therapy (4.9 ng/ml) compared to controls (6.4 ng/ml), p=0.055. PSA velocity was significantly lower in low risk patients (0.02 ng/ml/year) compared to low risk controls (0.89 ng/ml/year), p=0.024. Percentage change in PSA per year was significantly lower in low risk patients receiving statin therapy (−1.7%/year) compared to low risk controls (11.6%/year), p=0.05. The percentage of low risk patients receiving definitive therapy following a period of active surveillance on statin therapy was 9% (2/22) compared to 26% (5/19) in controls, p = 0.14.

**Conclusions:** PSA kinetics during active surveillance appear to be significantly altered by statin therapy in low risk patients. Further evaluation of the impact of statin therapy on PSA kinetics and clinical outcomes of men undergoing active surveillance for prostate cancer are warranted.
Poster #79

CREATION OF A COMPREHENSIVE OUTCOMES ANALYSIS UNIT AND BIOSPECIMENS REPOSITORY FOR ROBOT-ASSISTED RADICAL PROSTATECTOMY
Rafael Nunez-Nateras, Mark Todd and Erik Castle
Mayo Clinic
(Presented By: Rafael Nunez-Nateras)

Purpose: To present our experience with an IRB approved research effort dedicated to outcomes analysis and the development of a biospecimens repository for prostate cancer. Both initiatives are intimately linked and establish a foundation for further research in patients undergoing robot-assisted radical prostatectomy (RARP).

Materials and Methods: One full time coordinator for biospecimen collection and one part time coordinator for outcomes analysis have been designated to this project. RARP patients are invited to participate. Patient consent is obtained during the pre-op visit or mailed to patients not captured pre-operatively. A series of workflow steps are performed to ensure samples and QOL data are collected at established time points:
1. Preoperatively: blood (plasma, buffy coat, and serum) and urine,
2. Time of surgery: Pathology obtains a prostate tissue sample from gross tumor or based on the location from the preoperative biopsy. The sample is frozen for storage along with unique coding linking to the clinical database. A mirror image of this tissue is processed with the routine pathology exam to confirm the presence of malignancy.
3. Postoperatively: Same as pre-op at 3, 6, 12, 18, 24, 36, 48 and 60 months. Surveys (EPIC, SHIM and AUA-SS) are sent by mail at the following time points:
   Pre-op, 6 weeks, 3, 6, & 9 months, 1, 1½, and 2 years postoperatively. Clinical variables extracted from the electronic medical record are also captured.

Results: The program has been in practice for 12 months. During this time, obstacles have been identified and addressed, leading to 225 patients (60% of patients undergoing RARP for 1 year) currently contributing to the biospecimen repository. Samples stored yielded a 74% rate of cancer in the specimen. Regarding the outcome analysis, surveys have been sent to 382 patients with a response rate of 65%.

Conclusion: A comprehensive biorepository and quality of life collection can be challenging but feasible. This requires coordination between the departments of urology, pathology, laboratory services, and data coordinators to be accomplished efficiently and effectively. Identifying pitfalls and obstacles can help further future efforts in our institution as well as others across the country.

Poster #80

CERTIFICATE OF NEED PROGRAMS AND IMRT UTILIZATION FOR PROSTATE CANCER: AN EFFECTIVE CONTROL?
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(Presented By: Abhinav Khanna)

Introduction and Objectives: Certificate of Need (CON) designation, which requires state approval before the purchase of medical equipment or the establishment of health facilities, purportedly controls IMRT utilization and costs. We compared IMRT utilization and prostate cancer cost in regions with and without active CON programs.

Methods: Surveillance Epidemiology and End Results (SEER)-Medicare linked data was used to identify men diagnosed with prostate cancer during 2002 through 2007. SEER registries were designated CON Yes versus CON No based on whether the state in which they are located required CON for IMRT during the study period. IMRT utilization was assessed relative to all radiation and surgical therapies for prostate cancer. A Mantel-Haenszel test was performed to compare IMRT utilization in CON Yes vs. CON No regions. Wilcoxon rank-sum test compared median cost of prostate cancer therapy in the year following diagnosis.
**Results:** 45,636 men with a prostate cancer diagnosis were identified, including 16,840 men in 6 CON No regions and 28,796 patients in 10 CON Yes regions. Utilization of IMRT increased in all regions during the study period. There was a 73.1% (95% CI: 69.3%, 77.1%) increase in the odds of IMRT usage increasing per year in CON Yes regions, as compared with a 53.9% (95% CI: 49.3%, 58.7%) increase in the odds of IMRT usage increasing per year in CON No regions. Conversely, use of surgery decreased, with no difference in the odds of surgery utilization declining per year between CON Yes (8%; CI 6%, 10%) and CON No (9%; CI 7%, 12%) groups. CON designation was not associated with variation in greater prostate cancer costs over time.

**Conclusions:** Greater IMRT utilization was observed in CON Yes vs. No regions, and CON designation did not attenuate prostate cancer costs. Our findings suggest that alternative mechanisms may be necessary to check the rapid adoption of costly technology with limited comparative effectiveness outcomes.

**Poster #81**

**IDENTIFICATION OF PROSTATE CANCER-EXPRESSED MICRORNAS ASSOCIATED WITH CLINICAL RECURRENCE AND PROSTATE CANCER SPECIFIC SURVIVAL FOLLOWING RADICAL PROSTATECTOMY**

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(Presented By: Eric Klein)

**Background:** We have previously reported the identification of messenger RNAs (mRNAs) whose expression in prostate cancer can distinguish between aggressive and indolent disease. Representing multiple key genomic pathways, these mRNAs are significantly associated with clinical recurrence (cR) after radical prostatectomy (RP) as well as prostate cancer–specific survival (PCSS), providing prognostic information beyond PSA, cT stage and Gleason Score (Klein SUO 2010; Klein ASCO GU 2011 #39). We evaluated expression of microRNAs in the same specimens for association with cR and PCSS.

**Methods:** As previously described, all pts with cT1/cT2 prostate cancer treated with RP at Cleveland Clinic from 1987–2004 were identified(n=2,600), of which 127 patients with cR and 374 pts without cR after RP were randomly selected using cohort sampling. RNA was purified from 2 macrodissected, fixed paraffin–embedded (FPE) tumor specimens per pt. Expression of 76 test and 5 reference miRs was quantified with Taqman® RT–PCR assays. Cox regression and control of the false discovery rate (FDR) was used to assess reference–normalized microRNA and mRNA expression for association with cR and PCSS.
Results: 106 pts with cR and 310 without cR had sufficient RNA and successful assays for microRNAs. Analysis of primary Gleason pattern tumor tissue for each pt identified 21 microRNAs associated with cR and 13 microRNAs associated with PCSS, with FDR at 10%; 8 microRNAs were associated with both endpoints. Similar analysis of highest Gleason pattern tumor tissue for each pt identified 22 microRNAs associated with cR and 7 microRNAs associated with PCSS, with FDR at 10%; 4 were associated with both endpoints. miR−1, miR−21, miR−93, and miR−106b were associated with both cR and PCSS in the primary and highest Gleason pattern specimens. The 76 microRNAs in this study tended to have lower standardized hazard ratios and weaker association with cR and PCSS than the 732 mRNAs. In multivariable analyses, mRNAs and microRNAs provided prognostic information beyond baseline PSA, clinical T−stage, and biopsy Gleason score. MicroRNAs co−express more frequently with each other than with mRNAs, which may indicate distinct biological regulation.

Conclusions: Expression of some microRNAs assayed in FPE prostate tumor tissue was associated with cR and PCSS after RP in this study, and may retain prognostic value in the face of tumor heterogeneity.

Poster #82

BLOCKADE OF TGF-BETA ENHANCES CYTOTOXICITY OF GENETICALLY MODIFIED HUMAN T CELLS TARGETED AGAINST PROSTATE SPECIFIC MEMBRANE ANTIGEN

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(Presented By: Stephen Poon)

Introduction: Phase I clinical trials utilizing genetically modified T cells for the treatment of metastatic prostate cancer (PCa) are currently underway. We have created a 2nd generation chimeric antigen receptor (CAR) P28z against prostate specific membrane antigen (PSMA). Thus, P28z CAR+ T cells receive an activating CD3 zeta chain signal and CD28 costimulatory signal when PSMA expressing tumors are encountered. However, tumors have adopted a number of mechanisms to evade the host immune response. PCa is known to secrete high levels of TGFBeta that has a direct immunosuppressive effect. We hypothesized that blocking TGFBeta signaling would enhance T cell function.

Methods: We created three gamma retroviral bicistronic vectors expressing the P28z CAR and 1) a dominant negative mutant (DNR) with a truncated version of the TGFBeta Receptor II (TBR2), 2) a soluble TBR2 (sTBR2) or 3) a neutral protein (LNGFR) as a control [see figure]. Human T cells from healthy donors were transduced with virus and cultured with or without the presence of TGFBeta. These three groups were compared. Cytotoxicity was assayed by a chromium release assay. In vitro proliferation and cytokine expression were tested by weekly stimulation of CAR+ T cells on LNCaP PCa cells. A systemic xenograft PCa model was established by injecting TGFBeta secreting PSMA+ PC3 PCa cells into immunodeficient (NSG) mice. Engineered T cells were given intravenously. In vivo anti−tumor activity was determined by bioluminescent imaging to assess tumor burden and animal survival.

Results: Transduced T cells with the DNR and sTBR2 were more resistant to TGFBeta than T cells with LNGFR. DNR+ and sTBR2+ T cells exhibited increased cytotoxicity against PSMA+ EL4 target cells and increased secretion of effector cytokines (IL2, GM−CSF, and IFNy) after stimulation. Elevated levels of TGFBeta were detected in the serum of NSG mice with PC3 metastases, and transduced T cells were effective in eradicating these PCa tumors.

Conclusions: TGFBeta signaling blockade can successfully be incorporated into viral vectors via the DNR or sTBR. These modifications enhance the function of P28z CAR+ T cells against PCa tumors.

Funding: T32 CA082088−11 (SP); P01 CA059350−17 (MS)
MULTIPARAMETRIC MAGNETIC RESONANCE IMAGING DETECTS PROSTATE CANCER IN PATIENTS WITH PRIOR NEGATIVE TRUS BIOPSIES

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¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Philips Research North America, Briarcliff Manor, NY; ³Department of Interventional Oncology, National Institutes of Health, Bethesda, MD; ⁴Laboratory of Pathology, National Institutes of Health, Bethesda, MD; ⁵Molecular Imaging Program, National Institutes of Health, Bethesda, MD

(Presented By: Nitin Yerram)

Introduction: Patients with multiple negative trans−rectal ultrasound (TRUS) biopsies, a rising prostate specific antigen (PSA) and high clinical suspicion for prostate cancer create a diagnostic dilemma. The ability of multiparametric (mp) MRI to detect distinct lesions within the prostate and its increased sensitivity as compared with TRUS biopsy alone, may make MR/US guided biopsy an effective tool in this select group of patients.

Methods: A retrospective review was performed on all patients undergoing MR/US fusion biopsy from March 2007 to July 2011. All patients had one or more previous negative biopsies at an outside institution. Patients underwent 3 Tesla mpMRI of the prostate with endorectal coil, consisting of T2, dynamic contrast enhanced, diffusion weighted and spectroscopy images. All prostate MRI lesions were graded by number of positive parameters into low, moderate, and high risk for prostate cancer. Patients had both a 12 core TRUS biopsy and targeted MRI tracked biopsies of any concerning lesions. Patients with all negative previous biopsies followed by a positive biopsy at the NIH were selected and analyzed.

Results: Of 119 patients with previous negative biopsies, 47 (39%) had positive initial biopsies on our current MR fusion protocol. Of these 47, 11 (23%) were positive on random US biopsy only, 21 (45%) were positive on MR targeted biopsy and TRUS biopsy, and 15 (32%) were positive on MR targeted biopsy only. Of the 15 patients positive on MR targeted biopsy only, 6 (40%) were primary Gleason 4 or higher. Mean age at biopsy was 62.2 years (range 40–80), mean number of previous biopsy sessions in these patients was 2.5 (range 1–9), mean PSA was 20.84 ng/ml (range 2.57–64.1), and mean prostate volume was 50cc (range 26–124).

Of the 36 patients identified by MR targeted biopsy, there were 66 lesions positive for prostate cancer after biopsy. Upon review by an experienced GU pathologist, 25 of these lesions were characterized as high risk prostate cancer (Gleason primary 4) and 41 were lower risk prostate cancer (Gleason primary 3).

Conclusions: Multiparametric MRI, in conjunction with a MR/US fusion biopsy platform, is a novel diagnostic tool for detecting prostate cancer in patients with previously negative TRUS biopsies in the face of a persistent clinical suspicion for cancer. Furthermore, a sizeable percentage of these patients harbor aggressive disease which otherwise may go undetected, without the addition of fusion biopsy.
ROLE OF ENDORECTAL MRI FUSION PROSTATE BIOPSY IN TREATMENT OF LOCALIZED PROSTATE CANCER BEFORE AND AFTER HIGH-INTENSITY FOCUSED ULTRASOUND (HIFU) THERAPY

Anup Vora¹, Heinric Williams², Douglass Chinn³, Baris Turkbey², Peter Choyke², Sam Khadoury⁴, Jochen Kreuker¹, Bradford Wood², Gennady Bratslavsky² and Peter Pinto²

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(Presented By: Anup Vora)

Introduction: Transrectal high−intensity focused ultrasound (HIFU) is becoming increasingly utilized despite its lack of availability in the USA. As treatment guidelines are not established, we report our experience with multiparametric MRI (mpMRI) and image guided fusion biopsy technology in the perioperative detection of occult malignancy in patients undergoing HIFU.

Materials & Methods: Eleven patients were referred to the NIH for 3T−endorectal coil mpMRI, with areas suspicious for malignancy sampled via a MRI/TRUS fusion biopsy platform. Three patients were being considered for primary HIFU treatment (median PSA 4.97, Gleason 6) and eight patients were post HIFU ablation (median time 41 months) with a rising serum PSA (median 4.3) and prior negative TRUS biopsies.

Results: Of the three patients undergoing preablative evaluation, our standard TRUS biopsy revealed similar patterns of prostate cancer as their outside institution. However, in two of these patients (67%), MRI targeted fusion−biopsy of suspicious lesions identified new areas of Gleason 6 disease. Of the eight patients who presented with biochemical recurrence post−HIFU, four patients (50%) had residual malignancy detected on the MRI targeted biopsy and not on the standard TRUS.

Conclusions: In this series, our mpMRI and image−fusion biopsy platform was able to identify occult malignancy in patients who have had biochemical recurrence after HIFU. New areas of malignancy were also identified in pre−HIFU planning when compared to standard−TRUS. MR imaging may be useful in delineating the burden of disease in patients being selected for HIFU as primary therapy or in managing patients with post HIFU ablation failure.

Poster #85

SMALLER PROSTATE SIZE IS INDEPENDENTLY ASSOCIATED WITH BIOCHEMICAL RECURRENCE IN GLEASON 7 PROSTATE CANCER

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(Submitted By: Boris Gershman)

Introduction and Objectives: Prostate size is associated with a number of negative prognostic indicators. We evaluated the effect of prostate size on biochemical recurrence following radical prostatectomy.

Methods: We conducted a retrospective review of patients with Gleason 6−10 prostate cancer who underwent radical retropubic prostatectomy at the Massachusetts General Hospital from 1993 – 1999. Patients were excluded if they received neoadjuvant therapy, had less than 8 weeks of follow−up, or PSA did not fall below 0.2 ng/ml post−operatively. Biochemical recurrence was defined as a PSA rise to 0.2 ng/ml or greater with a confirmatory value if available. Cox proportional hazards models were used to evaluate for association between variables and biochemical recurrence.
**Results Obtained:** A total of 877 patients underwent surgery with a mean follow-up of 7.5 ± 4.5 years (range 0.2 – 16.3). Mean age, PSA, and prostate weight were 61.0 ± 6.9 years, 7.3 ± 5.5 ng/ml, and 46.7 ± 19.1 grams, respectively. Gleason score was distributed as follows: 6 in 422 patients (48.1%), 7 in 372 patients (42.4%), and 8–10 in 83 patients (9.5%). Using univariate Cox proportional hazards models, older age, higher PSA, higher Gleason score, presence of pT3 or pT4 disease, positive margins, and smaller prostate weight were associated with biochemical recurrence (p < 0.05 for each). After stepwise addition of each variable in a multivariate Cox model, prostate weight lost significance only when Gleason score was included in the model. To assess for effect modification, multivariate Cox models were stratified by Gleason score (Table 1). In this analysis, prostate weight was associated with biochemical recurrence only for Gleason 7 disease, but margin status was associated with recurrence for Gleason 6 disease.

**Conclusions:** Smaller prostate size is independently associated with biochemical recurrence for Gleason 7 disease while a positive surgical margin is associated with biochemical recurrence for Gleason 6 disease. These results have implications in the management of patients with small prostate glands.

**Table 1:** Multivariate Cox proportional hazards model stratified by Gleason score. HR represents unit odds ratio for continuous variables. n represents number of events / total number of patients in Gleason category.

<table>
<thead>
<tr>
<th></th>
<th>Gleason 6 (n=40/368)</th>
<th>Gleason 7 (n=123/315)</th>
<th>Gleason 8-10 (n=45/68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>1.01 (p=0.657)</td>
<td>1.02 (p=0.091)</td>
<td>0.993 (p=0.778)</td>
</tr>
<tr>
<td>PSA (ng/mL)</td>
<td>1.04 (p=0.312)</td>
<td>1.05 (&lt;0.001)</td>
<td>1.02 (p=0.485)</td>
</tr>
<tr>
<td>Prostate weight (grams)</td>
<td>0.985 (p=0.147)</td>
<td>0.986 (p=0.023)</td>
<td>1.01 (p=0.355)</td>
</tr>
<tr>
<td>pT3+ vs pT2</td>
<td>0.675 (p=0.410)</td>
<td>1.42 (p=0.076)</td>
<td>1.39 (p=0.302)</td>
</tr>
<tr>
<td>Positive Margin</td>
<td>3.08 (&lt;0.001)</td>
<td>1.43 (p=0.054)</td>
<td>0.779 (p=0.406)</td>
</tr>
</tbody>
</table>

**Poster #86**

**COMPARATIVE OUTCOME ANALYSIS OF OPEN VERSUS LAPAROSCOPIC VERSUS ROBOTIC-ASSISTED RADICAL PROSTATECTOMY MATCHED BY D'AMICO RISK CATEGORY IN A LARGE, MULTINATIONAL, MULTI-INSTITUTIONAL DATABASE**

Prasanna Sooriakumaran, Abhishek Srivastava, Matthieu Durand, Danielle Brooks, Daniel Sagalovich, Adam Calaway, Samarpit Rai, Shahrrokh Shariat and Ashutosh Tewari

Weill Cornell Medical College, Department of Urology, New York, NY

(Presented By: Prasanna Sooriakumaran)

**Introduction and Objectives:** We report a comparison of the biochemical recurrence rates (BCR) of ORP, LRP, and RARP in a large multinational, multi-institutional series.

**Methods:** 22,403 patients with prostate cancer underwent RP from January 2000 onwards by 40 surgeons at 15 institutions. 10,092 patients underwent ORP with a median follow up of 32.2 months; 7873 patients underwent LRP with a median follow up of 32.3 months; 4438 patients underwent RARP with a median follow up of 22.3 months. BCR was stratified by D’Amico risk. Cox regression was used to identify independent predictors of BCR.
Results: 7543 patients were D’Amico low risk, 7387 patients were intermediate risk, and 2969 patients were high risk. The percentage of patients that remained free of BCR was 95.4% ORP, 93.0% LRP, and 97.8% RARP for low risk; 80.1% ORP, 82.1% LRP, and 94.2% RARP for intermediate risk; and 57.3% ORP, 68.0% LRP, and 86.4% RARP for high risk. Cox regression analysis identified preop PSA, RP Gleason 7, RP Gleason ≥ 8, positive margins, ECE, and SVI as independent predictors of BCR for all risk categories. LRP was also identified as an independent predictor of BCR for D’Amico low risk, and RARP was identified as a negative predictor for D’Amico intermediate (OR=0.64) and high (OR=0.68) risk groups.

Conclusions: RARP appears to be at least non–inferior to ORP and LRP in terms of short to medium term BCR rate, regardless of D’Amico risk categorization.

Poster #87

CD117 EXPRESSION IN CIRCULATING CELLS AS POTENTIAL PREDICTOR OF ADVANCED PROSTATE CANCER
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(Presented By: Bethany Kerr)

Introduction: Recent evidence suggests that cancer stem cells (CSCs) may be responsible for the initiation, maintenance, and relapse of tumors. We investigated the presence/concentration of two CSC markers, CD117+ and CD133+, and their potential prognostic capability in the blood of patients undergoing surgical treatment for localized prostate cancer.

Methods: Whole blood samples were collected immediately pre–operatively, at 1 and 12 weeks post–operatively from 115 consecutive prostate cancer patients undergoing surgery between 2008 and 2011. The lymphocyte layer was isolated for evaluation by flow–cytometry. Immunohistochemical staining for the two markers was performed on final pathological specimens. We evaluated the correlation between the blood concentrations of CD117 and CD133 markers in the pre– and post–operative period with the stage of disease, Gleason score, PSA, and disease recurrence/progression.

Results: The median patient follow–up was 11 months (range, 2–30). Prostate cancer recurrence was observed in 11 (10%) patients. Only circulating CD117 marker, and not CD133, was increased in patients with higher stage cancers pT3 (3.6%±0.4) in comparison to lower stage pT2 disease (2.6%±0.2). The decline in circulating marker levels after tumor removal was only observed with the CD117 marker, and only in patients with higher stage pT3 disease (T2: 2.3%±0.2 vs T3: 1.8%±0.2). CD117 expression did not decrease at 3 months post–operatively in patients with subsequent biochemical recurrence in comparison to patients without evidence of disease. Immunohistochemical staining showed that both CD133 and CD117 were significantly increased in high grade tumors in comparison to benign tissues (3.9 and 3.5 fold, respectively).

Conclusion: CD117 expression in circulating cells may be predictive of high grade, clinically significant prostate cancers. It may play an important role in identifying patients likely to have future recurrence and metastatic disease.

Poster #88

ULTRA HIGH-RESOLUTION TRANSRECTAL ULTRASOUND: A NOVEL TECHNIQUE FOR ENHANCED PROSTATE CANCER IMAGING
Jeffrey Mullins, Toby Cornish, Adam Reese, Joel Fradin, Lynda Mettee, Frederic Askin, Angelo DeMarzo, Jonathan Epstein and Christian Pavlovich
Johns Hopkins Medical Institutions, Brady Urological Institute, Baltimore, MD
(Presented By: Jeffrey Mullins)

Introduction and Objectives: Prostate cancer is the only solid malignancy for which no reliable imaging modality exists. Ultra high–resolution transrectal ultrasound (UHR–TRUS) provides enhanced image definition by utilizing a unique transducer with a center frequency of 21 MHz. We report the initial experience with UHR–TRUS in the detection of human prostate cancer.
**Methods:** 25 men with prostate cancer scheduled for radical prostatectomy (RP) are being prospectively recruited into a clinical trial comparing ultra high-resolution and low-resolution TRUS. Patients with glands <60gm are imaged transrectally using both modalities in an attempt to identify foci of altered echogenicity ≥ 5mm in maximum diameter in each sextant area of the prostate. Actual areas of prostate cancer > 5mm in maximal diameter at sagittally-sectioned RP specimen are correlated to abnormal foci previously noted on sagittal LR− and UHR−TRUS cine−loops. Complications, adverse events, and pain scores using LR−TRUS or UHR−TRUS are recorded. Sensitivity and specificity analysis are performed for each imaging modality. Ultrasound equipment was provided by Imagistx Inc.

**Results Obtained:** 20 men have been enrolled to date. There have been no complications or adverse events. Pain scores using the LR− and UHR−probes were not significantly different. Imaging and RP pathologic data analysis has been completed for 15 patients. Among the 42 pathologically identified cancerous foci, LR−TRUS identified 16 and missed 26. HR−TRUS identified 28 and missed 14. Sensitivity was 38.1% for LR−TRUS and 66.7% for UHR−TRUS. Specificity was 54.2% for LR−TRUS and 72.9% for UHR−TRUS. Agreements between LR−TRUS vs. pathology and UHR−TRUS vs. pathology were compared using McNemar’s test; UHR−TRUS was significantly superior to LR−TRUS (p = 0.034) for cancer detection.

**Conclusions:** UHR−TRUS appears to be a safe and promising imaging modality for prostate cancer detection. Our initial experience suggests superiority to LR−TRUS in the detection of cancerous foci. Completion of our pilot study is likely to support larger scale clinical trials of this novel ultrasound technology.

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**Poster #89**

**THE QUALITY OF PROSTATE CRYOTHERAPY INFORMATION ON THE INTERNET**

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(Presented By: Raj Kurpad)

**Introduction and Objectives:** It is becoming more common for patients to refer to the Internet to supplement information from their physicians concerning their healthcare. In fact, it has been estimated that over 80% patients utilize the Internet as a primary source of oncology−related information. We sought to evaluate current information on the Internet that relates to cryotherapy for prostate cancer.

**Methods:** Two top search engines, Google and Yahoo, were used to search the term “cryotherapy for prostate cancer” and obtain the top 50 websites for each. The provider sites were analyzed with regard to presence and accuracy of evidence−based (EB) information on three outcome measures; procedural efficacy, functional outcomes and side effects from cryotherapy for prostate cancer. (The AUA Best Practice Statement (2008), Cochrane Database Systematic Review (2007), along with peer−reviewed literature was used as the primary reference to evaluate the information from these sites.)

**Results:** Of the 100 websites, 43 were from private provider sites, 17 from academic institutions, 19 news articles, 18 links to published manuscripts, 2 programs and 1 support group. Analysis of the 60 provider sites showed that 57% posted EB information concerning efficacy of cryotherapy, 30% had non−EB information, 5% had both, and 8% had no information at all. With regard to functional outcomes, 44% had EB information, 43% had non−EB information, 3% had both, and 10% had no information. With regard to side effects from cryotherapy, 43% had EB information, 40% had non−EB information, 5% had both, and 12% had no information. No website listed the AUA guidelines as a primary reference to evaluate the information from these sites.

**Conclusions:** These findings suggest that physicians/providers, both private and academic, are responsible for a majority of the information online about cryotherapy for prostate cancer, but do not always present evidence−based literature. Non−EB information is provided almost as often as EB information with regard to oncologic and functional outcomes. This highlights the importance for providers to offer factual and evidence−based information to the public and avoid unproven claims.
**Poster #90**

**A LOWER PSA AT THE TIME OF TREATMENT WITH SALVAGE CRYOABLATION OF THE PROSTATE RESULTS IN IMPROVED FREEDOM FROM BIOCHEMICAL FAILURE**

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(Presented By: Brooke Edwards)

**Introduction:** Curative treatment options for recurrent prostate cancer (PCA) after radiation therapy (RT) include salvage prostatectomy and salvage cryoablation of the prostate (SCAP). SCAP has previously been reported to be generally well tolerated with disease free survival rates similar to salvage prostatectomy.

**Objectives:** We sought to evaluate the effect of stratifying by preoperative PSA values on freedom from biochemical failure with SCAP using the Cryo On Line Database (COLD) registry.

**Methods:** Using the COLD registry, we retrospectively reviewed 604 patients who underwent SCAP for recurrent PCA after RT. We stratified patients by preoperative PSA in the following groups: PSA < 5 (266 patients), PSA 5–10 (192 patients), and PSA >10 (146 patients). The groups were compared for biochemical failure rates defined as by the Phoenix criteria using PSA nadir + 2, as well as by functional outcomes.

**Results:** The groups, though not a matched cohort being a registry, were surprising evenly matched by age (mean 70), Gleason score, and stage. The freedom from biochemical failure by the Phoenix criteria at the 4 year mark for PSA < 5, PSA 5–10, and PSA > 10 was 62.3%, 50.3%, and 39.8% respectively. The comparison of function outcomes was similar in pad use (defined as any) of 12%, 10%, and 14%; postoperative urinary retention of 13%, 11.5%, and 10%; and fistula rate of 1.1%, 2.6%, and 0.7% respectively. The ability to have intercourse in those with preoperative potency (only 61 patients in total cohort) was 35%, 59%, and 28% respectively. Overall 75 of the 604 patients have had a follow up prostate biopsy with the positive biopsy rate being 20%, 30%, and 24% for the groups respectively.

**Conclusions:** Salvage cryoablation of the prostate offers a reasonable freedom from biochemical failure with good functional outcomes. Stratifying patients by PSA < 5, PSA 5–10, and PSA > 10 does provide improved freedom from biochemical failure in the patients with lower PSA’s with no apparent effect on functional outcomes. Therefore earlier detection and treatment of recurrent prostate cancer after radiation therapy is warranted in patients deemed candidates for curative intent.

The COLD registry is sponsored by an unrestricted research grant from Endocare/HealthTronics. Data are held and analyzed by Watermark, an independent research company under the direction of an independent physician board.

**Poster #91**

**LOCAL FAILURE AFTER WHOLE- GLAND SALVAGE THERAPY WITH SONABLATE HIGH INTENSITY FOCUSED ULTRASOUND IN RADIO-RECURRENT PROSTATE CANCER**

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(Presented By: Ana Maria Autran-Gomez)

**Introduction and Objective:** An estimated 20–30% of patients with localized (PCa), presented fail after radiation therapy (RT) where the patients with local recurrence may benefit from a local salvage therapy. Salvage HIFU therapy, has emerged as a new alternative. The aim was to determine the ability of HIFU as a salvage therapy in local radio-recurrent prostate cancer (PCa) following external beam radiotherapy (EBRT) or Brachytherapy (BT) and to analyses the effects adverse following the therapy in terms of morbidity and QoL on short-term.

**Material and Methods:** From 2006 to 2010. 55 patients with biopsy proven recurrent PCa after EBRT or BT, clinical stage T1–T3, PSA level ≤10ng/ml, pre Gleason score ≤8, and no distant metastasis, were subjected to salvage HIFU using Sonablate®500. PSA and IPSS, IIEF–5, QoL and Adverse events (CTCAE) questionnaires were assessed at 45, 90, 180 days and 12 months. Follow–up biopsy was done at 180 days after HIFU.
Results: 47 pts (85%) had EBRT and 8(15%)BT. Age 69 (57–79)yr. Prostate volumen 21(13–56)cc, PSA 3.61 (0.10–10.80). Mean follow–up was 25 (5–56) months 14(25%) pts presented local relapse at 180 days. Post–salvage PSA nadir 0.19(0.02–3.30) ng/ml. The Erectile Dysfunction increased after salvage HIFU therapy, from 42% pretreatment to 65% at 1 year (p=0.005). Prostate volume (p=0.010), IPSS (p=0.002), showed statistical difference at 12 months compared with the basal values. No statistically differences were observed (p=0.064) in the QoL evaluation in pre–HIFU and post therapy at 1 year. Rectourethral fistula occurred in 2(3%) pts, moderate stress urinary incontinence in 2(3%), and 25 pts (45%) presented any AEs . Clinical stage for T3vsT1 ( OR: 0.09; p=0.017) and Gleason score 6vs7(OR: 4.64; p=0.028) were associated with increased risk of AES. There was no difference in complications between EBRT and BT pts.

Conclusions: Our preliminary results using HIFU salvage showed a low rate of complications with acceptable oncologic results at short–term, being comparable to the reported literature. HIFU is a viable salvage treatment option. A prospective FDA–sponsored multicenter controlled trial is underway to confirm its utility.

Poster #92

SALVAGE ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY: A SINGLE INSTITUTION FIVE-YEAR EXPERIENCE
Samuel D. Kaffenberger¹, Kirk A. Keegan¹, Todd M. Morgan¹, Dominic H. Tang¹, Neil K. Bansal², Daniel A. Barocas¹, David F. Penson¹, Rodney Davis¹, Peter E. Clark¹, Sam S. Chang¹, Michael S. Cookson¹, S. Duke Herrell¹ and Joseph A. Smith¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University School of Medicine, Nashville, TN
(Presented By: Samuel D. Kaffenberger)

Introduction: Salvage robotic–assisted laparoscopic prostatectomy (sRALP) is a feasible treatment option for certain patients with recurrent prostate cancer (CaP) after primary therapy; however, its use remains controversial. Data regarding patient selection, complication rates, and cancer outcomes are scarce. Here, we report our initial 5–year experience with sRALP.

Methods: We evaluated 33 consecutive patients who underwent sRALP from 2006 to 2011. Patients who underwent brachytherapy (n=14), external beam radiation therapy (XRT) (n=10), combined brachytherapy/XRT (n=5), and high–intensify focused ultrasound (n=4) for localized CaP were included. All patients had biopsy–proven recurrent CaP and no evidence of nodal or metastatic disease. The primary oncologic outcome was lack of PSA nadir <0.1 ng/ml post–sRALP. Univariate logistic regression was used to test the correlation between margin status and PSA nadir.

Results: The median age of the cohort was 66.5 years (interquartile range (IQR) 57.9–67.4 years). The median time from primary therapy to sRALP was 50 months (IQR 26–61 months), and the median PSA prior to sRALP was 3.71 ng/ml (IQR 2.41–5.07 ng/ml). 13 patients had Gleason 6 (39.4%), 8 had Gleason 7 (24.2%), and 11 had >= Gleason 8 (33.4%) CaP at radiation failure biopsy. Median time of surgery was 2.93 hours (IQR 2.65–3.18 hours) and median blood loss was 150ml (IQR 100–213ml). There was 1 Clavien IIIb complication, a rectal laceration requiring repair and diversion. There was 1 Clavien II (Pulmonary Embolism) and 5 Clavien I complications: 4 anastomotic leaks and 1 bladder neck contracture. 31 of 33 patients (93.9%) were discharged on the first post–operative day. On pathologic analysis, 18 patients had stage T2 (54.5%), 14 patients had T3 (42.5%), and 1 patient had T4 (3%) disease. 3 patients had Gleason 6 (9.7%), 15 had Gleason 7 (48.4%), and 8 had >= Gleason 8 (25.8%) CaP. No patients had node positive disease. 9 of 33 patients had positive margins (27.3%), of which 3 did not achieve a PSA nadir <0.1 ng/ml (OR 5.5, 95%CI 0.74–40.8). In all, 28 of 33 patients (85%) had a post–sRALP PSA <0.1 ng/ml.

Conclusions: In our experience, sRALP is safe and is associated with low blood loss, and short length of stay. Pathologic and early oncologic outcomes are in line with open series. Although initial results are promising, further follow–up will be required to determine the oncologic efficacy of this procedure.
**Poster #93**

**WAITING TILL THEY COME TO US; THE IMPACT OF VOIDING COMPLAINTS ON CANCER DETECTION RATES IN THE INNER CITY**
Clifford Georges, Nicholas Karanikolas, Llewelyn Hyacinthe, Fernando Cabrera-Piquer and Semyon Gurgov
SUNY Downstate Department of Urology
(Presented By: Clifford Georges)

**Introduction:** We sought to determine whether African American or Caribbean American men undergoing prostate biopsy for elevated PSA in an inner city setting had higher rates and grade of prostate cancer if they had associated lower urinary tract complaints.

**Methods:** A retrospective review of 770 consecutive prostate biopsies performed at an inner city health care facility from 1/1/2005 to 8/31/2010 was performed. Patients were defined as having LUTS if they reported symptoms of frequency, intermittent stream, weak force of stream, nocturia on history or were taking alpha blocker therapy at the time of prostate biopsy.

**Results:** Of the 770 men, 598 met the inclusion criteria; 302 were biopsied for elevated PSA (Group1), 296 were biopsied for elevated PSA and associated LUTS (Group2). The average age for men in Group 1 was 64, average TRUS volume of 40.1cc and median PSA of 8.2ng/ml; Group 2 average age was 65, average TRUS of 54.1cc and median PSA 8.8ng/ml (p=.2, p=0.001, p=0.8, respectively). Of the 302 Group 1 men, 104 (34.4%) had negative prostate biopsies and 189(62.6%) had positive biopsies. Of the 296 Group 2 men, 148 (50.0%) had negative prostate biopsies and 140(47.3%) had positive biopsies (p=0.0002). The median Gleason score for both groups was 7. 31.2% of Group 1 patients had total Gleason score of 8 or more compared to 40.7% of Group 2, (p=0.1).

**Conclusion:** Prostate cancer was less readily identified in black men with LUTS and elevated PSA as compared to those with elevated PSA alone. The decreased rate of cancer detection, however, was associated with higher rates of intermediate and high-risk disease in the LUTS group. This study highlights the importance of prostate screening with PSA specifically in a high-risk, underserved inner city black population.

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<th>Gleason 6 (%)</th>
<th>Gleason 7 (%)</th>
<th>Gleason 8 (%)</th>
<th>Gleason 9 (%)</th>
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<tr>
<td>Group 1</td>
<td>40(21.1)</td>
<td>91(48.1)</td>
<td>47(24.9)</td>
<td>11(5.8)</td>
<td>1(0.5)</td>
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<td>Group 2</td>
<td>23(16.4)</td>
<td>60(42.9)</td>
<td>37(26.4)</td>
<td>18(12.9)</td>
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**Poster #94**

**COST-EFFECTIVENESS OF STANDARD VERSUS INTENSIVE ANTIBIOTIC REGIMENS FOR TRANS-RECTAL ULTRASOUND GUIDED PROSTATE BIOPSY PROPHYLAXIS**
Mehrad Adibi, Margaret Pearle and Yair Lotan
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(Presented By: Mehrad Adibi)

**Introduction:** To compare cost-effectiveness of fluoroquinolones to intensive antibiotic regimens for transrectal ultrasound guided prostate biopsy (TRUSBx) prophylaxis.

**Methods:** A literature search was performed to determine the risk of hospital admissions after TRUSBx due to infectious complications. Average costs of hospital admission due to post-biopsy infections were determined from patients admitted to our University hospital within 1 week after biopsy. The standard antibiotic prophylactic regimen was chosen as two doses of ciprofloxacin or bactrim DS in the peri-procedural period and the intensive prophylactic regimen consisted of one dose of intramuscular amikacin along with 5 days of cipro or bactrim administered in the peri-procedural period. A decision tree analysis was created to compare cost-effectiveness of standard versus intensive antibiotic prophylactic regimens based on varying risk of infection, cost, and effectiveness of the intensive antibiotic regimen.
Results: The base case included the cost of TRUS biopsy as reimbursed by Medicare 2011 rates ($559). The rate of admission was set at 1%, and the average cost of admission was $5900. The total costs for the standard and intensive antibiotic regimens were $1 and $33, respectively. Assuming a 50% risk reduction in admission with the intensive regimen, the standard antibiotic regimen was slightly more cost–effective than the intensive protocol with average cost of $619 versus $622. One way sensitivity analysis showed that a very small increase in risk of admission from quinolone–resistant infections or risk reduction of the more intensive antibiotics will result in cost–superiority of the more intensive regimen. Three way sensitivity analyses showed that as the probability of admission using the standard antibiotics increased from 1% to 5%, or the risk reduction using the intensive regimen increased from 50% to 75%, using the intensive prophylaxis became substantially more cost–effective even at higher costs.

Conclusion: As the risk of admissions from infectious complications due to TRUSBx increases, use of an intensive prophylactic antibiotic regimen becomes significantly more cost–effective than current standard antibiotic prophylaxis.

![Three-way Sensitivity Analysis evaluating the impact of varying risk reduction, cost of intensive antibiotic regimen and incidence of hospital admission]

Poster #95

**DOES INTRAOPERATIVE SHEDDING OF PROSTATE CANCER CIRCULATING TUMOR CELLS OCCUR DURING ROBOTIC PROSTATECTOMY?**

Eric Kauffman¹, Min Jung Lee², Sylvia Alarcon², Sunmin Lee², Jane Trepel² and Peter Pinto¹

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(Presented By: Eric Kauffman)

Objective: Research is being carried out to support the prognostic value of circulating tumor cells (CTC) in patients with clinically localized cancers, including prostate cancer. Few studies, however, have evaluated the effect of surgical resection and intraoperative tumor manipulation on CTC shedding. Here we explore whether CTC counts in patients with clinically localized prostate cancer are increased during robotic prostatectomy.

Methods: 8 mL blood specimens were obtained from 7 healthy donors and 12 patients with clinically localized prostate cancer undergoing robotic prostatectomy both immediately prior to and following surgery. CTC counts were determined using multiparameter flow cytometry–based detection of EPCAM(+)/PSMA(+)/CD45(−) cells which were viable as determined by Hoechst 33258 staining. CTC counts in preoperative vs postoperative blood specimens were correlated with primary tumor pathology.
Results Obtained: The average age of patients was 61 years old. No patients received an intraoperative blood transfusion. Final pathology revealed pT3 stage disease in 2 patients (1 pT3a, 1 pT3b), and the remainder were pT2. Most (83%) patients had moderate or high grade disease, including frequent perineural invasion (50%), and an average of 18% of the prostate gland was involved. The detectable CTC range for this assay performed on 7 healthy donors is from 0–8 cells. Among the prostatectomy patients, CTC numbers ranged from 0–8 cells preoperatively and 0–4 cells postoperatively (p=0.40). No correlation was observed between CTC counts and primary tumor pathology. There was no difference in mean levels prior to (1.6 +/- 2.3 cells) and after (1.5 +/- 1.3 cells) surgery.

Conclusions: We observed no significant changes in CTC counts during robotic prostatectomy for localized prostate cancer. Further all CTC counts in the pre and post prostatectomy blood draws were within the normal healthy donor range. Surgery did not result in significant CTC shedding. Continued accrual in this cohort and ongoing research is being carried out.

Poster #96

RISK OF PROSTATE CANCER ON THIRD PROSTATE BIOPSY FOLLOWING DIAGNOSIS OF ATYPICAL GLANDS SUSPICIOUS FOR CARCINOMA ON REPEAT BIOPSY
Brandon Isariyawongse, Ahmed El-Shafei and J. Stephen Jones
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(Presented By: Brandon Isariyawongse)

Introduction and objectives: Atypical glands suspicious for carcinoma (ASAP) are identified in approximately 3–5% of prostate biopsy specimens. Recommendations are to repeat biopsy based on an estimated 40% risk of cancer following this diagnosis. Most studies have involved this finding on initial biopsy, so we sought to identify the risk of cancer following a diagnosis of ASAP on repeat biopsy.

Methods: We identified 96 men with a diagnosis of ASAP on repeat prostate biopsy between January 2000 and June 2010. We analyzed the patient demographics and incidence of prostate cancer, high-grade prostatic intraepithelial neoplasia (HGPIN), and ASAP in third biopsy specimens. In patients diagnosed with cancer, we examined Gleason score, number of positive cores, and the presence of inflammation.

Results obtained: Fifty-two men (54.2%) were diagnosed with cancer on third prostate biopsy following ASAP diagnosis. Gleason grades 6, 3+4=7, 4+3=7, and 8 were observed in 26, 15, 6, and 4 (50%, 28.8%, 11.5%, and 7.7%) of these men, respectively. Of the 44 biopsy-negative men, 21 (47.7%) had HGPIN and 11 (25%) had ASAP on third biopsy. Of 33 men with inflammation, 15 (45%) were thereafter diagnosed with prostate cancer, as opposed to 37 (58.9%) of 63 men without inflammation on repeat biopsy.

Conclusions: After a second biopsy demonstrates ASAP, there remains a significant risk of prostate cancer, and only a small percentage of men will exhibit no abnormal pathologic features on subsequent biopsy.

Poster #97

HISTOPATHOLOGICAL FEATURES IN LOCAL RADIO-RECURRENT PROSTATE CANCER FOLLOWING HIGH INTENSITY FOCUS ULTRASOUND AS WHOLE-GLAND SALVAGE THERAPY
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(Presented By: Ana Maria Autran-Gomez)

Introduction and Objectives: The diagnosis of local radio–recurrent prostate cancer (PCa) following radiotherapy (RT) is controversial. Post–radiation prostatic biopsies, remaining as definitive means of assessing local response after RT with inter–observer variability in the interpretation and indications. Salvage High Intensity Focused Ultrasound (HIFU) has emerged as alternative in salvage setting. We provide a detailed histopathological description of the effects of whole–gland salvage HIFU, on post–treatment biopsy specimens in patients with local radio–recurrent PCa.
Material and Methods: The histopathological review of positive prostatic biopsy in pts with biopsy−proven recurrent localized PCa who underwent whole−gland salvage HIFU therapy following external beam radiation or brachytherapy , treated at our institution between 2006 and 2010 was conducted. Follow−up biopsies were performed at 180 days post−HIFU. H&E −stained slides were examined. Immunohistochemical stains for racemase, p63 and high molecular weight cytokeratin (34BE12) were using.

Results: Of 55 pts who underwent HIFU, 49 (89%) pts following a standardized follow−up biopsy. Positive biopsies reported in 14 pts (29%) and negative in 35(71%). Median follow−up was 25 months (range 5− 56). In 14 (100%)cases benign prostate ducts and acini showed variable degrees of atrophy. The glands presented marked reactive atypia and cystic changes (71%).Squamous metaplasia was observed in 8 cases (57%). Primary and secondary Gleason grades were assigned in 10 biopsies (71%). We observed concordance of Gleason grading between the pre and post therapy in 6 (60%) cases. The mean combined Gleason score pre (7.214±1.050) and post−salvage HIFU (7.333±0.707) was not statistically significant (p=0.320). Fibrosis, edema and reactive atypia were present in 93%. Coagulative necrosis was identified in 86%. Acute and chronic inflammation associated at treatment was detected.

Conclusion: Our results showed as main findings the presence of coagulative necrosis associated at acute and chronic inflammation, as well as stromal fibrosis and edema. In our cohort, the rate of local cancer control was 70 to 75% at 25 months. The histopathological analyses of prostatic biopsies following salvage HIFU in local radio−recurrent PCa require an accurate interpretation and presents an enormous challenge to pathologists and urologists.

Poster #98

INCREASED NUMBER OF NODES REMOVED AT RETROPERITONEAL LYMPH NODE DISSECTION IMPROVES OVER−ALL- AND CANCER−SPECIFIC SURVIVAL IN PATIENTS WITH TESTICULAR CANCER
Dan Lewinshtein, Sandra Koo and Christopher Porter
Virginia Mason Medical Center, Seattle, WA
(Presented By: Dan Lewinshtein)

Background: The benefit of a thorough retroperitoneal lymph node dissection (RPLND) for testicular cancer has been well established and essentially eliminates retroperitoneal recurrence of disease. RPLND is known to be a complex, advanced procedure and the number of nodes removed may vary amongst institutions. Thus, we explored whether number of nodes removed at RPLND may predict overall− and cancer−specific survival in patients who have undergone RPLND.

Methods: We retrospectively searched the Surveillance Epidemiology and End Results (SEER) database for all patients who had undergone RPLND for primary testicular cancer between 1973 and 2006. We performed logistic regression to assess the ability of number of nodes removed at RPLND to predict overall survival and cancer specific survival. We adjusted for stage, age, and tumor histology. In addition, we used Kaplan−Meier life table analysis to evaluate actuarial survival probability as a function of removed nodes at the time of RPLND. Finally, we performed these analyses in a subgroup of patients with nonseminomatous germ cell tumor (NSGCT).

Results: The cohort consisted of 1494 patients. The median age and median number of nodes removed at RPLND were 30 years (0−87) and 14 (+/− 13.9 SD). Of all patients, 46.2%, 45.4%, and 8% were stage I, II and III, respectively. There were 1262 (84.5%) NSGCT and 178 (11.9%) seminoma diagnoses. On multivariate analysis, stage (<0.001), age (HR 0.057; p<0.001), and number of nodes removed (p<0.024)were all significant predictors of overall mortality. On Kaplan−Meier analysis, mean time to overall mortality (16.939 vs. 18.583 years, p<0.001) and cancer specific mortality (17.69 vs. 18.7 years, p<0.001) were significantly shorter for patients that had 5 or fewer nodes removed compared to those than had 6 or more removed.

Conclusions: The number of nodes removed at RPLND significantly predicted the overall− and cancer−specific survival in patients with NSGCT. Moreover, patients with fewer nodes removed at time of RPLND had significantly shorter mean actuarial overall survival and cancer specific survival. This analysis emphasizes the critical importance of a thorough RLPND on survival in patients with testicular cancer.
**Poster #99**

**A DESCRIPTIVE ANALYSIS OF SEX CORD STROMAL TUMORS USING A NATIONAL DATABASE**

Kunj Sheth, John Cashy and Shilajit Kundu  
Northwestern University Feinberg School of Medicine, Department of Urology, Chicago, IL  
(Presented By: Kunj Sheth)

**Introduction and Objectives:** Sex cord stromal tumors (SCSTs) account for 3–5% of all adult testicular tumors. However, biologic behavior of these rare tumors is not well elucidated. We report the treatment and outcomes in a large cohort of men with SCSTs.

**Methods:** The Surveillance Epidemiology and End Results (SEER) Program of the National Cancer Institute works to coordinate population–based cancer registries located across the United States starting from 1973. From the SEER database, continuous data on testicular cancer incidence, extent of disease at diagnosis, therapy, and patient survival were obtained for the years 1975 to 2008. Tumor histology was used to divide tumors into germ cell tumors (GCTs) and SCSTs. Further descriptive statistics and Kaplan–Meier survival analyses were employed for SCSTs.

**Results Obtained:** The overall incidence of malignant SCSTs was 0.45% (158) of all testicular tumors. In descending order, the histologic categorization of these tumors consisted of Leydig cell (56.3%), Sertoli cell (26.6%), sex cord–gonadal stromal tumor NOS (9.5%), Sertoli–Leydig cell tumor, poorly–differentiated (3.8%), Granulosa cell tumor (3.2%), and lastly Androblastoma (0.6%). The mean age of patients diagnosed with Leydig cell tumor (49.3 years) was significantly higher (p<0.001) than the mean age of patients diagnosed with Sertoli cell tumor (38.5 years). At the time of diagnosis 76.7% (115) of clinically staged tumors were localized and 23.3% (35) were considered to have regional or distant spread. 96.8% (153) of patients proceeded with radical orchiectomy at time of diagnosis. The majority of patients were observed. A small number of men received radiation treatment (3.3%, n=5) or RPLND (13.7%, n=21). Five−year cancer−specific survival was 68.8% in the entire cohort, with 82.8% 5−year survival for localized tumors and 30.4% 5−year survival for tumors with regional or distant spread. 5−year cancer specific survival was 68.0% for Leydig cell tumors and 72.0% for Sertoli cell tumors.

**Conclusions:** This is the largest population based analysis of SCSTs. Patient survival for SCST is significantly lower than patient survival in GCTs. Furthermore, once the tumor progresses past a localized state, the patient survival is significantly worse, underscoring the importance of early treatment.

**Funding:** none

**Poster #100**

**THE IMPACT OF SURGICAL OR SYSTEMIC THERAPY FOR TESTICULAR GERM CELL MALIGNANCY ON RENAL FUNCTION**

Nicholas Cost, Mehrad Adibi, Jessica Lubahn, Adam Romman, Ganesh Raj, Arthur Sagalowsky and Vitaly Margulis  
University of Texas Southwestern Medical Center, Dallas, Texas  
(Presented By: Nicholas Cost)

**Introduction & Objective:** Despite the good prognosis of patients with testicular germ cell tumors (T−GCTs), the therapy needed to achieve cure may induce long–term morbidity. Data from other malignancies suggests that developing chronic kidney disease (CKD) affects long–term renal, cardiovascular and survival outcomes. Thus, we assessed patients treated for T−GCT to determine the effect of therapy on the natural history of renal function.

**Methods:** We reviewed an institutional database of T−GCT patients and included those >13yrs old with available pre and post−therapy serum Creatinine (Cr). Renal function was estimated with a calculated Glomerular Filtration Rate (eGFR). Patients were classified according to the CKD staging system. We also compared those managed with surgery−only vs. those also treated with chemotherapy (CT).

**Results:** 144 patients were reviewed. T−GCT stage distribution was: I−78(54.2%), II−28(19.4%) and III−38(26.4%). The median Cr and eGFR at diagnosis were 0.9(0.5–1.5) and 104.0(58.7–235) respectively. 102(70.8%) were CKD 0–I, 41(28.5%) CKD II and 1(0.7%) CKD III. The median Cr and eGFR at last followup were 1.0(0.6–2.6) and 95.5(31.5–167.6) respectively. This difference between the pre and post−therapy eGFR was significant, p<0.01. The median change in eGFR was −2.1(−148–58).
81 (56.3%) patients received CT, median 4 cycles (1–12), and 63 (43.8%) were treated without CT, Table I. We observed that 8 (9.9%) of the CT treated patients developed new−onset CKD III, compared to none in the non−CT group, p=0.01. This increased risk with CT was related to an increasing number of CT cycles with 8.1% of those given 1−4 cycles developing CKD III vs. 15.8% of those given >4 cycles, p=0.02. Also, while there was an increase in new−onset CKD III with increasing T−GCT stage (2.6% Stage I, 3.6% Stage II and 13.2% Stage III), this was not statistically significant.

**Conclusions:** Patients with T−GCT treated with CT suffered a significant decrease in eGFR and were at a significantly increased risk of developing CKD III compared to those managed without CT. This is important as we assess for the long−term risks of T−GCT survivorship, and is useful in counseling patients on the risks of therapy.

**Table I**

<table>
<thead>
<tr>
<th>Measure of Interest</th>
<th>Chemotherapy</th>
<th>No Chemotherapy</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Cr at Diagnosis (Range)</td>
<td>0.9 (0.5–1.5)</td>
<td>1.0 (0.7–1.5)</td>
<td>0.005</td>
</tr>
<tr>
<td>Median eGFR at Diagnosis (Range)</td>
<td>100.1 (67.4–231.9)</td>
<td>97.3 (68.7–146.7)</td>
<td>0.005</td>
</tr>
<tr>
<td>CKD Stage at Diagnosis (%)</td>
<td>Stage I (GFR &gt; 60): 85 (77.8%)</td>
<td>59 (61.9%)</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Stage II (GFR 60–89): 13 (22.2%)</td>
<td>23 (36.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stage III (GFR 30–60): 0</td>
<td>1 (1.6%)</td>
<td></td>
</tr>
<tr>
<td>Median Cr at Last Follow Up (Range)</td>
<td>1.0 (0.66–2.59)</td>
<td>0.9 (0.6–1.4)</td>
<td>0.003</td>
</tr>
<tr>
<td>Median eGFR at Last Follow Up (Range)</td>
<td>91.4 (31.5–166.8)</td>
<td>102.3 (35.7–167.8)</td>
<td>0.015</td>
</tr>
<tr>
<td>Median Change in GFR (Range)</td>
<td>-16.3 (-147.7–1.0)</td>
<td>-0.47 (-213.5–58.1)</td>
<td>0.0001</td>
</tr>
<tr>
<td>CKD Stage at Last Follow Up</td>
<td>Stage I (GFR &gt; 60): 4 (4.3%)</td>
<td>46 (72.9%)</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Stage II (GFR 60–89): 25 (53.3%)</td>
<td>16 (35.4%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stage III (GFR 30–40): 1 (9.9%)</td>
<td>1 (1.6%)</td>
<td></td>
</tr>
<tr>
<td>Length of Follow Up in Mo (Range)</td>
<td>31.3 (4.2–181.9)</td>
<td>23.1 (0.1–164.7)</td>
<td>0.19</td>
</tr>
</tbody>
</table>
Poster #101

RECURRENT AND TREATMENT PATTERNS IN PATIENTS WITH NON-MUSCLE-INFRINGEMENT BLADDER CANCER
Karim Chamie¹, Mark S. Litwin¹, Jeffrey C. Bassett¹, Timothy J. Daskivich², Julie Lai², Jan M. Hanley², Badrinath R. Konety³, Christopher S. Saigal¹ and the Urologic Diseases in America Project²
¹UCLA, Los Angeles, CA; ²RAND, Santa Monica, CA; ³University of Minnesota, Minneapolis, MN
(Presented By: Karim Chamie)

Introduction and Objectives: Patients with bladder cancer are apt to develop multiple recurrences that necessitate aggressive treatment. We examined the recurrence and progression rate, and treatment patterns in a cohort of individuals with high-grade non-muscle-invasive bladder cancer.

Methods: Using linked SEER–Medicare data, we identified subjects with a diagnosis of high-grade non–muscle–invasive disease between 1992 and 2002 to determine recurrence and progression rates. We then used competing–risks regression analyses to examine the incidence of cystectomy, radiotherapy, and chemotherapy after each recurrence.

Results: Of 7,410 subjects, 4,826 (65.1%) experienced a recurrence and 1,909 (25.8%) experienced progression of disease. Of those that progressed, 588 (30.8%) underwent cystectomy, 551 (28.9%) underwent radiotherapy, 201 (10.5%) underwent systemic chemotherapy, and 569 (29.8%) died without undergoing any treatment. Increasing recurrences were associated with a higher rate of non–surgical aggressive treatment: increasing use of radiotherapy after the second (HR 1.53; 95% CI 1.21–1.93) and third recurrence (HR 1.59; 95% CI 1.24–2.03) and systemic chemotherapy after the third recurrence (HR 1.97; 95% CI 1.30–2.98). Among those subjects 66–69 years of age without any comorbid conditions treated at an NCI–designated cancer center with medical school affiliation for an undifferentiated T1 tumor that has recurred more than three times, approximately 58% do not undergo cystectomy or radiotherapy.

Conclusion: Approximately 30% of patients who progress to invasive disease do not undergo any form of treatment. Many healthy patients younger than 70 years of age do not undergo aggressive treatment, despite aggressive tumors that have recurred multiple times.

Poster #102

USING GEOGRAPHIC INFORMATION SYSTEMS TO IDENTIFY CHANGES IN BLADDER CANCER MORTALITY “HOT SPOTS” IN THE UNITED STATES
Sandip Prasad, Amit Patel, Aria Razmaria, Kyle Kiriluk, Alexandre Rosen, Todd Schuble, Chieko Maene, Brandon Pierce, Gary Steinberg and Norm Smith
University of Chicago, Chicago, IL
(Presented By: Sandip Prasad)

Introduction and objectives: Environmental factors have long been linked to carcinogenesis, progression and mortality from bladder cancer and regional variations in bladder cancer mortality have been observed for several decades. We sought to characterize geographic patterns in bladder cancer mortality in the United States by gender and race and assess for the impact of environmental exposure on the natural history of bladder cancer.

Methods: We analyzed age–adjusted county level data on bladder cancer mortality from the National Cancer Institute using a geographically–weighted regression model to identify clusters of increased bladder cancer mortality from 1950 to 2007. County–level socioeconomic, clinical and environmental data were obtained from the County Health Rankings. Hot spot analysis was calculated using the Getis–Ord Gi* statistic and spatial regression analysis was performed using Box–Cox transformation and OLS regression models with ArcGIS 10 adjusting for spatial autocorrelation.
Results obtained: The Northeast and upper Midwest had the highest number of bladder cancer mortality hot spots from 1950 to 1969, but the majority of areas in the Midwest were no longer hotspots in the latter part of the past century. (Figure) On multivariate spatial analyses of bladder cancer mortality from 1996 to 2007, mentally unhealthy days, adult smoking, motor vehicle mortality rate, college education, single parent households, premature deaths, diabetic screening and air pollution days were all associated with increased rates of bladder cancer mortality in all US or hot spot counties for white and black men (p<0.05). Model fit was significantly improved when looking at hot spots versus all US counties (R−squared= 0.66 vs. 0.09 for white men and 0.41 vs. 0.02 for black men).

Conclusions: Risk factors for bladder cancer mortality differ significantly by gender and race in different geographic locations within the United States. Models predicting bladder cancer death can be derived in hot spot counties, and these counties should be the focus of individual-level study of occupational and environmental factors.

Poster #103

THE HISTOPATHOLOGIC CHARACTERISTICS OF BLADDER CANCER AFTER PROSTATE RADIOTHERAPY
Michael Abern¹, Ann Dude² and Christopher Coogan³
¹Duke University Medical Center, Urology, Durham, NC; ²Duke University Medical Center Durham, NC; ³Rush University Medical Center Chicago, IL
(Presented By: Michael Abern)

Introduction: Radiation therapy (RT) for prostate cancer (CaP) results in an increased risk of second malignancies including bladder cancer (CaB). While published series of radical cystectomy patients after RT have shown adverse pathology and increased complication rates, it is unknown how RT affects the characteristics of secondary CaB at the time of diagnosis.

Methods: We examined 278,234 cases of mean treated for clinically localized CaP reported to The Surveillance, Epidemiology and End Results (SEER) database between 1988-2007. Men diagnosed with CaB at least 1 year after the diagnosis of CaP (n = 3,085) were stratified by CaP treatment type, and histopathologic characteristics and survival were compared.

Results Obtained: 2,143 patients had RT for CaP and 942 had radical prostatectomy alone (RP). 1,300 men had external beam radiotherapy (XBRT), 306 had brachtherapy (BT), 226 had XBRT + BT, and 302 had XBRT after RP. CaB in men who had RT were more likely non–transitional cell carcinoma (TCC) (6.4% vs. 3.8%, p = 0.004), located at the trigone (6.9% vs. 5.4%, p = 0.012), and contain carcinoma in–situ (CIS) (9.2% vs. 7.0%, p < 0.001) compared to RP. Men who had RT had decreased prostate and bladder cancer specific survival (CSS) (median 37.2 vs. 43.4 months, p < 0.001) and RT independently predicted decreased survival (HR 1.33, p = 0.026) in a multivariate Cox analysis.

Conclusions: Men with CaB after RT for clinically localized CaP have adverse histopathologic characteristics and decreased CSS compared to CaB after RP.
NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER AT THE UNIVERSITY OF SOUTHERN CALIFORNIA
Adrian Fairey, Siamak Daneshmand, Tanya Dorff, Ryan Dorin, Gary Lieskovsky, David Quinn, Anne Schuckman, Jie Cai, Gus Miranda and Eila Skinner
University of Southern California, Los Angeles, CA
(Presented By: Adrian Fairey)

Introduction and Objectives: There is a paucity of data on neoadjuvant GC (Gemcitabine, Cisplatin) chemotherapy in patients with muscle−invasive bladder cancer (MIBC). Our aim was to compare pathologic and survival outcomes of neoadjuvant GC and M−VAC (methotrexate, vinblastine, doxorubicin, cisplatin) chemotherapy in patients with MIBC.

Methods: A retrospective analysis of prospectively collected data from the University of Southern California (USC) Bladder Cancer Database was performed. Between 1985 and 2011, 116 patients received neoadjuvant chemotherapy prior to radical cystectomy and extended pelvic lymph node dissection for clinical stage T2−T4N0M0 bladder cancer. The outcomes were pathologic complete response (pT0N0), pathologic tumor downstaging (pT0N0, pTaN0, pT1N0, or pTisN0), overall survival (OS), and recurrence−free survival (RFS). The Kaplan−Meier method and Cox proportional regression models were used to analyze survival data.

Results: The median follow−up duration was 4.5 years (range, 0 to 19.8 years). Fifty−eight patients each received GC and M−VAC chemotherapy. There were no statistically significant differences between the GC and M−VAC groups with regard to pathologic complete response (27.3% versus 17.1%, p=0.419) or pathologic tumor downstaging (45.5% versus 37.1%, p=0.498). The predicted 5−year OS (29% versus 38%, Log rank p=0.634) and RFS (36% versus 35%, Log−rank p=0.891) rates did not differ between the GC and M−VAC groups. However, in a subset of 37 patients with pathologic lymph node positive disease, the predicted 1−year RFS rate differed between the GC and M−VAC groups (0% versus 32%, Log rank p=0.019). Multivariable analysis showed a trend toward an independent association between type of neoadjuvant chemotherapy and RFS (GC versus M−VAC: HR 1.64, 95% CI 0.93 to 2.89, p=0.089).

Conclusions: Pathologic complete response, pathologic tumor downstaging, and survival did not differ in patients who received neoadjuvant GC and M−VAC chemotherapy. However, GC was associated with poorer RFS in a subset of patients with pathologic lymph node positive disease. Randomized controlled trials comparing neoadjuvant chemotherapy regimens are urgently needed.

COST ANALYSIS OF ROBOTIC-ASSISTED RADICAL CYSTECTOMY VERSUS OPEN RADICAL CYSTECTOMY UTILIZING A PROSPECTIVE, RANDOMIZED COHORT
Raj Kurpad, Jed Ferguson, Ian Udell, Angela Smith, Michael Woods, Matt Raynor, Eric Wallen, Matthew Nielsen and Raj Pruthi
University of North Carolina, Chapel Hill, NC
(Presented By: Raj Kurpad)

Introduction and Objectives: Robotic−assisted radical cystectomy (RARC) holds promise to improve patient perioperative outcomes while maintaining oncologic outcomes relative to open radical cystectomy (ORC). However, the cost−benefits of the robotic approach are under debate. We evaluated the detailed cost estimates of RARC and ORC utilizing a prospectively randomized patient cohort.

Methods: Over 10 months in 2008, 41 patients meeting inclusion criteria were randomized to either ORC (n=21) or RARC (n=20). Baseline demographic data, patient comorbidities, tumor characteristics, and perioperative outcomes were assessed. Real−world direct variable costs and allocated fixed costs including OR costs and hospital costs were obtained from hospital accounting and evaluated using parametric and non−parametric statistical analyses. Point estimates for RARC−specific OR capital expenses were calculated assuming 80% robot usage and subjected to sensitivity analysis.
Results: There were no statistically significant differences between groups for median age (ORC 70 yrs vs RARC 70; p=0.6), age–adjusted Charlson comorbidity index (6.2 vs 4.9; p=0.09), or pathologic tumor stage (p=0.14). The median for overall cost was higher for RARC (see table) (p=0.14). Significant differences between the two cohorts were found for OR time (293 mins vs 389; p<0.001), and length of stay (LOS) (6.0 days vs 4.0; p=0.02) which resulted in higher OR fees and lower post–op hospital costs for the RARC group, respectively. OR capital expenses and OR disposable costs were higher for the RARC group. Median transfusion costs were lower for RARC group ($98 vs $448; p=0.002).

Conclusions: Utilizing subjects enrolled in prospective randomized trial of ORC vs. RARC, the overall costs between RARC and ORC were not statistically different. RARC requires significant capital expenditure, longer OR times, and higher OR disposable costs in relation to ORC, while RARC patients have a significant decrease in LOS and post–op hospital costs. Future studies should aim to include differential costs due to time to convalescence to complete the cost analysis from the societal perspective.

Poster #106

QUALITY OF DIAGNOSTIC CARE IN PATIENTS WITH BLADDER CANCER: A POPULATION-LEVEL ANALYSIS.

Karim Chamie¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Meryl Leventhal², Dennis Deapen² and Mark S. Litwin¹

¹UCLA, Los Angeles, CA; ²Cancer Surveillance Program, Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, CA

(Presented By: Karim Chamie)

Introduction and Objectives: The initial transurethral resection of a bladder tumor (TURBT) should eradicate all macroscopic disease, establish tumor histology, and define grade and extent of disease. Detrusor muscle at diagnostic TURBT is often used as a surrogate of resection quality. We examined the incidence and mediators of muscle presence in the initial resection specimen among subjects diagnosed with non–muscle–invasive bladder cancer.

Methods: We retrospectively reviewed the medical records of all individuals with non–muscle–invasive bladder cancer between 2004 and 2005 within the confines of the Los Angeles SEER Registry. We recorded patient age, gender, race, marital status, socioeconomic and insurance status, tumor histology, grade, and stage, operating urologist and reporting pathologist volume, institution type, and the presence/mention of detrusor muscle in the initial resection specimen. We performed multivariate mixed–effects logistic regression analysis to determine variables associated with presence and mention of muscle in the diagnostic pathology report.

Results: We retrospectively reviewed the medical records of all individuals with non–muscle–invasive bladder cancer between 2004 and 2005 within the confines of the Los Angeles SEER Registry. We recorded patient age, gender, race, marital status, socioeconomic and insurance status, tumor histology, grade, and stage, operating urologist and reporting pathologist volume, institution type, and the presence/mention of detrusor muscle in the initial resection specimen. We performed multivariate mixed–effects logistic regression analysis to determine variables associated with presence and mention of muscle in the diagnostic pathology report.

Results: We identified 1,865 individuals, 335 urologists, and 278 pathologists. Muscle was reported as present in 972 (52.1%), reported as absent in 564 (30.2%), and not mentioned in 329 (17.7%) of the initial pathology reports. Advancing age was associated with higher odds of having muscle reported as present (age 66–75: OR 1.62; 95% CI 1.04–2.53; and age 76–85: OR 1.60; 95% CI 1.03–2.48), while female gender (OR 0.71; 95% CI 0.53–0.95) and stage Tis (OR 0.46; 95% CI 0.23–0.90) had lower odds of having muscle reported as present during the resection specimen. Individuals with high grade or stage were no more likely to have muscle reported as present in the initial resection as those with low grade and stage. The mention of muscle by the reporting pathologist was positively correlated with stage T1 (OR 3.41; 95% CI 2.16–5.38), grade (moderately differentiated: OR 1.57; 95% CI 1.02–2.43; and poorly differentiated: OR 1.88; 95% CI 1.05–3.35), and pathology volume (medium volume OR 1.88; 95% CI 1.13–3.35).

Conclusion: In nearly half of individuals diagnosed with non–muscle–invasive bladder cancer, the initial report does not contain or mention detrusor muscle. Since urologists were unable to discern between grade (high vs low) or stage (Ta vs T1), we contend that endoscopic resection including muscle should be accomplished for all patients during the initial diagnostic resection.
**Poster #107**

**UTILIZATION OF IMMEDIATE POSTOPERATIVE INSTILLATION OF INTRAVESICAL CHEMOTHERAPY (IPOIC): A QUALITY OF CARE CONCERN IN OLDER PATIENTS WITH NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)**

Daniel A. Barocas¹, Jack Gallagher², Danielle Colayco³, Brent Schwartz³, Kylee Heap² and Denise Globe³

¹Vanderbilt University Medical School; ²Clarity Pharma Research, Spartanburg, SC; ³Allergan, LLC, Irvine, CA

(Presented By: Daniel A. Barocas)

**Introduction and Objective:** IPOIC reduces the odds of bladder tumor recurrence by 30−40% compared with trans−urethral resection (TURBT) alone in patients with NMIBC. For this reason, its use is recommended or presented as an option in US and European urology guidelines. However, population-based studies have reported utilization rates ranging from 0.33−17%. We undertook this study to determine if elderly patients are equally likely to receive IPOIC on a first resection for NMIBC as younger patients.

**Methods:** In a nation−wide survey of 259 urologists (425 invited, 61% response rate), each was asked to document the last four treated cases of NMIBC (n=1,010) with elaborate detail on patient and disease characteristics, as well as provider characteristics. We identified 171 patients who were treated for a first occurrence of NMIBC, 79 (45.9%) under 65 and 92 (54.1%) 65 or older. We compared utilization of IPOIC in patients undergoing a first TURBT for NMIBC between age groups and across strata of patient, provider and disease characteristics. Variables significant on univariate analysis (p<0.05) were included in the final multivariate logistic regression.

**Results:** Use of IPOIC was significantly lower among patients 65 and over (92/677, 13.6%) compared to younger patients (79/333, 23.7%, p<0.02). Its use was higher in the West (27.1%) and lower in the Mid−West (10.8%) compared to other regions, and was higher among patients who were treated for a shorter length of time (mean length of time under physician’s care 27.0 months for those receiving IPOIC and 42.2 months for those who didn’t (p<0.02). In addition, use of IPOIC was higher in patients treated by physicians with fellowship training in urologic oncology (31.2% vs. 13.8%, p<0.02). After controlling for each of these covariates in a multivariate model, age remained a significant independent predictor of use of IPOIC (OR 0.97, p<0.001). All tumor characteristics tested in the analyses were not significant predictors of receiving IPOIC.

**Conclusions:** While IPOIC reduces recurrence of NMIBC, its utilization remains below expected levels. Utilization is lowest among older Americans, and those in the Mid−West, while patients seeing a fellowship−trained urologic oncologist have a higher likelihood of receiving treatment. This variation in use of IPOIC raises concern for a quality of care gap across age strata, region and provider type, which should be further explored in future studies.

**Poster #108**

**THE IMPACT OF POSTOPERATIVE TRANSFUSION ON SURVIVAL CHARACTERISTICS IN SURGICALLY TREATED MEN WITH TRANSITIONAL CELL CARCINOMA OF THE BLADDER**

Andrew Feifer¹, Jennifer M. Taylor², Annalisa Piccorelli³, Changhong Yu³, Michael Kattan¹ and Bernard Bochner²

¹Memorial Sloan Kettering Cancer Center, NY, NY; ²Department of Surgery, Urology Service, Memorial Sloan Kettering Cancer Center; ³Department of Quantitative Health Sciences, Cleveland Clinic, Cleveland, OH

(Presented By: Andrew Feifer)

**Objective:** Antigen sensitization from exogenous packed red cell transfusions has been hypothesized to impact a patients’ immunological response to solid tumors. We evaluated the influence of perioperative PRBC transfusion on primarily the cumulative incidence of recurrence [CIR], and secondarily on the overall survival [OS] as well as cancer specific death [CSD] in patients with muscle invasive transitional cell carcinoma of the bladder [TCC].

**Methods:** We identified 2545 patients in the MSKCC prospectively maintained institutional database who underwent a radical cystectomy from 1995−2005. Perioperative transfusion was defined as within 30 days after radical cystectomy. After excluding patients with any history of preoperative radiotherapy, nonmuscle−invasive disease and those who received preoperative transfusions, 2209 patients were included in the cohort. We assessed the unadjusted impact of transfusion of outcomes via the Kaplan−Meir Method for OS, and cumulative incidence for CIR and CSD. We then adjusted for patient and tumor covariates, including perioperative chemotherapy and baseline Hemoglobin, using a multivariable Cox proportional hazard regression model for OS, and multivariable competing risk regression models for CIR and CSD, and assessed the impact of PRBC transfusion on CIR, CSD and OS.
Results: Median overall survival was 4.96 years. When stratified by receipt of PRBC transfusion, the unadjusted OS was 4.62 and 6.62 years respectively for transfusion and non-transfusion groups respectively [p<0.0001]. Both the unadjusted CIR and CSD were not statistically significant between groups [P = 0.065 for CIR, p=0.854 for CSD]. After adjusting for tumor and patient characteristics, PRBC transfusion was an statistically significant independent predictor of CIR and OS [CIR; HR: 1.57 (1.1423,1.9882), p=0.0037, OS; HR: 0.9857 (0.8677, 1.10592) but not cancer specific death [CSD: Hr: 1.027 (0.7373, 1.14131), p=0.902].

Conclusions: The receipt of PRBCs in the postoperative period is an independent predictor of CIR and OS in surgically treated men with bladder cancer, but not CSD. The immunologic mechanisms that may mediate this effect are in need of further investigation. While the receipt of perioperative PRBC may be unavoidable, it may also serve as an important surgical quality metric with direct impact on tumor biology.

Poster #109

PROGNOSTIC SIGNIFICANCE OF HER2 ONCOGEN OVEREXPRESSION IN PRIMARY UROTHELIAL CARCINOMA OF THE BLADDER

Sepehr Salem¹, Abdolrasoul Mehrsai², Farid Kosari³ and Gholamreza Pourmand²
¹Department of Urology, University Hospitals of Case Medical Center, Case Western Reserve University, Cleveland, Ohio, USA; ²Urology Research Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran; ³Department of Pathology, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran
(Presented By: Sepehr Salem)

Introduction and objectives: The level of expression and the prognostic significance of HER2 protein in urothelial carcinoma vary among different investigations. This study sought to further evaluate the prognostic relevance of HER2 expression in urothelial carcinoma of the bladder (UCB), and also to clarify the role of associated factors in a comparative study.

Methods: 120 patients with newly diagnosed and clinicopathologically confirmed primary UCB, and 132 controls without any malignant disease were evaluated prospectively. The formalin–fixed, paraffin–embedded specimens were stained immunohistochemically and monoclonal HER2 antibody was used to determine the HER2 expression (FDA–approved Hercep Test, Dako). Staining characteristics were compared with the clinicopathological results. Cox regression was used to estimate the adjusted hazard ratios (HR) with 95% confidence intervals (CI), and impact on disease–free survival was analyzed using Kaplan–Meier method.

Results: Overall HER2 expression was detected in 31% patients (55% cases vs. 9% controls,p<0.0001). HER2 overexpression (staining intensity score(SIS)≥2+) was observed in 32.5% cases; however, none of the controls showed HER2 overexpression. Statistically significant correlation was revealed between HER2 expression and tumor stage and grade. Univariate analysis was revealed a significant relationship between the HER2 immunoreactive score and history of hypertension. In multivariate regression analysis, HER2 was found to be an independent prognostic factor. Moreover, HER2 positive patients had higher rate of relapse in comparison with HER2 negative patients (p=0.002). Kaplan–Meier curves demonstrated a significantly worse disease–related survival (log–rank:0.01) in patients with HER2 expressing tumors compared to those without HER2 expression. HER2 expression in patients was significantly correlated with poor prognosis (HR:2.45,95%CI:1.24–4.84, P:0.009).

Conclusions: Our findings suggest a prognostic significance of HER2 protein overexpression in patients with UCB. The relatively high percentage of HER2 expressing tumors (55%) indicates that there is a substantial collective of UCB patients who might potentially profit from anti–HER2 therapy. Moreover, hypertension might predispose the expression of HER2 oncogene in patients. Finally, HER2 evaluation test could be considered as a diagnostic procedure in differentiating the benign tissue from malignant one, particularly in patients with SIS≥2+.
Background: Surveillance after radical cystectomy is recommended to diagnose tumor recurrence and treatment complications. We evaluated the adherence of bladder cancer patients to the National Comprehensive Cancer Network guidelines for surveillance after radical cystectomy in a population-based cohort of Medicare beneficiaries with bladder cancer.

Methods: We used the Surveillance, Epidemiology, and End Results (SEER)–Medicare linked database to identify patients aged 65 years or older diagnosed with non–metastatic bladder cancer who underwent radical cystectomy between 2000 and 2007. We used information from Medicare claims to examine the frequency of surveillance tests in the two years following surgery. The guidelines recommend a urine cytology twice at the end of each year and imaging of the chest, abdomen and pelvis once at the end of each year. We evaluated the impact of patient and provider characteristics on adherence to surveillance guidelines, controlling for demographic, disease, and provider treatment characteristics.

Results: Of 3,757 patients who had radical cystectomy, 2,990 (80%) were alive after two years. Adherence with all recommended investigations was 17% in the first year following surgery and 17% in the second year. Among those alive after 2 years, only 9% of patients had complete surveillance in both years. Patients with advanced pathologic stage (III/IV) and those who were unmarried were less likely to be adherent with surveillance guidelines in either year. (adjusted odds ratio [AOR] for advanced stage 0.74, 95% CI 0.60–0.91; AOR for unmarried 0.82, 95% CI 0.68–0.99). Patients treated by high–volume surgeons and those who saw a medical oncologist were more likely to be adherent (AOR for high volume 2.00, 95% CI 1.70–2.36; AOR for medical oncology visit 1.52, 95% CI 1.27–1.82). We also observed significant geographic variability in adherence with surveillance guidelines.

Conclusions: There is substantial deviation of clinical practice from the standards recommended for surveillance after radical cystectomy. Variation in adherence with clinical guidelines suggests important opportunities for quality improvement in bladder cancer care.

Poster #111

NEOADJUVANT AND ADJUVANT CHEMOTHERAPY FOR MUSCLE INVASIVE BLADDER CANCER: THE LIKELIHOOD OF INITIATION AND COMPLETION

Murugesan Manoharan, Ahmed Eldefrawy, Devendar Katkoori, Ahmed M. Mansour, Rakish Singal and Mark Soloway
University of Miami, Miller School of Medicine, Miami, Florida
(Presented By: Ahmed M. Mansour)

Introduction: Chemotherapy was shown to improve survival in patients undergoing radical cystectomy (RC) for muscle invasive bladder cancer (MIBC). The initiation and completion rates for perioperative chemotherapy are variable. Our aim is to compare the likelihood of initiating and completing neoadjuvant (NAC) and adjuvant chemotherapy (AC) in patients who underwent RC for MIBC.

Materials and methods: We performed a retrospective analysis of patients who underwent RC between 1992 and 2010. NAC was advised for patients with clinical stage ≥T2, hydronephrosis, or in the presence of extensive lymphovascular invasion (LVI) or prostatic stromal invasion. Patients with ≥ pT3 or lymph node metastases were considered for AC.

Results: 363 patients were considered for perioperative chemotherapy. Among the 141 who were offered NAC, 125(88.6%) initiated NAC. 222 were considered for AC, 151 (68.0%) initiated AC (p<0.001). In the NAC group, 118 (83.5%) completed planned number of cycles of chemotherapy. In the AC group 79 (35.5%) completed at least 4 cycles (p<0.001). the reasons for not completing chemotherapy were listed in Table 1.

Conclusions: Patients with MIBC are more likely to initiate and complete NAC, when compared to AC.

Table 1: Reasons for not initiating/completing the chemotherapy.

<table>
<thead>
<tr>
<th>Reason for not initiating</th>
<th>NAC N (%)</th>
<th>AC N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient preference</td>
<td>16 (100)</td>
<td>15 (21.0)</td>
</tr>
<tr>
<td>Surgical/ Medical condition</td>
<td>N/A</td>
<td>56 (79.0)</td>
</tr>
<tr>
<td>Reason for non–completion</td>
<td>7</td>
<td>72</td>
</tr>
<tr>
<td>Renal impairment</td>
<td>2 (28.5)</td>
<td>9 (12.5)</td>
</tr>
<tr>
<td>Intolerability 3</td>
<td>43 (3.0)</td>
<td>23 (32.0)</td>
</tr>
<tr>
<td>Hematological complications</td>
<td>2 (28.5)</td>
<td>33 (46.0)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>0</td>
<td>7 (9.5)</td>
</tr>
</tbody>
</table>
Poster #112

PROSPECTIVE EVALUATION OF OUTCOME OF LYMPH NODE POSITIVE BLADDER CANCER TREATED WITH RADICAL CYSTECTOMY AND LYMPHADENECTOMY: EFFECT OF THE LEVEL OF NODE POSITIVITY

Tatum Tarin¹,², Nicholas Power¹,², Behfar Ehdai², John Sfakianos¹,², Jonathon Silberstein¹,², Daniel Sjoberg³, Guido Dalbagni¹,² and Bernard Bochner¹,²

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(Presented By: Tatum Tarin)

Purpose: To prospectively evaluate recurrence−free survival (RFS) and cancer−specific survival (CSS) of patients with bladder cancer managed with radical cystectomy (RC) and a mapping pelvic lymph node dissection (PLND) with a proximal limit extending at least to the aortic bifurcation.

Patients and Methods: Between 2000 and 2010, 597 patients underwent RC with a prospectively established mapping PLND. Nodal information and patient outcomes were collected in our prospective database. We evaluated the impact of lymph node involvement on disease outcomes in accordance with the 2010 American Joint Committee on Cancer TNM staging system. Survival estimates were described using Kaplan–Meier methods. Gender, age, pathologic stage, histology, and grade were evaluated as predictors of RFS and CSS using multivariate Cox proportional hazard regression.

Results: Overall, 119 patients (20%) had lymph node involvement and 47 (8%) had common iliac lymph node involvement. On multivariate analysis, positive nodal status was significantly associated with increased risk of recurrence (P < .001) and cancer−specific death (P < .001) compared to N0 disease. Five−year RFS for N3 patients undergoing RC with PLND was 30% (95% CI, 15%–46%). This was not statistically different from our N1 and N2 patients (38% [95% CI, 22%–54%] and 35% [95% CI, 11%–60%], respectively).

Conclusion: Our prospective study demonstrates that 30% of patients with bladder cancer with common iliac node involvement (N3) undergoing RC with PLND can be rendered disease free at 5 years. This data strongly supports the use of a PLND that includes the common iliac lymph nodes in patients undergoing RC for bladder cancer.
Poster #113

VALUE OF URETHRAL FROZEN SECTION AT RADICAL CYSTECTOMY AND IMPACT ON INTRAOPERATIVE DECISION MAKING

Glen Yang¹, Jared Whitson¹, Anobel Odisho¹, Peter Carroll¹ and Badrinath Konety²
¹University of California, San Francisco; ²University of Minnesota
(Presented By: Glen Yang)

Objective: It remains unclear which patients should remain candidates for urethral preservation during radical cystectomy and what factors should influence this decision. The aim of this study was to assess the accuracy of intraoperative urethral frozen sections (FS) during radical cystectomy and to evaluate factors associated with a positive urethral frozen section and urethral recurrence.

Methods: Consecutive patients undergoing radical cystectomy at UCSF who had urethral FS were identified. Data on preoperative clinical and pathologic factors, intraoperative decision making, urethral margins, and urethral recurrence were recorded.

Results: 243 patients with mean age of 65 years and median follow-up of 20 months were included. A positive urethral FS was present in 23 patients (9.3%). Urethral recurrence occurred in 7 patients (2.9%). Tumor number, size, location, grade, histology, and the presence of CIS were not associated with positive urethral FS or with urethral recurrence. Positive urethral FS was associated with positive final urethral margin (p<0.001), prostatic urethral tumor involvement at cystectomy (p=0.05), and urethral recurrence (p=0.03). The positive and negative predictive values of urethral FS for predicting urethral recurrence were 30% and 97%, respectively. Urethral frozen section altered intraoperative decision making in 6 (2.4%) cases.

Conclusions: Urethral recurrence rates after radical cystectomy are low. Given its minimal morbidity for patients, intraoperative urethral FS during cystectomy is a useful tool. However, because of low positive predictive value, the decision to forego orthotopic bladder replacement or perform prophylactic urethrectomy must be combined with other risk factors for urethral recurrence as well as patient preferences.

Poster #114

INVESTIGATION OF P53-INDEPENDENT FUNCTIONS OF ARF IN THE CONTEXT OF COMBINED FUNCTIONAL LOSS OF P53 AND PTEN IN A MOUSE MODEL OF INVASIVE BLADDER CANCER

Joan Delto, Takashi Kobayashi, James McKiernan, Mitchell Benson and Cory Abate-Shen
Columbia University, New York, NY
(Presented By: Joan Delto)

Introduction and Objective: Treatment of patients with muscle−invasive bladder cancer is still a major clinical challenge among urologists, since it is often associated with regional or distant metastasis, for which there is no curative treatment. Clearly, there is a need for identification of novel prevention and treatment paradigms for invasive bladder cancer; however, our limited understanding of the molecular mechanisms of bladder tumorigenesis has hampered the identification of new targets for therapeutic intervention. The purpose of this study is to interrogate molecular mechanisms of invasive bladder cancer, especially with regard to function of Arf, which is previously reported as a potent tumor suppressor.

Methods: Recently we established a genetically engineered mouse model for invasive bladder cancer with preceding carcinoma in situ lesion, based on the combinatorial deletion of p53 and Pten in bladder epithelium using an adenosvirus expressing Cre recombinase (Adeno−Cre) delivered to the bladder lumen (Puzio−Kuter Gene Dev 2009). In this mouse bladder tumor, we found upregulation of Arf. To investigate functional significance of Arf, we made an additional deletion of Arf to p53− and Pten−deficient tumor.

Results: Although Arf/p53/Pten triple floxed (TKO) mice developed invasive bladder cancer, its manifestation was slower than those developed in p53/Pten double floxed (DKO) mice (median tumor−free survival; 86 vs 73 days, p = 0.002). Tumor size at 8 wks after virus infection was significantly larger in DKO than in TKO mice (0.69 vs 0.22 g, p = 0.02).

Conclusions: Our results indicate that Arf has a significant impact on shortening bladder cancer latency in the context of p53− and Pten−deletions although it is not required for bladder tumorigenesis in this context.

This project is funded in part by the Alexander and Margaret Stewart Trust.
PRELIMINARY RESULTS OF PERIOPERATIVE OUTCOMES AND ONCOLOGIC EFFICACY FROM A SINGLE INSTITUTION RANDOMIZED CONTROLLED TRIAL OF OPEN VERSUS ROBOTIC ASSISTED RADICAL CYSTECTOMY
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University of Texas Health Sciences Center San Antonio, TX
(Presented By: Jamie Messer)

Introduction/Objective: In the past decade minimally invasive approaches including robotic assisted approach has emerged as a viable option for the treatment of many urologic malignancies. Robotic assisted Radical Cystectomy (RARC) for bladder cancer has been reported with the potential for lower blood loss, less transfusion requirement, and shorter hospital stay in previous retrospective and one prospective randomized study. We present preliminary data from a single institution prospective randomized clinical trial of open radical cystectomy (ORC) versus RARC.

Methods: Prospective randomized single institution series evaluating the feasibility of ORC versus RARC for consecutive patients was performed from July 2009 to June 2011. Oncologic efficacy was assessed based on the surrogates of total number of lymph nodes removed and positive surgical margins. Perioperative morbidity was assessed evaluating for estimated blood loss, transfusion requirements, length of stay and perioperative morbidity.

Results: To date 46 patients have been randomized with data available on 39 patients for analysis. Each group was similar with regards to age, sex, race, BMI, comorbidities, and previous abdominal procedures, operative time, and final pathologic stage. We observed no significant difference between oncologic outcomes of positive surgical margins (5% vs 5.263%, p 0.48) or number of LN removed (11 vs 23, p 0.40) for the RARC versus ORC groups respectively. The RARC group was noted to have decreased estimated blood loss (400 mL vs 800 mL, p 0.008) and a trend towards decreased rate of excessive length of stay (>5 days) (65% vs 84%, p 0.17) for the RARC versus ORC groups. The robotic group had a trend towards decreased rate of transfusion however this was not statistically significant (40% versus 53%, p 0.26).

Conclusions: Our preliminary findings from a single institution randomized trial of RARC versus ORC indicates that RARC has equivalent oncologic outcomes as measured by positive surgical margins and total number of lymph node removed. RARC demonstrates Perioperative benefits of decreased blood loss, fewer excessive hospital stays, and a trend toward fewer transfusions that was not significant.
Introduction and objectives: Upper urinary tract urothelial carcinomas (UTUC) are rare tumors, but cancer recurrence in the urinary bladder after nephroureterectomy is common and occurs in 22–69% of patients. Risk factors for bladder cancer recurrence after UTUC have been described, but series are small and results remain ambiguous.

Methods: We reviewed all upper tract urothelial cancers treated with nephroureterectomy at 10 Canadian University Centers between 1990 and 2010. 742 patients had the necessary information available. Covariables assessed at time of nephroureterectomy included age, gender, smoking status, presence of hydronephrosis, previous upper tract tumor, type of surgery, histopathological tumor entity, pT and pN stage, pathological grade, presence of CIS, tumor location, multifocality, tissue architecture, previous abdominal radiotherapy, distal ureter management, surgical margin status and the use of adjuvant chemotherapy. Univariate and multivariate Cox proportional hazards models were created to analyze the effect of various covariables on bladder cancer recurrence.

Results: 167 (22.5%) out of 742 patients developed a bladder cancer recurrence. Mean age was 69.7 years, 59% of the patients were male and median interval between nephroureterectomy and bladder cancer recurrence was 1.4 years. Univariate analysis of risk factors for bladder cancer recurrence identified the following factors: tumor location (HR 1.356, 95% CI 1.198–1.535, p<0.0001), multifocality (HR 1.579, 95% CI 1.121–2.222, p=0.0089), presence of CIS (HR 1.430, 95% CI 1.012–2.022, p=0.0428), architecture (HR 0.691, 95% CI 0.560–0.853, p=0.0006), use of adjuvant chemotherapy (HR 2.740, 95% CI 1.832–4.098, p<0.0001), and age (HR 1.017, 95% CI 1.001–1.033, p=0.0319). Multivariate analysis of risk factors for bladder cancer recurrence detected age (HR 1.034, 95% CI 1.014–1.055, p=0.0009), tumor location in both renal pelvis and ureter (HR 2.216, 95% CI 1.273–3.857, p=0.0049) and use of adjuvant chemotherapy (HR 2.674, 95% CI 1.468–4.873, p=0.0013).

Conclusions: Bladder cancer recurrence developed in 22.5% of patients. Only higher age, tumor location in both the renal pelvis and the ureter as well as the use of adjuvant chemotherapy were identified as risk factors for bladder cancer recurrence after nephroureterectomy for upper tract urothelial tumors.

Funding: None.
Poster #117

UTILITY OF PET/CT IN IDENTIFYING BONE METASTASIS IN PATIENTS WITH UROTHELIAL CARCINOMA
Phillip Abbosh, Robert Grubb, III, Kenneth Nepple, Aleksandra Klim, Barry Siegel, Farrokh Dehdashti, Seth Strope and Adam Kibel
Washington University, St. Louis, MO
(Presented By: Phillip Abbosh)

Purpose: Identification of bone metastasis in patients with urothelial carcinoma currently relies on alkaline phosphatase and bone scintigraphy. 18FDG−PET/CT (PET/CT) has proven useful in detecting soft tissue metastasis. Its role in identifying bone metastasis and its ability to replace bone scintigraphy is unknown. Herein, we compare the utility of PET/CT to bone scan in identifying osseous metastasis in patients with urothelial cell carcinoma.

Materials and Methods: We identified 321 patients with urothelial cell carcinoma at our institution that underwent either bone scan and/or PET/CT. Studies were considered concurrent if they were performed within 90 days of each other. We collected standard demographic, radiologic, and pathologic data on each patient.

Results: 98 of 321 patients (31%) had nonmuscle invasive tumors and 111 of 321 patients (66%) had muscle invasive tumors. 28 of 321 patients (9%) had metastatic disease prior to the time of evaluation. Overall, 58 of 321 (18%) of patients in this cohort had bone metastasis diagnosed as a result of one or both imaging tests. 45 of 244 patients (18%) had a bone scan showing bone metastasis and 20 of 125 patients (16%) of patients had a PET/CT showing bone metastasis. 48 patients had both studies, and 12 of these (25%) had osseous metastasis diagnosed as a result of one or both studies. However, only 30 patients had both studies performed within a 90 day interval. Five of these 30 patients (17%) had bone metastasis; all five had a PET/CT demonstrating skeletal disease, but bone scan was positive in 4 of the 5 patients (p=0.7, Chi−square). Bone scan underestimated the extent of disease compared to PET/CT, as all 4 patients with positive bone scans who had PET/CT within 90 days had additional lesions identified on PET/CT. Furthermore, CT scan, MRI, or plain film identified additional bony lesions which were missed on bone scan in 3 additional patients. However, no additional studies identified bony lesions which were missed by PET/CT.

Conclusions: In this retrospective analysis, bone scan and PET/CT identified a similar proportion of patients with skeletal metastasis, but bone scan often demonstrates less extensive disease than PET/CT. While sample size was small, the fact that PET/CT identified skeletal disease missed by bone scan raises the possibility that it could be superior to bone scan in this regard. Larger studies could confirm these findings.

Poster #118

USE OF NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER: 10-YEAR EXPERIENCE AT A SINGLE INSTITUTION
Stephen F. Kappa¹, Todd M. Morgan², Roxelyn G. Baumgartner², Sam S. Chang², Michael S Cookson², Peter E. Clark², Rodney Davis², David F. Penson², Joseph A. Smith², Chaochen You² and Daniel A. Barocas²
¹Vanderbilt University Medical Center, School of Medicine; ²Vanderbilt University Medical Center, Department of Urologic Surgery
(Presented By: Stephen F Kappa)

Introduction and Objectives: Increasing data over the past 10 years supports the use of platinum−based (PB) neoadjuvant chemotherapy (NAC) for patients undergoing radical cystectomy (RC) for muscle−invasive bladder cancer. While level−1 evidence indicates that NAC provides a long−term survival benefit, its use is variable. Thus, we sought to determine utilization patterns and factors affecting use of NAC at a high−volume tertiary care center.

Methods: We studied 1040 consecutive patients who underwent RC for urothelial bladder cancer from January 2001 to December 2010. Use of NAC and PBNAC was determined for each year across strata of clinical stage and renal function. Baseline characteristics (age, race, sex, Charlson comorbidity index [CCI], body mass index [BMI], albumin level, glomerular filtration rate [GFR], clinical stage, surgeon and year of surgery) were compared between those who received NAC and those who did not. A multivariable model was fit for predictors of NAC, controlling for factors significant on univariate analysis.
Results: Mean age was 67.9 years and 20.1% were female. Among 656 patients with muscle-invasive disease, 66 (10.1%) received NAC, increasing from 1.6% in 2002 to 32.9% in 2010 (Figure). Twenty-seven of 390 patients (7.2%) with muscle-invasive disease and adequate renal function (GFR>60 mL/min) received PBNAC, reaching 18.2% of 44 eligible patients in 2010. On univariate analysis, age, CCI, BMI, clinical stage, year of surgery and surgeon were associated with use of NAC. Age (OR 0.96, 95%CI [0.92−0.99]), clinical stage T2 or higher (3.60, [1.68−7.73]), year of surgery (1.55, [1.33−1.81]), and surgeon predicted use of NAC on multivariate analysis.

Conclusions: Although NAC is supported by level−1 evidence, there are substantial toxicities and the ideal utilization rate remains unclear. Its adoption in a particular center can be viewed as an improvement in quality, yet individual decisions regarding use of NAC are influenced heavily by the clinical scenario and by patient and provider preferences. This study demonstrates that implementation lags behind discovery and supports the notion that research resources should be allocated to both aspects of improving the quality of care.

Poster #119

RISK FACTORS FOR UPPER URINARY TRACT AND URETHRAL RECURRENTS FOLLOWING RADICAL CYSTECTOMY
Nathan Perlis¹, Polat Turker¹, David Margel¹, Peter J. Bostrom¹, Marcelo Wroclawski¹, Tuomas Miriti²³, Martti Nurmi², Neil E. Fleschner¹, Antonio Finelli¹, Michael A. Jewett¹ and Alexandre R. Zlotta¹⁴

¹University Health Network, Princess Margaret Hospital, Toronto, ON; ²Turku University Hospital, Turku, Finland; ³Helsinki University Hospital, Helsinki, Finland; ⁴Mount Sinai Hospital, Toronto, ON
(Presented By: David Margel)

Introduction: Recurrences in the upper urinary tract (UUT) and the urethra following radical cystectomy (RC) for urothelial carcinoma (UC) of the bladder are often recognized after symptomatic presentation. Accurate predictive risk factors would aid in designing individually tailored follow-up protocols, perhaps improving morbidity and mortality.

Methods: 635 consecutive patients undergoing RC for bladder UC without neoadjuvant chemotherapy at The University Health Network, Toronto, Canada (1992–2008) and University of Turku, Turku, Finland (1986–2005) were studied. The rates of upper urinary tract and urethral recurrences were analyzed. Patients with urethrectomy were excluded from urethral recurrences analysis. Clinical and pathological variable associated with recurrence were evaluated using the pearson chi−square test. The Kaplan–Meier method was used to analyze survival.
Results: Mean follow up was 45 months (0−264). Among the 635 RC patients, 22 (3%) had an UUT recurrence and among the 559 patients without urethrectomy during cystectomy, 17 (3%) had a urethral recurrence. Median time to upper tract recurrence was 20 months (3−84 mo) and to urethral recurrence was 30 months (10−96 mo). Male gender (p=0.035), T2 or higher primary stage (p=0.014), concomitant CIS (p=0.001), pathological stage higher than T2 (p=0.03) and prostatic urethral involvement (p=0.05) were significant risk factors for urethral recurrence. Disease specific and overall survival of upper tract recurrences was poorer than urethral recurrences (43 vs 74% at 10 years, p=0.047).

Conclusions: Upper tract and urethral UC recurrences for patients following radical cystectomy are rare. Efforts should be made to closely monitor patients with CIS and prostatic urethra involvement for recurrences post−cystectomy. We found that urethral recurrence had a lower mortality rate than in other series. Both upper tract and urethral recurrences remain a challenge to timely diagnose and manage post cystectomy, and an optimal monitoring schedule should be developed.

Poster #120

TREATMENT PATTERNS AND COSTS OF TREATING NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)
Cheryl Lee¹, Stephen Gruschkus², Danielle Colayco³, Tommy Bramley² and Denise Globe³
¹University of Michigan Comprehensive Cancer Center, Ann Arbor, MI; ²Xcenda, Palm Harbor, FL; ³Allergan, LLC, Irvine, CA
(Presented By: Danielle Colayco)

Introduction and Objective: Although intravesical perioperative instillation (IPOI) of chemotherapy reduces risk of recurrence in non−muscle invasive bladder cancer (NMIBC), it remains underutilized in the US. This study evaluates treatment patterns and costs associated with NMIBC.

Methods: Patients diagnosed with Ta bladder cancer (BC) from 1/1/2004 – 12/31/2007 were identified in the Surveillance, Epidemiology, and End Results−Medicare database. Patients were characterized by age at diagnosis, gender, tumor size and grade. Initial transurethral resection of bladder tumor (TURBT; CPT 52224, 52234, 52235, 52240, 52204, ICD−9 573.3, 574.9) was described with respect to setting and costs. IPOI was defined as intravesical instillation (CPT 51720, J9280, J9290, J9291, J9178, J9000, J9001, J9212 − J9215, J9340, ICD−9 99.25, V58.1) on day 0/1 post−TURBT. Predictors of IPOI utilization were evaluated using multivariate logistic regression. TURBT costs (physician services and facility) were based on 2011 Medicare rates.

Results: A total of 8,006 Ta BC patients were identified. Median age was 79.7 years and 76.1% of patients were male. A large majority (69.7%) of patients had low (23.4%) or moderate (46.3%) grade tumor, while 23.7% had high grade/undifferentiated disease; 6.5% was unknown. Most patients (69.5%) underwent initial TURBT in the outpatient setting (54.2% outpatient hospital, 9.7% ambulatory surgical center, and 5.5% physician’s office). The remainder (30.5%) were inpatient procedures. The overall mean TURBT cost was $3,214 based on the mean cost from an outpatient hospital ($1,814), ambulatory surgical center ($1,073), physician’s office ($1,131) or inpatient unit ($6,757). Among all patients, 6.7% received IPOI with/without subsequent induction therapy, 28.3% received instillations 2+ days post−TURBT, and 65% received no post−TURBT instillation. In multivariate analysis, patients receiving outpatient vs. inpatient TURBTs were more likely to receive IPOI (OR: 1.81; 95% CI= 1.43−2.28) as were patients with larger tumor size (OR: 2.44; 95% CI= 1.50−3.96) vs. smaller tumor size and those with higher grade vs. lower grade (OR: 1.47; 95% CI= 1.17−1.86).

Conclusions: A large proportion of potentially eligible BC patients do not receive IPOI. Patients receiving TURBTs in the outpatient setting were more likely to receive IPOI and clinicians targeted larger, higher grade tumors for IPOI, despite the fact that smaller, lower grade tumors derive greater benefit.
LENALIDOMIDE AUGMENTS THE RESPONSE OF BLADDER CANCER TO BCG IMMUNOTHERAPY IN AN IN VIVO MU-RINE MODEL
Eugene Lee, Jinesh Gerald and Ashish Kamat
MD Anderson, Houston, TX
(Presented By: Eugene Lee)

**Purpose:** Intravesical BCG is the gold standard for non–muscle invasive bladder cancer. However many patients do not respond to this therapy while others relapse and/or progress. As a result, there remains a need for therapies that can enhance the efficacy of BCG. Herein, we explore the efficacy of lenalidomide, a thalidomide derivative used as an immunomodulatory in multiple myeloma and myelodysplastic syndrome, in combination with BCG in vitro and in an in vivo bladder cancer model.

**Materials and methods:** We studied the effects of lenalidomide in combination with BCG induced cytokines in MBT−2 cells using PI−FACS. We then performed Western blotting for cell cycle and apoptosis regulatory proteins. Subsequently, we tested the efficacy of this combination in an immunocompetent murine model of bladder cancer with MBT−2 cells in C3H mice using the flank injection method. Tumor growth curves were created for the control, lenalidomide alone, BCG alone and combination treatment mice groups. Immunohistochemistry (IHC) was then performed using antibodies against cell cycle and apoptosis proteins.

**Results:** PI−FACS identified increased DNA fragmentation in the combinations of lenalidomide and TNF−α and FasL compared to control and each agent alone. Using Western blotting, we demonstrated that the combination resulted in apoptosis via caspase−3 activation. In the murine model, using the treatment groups described above, combination therapy resulted in a statistically significant decreased tumor size compared to the control group. While the BCG alone and lenalidomide alone groups did show a trend toward smaller tumor, they did not reach statistical significance. Furthermore, the TUNEL assay showed a substantial increase in apoptosis only in the combination group.

**Conclusions:** Our study demonstrates a potential role for the immunomodulatory agent, lenalidomide, in combination with BCG for non–muscle invasive bladder cancer. This in vivo model serves as a template for future clinical trials.

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**EVALUATION OF SELENIUM SUPPLEMENTATION ON THE PREVENTION OF BLADDER CANCER IN SWOG-COORDINATED SELECT**
Yair Lotan\(^1\), Phyllis Goodman\(^2\), Ramy Youssef\(^3\), Robert Svatek\(^4\), Shahrokh Shariat\(^4\), Catherine Tangan\(^2\), Ian Thompson\(^3\) and Eric Klein\(^5\)
\(^1\)University of Texas Southwestern Medical Center, Dallas, TX; \(^2\)SWOG Statistical Center, Fred Hutchinson Cancer Research Center, Seattle, WA; \(^3\)University of Texas Health Science Center, San Antonio, TX; \(^4\)Weil Medical College of Cornell University, New York, NY; \(^5\)Glickman Urological and Kidney Institute and Taussig Cancer Institute, Cleveland Clinic, Cleveland, OH
(Presented By: Yair Lotan)

**Introduction:** Epidemiological and biological evidence suggest a preventative effect of selenium and vitamin E on bladder cancer. The objective of this study was to assess the effect of selenium, vitamin E, or the combination on bladder cancer development.

**Methods:** This was a secondary analysis of the randomized, placebo−controlled trial (Selenium and Vitamin E Cancer Prevention Trial [SELECT]) which included 34,887 men randomly assigned to four groups (selenium, vitamin E, selenium + vitamin E, and placebo) in a double−blind fashion between August 22, 2001, and June 24, 2004. Baseline eligibility included African American men age 50 years or older, others age 55 or older, a serum prostate−specific antigen level of 4 ng/mL or less, and a digital rectal examination not suspicious for prostate cancer. The primary end point was bladder cancer incidence as determined by routine clinical management.

**Results:** Within a median follow−up of 7.1 years (interquartile range, 6.4 – 8.0 years), 224 bladder cancer cases were recorded. Bladder cancer cases were older, more likely to be Caucasian and to have a smoking history compared to non bladder cancer subjects. Most cancers were urothelial and non–muscle invasive cancers. There were no significant differences in bladder cancer incidence among subjects in the placebo, selenium, vitamin E or selenium+vitamin E arms (placebo, n=53; vitamin E, n=56, HR=1.05 (0.64, 1.73), p=0.79; selenium, n=60, HR=1.13 (0.70, 1.84), p=0.52; vitamin E + selenium, n=55, HR=1.05 (0.63, 1.70, p=0.86).

**Conclusions:** This secondary analysis found no preventative effect of selenium or vitamin E, alone or in combination on bladder cancer in this population of men. Further studies are necessary to assess the effect in females and at different doses and formulations.
**Poster #123**

**ROLE OF ESTROGEN, PROGESTERONE AND ANDROGEN RECEPTORS ON FORMATION AND PROGRESSION OF UROTHELIAL CARCINOMA OF THE BLADDER**

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(Presented By: Sepehr Salem)

**Introduction and Objectives:** Males have a substantially higher risk of developing UCB than females, whereas its etiology still remains largely obscure. This study sought to further clarify the role of ER/PR/AR expression in urothelial carcinoma of the bladder (UCB), and also to evaluate the possible associations with progression and survival of cancer.

**Methods:** 120 patients with clinicopathologically confirmed primary UCB, and 132 controls without any malignant disease were evaluated prospectively. Their pathologic specimens were stained immunohistochemically using avidin−biotin−peroxidase technique and monoclonal ER/PR/AR antibodies were used to determine the ER/PR/AR expression (Dako). Staining characteristics were compared with the clinicopathological results. Cox regression was used to estimate the adjusted hazard ratios (HR) with 95% confidence intervals (CI), and impact on disease−free survival was analyzed using Kaplan−Meier method.

**Results:** ER/PR expressions were observed in 4.2%/2.5% of cases and 2.3%/1.5% of controls. AR expression was detected in 22% of the patients with UCB and all controls were AR−negative. No significant association was found between ER/PR immunoreactive scores and age, tumor size, stage and grade, while statistically significant correlation was revealed between AR expression and tumor stage and grade. AR/PR−positive patients had higher rate of metastasis in comparison with AR/PR−negative patients(p<0.05). In multivariate regression analysis, AR/PR was not found to be independent prognostic factors and survival was not affected by their expressions. However, AR−positive patients showed a significantly poorer prognosis than AR−negative cases (log−rank test, p=0.02) and it could also be used as a prognostic factor (HR: 2.12; 95%CI: 1.36−4.65).

**Conclusions:** AR expression was found in almost 22% of the tumors and it was significantly associated with high stage, poorly differentiated tumors and unfavorable outcome. Hence, AR could be considered as a potential target for additional hormonal therapy. AR evaluation test could also be regarded as a diagnostic procedure for determining the malignant bladder issues. Moreover, ER and PR expression were not found to have any direct roles in formation and progression of UCBs.

**Poster #124**

**OUTCOMES OF RADICAL CYSTECTOMY FOR MICROPAPILLARY UROTHELIAL CARCINOMA AT THE UNIVERSITY OF SOUTHERN CALIFORNIA**

Adrian Fairey, Siamak Daneshmand, Anne Schuckman, Gary Lieskovsky, Hooman Djaladat, Jie Cai, Gus Miranda and Eila Skinner

University of Southern California, Los Angeles, CA

(Presented By: Adrian Fairey)

**Introduction and Objectives:** Outcomes of radical cystectomy for micropapillary urothelial carcinoma (MUC) are poorly defined. Our aim was to examine the impact of MUC on survival.

**Methods:** A retrospective analysis of prospectively collected data from the University of Southern California (USC) Bladder Cancer Database was performed. Between 1985 and 2008, 1681 patients underwent radical cystectomy and extended pelvic lymph node dissection for primary bladder cancer. All surgical specimens were reviewed by dedicated genitourinary pathologists. Histologic type was categorized according to the World Health Organization/International Society of Urological Pathology (WHO/ISUP) 2004 classification as urothelial carcinoma (n=1648) or micropapillary urothelial carcinoma (n=33). Patients were assigned a diagnosis of MUC if the review of pathologic material revealed any micropapillary component in the tumor. The outcomes were overall survival (OS) and recurrence−free survival (RFS). The Kaplan−Meier method and Cox proportional regression models were used to analyze survival data.
Results: The median follow-up duration was 10 years (range, 0 to 25 years). Baseline characteristics were similar between histologic types except MUC was associated with advanced clinical (cTanyN1–3: 2% versus 9%, p=0.03) and pathologic (pTanyN1–3: 23% versus 46%, p=0.01) TNM stage, multifocality (37% versus 58%, p=0.02), and high grade histology (84% versus 97%, p=0.04). The predicted 5-year OS (59% and 67%, Log rank p=0.79) and RFS (67% and 58%, Log rank p=0.50) rates did not differ between patients with UC and MUC. Multivariable analysis showed that histologic type was not independently associated with OS (HR 0.94, 95% CI 0.57 to 1.55, p=0.82) or RFS (HR 0.95, 95% CI 0.53 to 1.69, p=0.86).

Conclusions: Outcomes of radical cystectomy for patients with MUC are similar to those with UC when controlling for other clinical and pathologic factors.

Poster #125

INCIDENCE AND PROGNOSTIC IMPLICATIONS OF PERINEURAL INVASION AFTER RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA
Manoj Rao, Robert Flanigan and Marcus Quek
Loyola University Medical Center, Maywood, IL
(Presented By: Manoj Rao)

Introduction and Objectives: We studied the clinical implications of perineural invasion (PNI) in the setting of urothelial carcinoma after radical cystectomy.

Methods: We reviewed our radical cystectomy database from 1/1996 to 4/2010, focusing on PNI in patients with primary urothelial carcinoma with pathologically localized(pT2NOMO), advanced(pT3–4NOMO), and node positive disease (pTxN1–3M0).

Results: Of the 459 patients who underwent radical cystectomy, PNI was found in 8%(6/77) pT2, in 46%(48/104) pT3–4, and 34%(26/71) N+ patients. Comparing PNI+ vs PNI – patients by group, recurrence rates were 33%(2/6) vs 17%(12/71) in pT2(p=0.6), 40%(19/48) vs 21%(12/56) in pT3–4(p=0.04), and 42%(10/24) vs 36%(17/47) in N+(p=0.8). 5 year recurrence-free survival was significantly worse in PNI positive patients with pT3–4NOMO(p=0.03) and pTxN+MO disease (p=0.04) over mean follow up of over two years(25 months; refer to figure).

Conclusions: We report our perineural invasion rates after radical cystectomy. Perineural invasion may be an indicator of a poor prognosis, especially in pathologically advanced and node positive disease.

Source of Funding: None
**Poster #126**

**COMPARATIVE ANALYSIS OF EXISTING SURGICAL RISK ASSESSMENT TOOLS TO PREDICT POST-OPERATIVE MORTALITY RATES AFTER RADICAL CYSTECTOMY**

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(Presented By: Tracy Downs)

**Introduction:** Radical cystectomy with urinary diversion is currently the gold standard treatment for muscle invasive transitional cell carcinoma. However, large series of radical cystectomies report complication rates between 22%− 57% and 90-day mortality rates of 3−4%. Unfortunately, there are no widely accepted methods to identify which patients will suffer early mortality and not benefit from surgery. The objective of our study was to compare validated surgical risk tools to predict mortality rates in patients undergoing radical cystectomy and urinary diversion.

**Materials and Methods:** We retrospectively reviewed the physiologic parameters, operative parameters and 90 day−mortality in 100 consecutive patients who underwent radical cystectomy and urinary diversion performed at the University of Wisconsin. Predicted mortality were calculated using the POSSUM, Portsmouth POSSUM (P−POSSUM), Simplified Acute Physiologic scoring system II (SAPS) and the Acute Physiological and Chronic Health Evaluation II (APACHE). Observed and predicted surgical outcomes were compared.

**Results:** Our observed mortality rate was 4%. The mean predicted mortality rates for the different surgical risk tools were the following: POSSUM (20.4%), P−POSSUM (7.0%), APACHE II (5.4%) and SAPS II (3.6%) for the entire cohort of patients. The mean predicted mortality rates for the 4 patients who died were POSSUM (18.6%), P−POSSUM (6.7%), APACHE II (4.3%) and SAPS II (5.1%). The SAPS II was the most accurate of the analyzed risk assessment tools with an area under the curve (AUC) of 0.719.

**Conclusion:** Most risk stratification methods were inaccurate in predicting mortality in patients undergoing radical cystectomy. SAPS II performed best but additional studies are required to develop “cystectomy” specific risk calculators.

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**Poster #127**

**NON-CLEAR CELL HISTOLOGY IS INDEPENDENTLY ASSOCIATED WITH POOR OUTCOMES IN THE TARGETED THERAPY ERA**

Edward Rampersaud¹, Frederic Birkhaeuser¹, Joshua Logan¹, Geoffrey Sonn¹, Yvonne Chan², Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Fairooz Kabbinavar¹, Allan Pantuck¹ and Arie Belledegrun¹  
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(Presented By: Edward Rampersaud)

**Objective:** The role of targeted therapy (TT) in metastatic renal cell carcinoma (mRCC) having non−clear cell histology is still being defined. We sought to examine the factors associated with survival outcomes in patients presenting with various histologic subtypes in the TT era.

**Methods:** The UCLA Kidney Cancer Program database containing records of over 2000 patients, including 232 patients treated with TT since 2003, was queried. Of the 154 patients treated with FDA−approved TT, 131 had clear cell subtype (ccRCC) while 25 had non−clear cell histology (non−ccRCC). We compared the clinicopathologic factors and survival outcomes between these two groups using student’s t−test, chi−square, Kaplan−Meier (log rank), and multivariate Cox regression.

**Results:** The two groups were balanced for baseline demographic variables, including gender, race, BMI, pack−years of smoking, T−stage, and UCLA Integrated Staging System (UISS). Median survival of patients with ccRCC and non−ccRCC was 41.7 and 18.1 months, p<0.001. Among patients receiving TT−only, median survival of patients with ccRCC and non−ccRCC was 32.5 and 15.4 months, p=0.020. A subset of ccRCC patients treated sequentially with IMT followed by TT had a median survival of 47.9 months. Worsening UISS risk class, non−caucasian race, and non−ccRCC histology were all independently associated with risk of cancer death.

**Conclusion:** Non−clear cell histology is a significant risk factor for cancer specific death for mRCC patients treated by TT even after controlling for UISS risk category. Furthermore, subset analysis among those with clear cell histology suggests that carefully selected patients may achieve outstanding survival when treated by upfront immunotherapy followed by TT only at the time of progression.
A PROSPECTIVE TRIAL ASSESSING THE EFFECTS OF CLAMP ISCHEMIA DURING PARTIAL NEPHRECTOMY ON RENAL FUNCTION, BIOMARKERS, AND STRUCTURE
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(Presented By: Barbara Ercole)

Introduction: Tolerance of the human kidney to clamp ischemia (CI) during partial nephrectomy (PN) has been considered to be limited to 20–30 min. We determined the utility of new biomarkers for following renal injury in this setting.

Material and Methods: 40 patients undergoing open PN without (N=27, avg clamp time 32.3 min, range 15–53 min., 74% > 30 min.) or with cooling (N=13 avg clamp 48 min. range 30–61 min.) had biopsies of uninvolved areas of the kidney preclamp, during clamping and 5 min. after clamp release, along with serial measurements of standard renal functional parameters plus measurement of serum cystatin C and NGAL, and of urine NGAL, cystatin C, NAG, LFABP, NGAL, KIM−1 and IL−18.

Results: Serum creatinine transiently increased at 24 hours by 21.9±6.4% after warm CI and 27.2±7.9% after cold CI (Ps < .001), but serum cystatin C did not change and plasma NGAL was minimally affected. Urine biomarkers increased irrespective of whether they were factored for creatinine, with particularly large changes in KIM−1 and LFABP, but did not correlate with duration of CI, the change in creatinine at 24 hours, or the use of cold or warm CI. Ultrasound structure and staining for actin, phosphotyrosine, B1 integrin, and ICAM−1 showed changes consistent with CI, but much milder than predicted from animal models. Creatinine has remained stable in the patient cohort at up to 18 months of follow−up.

Conclusion: The data indicate that the insult to the clamped kidney from 30−60 minutes of CI under conditions of open partial nephrectomy is well tolerated despite increases of urinary biomarkers, which may in part reflect local effects of the surgery itself, expand indications for PN in the management of renal cancers, and support the use of CI as opposed to more complex procedures for PN.

SEQUENTIAL THERAPY OF CAREFULLY SELECTED PATIENTS WITH IMMUNOTHERAPY FOLLOWED, UPON PROGRESSION, BY TARGETED CANCER THERAPY FOR METASTATIC RCC CAN ACHIEVE OUTSTANDING SURVIVAL: THE UCLA EXPERIENCE
Frederic Birkhaeuser¹, Edward Rampersaud¹, Xiaoyan Wang², Nils Kroeger¹, Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Nazy Zomorodian¹, Joseph Riss¹, Gang Li², Fairooz Kabbinavar¹, Allan Pantuck¹ and Arie Beldegrun¹
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(Presented By: Frederic Birkhaeuser)
**Introduction and Objectives:** The understanding of the molecular pathways involved in renal cell carcinoma (RCC) has yielded a new age of molecule-targeted therapies for the treatment of metastatic RCC (mRCC). We have previously published our extensive experience with immunotherapy (IMT). The aim was to examine and compare survival of patients treated with targeted therapy (TT) agents to our historical experience.

**Methods:** 232 consecutive patients treated with at least one TT regimen for mRCC since 2003 comprised the TT database, which was merged with the existing prospectively collected UCLA Kidney Cancer Program database. Of these, 147 had a cytoreductive nephrectomy followed by an FDA-approved TT agent: 111 (76%) had TT alone, 27 (18%) had first line IMT followed by TT at the time of progression, and 9 (6%) had other combinations with TT. Since 2003, only patients meeting the UCLA Clinical Pathologic Molecular (CPM) criteria for Interleukin-2 were offered upfront immunotherapy. TT patients were compared to similar cohorts treated with IMT alone.

**Results:** Median disease-specific survival (DSS) of patients evaluable for IMT alone (n=299), TT alone (n=109), or IMT followed upon progression by TT (n=26) was 21.4, 30.0, and 63.0 months, respectively (p=0.001). For patients with first-line sunitinib (n=66), median DSS was 27.0 months (p=0.125 compared to IMT alone). DSS from the time of institution of TT until last contact was comparable in both subgroups TT alone (n=104, 26.0 months) and IMT followed by TT (n=23, 23.0 months) (p=0.513).

**Conclusions:** Patients fitting the UCLA CPM criteria treated by IMT followed upon progression by TT can achieve outstanding DSS compared to patients receiving TT or IMT alone. Moreover, TT appears to be as effective in patients who progress after IMT as in patients with first-line TT and thus can be used with equal efficacy to rescue patients who progress after having previous IMT. Carefully selected low and intermediate risk mRCC patients should be strongly considered for upfront IL-2 based immunotherapy while reserving their option of TT upon progression.

**Poster #130**

**DOES CYTOREDUCTIVE NEPHRECTOMY IMPROVE SURVIVAL IN NON-CLEAR CELL RENAL CELL CARCINOMA?**

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(Presented By: Patrick Kenney)

**Introduction:** Non-clear cell histology is associated with poor prognosis among patients undergoing cytoreductive nephrectomy (CN) for metastatic Renal Cell Carcinoma (mRCC). We compare patients with non-clear cell mRCC undergoing CN to patients managed with their primary tumor in situ to determine if CN is associated with improved overall survival (OS).

**Methods:** We reviewed all patients with pathologically-confirmed non-clear cell mRCC at a single institution from 2002–2009 (n = 152). Exclusion criteria were similar to prospective CN studies and included unresectable primary (n = 4), ECOG performance status ≥2 (n=48), thrombus above the hepatic veins (n=1), and other malignancy within 5 years (n = 2). Patients with palliative nephrectomy (n=1), ongoing or unreported trials (n=4), and recurrent disease following local therapy (n=2) were excluded. Univariate Cox proportional hazards regression and Kaplan-Meier were used to estimate OS.
Results: 55 (61%) of the 90 included patients underwent CN. Median follow-up for the CN and non-CN groups was 12.3 and 9.8 months. There were no significant differences between the CN and non-CN groups with regards to median age, gender, ethnicity, or BMI. Serum Cr, albumin, LDH, and hemoglobin were comparable. Median corrected serum calcium was lower among patients undergoing CN (9.5 vs. 9.2 mg/dL, p < 0.01), as was the median number of non-nodal metastatic organ sites (1 vs. 2, p < 0.01). ECOG performance status of 0 was more common among the CN patients (52.7 vs. 8.6%, p < 0.01). Comparing the CN and non-CN groups, histologies included papillary (43.6 vs. 25.7%), chromophobe (9.1 vs. 0%), collecting duct (1.8 vs. 0%), medullary (0 vs. 2.9%), translocation (3.6 vs. 8.6%) and unclassified RCC (41.8 vs. 62.8%). The frequency of sarcomatoid elements was similar (25.5 vs. 14.3%, p = 0.3). While there was no detectable difference in clinical node status, the CN patients were less likely to have clinical T3 or T4 disease (29 vs. 57%, p < 0.01). There was no difference in median OS between the CN and non-CN patients (12.8 vs. 13 months, HR 0.88 [0.53 – 1.46], p 0.62).

Conclusions: Despite several more favorable baseline characteristics among surgical patients, CN was not associated with improved median OS for patients with non-clear cell mRCC in this retrospective, single-institution review. Further efforts are needed to determine which patients with non-clear cell mRCC might benefit from CN.

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Poster #131

FUNCTIONAL RECOVERY AFTER PARTIAL NEPHRECTOMY: EFFECTS OF VOLUME LOSS AND ISCHEMIC INJURY
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(Presented By: Matthew Simmons)

Purpose: This study used a new method to estimate volume loss after partial nephrectomy (PN). The relative contributions of ischemic injury and volume loss on functional outcomes were evaluated.

Materials and Methods: We analyzed 301 consecutive patients with available data to meet inclusion criteria who underwent conventional PN between 2007 and 2010. Percent functional volume preservation (PFVP) was measured at a median of 1.4 years after surgery. MDRD-2 estimated GFR was measured pre- and perioperatively, and at a median of 1.8 years after PN. Statistical analyses were conducted to study associations.

Results: Hypothermia or warm ischemia ≤25 minutes were applied in 75% of cases. Median PFVP was 91% (range: 38–107%). Percent GFR preservation (PGP) at nadir and late time points was 77% and 90% of preoperative GFR, respectively. In multivariate analysis PFVP and warm ischemia time (WIT) associated with nadir GFR (p<0.001), while only PFVP associated with late GFR (p<0.001). Late PGP and PFVP were directly associated (p<0.001). Recovery of function to ≥90% of PFVP–adjusted levels was observed in 86% of patients. In patients with de novo postoperative stage ≥3 CKD, PFVP and Charlson score were associated with late PGP. WIT was not associated with late functional GFR decreases in patients considered high risk for ischemic injury.

Conclusions: In this cohort PFVP, and not ischemia time, was the primary determinant of ultimate renal function after PN. Technical modifications aimed at minimizing volume loss during PN while still achieving negative margins may result in improved functional outcomes.
Introduction and Objective: The primary goal of this project is to compare the survival and renal function outcomes for various types of treatment for renal cell carcinoma (RCC). This study compares open partial nephrectomy (OPN), laparoscopic radical nephrectomy (LN) and cryoablation (CA) in patients 30–90 year old. The secondary end point for this study is to compare complication rates between these cohorts.

Methods: We performed a retrospective review using our RCC database of over 500 patients from 2001–2011. Patients included in the analysis underwent OPN, LN, or CA. 293 patients were identified of which 116, 110 and 67 had OPN, LN, or CA, respectively.

Results: For the OPN, LN, and CA groups overall survival (OS) was 95.7%, 87.3%, and 89.6%, respectively. Cancer specific survival (CSS) was 99.1%, 96.4%, and 100%, respectively. Subset analysis of patients 70 years or older with Kaplan–Meier analysis did not show any statistical difference between the cohorts with regards to OS (p = 0.148) or CSS (p = 0.508). The average follow up was 23 months. Only two patients went on to require hemodialysis (HD). The mean absolute decrease from pre to post–operative glomerular filtration rate (GFR) for OPN, LN and CA were 3.9, 25.2, and 8.8, respectively (p < 0.001). The total number of complications was 24.1%, 16.4%, and 10.5% for the OPN, LN and CA cohorts respectively.

Conclusions: OS and CSS were similar amongst the various types of surgical treatments for RCC, regardless of age. While the OPN cohort experienced the most complications, their renal function outcomes were the most superior.
**Poster #133**

**RENAL FUNCTION AFTER PARTIAL NEPHRECTOMY: IMPACT OF WARM ISCHEMIA RELATIVE TO THE QUANTITY AND QUALITY OF THE PRESERVED KIDNEY**

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(Presented By: R. Houston Thompson)

**Purpose:** The impact of ischemia time on renal function after partial nephrectomy (PN) relative to the quantity and quality of kidney preserved has recently been challenged. We evaluate the effects of warm ischemia time (WIT), preoperative glomerular filtration rate (GFR), and percent kidney preserved on renal functional recovery after PN for a solitary kidney.

**Materials:** Using the Cleveland Clinic and Mayo Clinic databases, we identified 362 consecutive patients with a solitary kidney who underwent PN utilizing warm ischemia with hilar clamping. Multivariable models with multiple imputations were used to evaluate associations with acute renal failure (ARF) and new onset stage IV chronic kidney disease (CKD).

**Results:** Median (range) WIT was 21 (4−55) minutes, median percent kidney preserved was 80 (25−98), and median preoperative GFR was 61 mL/min/1.73m² (11−133). Postoperative ARF occurred in 70 (19%) patients; among the 226 patients with a preoperative GFR >30 mL/min/1.73m², 38 (17%) developed new onset stage IV CKD during follow−up. In multivariable analysis, WIT (p=0.021), percent kidney preserved (p=0.009), and preoperative GFR (p<0.001) were significantly associated with ARF while percent kidney preserved (p<0.001) and preoperative GFR (p<0.001) were significantly associated with new onset stage IV CKD during follow−up. Using our previously published cutoffpoint of 25 minutes, >25 minutes WIT remained significantly associated with new onset stage IV CKD in a multivariable analysis adjusting for percent kidney preserved and preoperative GFR (hazard ratio 2.27, p=0.049).

**Conclusions:** Our results validate that quality and quantity of kidney are the most important features associated with renal function after PN. In the setting of warm ischemia, we also demonstrate that WIT remains an important modifiable feature associated with short and long−term renal function. Precision of surgery, maximizing the amount of preserved, vascularized parenchyma, should be a focus of study for optimizing the PN procedure.

**Poster #134**

**SURVEILLANCE PROTOCOLS FOR LOCALIZED KIDNEY CANCER: A COST COMPARISON**

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(Presented By: Ian Udell)

**Introduction and Objective:** Approximately 58,240 new kidney cancer cases were diagnosed in 2010. Currently no prospectively validated regimen exists for postoperative follow−up in surgically treated patients (pts). The UCLA Integrated Staging System and Campbell’s Urology Guidelines represent two commonly accepted, risk−stratified, post−treatment kidney cancer surveillance protocols. We used Medicare charges to estimate per pt and total cohort direct medical costs to investigate the extent to which variation in intensity of recommended surveillance impacts these.

**Methods:** Medicare charges for each aspect of the surveillance protocols were obtained. Annual per−protocol costs were calculated according to the UCLA and Campbell’s guidelines and extrapolated to overall 5−year cost per pt. Total surveillance cost for a cohort of localized kidney cancer pts diagnosed in one year were obtained using proportions of cases in relevant stage strata reported in the SEER database from 2004−2008.
**Results:** The total cohort of localized kidney cancers diagnosed in 2010 is estimated at 54,198. Following the UCLA guidelines, the average yearly cost per pt is $3,151, $6,302, and $13,528 for low, intermediate, and high risk pts respectively. Five-year costs are $22,981, $32,434, and $56,801 respectively. Total cohort costs at five years would be $1,245,524,388, $1,757,857,932, and $3,078,500,598 respectively. Using Campbell’s guidelines, per-pt costs for localized T1, T2, and T3 tumors are $425, $533, and $4679 at one year and $2,125, $9,891, and $15,103 at five years respectively. Total cohort costs would be $115,170,750, $536,072,418, and $818,552,394 respectively.

**Conclusions:** With heightened economic pressure to provide cost-effective care, the substantial differences in recommended follow-up protocols for localized kidney cancer represent an area of uncertainty with substantial variation in hypothetical costs at the level of individual pts and for the population of kidney cancer survivors. These results motivate critical reevaluation of costs and benefits for different recommendations for surveillance of localized disease.

**DIAGNOSTIC UTILITY OF CONTRAST WASHOUT TO DIFFERENTIATE BENIGN AND MALIGNANT RENAL TUMOR HISTOLOGY ON COMPUTERIZED TOMOGRAPHY**

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(Presented By: Ryan Kopp)

**Introduction and Objectives:** Renal tumor subtypes are distinct biological entities. Diagnostic methods that differentiate tumor types will have an increasing role for targeted therapy. We investigated the use of 4-phase computerized tomography (CT) with intravenous contrast to predict renal tumor histology.

**Methods:** Two-center retrospective cohort study of 163 patients with 4-phase CT for renal masses obtained 10/2002 to 7/2011. Pathology confirmed clear cell (CC–RCC; n=92), papillary (Pa–RCC; n=43), chromophobe (Ch–RCC; n=6), oncocytoma (OC; n=11), or angiomylipoma (AML; n=11) histology. Demographics, history of smoking, hypertension, and diabetes, and preoperative creatinine were recorded. Imaging was interpreted by a radiologist (LA) who recorded tumor size, density measurements in Hounsfield Units (HU), composition, collecting system entry, necrosis, and cystic components. Data were analyzed within subgroups based on histology. Washout was calculated by the formula (Mass Nephrographic HU – Mass Delayed HU)/(Mass Nephrographic HU – Mass Noncontrast HU) and used to calculate sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV).

**Results Obtained:** Significant differences existed in age (p<0.001), sex (P<0.001), history of diabetes (p=0.005), preoperative creatinine (p=0.008). Tumor size was largest among CC–RCC and smallest among AML (p<0.001). Homogeneous composition was more common among Pa–RCC and Ch–RCC (p<0.001). Tumors with washout value <0 were Pa–RCC 96%, and Ch–RCC 4%. Washout value <0 had a specificity of 99.2% for Pa–RCC and 100% for non–CC–RCC. Washout value ≥0 had a sensitivity of 100% for CC–RCC, OC, and AML.

**Conclusions:** Washout value <0 is highly specific for Pa–RCC and non–CC–RCC. Washout value ≥0 is highly sensitive for CC–RCC, OC, and AML. These findings may provide a further tool in clinical decision making regarding initiation of targeted therapy. Additional prospective analysis is warranted.
**Poster #136**

**NATIONWIDE PRACTICE PATTERNS FOR THE MANAGEMENT OF SMALL RENAL MASSES**  
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(Presented By: Glen Yang)

**Purpose:** The diagnosis of small renal masses is increasingly common, and the use of surveillance, ablation, and partial nephrectomy have increased as familiarity with new technology and operative technique becomes more pervasive. We describe the changing national practice patterns in the management of small renal masses, including the use of surveillance and ablative techniques.

**Methods:** All patients in the SEER registry treated for renal masses up to 7 cm in diameter from 1998 through 2008 were included for analysis. Annual trends in the use of surveillance, ablation, partial nephrectomy, and radical nephrectomy were calculated. Multinomial logistic regression was used to determine the association of demographic and clinical characteristics with treatment modality.

**Results:** A total of 48,148 patients from 17 registry sites with a mean age of 63.4 years were included for analysis. Between 1998 and 2008, for masses < 2cm and 2−4 cm, a dramatic increase was observed in the proportion of patients undergoing partial nephrectomy (31% vs. 50%, 16% vs. 33%, respectively) and ablation (1% vs. 11%, 2% vs. 9%, respectively). In multivariable analysis, year of diagnosis, younger age, male gender, and smaller tumor size were associated with increased use of partial versus radical nephrectomy. Older age, smaller tumor size, male gender, and the presence of bilateral masses were associated with increased use of ablation and surveillance versus radical nephrectomy.

**Conclusions:** While partial nephrectomy is now employed in 50% of patients with the smallest renal masses, it is still likely underutilized. Ablation and surveillance are less common overall, but increased usage is observed in men, older patients, and those with small or bilateral tumors.

**Poster #137**

**NATURAL HISTORY OF RENAL FUNCTION IN UNTREATED KIDNEY CANCER**  
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(Presented By: A. Almatar)

**Introduction:** Chronic kidney disease (CKD) is an increasing health problem and we now appreciate its relationships with kidney cancer. Many patients presenting with renal cell carcinoma (RCC) have pre-existing renal impairment and surgical or ablative treatment has been documented to cause further loss of function. However, the natural history of renal function in patients with untreated localized RCC has not been well documented. This would provide a new baseline for measuring the impact of kidney cancer therapy on renal function.

**Objective:** To establish the natural history of renal function in patients who are managed by active surveillance (AS)) for T1a RCC.

**Methods:** 45 patients with localized sporadic biopsy−proven RCC < 4 cm managed by AS were retrospectively identified from May 2003 to September 2010. Patients all had baseline estimated glomerular filtration rate (eGFR)> 60 ml/min/1.73 m2 and normal contralateral kidney function.

eGFR was calculated using the Modification of Diet in Renal Disease (MDRD) equation. The rate of change in eGFR per year was calculated. Kaplan−Meier analysis was used to estimate the percentage of freedom from CKD stage 3 at follow−up.

**Results:** Median follow up was 26(IQR12−43) months. Median age was 69.5(62−77) years. The median baseline eGFR was 81(73−95) ml/min/1.73 m2. 12 (27%) patients had an eGFR ≥ 90 (CKD stage 1) and 33 (73%) patients had an eGFR between 60 and 89 (CKD stage 2). 8 patients (17.8%) developed CKD stage 3 by the end of follow−up. The median rate of change of eGFR was −1.75 (−2.2−10) ml/min/1.73m2 per year. The 3 year freedom from eGFR < 60 ml/min/1.73m2 in this cohort of patients is 80%. In the group of patients ≥ 65 years old (29 out of 45 or 64%), 6 out of 29 patients (20.6%) had CKD stage 3 at the end of follow−up with a 75% 3−year freedom from eGFR < 60 ml/min/1.73m2.

**Conclusion:** This is the first study, to our knowledge, to report the natural history of renal function in a cohort of biopsy−proven RCC patients undergoing AS. RCC patients may be at a higher risk for the development of renal dysfunction. The rate established in this study can be used in the future to compare with the rate of eGFR decline in patients who have undergone surgical or ablative treatment for RCC, and to assess the actual impact of these treatments on renal function.
Poster #138

SAFETY AND TOLERABILITY OF THE NOVEL POSITRON EMISSION TOMOGRAPHY (PET) MOLECULAR IMAGING TRACER 124I-GIREN'TUXIMAB IN THE DIAGNOSIS OF CLEAR CELL RENAL CELL CARCINOMA (ccRCC)

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(Presented By: Robert Uzzo)

Introduction & Objectives: Histopathology is the definitive method for identifying ccRCC. Existing imaging modalities (e.g., computed tomography [CT], PET/CT) are not optimal for detection of ccRCC before surgical resection. Currently, 18F-FDG-PET/CT has few safety issues, but its low uptake in small tumors, poor imaging of slow-growing tumors, and false-negative results limit its use as a presurgical renal tumor diagnostic agent. 124I may be preferable to 18F in the development of antibody-linked PET isotopes because of a longer t1/2 (4.2 d), which allows for maximal vascular clearance of the labeled antibody. The chimeric antibody cG250 (124I-girentuximab), a carbonic anhydrase-avid marker upregulated in >95% of ccRCC, successfully utilizes 124I for presurgical characterization and diagnostic management aid in patients with renal masses. 124I-cG250’s medical benefit and its safety profile are presented.

Methods: Ph 1–2 (Divgi CR et al. Lancet Oncol. 2007) and ph 3 REDECT study (Uzzo et al., AUA 2010) data were used to assess the safety profile (n=26 & n=226). Patients with renal masses scheduled for surgical resection received a 15–20 min 124I-cG250 infusion (5 mCi/10mL); PET/CT occurred ≤7 d.

Results: 124I-cG250 was well tolerated for diagnostic identification of ccRCC, with no evidence of clinically-significant toxicity in either trial. Treatment-related adverse events (TRAEs) occurred in 13.3% (30/226) of patients in REDECT (most common: headache [4.4%]; nausea [1.3%]); no TRAEs occurred in ph 1–2. One serious TRAE (hepatic enzyme increase) was reported in REDECT in a patient recently started on ciprofloxacin while 3 patients discontinued REDECT because of AEs unrelated to 124I-cG250. Human antichimeric antibodies (HACAs) were observed in 28% (56/198) of evaluable REDECT patients, with no difference in the frequency/severity of AEs vs those without HACA. Product performance was robust with sensitivity/specificity of 94%/100% and 86%/86% for ph 1–2 and ph 3 trials, respectively.

Conclusions: Radiolabeled cG250 has demonstrated a favorable safety profile in diagnosis of ccRCC, with the imaging flexibility & convenience, resolution and tolerability of the 124I isotope. Completed clinical trials have shown that presurgical detection of ccRCC using 124I-girentuximab-PET/CT is a well tolerated and accurate diagnostic technique to distinguish and characterize ccRCC from indolent malignant or benign renal tumors.

Funding: Wilex AG/IBA Molecular

Poster #139

PROGNOSTIC ROLE OF LYMPHOVASCULAR INVADEN IN CLEAR CELL RENAL CELL CARCINOMA

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(Presented By: Michael Belsante)

Introduction and Objectives: Lymphovascular invasion (LVI) has been proven to be a predictor of clinical outcomes in multiple cancers, but its role in clear cell renal cell carcinoma (ccRCC) has yet to be elucidated. We sought to establish a relationship between LVI and aggressive pathological features of ccRCC as well as clinical outcomes.

Methods: Pathology slides were reviewed by a single pathologist and retrospective chart review was performed on partial and radical nephrectomy specimens performed in 1997–2010. Relationships between LVI and aggressive pathological features and clinical outcomes of ccRCC patients were evaluated.
Results: The study included 470 patients. All metastatic and node positive cases were excluded leaving 409 cases of ccRCC. Patients were 59% male, 81% stage pT1−2, and 69% Fuhrman grade 1 or 2. LVI was seen in 53 cases(13%) and was associated with aggressive pathological features including high grade (Fuhrman grade 3−4), stage (pT3−4), sarcomatoid differentiation, tumor necrosis, extraparenchymal extension, positive margins, adrenal involvement, and venous thrombus (p≤.002 for all). Presence of LVI was associated with shorter disease free survival (DFS) (p<.001) and cancer specific survival (CSS) (p=.003) on Kaplan–Meier analysis (see Figures 1−2). 5−year CSS and DFS were 97% and 89% for patients with no LVI and 82% and 72% for patients with LVI, respectively. Presence of more than one adverse pathological feature [advanced stage (pT3−4), grade (Fuhrman grade 3−4) or LVI] was an independent predictor of both CSS (HR 11.4 and p=.009) and DFS (HR 5.2 and p=.02) on multivariate analyses.

Conclusions: In our study the presence of LVI appears to be predictive of aggressive pathological behavior and may be used in conjunction with stage and grade as a predictor of poor oncologic outcomes in patients with node−negative, non−metastatic ccRCC. Further study should include LVI among prognostic indicators in this patient population.

Poster #140

SYSTEMATIC CLASSIFICATION AND PREDICTION OF POSTOPERATIVE COMPLICATIONS FOLLOWING NEPHRECTOMY IN PATIENTS WITH METASTATIC RENAL CANCER
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(Presented By: Jonathan Silberstein)

Aim: To evaluate and identify predictive factors for postoperative morbidity following nephrectomy in patients with metastatic renal cell carcinoma (mRCC).

Methods: We identified patients with mRCC who received nephrectomy between 1989–2009. Postoperative complications were characterized using a modified Clavien classification. Patient and disease characteristics, including a previously validated Memorial Sloan Kettering Cancer Center (MSKCC) risk stratification system utilizing calcium, hemoglobin, lactate dehydrogenase, and Karnofsky performance status (KPS), were evaluated as predictors of postoperative complications using univariate and multivariable logistic regression models.
Results: Over the study period, 195 patients with mRCC received nephrectomy, 53 (27%) developed grade ≥2 complications within 8 weeks of surgery. Pulmonary, thromboembolic events and anemia requiring transfusion were the most common types of complications following nephrectomy in the metastatic setting. In univariate analysis, age, low albumin, low KPS, high corrected serum calcium, low serum hemoglobin, and unfavorable MSKCC risk score were predictive of complications. Patients who sustained postoperative complications were less likely to receive systemic therapy within 56 days (OR 0.32; 95% CI 0.12, 0.86; p=0.024). A multivariable model containing KPS (OR 14.5; 95%CI 4.34, 48.6; p<0.0005) and age (OR 1.04; 95%CI 1.01, 1.08; p=0.014) demonstrated the greatest predictive accuracy (corrected AUC 0.72; 95%CI 0.63, 0.80) for postoperative complications.

Conclusions: Postoperative complications after radical nephrectomy in the setting of mRCC are common and occur frequently in older patients and those with worse KPS. These complications are important because they may delay or deny receipt of subsequent systemic therapy.

Poster #141

REGIONALIZATION OF RENAL SURGERY: IMPACT OF HOSPITAL VOLUME ON UTILIZATION OF PARTIAL NEPHRECTOMY
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(Presented By: Marc Smaldone)

Introduction and Objectives: In an effort the reduce the risk of chronic kidney disease and it’s attendant cardiovascular and mortality risks, the AUA guidelines recommend nephron sparing surgery for all localized lesions amenable to partial nephrectomy. The purpose of this study was to investigate trends in regionalization of care for surgical management of renal cell carcinoma (RCC).

Methods: Using 1996 to 2009 hospital discharge data from NY, NJ, and PA, patients undergoing surgery for RCC were identified using ICD−9 coding. We assigned hospital volume status by quintiles based on relative proportions of renal procedures (radical nephrectomy, partial nephrectomy, ablation) performed on a per hospital basis in 1996; very low volume hospital: 0−6 (VLVH), low: 7−12 (LVH), moderate: 13−20 (MVH), high: 21−46 (HVH) and very high: ≥47 (VHVH). Procedure performance by hospital volume status was assessed over time using regression models and patient characteristics were compared between groups.

Results: Of 57,886 patients identified, there was a significant shift towards regionalization for total renal procedures to VHVH’s (18 to 48%, p<0.001) from 1996 to 2009. Patients treated at a VHVH were less likely to be older (ages 65−74 (OR 0.89 [CI 0.82−0.96]); 75−84 (OR 0.89 [CI 0.84−0.96]), have Medicaid (OR 0.68 [0.50−0.91]), Medicare (OR 0.88 [0.82−0.94]), or be uninsured (OR 0.39 [CI 0.30−0.51]). Over the duration of the study period, partial nephrectomy treatment increased from 8.3% (1996) to 35.4% (2009). Controlling for year treated and number of procedures performed, use of radical nephrectomy significantly decreased across volume strata compared to VLVH (all p values <0.001), while trends in use of ablation were less affected by volume status. A significant trend towards increased utilization of partial nephrectomy was observed with increasing volume status; LVH (OR 1.3 [CI 1.1−1.6]), MVH (OR 1.7 [CI 1.5−1.9]), HVH (OR 2.2 [CI 1.9−2.5]), VHVH (OR 4.3 [CI 4.0−4.6]).

Conclusions: While increasing overall, performance of partial nephrectomy has shifted to higher volume hospitals from 1996 to 2009. Inequities in access to optimal care exist and must be addressed in future studies.
**Poster #142**

AFFECT OF ACUTE KIDNEY INJURY ON LONG TERM RENAL FUNCTION ON PATIENTS UNDERGOING SURGEON CONTROLLED ROBOTIC PARTIAL NEPHRECTOMY

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(Presented By: L. Spencer Krane)

**Introduction:** The association between short term changes in renal function immediately following surgeon controlled robotic partial nephrectomy (RPN) have not been linked to long term functional outcomes. The purpose of this study is to evaluate what perioperative parameters, including acute kidney injury (AKI), following RPN predict changes in long term renal function.

**Materials and Methods:** Analyzing a prospectively maintained institutional review board approved database of 151 patients who underwent RPN by a single surgeon between March 2008 and June 2011 we identified 77 who had serum creatinine measurements greater than 3 months following discharge. AKI was defined as >25% decrease in MDRD calculated GFR at the time of discharge from the RIFLE definition. Median follow up was months (Range 3 – 36).

**Results:** 21 of 77 patients (27%) had AKI based on greater than 25% decrease in calculated GFR at the time of discharge (Median 31%, range 25−44%). Patient with AKI had a median 14% decrease (range 13% increase to 46% decrease) in estimated GFR as compared to those patients without AKI (median 4% decrease, range 50% increase to 64% decrease, p=0.01). On multivariate analysis including warm ischemia time, EBL, tumor size, and clamping technique, preoperative GFR and % change in GFR at discharge had the strongest association with change in long term GFR (p=0.0096 and 0.0207 respectively).

**Conclusions:** Change in GFR at the time of discharge predicts worse renal function at three months. Patients who have AKI may require more frequent monitoring of renal function postoperatively to ensure maintenance of GFR.

**Poster #143**

CONTEMPORARY EXPERIENCE OF INTERLEUKIN-2 TREATMENT IN ADVANCED RENAL CELL CARCINOMA

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(Presented By: Andrew Windsperger)

**Introduction:** Advanced renal cell carcinoma (aRCC) has historically been considered a chemotherapy— and radiotherapy—resistant malignancy. High dose Interleukin−2 (IL−2) has been the only therapy to produce durable complete responses in a small percentage of aRCC patients. We review our experience of high dose IL−2 treatment in patients with aRCC, and examine predictors of response to therapy.

**Methods:** A retrospective review of patients undergoing treatment with IL−2 from January 2003 to January 2010 for aRCC was performed. Age, number of treatment doses, metastatic organ sites, number of metastatic organ sites, histology, treatment responses, performance status, time to progression, and overall survival were evaluated. Responses were classified as complete response, partial response, stable disease, or progression.

**Results:** A total of 60 patients underwent treatment with IL−2 for aRCC between January 2003 and January 2010. Mean age was 52 years and performance status was 0 in 56 and 1 in 4 patients. Mean IL−2 courses administered were 1.5 with a mean of 14 doses per course. All patients but one had undergone prior nephrectomy. Over 48 months of median follow−up time, 9 out of the 60 (15%) patients had a complete response out of which 2 were partial responders that converted to complete responses after surgical resection of metastatic sites. Nine out of 60 (15%) had a partial response. Although metastatic disease in the lung was not significant amongst the groups, responders had a significantly smaller number of metastatic organ sites compared to non−responders (p=0.02). The number of doses administered was a predictor of response when comparing all responders to non−responders (p<0.05), although it was not significant when comparing complete and partial responders. Mixed, non−clear cell, or sarcomatoid histology were negative predictors of response. Median time to progression was 7 weeks and 32 weeks in the progression and partial responders respectively. Overall survival was 86%, 50%, and 27% in the complete response, partial response, and stable/progression groups respectively.

**Conclusion:** Our series shows a 15% complete response and 15% partial response rate. Responders had smaller number of metastatic organ sites and higher number of doses administered. IL−2 continues to be a viable treatment option in aRCC for young patients who have good performance status and limited number of metastatic organ sites.
COMPARISON OF PARTIAL AND RADICAL NEPHRECTOMY IN STAGE II OR GREATER RENAL TUMORS
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(Presented By: Ryan Kopp)

Objectives: Partial nephrectomy (PN) has emerged as a preferred treatment option for stage cT1 renal masses, comparing favorably with radical nephrectomy (RN) from the standpoint of oncologic efficacy and conferring superior renal functional preservation. Further data is needed to show equivalence of PN to RN for higher stage tumors. We compared outcomes of patients who underwent PN and RN for stage II or higher tumors.

Methods: Retrospective review of 105 patients (61 RN/44 PN, mean age 55 years, median follow-up 21.5 months) who underwent RN or PN for stage ≥cT2 or ≥pT2 renal tumors at two institutions from 3/2003 to 5/2010. Patient and disease characteristics, RENAL nephrometry score, renal function, and oncologic outcomes were recorded and analyzed within subgroups based on treatment. Kaplan–Meier analysis compared development of metastases, disease specific (DSS) and overall survival (OS).

Results Obtained: Patient characteristics, including preoperative eGFR, were similar except for hypertension (RN 49% vs. PN 73%, p=0.017). Mean tumor size (cm) was larger (p<0.001) in RN (10.3) vs. PN (7.3). Mean nephrometry sum was higher (p<0.001) in RN (10.7) vs. PN (9.5). PN had 6 (13%) urine leaks. De novo GFR<60 was significantly greater in the RN cohort (32% vs. 10%, p=0.023). AJCC stage distribution between RN (II 30%, III 26%, IV 44%) and PN (II 43%, III 46%, IV 11%) groups was significant (p=0.002). Survival curves demonstrated OS was less for RN (p<0.001), but not within stage III (p=0.440). DSS was less for RN (p<0.001) except in stage III (p=0.259).

Conclusions: Patients undergoing PN for higher stage tumors may have equivalent oncologic benefits and superior renal functional outcomes compared to RN for >Stage I RCC. Larger populations with further follow-up are needed to investigate effects on renal function and overall survival. PN may be an effective treatment for select patients with advanced RCC.

LAPAROENDOSCOPIC SINGLE-SITE PARTIAL NEPHRECTOMY: PATHOLOGIC, SHORT-TERM ONCOLOGIC, AND RENAL FUNCTIONAL OUTCOMES
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(Presented By: Soroush Rais-Bahrami)

Objectives: We aim to present our experience of transumbilical LESS partial nephrectomy (LESSPN) with perioperative, short-term onco logic, and renal functional outcomes.

Methods: Perioperative data was collected on LESSPN cases performed between July 2008 and August 2011. A total of 15 LESSPNs were performed in 14 patients. One patient had LESSPN performed 3 months apart on contralateral kidneys for treatment of bilateral renal masses. All patients underwent transumbilical LESS using either one 12mm and two 5mm trocars or a single GelPoint device through which a 5mm flexible-tip laparoscope and a combination of flexible and conventional laparoscopic instruments were used. The 12mm trocar allowed for bulldog clamp placement for hilar−control, used in 9 cases. The remaining 6 cases were done without clamping hilar vessels. One case required insertion of an additional trocar remote from the single−site access.

Results: Of the 14 patients (57% male), undergoing 15 distinct LESSPN, the mean age was 57.9±8.7yrs with a mean ASA score of 2.1±0.7. The mean tumor size resected was 2.4±0.8cm (range 1.2−4.0): 8 clear cell renal cell carcinoma (RCC), 1 papillary type I RCC, 2 papillary type II RCC, 1 chromophobe RCC, 2 angiomyelolipomas, and 1 metanephric adenoma on final pathology, all with negative margins. The mean operative time was 169±47min with a warm ischemia time of 14.7±13.4minutes. The mean estimated blood loss in this series was 293±325mL (median 200mL), largely skewed by a single off−clamp case with a blood loss of 1300mL. No cases required intraoperative or postoperative blood transfusions. The mean length of hospitalization was 2.7±0.8days and mean analgesic requirement in morphine equivalents was 21.7±11.6mg. There was a notable downtrending of the patient reported visual analog pain scale (0−10) rating with each progressive postoperative day (line of best fit: y=−1.12x+6.05). Surveillance axial radiologic imaging, available for 14 cases, demonstrated no recurrence at a mean followup of 12.2±7.2mo (6−25). Change in serum creatinine at a mean followup of 10.9±7.4mo (1−27) was negligible (<0.1 mg/dL).
Conclusions: LESSPN is an efficacious operation, providing complete oncologic resection, excellent short-term oncologic outcomes, and renal functional outcomes comparable to reported series of conventional laparoscopy. Also, the LESS technique did not preclude employment of the off-clamp approach for optimal renal function preservation.

Poster #146

URINARY AND SERUM NEUTROPHIL GELATINASE ASSOCIATED LIPOCALIN (NGAL) LEVELS IN RESPONSE TO RENAL ISCHEMIA IN A NOVEL PILOT PORCINE MODEL
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(Presented By: Jonathan Silberstein)

Aim: To develop a novel porcine model of study acute kidney injury (AKI) and determine the utility of urinary and plasma NGAL to measure AKI.

Methods: Laparoscopic bilateral cutaneous ureterostomies were created in female Yorkshire pigs followed by variable times of left renal hilar clamping (0, 15, 30 or 60 minutes); the right side served as internal control. Animals were survived for a minimum 48 hours. Urine was selectively collected and analyzed from each renal unit (RU) for volume and concentration of creatinine (uCr) and NGAL (uNGAL). uNGAL was measured using ELISA assay (Bioporto Diagnostics, Salem, NH). Serum was collected daily, and analyzed for NGAL (sNGAL) and creatinine (sCr). At necropsy, renal procurement was performed for histopathologic evaluation.

Results: Surgical intervention was performed on 12 swine; 1 experienced a bowel injury and was euthanized, eleven completed the planned surgical intervention. Of these, one had severe signs of sepsis; another had evidence of complete right ureteral obstruction at necropsy, leaving 9 animals in the final analysis.

Urine production was reduced in ischemic RU compared to controls (ischemic RU =223cc vs control=838cc @ 24 hrs, p= 0.04) and accompanied by increases in urine output from the nonischemic contralateral RU (ischemic RU 1285cc vs control=578 cc @ 24hrs, p=.14). uNGAL production increased to greater levels in RU exposed to ischemia than either controls or nonischemic contralateral RU (figure 1) (uNGAL Ischemic RU= 1022ng/mL vs nonischemic unit = 38 ng/mL @ 24hrs, p=0.14). The peak increase in NGAL corresponded with longer ischemic times, while the time to peak was inversely related to the amount of ischemia. uNGAL measurements normalized to uCr (normalized uNGAL) demonstrated similar rises compared with controls but in an earlier time frame (<10 hours). uNGAL was more strongly associated with AKI than was sNGAL.

Conclusions: In this novel pilot porcine model utilizing selective urine sampling we have observed that induction of unilateral renal ischemia corresponds with acute physiologic changes in the contralateral RU. Additionally induced AKI is associated with increases in uNGAL concentration that are specific to the RU exposed to ischemia.

![NGAL Left Kidney](image)
**Poster #147**

**COMPLICATIONS IN SURGEON CONTROLLED ROBOTIC PARTIAL NEPHRECTOMY: INITIAL 175 CASES FROM A SINGLE SURGEON**

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(Presented By: L. Spencer Krane)

**Introduction:** Surgeon controlled robotic partial nephrectomy (RPN) has become an increasingly popular management option for patients with small renal masses. As this technology has disseminated from the academic centers to other institutions, the expected complications and management of these should be described.

**Materials and Methods:** We queried a prospectively maintained institutional review board approved database 175 patients who underwent RPN by a single surgeon between March 2008 and June 2011 to identify all patients who deviated from routine postoperative course (Discharge post op day two from surgical floor) within 30 days of surgery. Complications were graded according to the Clavien classification and divided into either surgically related or medical complications.

**Results:** Overall, 39 (23%) of patients had any deviation from defined postoperative pathway and there were 36 with at least one Clavien complication. The majority of these were minor Clavien complications (26 Clavien I/II) and none had any significant sequelae. 6 (4%) major medical complications occurred, all of which required ICU monitoring and were mostly cardiac related (4). All of these patients had significant cardiac comorbidities. 7 (5%) were major surgical complications which required bladder clot evacuation (2), angioembolization of bleeding renal vessel (2), percutaneous drain placement (2), thoracostomy placement (1). A total of seven (7) patients required conversion to either open partial (5) or robotic radical (2) nephrectomy.

**Conclusions:** RPN can be performed safely in patients with renal masses. Medical comorbidities place patients at risk for increased non-surgical complications. While some major complications do occur, most complications occurring from this procedure are minor and do not have long-term adverse patient consequences.

**Poster #148**

**A PILOT STUDY ON THE ASSESSMENT OF CIRCULATING TUMOR CELLS AND CIRCULATING ENDOTHELIAL CELLS IN RENAL CELL CARCINOMA**

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(Presented By: Andrew Windsperger)

**Objective:** Circulating tumor cells (CTC) and circulating endothelial cells (CEC) are found in the peripheral blood of most common malignancies and are promising surrogate biomarkers. Evolving data demonstrates a potential role of CTCs as an assessment for treatment response in several malignancies, but data is limited in regard to renal cell carcinoma (RCC). We sought to obtain preliminary data to correlate CTC and CEC levels in patients with RCC with response to treatment with antiangiogenic agents.

**Methods:** After IRB approval, 20 patients were enrolled between 7/2010 and 11/2010. Inclusion criteria included any patient with radiologic or histologic evidence of metastatic or locally advanced RCC who was scheduled to receive sunitinib, sorafenib, temsorlimus, or bevacisumab. Patients undergoing nephrectomy prior to treatment were sampled within one week of surgery, within one week of systemic treatment, and at the first planned radiologic assessment of response after two treatment cycles; all other patients had CTC/CEC’s collected at baseline (at time of first radiologic assessment). Patient characteristics, prior treatment history, clinical response and survival data were obtained to correlate with CTC/CEC levels.

**Results:** There were 15 male patients and 5 female patients enrolled in the study with a median age of 61.5 years. Baseline performance status was 0 in six patients, 1 in 12 patients, and 2 in two patients. In the study, 18 of 20 patients had undergone prior nephrectomy. Review of histology found 12 patients with clear cell carcinoma, 2 with papillary RCC, 4 with mixed tumor (clear cell with sarcomatoid, rhabdoid, eosinophilic variant, and papillary features), 1 collecting duct carcinoma, and 1 undifferentiated histology. There were 12 patients with progression of disease (no response), 8 with a partial response, and 2 with mixed response (some progression and some response). Two patients died shortly following the second CEC level. Univariate analysis found a positive correlation between CEC level and progression in four patients, and negatively correlated with response in two patients, while CTC levels positively correlated with progression in one patient.
Conclusion: In this preliminary analysis, CTC and CEC levels appear to correlate with response to treatment for advanced RCC. Additional studies are ongoing to confirm these preliminary findings and predict which patients should receive a specific therapy.

Poster #149

A PROGNOSTIC MODEL FOR SURVIVAL FOLLOWING CYTOREDUCITIVE NEPHRECTOMY FOR METASTATIC RENAL CELL CARCINOMA
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(Presented By: Samuel D. Kaffenberger)

Introduction: Cytoreductive nephrectomy (CN) for metastatic renal cell carcinoma (mRCC) has been shown to improve survival in select patients. While a number of pre−treatment prognostic criteria have been identified in patients with mRCC, little data exist on predictors of mortality following CN. We therefore sought to evaluate potential prognostic markers in these patients.

Methods: We evaluated 88 consecutive patients with complete laboratory data who underwent CN for mRCC. Clinical features selected for inclusion in the analysis were based upon the Memorial Sloan Kettering pre−treatment prognostic models with an emphasis on serum markers. These included post−operative lactate dehydrogenase (LDH), corrected serum calcium, white blood cell count (WBC), and hematocrit, as well as the Stage, Size, Grade, Necrosis (SSIGN) score, a validated post−nephrectomy predictive tool. Use of targeted therapy was also included in the model to account for variation in treatment after CN. Performance status was not included due to the overall favorable condition of patients selected for CN. Labs were drawn approximately 6−8 weeks following CN and before initiation of targeted therapy. The primary endpoint was overall survival, and multivariable analysis was performed using a Cox proportional hazards model. Harrell’s c−index was calculated as a measure of the predictive discrimination of the model.

Results: Median follow up of the entire cohort was 19.1 months (interquartile range (IQR) 1.9−82.8 months). 62 of the 88 patients were dead at time of last censor and median follow up of the survivors was 42 months (IQR 16.8−68.3 months). Results of the multivariable analysis are shown in the Table and demonstrate that anemia, elevated LDH, elevated WBC, and increasing SSIGN score are all independently associated with increased mortality in these individuals after CN. The C index for the model was 0.75.

Conclusions: We have identified several post−operative serologic markers that independently predict mortality after CN. Abnormalities in these serum markers may reflect a persistent paraneoplastic process, and our data suggest a potential role for these serologic tests in clinical decision−making and risk stratification post−CN.

| Table: Multivariable Cox proportional hazards regression for overall survival |
|-----------------|-----------|-----------|
|                  | HR       | CI        | p value |
| Post-operative elevated WBC | 3.77     | 1.43-9.97 | 0.007     |
| Post-operative anemia    | 2.16     | 1.13-4.17 | 0.021     |
| Post-operative elevated LDH | 2.28     | 1.17-4.45 | 0.015     |
| Post-operative hypercalcemia | 0.71     | 0.28-1.79 | 0.472     |
| SSIGN score             | 1.19     | 1.08-1.32 | 0.001     |
| Targeted Therapy        | 0.37     | 0.21-0.67 | 0.001     |
Poster #150

ADVERSE PATIENT SAFETY EVENTS: A COMPARISON OF LAPAROSCOPIC AND OPEN PARTIAL NEPHRECTOMY FROM 1998-2008
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(Presented By: Sean Stroup)

Objective: Associations of the diffusion of laparoscopic partial nephrectomy with patient safety remain uncharacterized. We compared the frequency of adverse patient safety events occurring in laparoscopic versus open partial nephrectomy over a 10−year period.

Methods: We utilized the Nationwide Inpatient Sample (NIS), a 20% sample of inpatient discharges in the U.S., from 1998 to 2008. All raw data was weighted to produce national estimates. We identified discharges with a principal diagnosis of kidney surgery by ICD−9CM codes. The primary outcome was occurrence of any Patient Safety Indicator (PSIs)—validated measures developed by the Agency for Healthcare Research and Quality to describe adverse outcomes related to patient safety. We used multivariate logistic regression to compare PSIs occurring in laparoscopic and open partial nephrectomy.

Results: The prevalence of both open and laparoscopic partial nephrectomy increased steadily during the study period (Figure 1). Compared to open, patients undergoing laparoscopic partial nephrectomy had lower Charlson Index morbidity scores (p < 0.001) and were more likely to undergo surgery at urban (p < .001) and teaching (p < 0.001) hospitals. Among the 60,149 open partial nephrectomies and 5,659 laparoscopic partial nephrectomies performed, PSIs occurred in 3,810 (6.3%) and 255 (4.5%) (p = 0.016) cases, respectively. On multivariate analysis, there were no significant differences in the probability of at least one PSI between open and laparoscopic partial nephrectomy [Odds Ratio (OR) 0.768, 95%CI 0.571−1.032, p<0.08)]. The probability of any PSI was 39% higher for Charlson ≥ 3 compared to < 3 (OR 1.39, 95% CI 1.2 to 1.6, p < 0.001).

Conclusions: Laparoscopic and open partial nephrectomy demonstrated similar risks of adverse patient safety events as defined by PSIs. These data suggest that, as it has diffused into clinical practice, laparoscopy has remained a relatively safe technique for performing partial nephrectomy.

Poster #151

R.E.N.A.L NEPHROMETRY AND NUMBER OF CRYOPROBES PREDICT COMPLICATIONS OF IMAGE-GUIDED PERCUTANEOUS RENAL CRYOABLATION.
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(Presented By: Michael L. Blute, Jr.)

Purpose: The R.E.N.A.L nephrometry score is a validated scoring system to classify the complexity of renal masses treated by partial nephrectomy. We aimed to evaluate the predictive value of the scoring system in patients undergoing image−guided percutaneous cryoablation (PCA) of renal masses.

Materials and Methods: The study included 139 patients with available preoperative CT or MRI images that underwent PCA were included in this study. All images were reviewed by a Urology resident. The primary endpoint variable was perioperative complications. R.E.N.A.L. scores were categorized into low (4−6), moderate (7−9), and high (10−12). Logistic regressions were conducted to determine which parameters were associated with complications. Additional variables collected included age at surgery, ASA score, lesion size, skin−to−tumor distance, skin−to−hilum distance, and number of treatment cryoprobes.

Results: Patient characteristics and operative data are listed in table 1. Overall, there were 16 (11.5%) patients with post−procedural complications. Complications included [list the most common complications here]. Median number of probes used was 2.1 (range 1–8). The model that best predicted complications included the number of probes used (χ²=9.38, p=0.002) and R.E.N.A.L. score (χ²=4.96, p=0.03). For each additional probe used, patients were twice as likely to have complications (OR=1.98, 95%CI 1.28−3.05). With each unit increase in R.E.N.A.L. scores, patients were 1.5 times more likely to experience a complication (OR=1.49, 95%CI 1.05−2.11).
Conclusions: Our results suggest that, an increase in both R.E.N.A.L Nephrometry score and number of probes used are associated with an increased risk of PCA post procedural complications. Nephrometry score assessment may be helpful in decision for treatment choice in the management of renal masses.

Poster #152

CYTOREDUCTIVE RADICAL NEPHRECTOMY (CRN) AND LEVEL II-IV INFERIOR VENA CAVA (IVC) THROMBECTOMY FOR METASTATIC RENAL CELL CARCINOMA (MRCC)
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(Presented By: Karin Westesson)

Introduction and Objectives: cRN for mRCC is associated with some improvement in survival when combined with cytokine therapy in patients with good performance status. Select patients with mRCC may have adverse local features such as level II–IV IVC thrombus that render cRN a technically challenging endeavor with increased risks of perioperative morbidity and mortality. Thus, the outcome of these patients relative to the overall cRN population is poorly defined.

Methods: Between 1990–2011, 56 patients with mRCC and level II (N =19), III (N =25) or IV (N =12) IVC thrombus underwent cRN and IVC thrombectomy at our institution.

Results: The age range of patients was 23 to 84 years old and 36 (64%) were male. Clinical information and follow–up data were obtained from an institutional retrospective data base. Site of metastasis were: lung, 22 (39%); liver 3 (5%); mediastinum 3 (5%); multiple sites 17 (30%). Clinical stage was T3a in 2 (3.6%), T3b in 38 (68%), T3c in 12 (21%), and T4 in 4 (7%). Twenty (36%) patients were clinical N1. Median tumor size was 10.2 cm (range, 1.4–21). Histologic classification was clear cell in 40 (71%), papillary in 4 (7%), and unclassified in 12 (21%). Five patients (9%) received neoadjuvant systemic therapy. Median ICU stay was 1 day and median hospital LOS was 7 days. Intraoperatively, 2 patients had splenectomies and 2 patients had embolization of thrombus. Clavien grade 3−5 complications occurred in 3 (5%) patients, of which two (3.6%) were fatal. Follow–up information was available for 49 patients and the median follow–up was 13 months (IQR: 6–33). Of these patients, 31 (63%) received postoperative systemic therapy with cytokines (14), targeted agents (16), or both (1). The overall median survival was 13 months (95% CI: 10–16), and was similar before (median 12 months) and after (median 13 months) the introduction of targeted therapy.

Conclusions: Among patients with mRCC with level II–IV IVC thrombus managed at a high–volume kidney center, cRN and IVC thrombectomy is associated with acceptable perioperative morbidity and mortality. The median survival of patients in our cohort is similar to the overall population of patients managed with cRN and cytokine therapy though less than those managed with cRN and targeted therapy based on data from published randomized trials. Patients with mRCC and level II–IV IVC thrombus may be considered for cRN provided that surgeons with experience with this procedure are available.
**DOES TUMOR SIZE AT PRESENTATION PREDICT RATES OF DISTANT DISEASE IN PATIENTS WITH ADRENOCORTICAL CARCINOMA?**

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(Presented By: Daniel Canter)

**Introduction and Objectives:** Current recommendations for adrenalectomy in metabolically inactive incidental adrenal lesions pivot on adrenal tumor size given that larger adrenal lesions are more likely to prove to be adrenocortical carcinoma (ACC) upon resection. In this study using a large administrative dataset, we assessed the impact of tumor size at presentation in patients with ACC on rates of metastatic disease.

**Methods:** We queried the National Cancer Database (NCDB) to assemble a cohort diagnosed with localized or regional/distant ACC based on SEER staging from 1985 to 2000 (n=2,251). Patients were stratified into three groups based on primary tumor size: < 4 cm, 4−6 cm, and > 6 cm, and rates of metastatic disease were then determined. A multivariable logistic regression model was then constructed to predict for local versus regional/distant disease.

**Results:** 1,721 patients with ACC had available staging information. Among patients with primary tumor sizes < 4 cm, 4−6 cm, and > 6 cm tumors, the rates of metastatic disease at presentation were similar: 50.6%, 45.2%, and 53.6% (p=0.09). Further stratification of the group with an initial primary tumor size > 6 cm reveals a statistically significant trend for increasing rates of metastatic disease at presentation once tumor size is > 12 cm (p<0.001). In a multivariable logistic regression model to predict the occurrence of local versus regional/distant ACC, only tumor size was found to be significant (p=0.01), with tumor size > 12 cm having increased odds of non-localized disease.

**Conclusions:** Approximately 50% of patients with adrenocortical carcinoma present with non-localized disease. Rates of localized versus regional/distant disease do not strongly relate to adrenal tumor size for tumors <12 cm. As such, these data should be considered when formulating recommendations for resection in patients with adrenal incidentalomas.

**Funding:** None

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**LEVEL 1 EVIDENCE IN UROLOGIC ONCOLOGY: A SYSTEMATIC REVIEW OF SURGICALLY RELEVANT POSITIVE RANDOMIZED CONTROLLED TRIALS (RCT)**

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(Presented By: Anthony Corcoran)

**Objective:** RCTs provide the highest level of scientific evidence upon which to base objective treatment recommendations and further study. Here we perform a systematic review of surgically relevant positive RCTs for the treatment of localized genitourinary cancers over the last ten years and their applicability to contemporary practice.

**Methods:** An advanced search of English-language publications was performed using the Medline database from January 2000 to February 2011 using the terms prostate, kidney, bladder and testicular cancer with the ‘randomized controlled trials’ limiter. Articles with statistically significant positive results for surgical disease were included with the consensus of all the authors and reviewed. Phase III data evaluating systemic therapies for metastatic disease were excluded from this analysis. Studies were reviewed for number of patients, median follow up, primary and secondary endpoints outcomes and limitations. The search was repeated for breast, lung and colon cancers to provide a benchmark for comparison.

**Results:** We identified 24 RCTs encompassing a total of 265,418 pts for localized prostate (n=11; 3 screening, 1 chemoprevention, 4 surgical, 3 adjuvant encompassing 259,744 pts), kidney (n=7; 6 surgical, 1 adjuvant encompassing n=2,067 pts), bladder (n=3 with 1,334 pts) and testicular cancers (n=3 with 2,243 pts). Of the 24 studies identified, 11 (46%) were adequately powered, while 7 studies (28%) did not report power calculations. When evaluating American Urological Association and National Comprehensive Cancer Network guidelines and best practice statements, outcomes from 14 of the 24 studies were utilized. When compared to localized lung cancer (n=26), breast (n=20) and colon (n=20), level 1 RCT data in urologic oncology are underrepresented.
Conclusions: Urologic tumors account for 40% of all tumors in American males and nearly 20% of cancer deaths. A relative paucity of level 1 evidence exists in the surgical management of genitourinary tumors. When such data do exist they are often underpowered and infrequently objectified in contemporary guidelines. The reasons for this are multifactorial and require further study and improved

Poster #155

TUMOR MULTIFOCALITY IS ASSOCIATED WITH WORSE OUTCOMES IN PATIENTS WITH ORGAN-CONFINED UPPER TRACT UROTHELIAL CARCINOMA

Eugene Cha¹, Thomas Chromecki¹, Vitaly Margulis², Giacomo Novara³, Douglas Scherr¹, Yair Lotan², Jay Raman⁴, Wassim Kassouf⁵, Karim Bensalah⁶, Alon Weizer⁷, Shahrokh Shariat⁸ and for the UTUC Collaboration⁹

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(Presented By: Eugene Cha)

Background: The prognostic impact of multifocal upper tract urothelial carcinoma (UTUC) disease is poorly understood. We sought to investigate the association of tumor multifocality (TM) with clinicopathologic features and outcomes of UTUC in patients managed by radical nephroureterectomy (RNU).

Methods: The study included 2492 patients treated with either open or laparoscopic RNU. Tumor characteristics included tumor stage, tumor grade, lymph node status, lymphovascular invasion, tumor architecture, tumor location, unifocal or multifocal disease, gender, age, history of bladder cancer, ECOG performance status and adjuvant chemotherapy. TM of UTUC was defined as synchronous presence of multiple tumors in the renal pelvis and/or ureter. Univariable and multivariable models tested the effect of TM on disease recurrence and cancer-specific mortality.

Results: Five-hundred and ninety patients (23.7%) had TM at the time of RNU. The median follow-up was 45 months (interquartile range:61). TM was significantly associated with a history of previous bladder cancer (p=0.032), lymph node involvement (p=0.036), tumor location in the ureter (p=0.003), higher tumor stage (p<0.001), higher tumor grade (p<0.001), infiltrative tumor architecture (p=0.003) and lymphovascular invasion (p=0.001). In organ-confined patients, TM was an independent predictor of both disease recurrence (hazard ratio [HR]: 1.43; p=0.019) and cancer-specific mortality (HR: 1.46, p=0.027). When assessed in all patients, TM was associated with both disease recurrence and cancer-specific mortality in univariable (p=0.005 and p=0.006, respectively), but not in multivariable analyses (p=0.468 and p=0.798, respectively). The main limitation is the retrospective design of the study.

Conclusions: TM is an independent prognosticator of disease recurrence and cancer-specific mortality in patients with organ-confined UTUC treated with RNU. Organ-confined patients with UTUC may need closer follow-up. Integration of TM with other factors may help identify those patients who would benefit from multimodal therapy.
**Poster Session II**

**Poster #156**

**ONCOLOGIC OUTCOMES AFTER RADICAL NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL CARCINOMA: COMPARISON OVER THE THREE DECADES**

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(Presented By: Mehrad Adibi)

**Introduction & Objective:** To compare clinico−pathologic features, therapeutic management and oncologic outcomes of upper tract urothelial carcinoma (UTUC) over the last three decades.

**Methods:** Utilizing a multi−institutional database of patients treated with radical nephroureterctomy (RNU) between 1983 and 2007, we compared clinico−pathologic features and survival outcomes over the last three decades. The following patient cohorts were utilized for analysis: group 1 comprised of patients treated prior to 1990s (n=106), group 2 included patients treated from 1990 to1999 (n=655), and group 3 consisted of patients managed from 2000 to 2007 (n= 701). Survival rates were compared using Kaplan−Meier survival analysis.

**Results:** The study included 1462 patients, 992 men and 470 women with 36 months median follow up after RNU. Tumors were organ confined (≤T2/N0) in 88% and high grade in 64%. Concomitant LND was performed in 600 (41%) patients and LN involvement was found in 143 patients. Neoadjuvant and adjuvant chemotherapy was administered to 47 (3.2%) and 171 (11.7%) patients, respectively. There were no significant differences in the distribution of organ−confined versus non−confined disease, performance of lymph node dissection during the RNU, and pathologic nodal status. There was a significant increase in high grade sessile tumors between groups 1 and 2, use of laparoscopic RNU and endoscopic management of UTUC between groups 2 and 3, and utilization of peri−operative chemotherapy from groups 1 to 3 (p<0.05). The overall 5 year disease−free survival rates were 66±5%, 68.5±2%, 71±2% and the 5 year cancer−specific survival rates were 75±5%, 72±2%, and 75±2% in group 1, 2 and 3 respectively, with no significant differences among the 3 groups (p>0.05).

**Conclusion:** Outcomes after RNU did not change significantly over the last 3 decades, despite staging and surgical refinements. Utilization of peri−operative systemic chemotherapy in UTUC management remains low. Further improvements in outcomes of UTUC patients necessitate rigorous investigation of multi−modal treatment approaches.

**Poster #157**

**CIGARETTE SMOKING ADVERSELY IMPACTS PROGNOSIS IN UPPER TRACT UROTHELIAL CARCINOMA**

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(Presented By: Behfar Ehdaie)

**Background:** Cigarette smoking is a primary causative factor for urothelial carcinoma but little data are available on the impact of smoking on prognosis in patients with upper tract urothelial carcinoma (UTUC). Our objective was to evaluate the impact of cigarette smoking on recurrence−free survival (RFS) and overall survival (OS) in UTUC patients treated with radical nephroureterectomy (RNU).

**Methods:** Data on demographic, smoking, and disease characteristics of 324 patients with UTUC treated with RNU between 1995 and 2008 were obtained from a prospectively maintained database. Disease recurrence was defined as local failure in the operative site, regional nodes, or distant metastases. We used Cox regression models to evaluate the association between several aspects of smoking, including lifetime duration of smoking, quantity and status, on RFS and OS.
Results: The study included 219 patients who were classified as ever smokers; 74% smoked ≥20 years and 37% smoked >20 cigarettes per day (CPD). Median follow-up was 72 months (95% CI: 65–91 months) for patients alive at last follow-up. Disease recurrence occurred in 27% (n=60) of patients and 41% (n=90) died during follow-up. Duration of smoking was not associated with RFS or OS. Compared to smoking 1–10 CPD, smoking 21–30 CPD (RFS: HR=3.34; 95%CI, 1.49–7.49; OS: HR=4.71; 95%CI, 1.99–11.20) or >30 CPD (RFS: HR=2.12; 95%CI, 1.09–4.13; OS: HR=2.65; 95%CI, 1.26–5.55) was significantly associated with lower RFS and OS probabilities. Among current smokers (n=41), associations remained significant and effect sizes comparing those who smoked >20 versus 1–10 CPD increased (RFS: HR=6.19; 95%CI, 1.28–29.9; OS: HR=6.40; 95%CI, 1.33–30.9). Among former smokers (n=163), associations were attenuated, and no longer significant.

Conclusions: Higher smoking quantity was associated with an increased risk of tumor recurrence or death, especially among patients who were actively smoking at the time of diagnosis. Treatment plans to promote smoking cessation are recommended for patients with UTUC.

Poster #158

COMPLICATIONS AFTER OPEN AND LAPAROSCOPIC RADICAL NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL CANCER
Adrian Fairey¹, Eric Estey², Don Voaklander² and Niels-Erik Jacobsen³
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(Presented By: Adrian Fairey)

Introduction and Objectives: No study has compared morbidity after open (ORNU) and laparoscopic radical nephroureterectomy (LRNU) for upper urinary tract urothelial carcinoma (UTUC) using a standardized reporting methodology. Here we examined the association between surgical approach and complications.

Methods: A retrospective analysis of 142 consecutive patients treated with radical nephroureterectomy for UTUC between April 1994 and December 2008 was performed. Surgical approach was classified as ORNU or LRNU. All complications within 90 days of surgery were analyzed and graded according to the Clavien classification system. Univariable and multivariable logistic regression analyses were used to examine the association between surgical approach and complications.

Results: Baseline characteristics were similar between groups except that ORNU patients were less likely to have a preoperative serum Cr > 125 mmol/l (16% versus 32%, p=0.03), more likely to undergo complete lymph node dissection (9% versus 0%, p=0.01), and more likely to undergo extravesical only excision of the distal ureter (70% versus 60%, p=0.01). The 90–day overall complication rate (51% versus 21%), low–grade complication rate (27% versus 14%), and high–grade complication rate (25% versus 7%) differed between the ORNU and LRNU groups (p<0.01). Multivariable logistic regression analysis showed that LRNU was independently associated with a decreased risk of any complication (OR 0.25, 95% CI, 0.12 to 0.56, p<0.01) and high–grade complications (OR 0.22, 95% CI, 0.07 to 0.65, p<0.01).

Conclusions: LRNU was independently associated with a decreased risk of any complications and high–grade complications. Randomized controlled trials comparing surgical approach in the setting of UTUC are needed.

Poster #159

LONG TERM OUTCOMES AFTER PARTIAL ADRENALECTOMY FOR PHEOCHROMOCYTOMA IN PEDIATRIC PATIENTS WITH VON-HIPPEL LINDAU
Nitin Yerram, Dmitry Volkin, Faisal Ahmed, Dawud Lankford, Jeffrey Nix, Anthony Hoang, Gopal Gupta, Angelo Baccala, Ronald Boris, W. Marston Linehan, Gennady Bratslavsky and Peter Pinto
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(Presented By: Dmitry Volkin)

Purpose: Children with hereditary cancer syndromes such as Von–HippeL Lindau Disease (VHL) are at an increased risk for developing bilateral pheochromocytomas. Traditional surgical management consisted of bilateral total adrenalectomy (TA) as the standard of care. Consequently, bilateral TA predisposes these children to a lifetime of hormone replacement with the associated morbid side–effects. To illustrate the advantage of partial adrenalectomy (PA), we report the largest single series on partial adrenalectomy for pediatric VHL patients.
Methods: From December 1994 to July 2011, a prospectively maintained database was retrospectively reviewed to identify pediatric patients (<16 yrs age) with hereditary pheochromocytoma treated by PA. Demographic, perioperative, pathologic, and long term follow-up data were collected, including operative time, estimated blood loss, and steroid replacement status. PA (open, laparoscopic or robotic assisted) was performed if normal adrenocortical tissue was evident on preoperative imaging and/or intraoperative ultrasonography. Seven patients underwent a minimally invasive approach (6 laparoscopic, 1 robotic assisted) and four patients underwent open procedures.

Results: We identified 11 pediatric patients who underwent successful PA. All patients were diagnosed with VHL. Seven patients (64%) underwent PA by minimally invasive technique (6 laparoscopic and 1 robot assisted) and four patients underwent open PA. The average tumor size was 2.6 cm and the histology of all tumors was pheochromocytoma, with one being described as composite pheochromocytoma. 7 of the 11 patients remained tumor free radiographically and did not have evidence of elevated catecholamines at a median follow up of 8.8 years (range 4.12–14.8 yrs). Four patients (36%) were identified to have ipsilateral recurrence of pheochromocytoma. Three patients underwent repeat ipsilateral PA and 1 patient required total adrenalectomy due to lack of remnant normal adrenal gland. Only one patient required intermittent steroid replacement therapy.

Conclusion: Adrenal sparing surgery is safe and feasible in pediatric patients with hereditary cancer syndromes that predispose to the formation of pheochromocytoma. This approach allows for removal of tumor while preserving adrenocortical function and minimizing the side effects of long term steroid replacement on puberty and quality of life. Routine radiologic surveillance is critical to detecting recurrence or de novo lesions.

Poster #160

URINE NGAL LEVELS ALTERED BY COLLECTION AND PROCESSING PRACTICES
Preston Sprenkle, Sun Cho, Martin Fleisher, Jennifer Taylor, Andrew Feifer, Tarek Ghoneim and Paul Russo
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(Presented By: Preston Sprenkle)

Introduction And Objectives: Urine neutrophil gelatinase associated lipocalin (uNGAL) has been used as a marker of acute kidney injury (AKI) in pediatric surgery, emergency room, transplant surgery, and intensive care unit settings. Limited information is available on the factors that may alter the assay results. Internal validation of the NGAL ELISA was performed in the clinical laboratory to elucidate these factors before implementation of the assay for clinical use.

Methods: NGAL ELISA kits were internally validated in the clinical laboratory to identify the variables that effect measured uNGAL levels. Evaluations included: the effect of the freeze/thaw cycle (uNGAL levels were measured at 4C prior to freeze and after being frozen at −80C then thawed for analysis); impact of blood contamination (urine samples were spiked with blood and with hemoglobin before analysis); gender differences (80 male and female volunteer voided specimens were compared); voided vs. catheterized (80 voided specimens were compared to 90 catheterized specimens).

Results: Freezing uncontaminated urine specimens at −80C does not alter the uNGAL levels compared to fresh (refrigerated) specimens, with a mean difference of 3.8% Blood contamination, especially leukocyte rich blood, significantly increases uNGAL levels up to twice the level of uncontaminated specimens. In voided urine samples from normal controls, women tend to have approximately twice the uNGAL of men (mean 15.7 vs. 9ug/L, respectively), however this difference is negligible when evaluating preoperative catheterized specimens (Men 15ug/L and women 18.8ug/L).

Conclusions: uNGAL is a reasonably stable biomarker that can be measured in fresh or previously frozen specimens without significant alteration of uNGAL level. Contamination of the urine specimen with blood, but especially leukocytes significantly alters the uNGAL level which likely explains the elevated uNGAL levels in voided urine specimens from women.
THE IMPACT OF MULTIPLE BIOPSIES ON ERECTILE FUNCTION IN MEN THAT PROGRESS FROM ACTIVE SURVEILLANCE TO RADICAL PROSTATECTOMY
Adam Calaway, Daniel Sagalovich, Prasanna Sooriakumaran, Abhishek Srivastava, Danielle Brooks, David Flomenbaum, Samarpit Rai, Matthieu Durand and Ashutosh Tewari
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(Presented By: Adam Calaway)

Introduction and Objectives: The main reason for men choosing active surveillance is for the desire to preserve sexual potency. What is less clear is the impact of multiple biopsies on men in an active surveillance protocol who then undergo radical prostatectomy for progression of their disease. This study sought to investigate the effects of multiple prostate biopsies on functional outcomes after robotic assisted radical prostatectomy (RARP).

Methods: Between May 2009 and December 2009, 367 consecutive patients who underwent RARP by a single surgeon were retrospectively divided into two groups, one that had single prostate biopsy and another multiple biopsies before RARP. All patients were preoperatively potent and continent. After excluding the patients who did not have bilateral nerve sparing and who were intermediate and high risk, the two cohorts were matched for significant clinicopathologic preoperative variables. This left 50 and 23 patients for analysis in the single and multiple biopsy groups. The primary endpoint for our analysis was postoperative functional outcomes including potency and continence at 3 and 6 months after surgery.

Results: Age, prostate volume, preoperative PSA, total cores during last biopsy, and number of positive cores on last biopsy, were comparable between patients in both groups. The median number of biopsies in the multiple biopsy group was two which was statistically significant when compared to the single biopsy group (p<0.001). The median interval between (last) biopsy date and date of surgery was 78 and 82 for the multiple and single biopsy groups (p=0.897). We found no effect on postoperative continence as a result of multiple biopsies, with rates of 84% (83%) and 94% (96%) for the single (multiple) biopsy groups at 3 and 6 months(p=0.88, p=0.77). However, multiple biopsy patients had worse postoperative erectile function with 43% of such patients being potent compared to 64% of single biopsy patients at 3 months (p=.25). Potency recovery at 6 months was significantly worse in the multiple biopsy group (57% v 80%, p=0.03).

Conclusions: Men subject to multiple preoperative biopsies are more likely to become impotent postoperatively than those who undergo surgery after a single biopsy. Patients and their doctors should be aware that active surveillance is not a non-morbid management option, as those that eventually progress to surgery have worse erectile function outcomes than those that opt for surgery initially.

TRANSPERINEAL BIOPSY – TEMPLATE BASED VERSUS CORES TARGETED TO A SUSPICIOUS AREA ON MRI: AN EFFICIENCY ANALYSIS
Robert Dufour¹, Caroline Moore², Nicola Robertson², Alex Freeman³, Clare Allen⁴ and Mark Emberton²
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Introduction: There is much interest in improving the performance of prostate biopsy from the current standard of transrectal cores taken with ultrasound guidance alone. One approach is to do a transperineal template guided biopsy using a greater sampling density than the usual transrectal approach. An alternative approach is to use MR imaging to identify suspicious regions within the prostate for intensive sampling. We report a cohort of men who underwent both approaches, under general anaesthetic. We compare the two approaches for detection rates for clinically significant disease and the number of cores taken to give a diagnosis of clinically significant prostate cancer.
Patients and Methods: Men with a raised PSA underwent multi-parametric MRI. Suspicion of significant prostate cancer was scored using a 5 point scale. 69 men who scored 3 points or more were offered a combination of targeted and template guided transperineal biopsy. Significant cancer was defined as maximum cancer core length \( \geq 4 \text{mm} \) cancer and/or the presence of any Gleason pattern 4. The sampling efficiency (cores per case detected) was calculated.

Results: 56/69 men (81%) had cancer detected, with significant cancer in 45/69 men (65%). Image guided biopsy detected 40 significant cancers (detection rate 58%) with a mean of 5 cores. Template guided biopsy detected 36 significant cancers (detection rate 52%) using a mean of 23 cores. Targeted biopsy detected only 5 insignificant cancers (7% of men), whilst template biopsy detected 14 (20% of men). The sampling efficiency (cores per diagnosis) for clinically significant cancer was 9 cores for targeted sampling versus 45 cores for template based sampling.

Conclusions: Cores targeted to a suspicious area on MRI are at least equivalent in the detection of clinically important prostate cancer and better at overlooking clinically insignificant prostate cancer than a transperineal template guided approach. Moreover, targeting in this manner achieves this with less than a quarter of the cores required for a template based approach.

Poster #163

IMPACT OF DIFFERENT DEFINITIONS OF HIGH RISK PROSTATE CANCER ON SURVIVAL AFTER RADICAL PROSTATECTOMY

Gurdarshan Sandhu¹, Kenneth Nepple¹, Dorina Kallogjeri¹, Seth Strope¹, Robert Grubb, III¹, Eric Klein², Andrew Stephenson² and Adam Kibel¹

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(Presented By: Gurdarshan Sandhu)

Introduction and Objectives: Multiple definitions of high risk prostate cancer exist. Studies have primarily correlated these definitions with biochemical recurrence and not with survival. We applied six previously described high risk definitions to men treated with radical prostatectomy and evaluated their ability to predict survival outcomes in a multi-institutional cohort.

Methods: The study population included 6477 men who were treated with radical prostatectomy between 1995 and 2005 and were followed for a median of 67 months. The six high risk definitions used in this study were preoperative PSA \( \geq 20 \text{ng/ml} \), biopsy Gleason score 8–10, clinical stage \( \geq \text{T2c} \), clinical stage T3, D'Amico definition, or National Comprehensive Cancer Network definition. Survival was evaluated using the Kaplan–Meier method to generate unadjusted prostate cancer survival estimates. To control for the competing risks of age and comorbidity, multivariable Cox proportional hazard regression models were used to estimate the hazard ratio for prostate cancer specific mortality (PCSM) and overall mortality (OM) in high risk patients compared to low/intermediate risk.

Results: High risk patients comprised between 0.7% (cT3) and 8.2% (D'Amico) of the study population. The 10-year Kaplan Meier prostate cancer survival estimates varied from 89.7% for PSA \( \geq 20 \text{ng/ml} \) to 69.7% for cT3 (Figure 1). On multivariable analysis controlling for age and comorbidity, high risk prostate cancer (of all definitions) had an increased risk of PCSM compared to low/intermediate risk with a hazard ratio (HR) ranging from 4.38 for PSA \( \geq 20 \) to 19.97 for cT3 (all \( p<0.0001 \)). For OM, again controlling for age and comorbidity, high risk patients of all definitions except preoperative PSA \( \geq 20 \text{ng/ml} \) (HR=0.98) were associated with increased risk of OM (HR range: 1.72 for D'Amico to 3.31 for cT3, all \( p<0.01 \)).

Conclusions: In a contemporary cohort of men with high risk prostate cancer treated with radical prostatectomy, the majority of men experienced long term prostate cancer survival. However, heterogeneity in survival outcomes existed based on the definition of high risk used. Clinical stage T3 and high Gleason grade were most strongly associated with PCSM and OM.
Poster #164

PERINEURAL VERSUS LYMPHOVASCULAR INV ASION: WHICH IS A BETTER MARKER FOR UNFA VORABLE BIOCHEMI-
CAL OUTCOMES FOLLOWING PROSTATECTOMY? – RESULTS FROM THE DUKE PROSTATE CENTER DATABASE
Abhay Singh¹, Lionel Banez¹,², Leah Gerber¹,², Stephen Freedland¹,², Cary Robertson¹, Michael Ferrandino¹, Thomas Polascik¹, Philip Walther, MD, PhD¹ and Judd Moul¹
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(Presented By: Abhay Singh)

Introduction: There has been a substantial effort to study the clinical significance of perineural invasion in prostate biopsies (PNIb) however its prognostic significance remains controversial. Furthermore, the prognostic potential of perineural invasion in radical prostatectomy (RP) specimens (PNIp) has not been well studied. Available data suggests that biopsy specimens inadequately represent whole gland pathology with regards to perineural invasion thus rendering investigation of PNIp even more clinically relevant. While lymphovascular invasion in pathology specimens (LVIp) has been more rigorously investigated, studies examining its relationship with biochemical recurrence (BCR) risk have shown conflicting results. More importantly, there has been minimal comparison of PNIp and LVIp in the same cohort to determine which marker is the superior prognostic factor.

Methods: We retrospectively analyzed data from 1611 men who underwent RP from 1999 to 2010 from the Duke Prostate Center database. We evaluated PNIp and LVIp as predictors of time to BCR by comparing hazard ratios (HR) and 95% confidence intervals (CI) using crude and adjusted proportional hazards regression models that included both variables and controlled for age, race, year of RP, preoperative risk group (D’Amico criteria), pathological Gleason sum, seminal vesicle invasion, margin status, extracapsular extension, and lymph node involvement.

Results: A total of 1304 (81%) men had PNIp while only 82 (5%) men had LVIp. On crude regression, both PNIp (HR=3.39; 95%CI=1.94−5.84; p<0.001) and LVIp (HR=2.33; 95%CI=1.49−3.64; p<0.001) were significant predictors of adverse BCR risk. After adjusting for clinicopathological covariates, PNIp remained significantly associated with increased BCR risk (HR=1.85; 95%CI =1.04−3.31; p=0.04). Specifically, men with PNIp were 85% more likely to experience BCR relative to PNIp (−) men. In contrast, LVIp was not independently associated with BCR risk (p=0.23).

Conclusions: In a cohort of men who underwent RP in a tertiary−care hospital, PNIp is predictive of adverse BCR outcomes independent of clinicopathological parameters that include LVIp. Consequently, LVIp is a poor predictor of BCR risk. PNIp may thus provide additional prognostic information for men treated with RP and its inclusion in predictive nomograms requires study. Further analyses to determine if PNIp is likewise associated with metastasis and cancer−specific survival are warranted.

Poster #165

PROSTATE CANCER SPECIFIC MORTALITY AND COMPETING CAUSES OF MORTALITY AMONG ELDERLY MEN AFTER LOCAL THERAPY FOR PROSTATE CANCER
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(Presented By: Joseph Klink)

Introduction and Objectives: The benefit of definitive local therapy among elderly patients (> 65 years) with localized prostate cancer (PC) is uncertain, particularly for those with comorbid illness. Despite this uncertainty, the majority of these men currently receive local therapy. We analyzed the risk of prostate cancer−specific mortality (PCSM) relative to competing causes of mortality (CCM), stratified by disease severity and comorbidity, among contemporary men treated at two high−volume hospitals.

Methods: Between 1995−2005, 4237 consecutive men aged 65 years or older were managed by radical prostatectomy (N = 1634), external−beam radiotherapy (N = 1570), or brachytherapy (N = 1033) at Cleveland Clinic or Barnes−Jewish Hospital. Clinical information was obtained from prospective data bases. Comorbidity was assessed using ACE−27 and Charlson Comorbidity indices. PC risk was classified according to D’Amico criteria. Fine and Gray competing risk analysis was used to assess PCSM and CCM at 10 years.
Results: Over a median follow-up of 72 months (IQR: 46−97), 88 and 748 PCSM and CCM events were observed. Among healthy men with low risk PC, 10 year PCSM was 2% and CCM was 19%. Among healthy men with high risk PC, PCSM was 11% and CCM was 27%. In the group with moderate–to–severe comorbidities, CCM was 49, 59%, and 58% and PCSM was 1%, 3%, and 21% among those with low−, intermediate−, and high−risk PC, respectively. Among these unhealthy men, 26% were treated by radical prostatectomy, of whom 45% had low−risk PC and 16% had high−risk PC. Among healthy men, 41% were treated by radical prostatectomy, of whom 54% and 9% had low− and high−risk PC, respectively.

Conclusions: The risk of PCSM vs. CCM for older men is low, particularly for those with moderate–to–severe comorbidity; 49−59% had died from CCM within 10 years. Current evidence suggests that local therapy for PC is associated with a 25% reduction in PCSM, at best. Thus, with active surveillance, it is unlikely that PCSM would exceed 5−7% in those with low− and intermediate−risk PC. These results should inform elderly men and physicians about the risk of PCSM and CCM when deciding upon treatment for localized PC.

Poster #166

TRENDS IN USAGE OF RADICAL PROSTATECTOMY IN THE UNITED STATES: 2000-2008
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(Presented By: Christopher Anderson)

Objectives: Radical prostatectomy (RP) remains one of the most common treatments for organ−confined prostate cancer and recent data suggests its use is rising. We examined the trends in use of RP in the United States from 2000–2008 and how the rise in volume is being distributed among different types of hospitals.

Methods: Using the Healthcare Utilization Project National Inpatient Sample (NIS) we identified all men ≥18 years old that underwent RP for prostate cancer from 2000–2008. Surgical robot ownership data from the 2007 American Hospital Association Statistics database was merged with NIS. The relationship between annual RP volume and several hospital variables was investigated. All statistics are presented as means and standard deviations. Multivariate analysis was performed using linear regression.

Results Obtained: Approximately 586,431 patients underwent RP at 3074 different hospitals from 2000–2008. There was a significant increase in use of RP after 2005, particularly in the highest volume−quartile hospitals (Figure 1). From 2000 to 2008, annual RP volume increased by 72% (50,729 to 87,108) and the number of hospitals performing RP decreased by 19% (2,630 to 2,135) resulting in an increase in average yearly hospital volume from 22.6 to 41.7. Several hospital variables were associated with a rise in mean hospital volume including teaching status (2000, 2008: 41.1, 77.7 vs. non−teaching 15.7, 21.6), urban location (2000, 2008: 26.2, 48.2 vs. rural 10.2, 11), and large bed size (2000, 2008: 29.7, 55.7 vs. small bed size 11.7, 20.5). Hospitals that owned a surgical robot in 2007 had a higher RP volume in 2000 (53.9) and 2008 (128) than hospitals without a robot (2000, 2008: 16.1, 16.5) and also accounted for a significant increase in volume after 2005. On multivariate analysis, teaching status, larger bed size, Western region, urban location and presence of a surgical robot all predicted a higher rate of annual hospital RP volume.
Conclusions: From 2000–2008 use of RP increased substantially, most notably after 2005. The dramatic increase in RP has resulted in higher case volume at certain hospitals, particularly those in the top tier of RP volume and those that invested in robotic technology by 2007.

Poster #167

RECOVERY OF URINARY FUNCTION FOLLOWING RADICAL PROSTATECTOMY: IDENTIFICATION OF TRAJECTORY CLUSTER GROUPS
Christopher Anderson¹, Melissa Kaufman¹, Mary Dietrich², Daniel Barocas¹, Sam Chang¹, Michael Cookson¹, Joseph Smith, Jr.¹, Peter Clark¹ and Duke Herrell¹
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(Presented By: Christopher Anderson)

Objective: Post–prostatectomy urinary incontinence (PPI) can impact health related quality of life (HRQOL) among men treated with radical prostatectomy (RP) for prostate cancer. Currently, no consensus exists regarding which patients are at risk for impaired HRQOL secondary to PPI. Using a trajectory clustering analysis, we identified predictors of PPI recovery in unique patient groups.

Methods: Over a 5–year period, HRQOL was evaluated in patients undergoing RP using the Prostate Cancer Index (PCI) preoperatively and at 3, 6, and 12 months postoperatively. A novel cluster modeling technique was used to identify unique group trajectories of urinary function recovery over time.

Results Obtained: Group–based modeling of PCI urinary function scores identified three distinct PPI recovery patterns. Group 1 (n=73) had a significant postoperative decline with only 33.4% of optimum function at 12 months. Group 2 (n=258) had moderately diminished urinary function at 3 months with improvement to 76.8% of optimum function at 12 months. Group 3 (n=89) had high scores throughout. Members of group 1 tended to be older (p=0.001), suffer from major depression (p=0.008), have lower extremity circulatory disease (p=0.004), be past or current smokers (p=0.004) and have a higher number of comorbidities (p<0.001) relative to groups 2 and 3. On multivariate analysis, age and number of comorbidities significantly predicted inclusion in the poor functioning group.
Conclusions: A novel modeling approach identified three distinct PPI recovery patterns. Patient age and number of comorbidities predicted worse outcomes. These findings have implications for preoperative patient counseling and early intervention for treating PPI.

Poster #168

PROSTATE-SPECIFIC ANTIGEN TESTING AMONG PRIMARY CARE PHYSICIANS AND UROLOGISTS: PATTERNS OF CARE AND IMPACT OF PROFESSIONAL SOCIETY GUIDELINES
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(Presented By: Sandip Prasad)

Introduction and Objectives: During the past decade, the incidence of prostate cancer in the United States has declined. We hypothesized this was related to lower rates of prostate-specific antigen (PSA) testing and sought to evaluate PSA testing rates nationally.

Materials and Methods: Using the National Ambulatory Medical Care Survey, a nationally representative sample of outpatient visits in the United States, we analyzed rates of PSA testing in men age 40 years or older who visited PCPs or urologists from 1997 to 2008.

Results Obtained: An estimated 26.6 million (95% CI: 24.8–28.4 million) PSA tests were ordered during 94.5 million (95% CI: 90.9–98.1 million) office visits to urologists and 95 million (95% CI: 87.5–102.8 million) tests were ordered during 1.17 billion (95% CI: 1.15–1.18 billion) visits to PCPs, with an annual increase of 3.4% and 6.0%, respectively (p=0.055 and p<0.001 for trend). After adjusting for year, race, ethnicity, region, insurance and provider type, testing by PCPs was more likely among older men and highest among men aged 60 to 69 years (reference: 40–49 years; OR 2.32, 95% CI: 1.88–2.85). Compared to men without a chronic medical condition, those with one chronic condition had greater odds of receiving a PSA test (OR 1.28, 95% CI: 1.08–1.52).

Conclusions: Prostate cancer incidence has declined over the past decade despite increasing rates of office-based PSA testing by PCPs and urologists during the period. Increasing rates of PSA testing merit scrutiny, especially in men with limited life expectancies who are unlikely to benefit from screening.
**Poster #169**

**PROSTATE CANCER IN THE ELDERLY: FREQUENCY OF ADVANCED DISEASE AT PRESENTATION AND DISEASE-SPECIFIC MORTALITY**

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University of Rochester, Rochester, New York

(Presented By: Edward Messing)

**Objectives:** The purpose of this study was to determine the frequency of metastatic (M1) prostate cancer (PC) at presentation in different age groups, to examine the association of age with PC-specific mortality, and to calculate the relative contribution of different age groups to the pool of M1 cases and PC deaths.

**Methods:** Records of 464,918 patients diagnosed with PC during 1998–2007 were obtained from the Surveillance, Epidemiology, and End Results (SEER) database. Age at PC diagnosis was grouped as: <50, 50–54, 55–59, 60–64, 65–69, 70–74, 75–79, 80–84, 85–89, 90+. The cumulative incidence of death from PC was computed using Gray’s method. Funding for this work was provided by the Ashley Family Foundation.

**Results:** The frequency of M1 PC at presentation was 3% for age categories <75; 5% for 75–79; 8% for 80–84; 13% for 85–89; and 17% for 90+. The 5-year cumulative incidence of death from PC was 3%–4% for all PC patients in any age category <75; 7% for 75–79; 13% for 80–84; 20% for 85–89; and 30% for 90+. Despite representing only 15% of older (50+ year old) male adults in the general US population, men age 75 and older contributed almost half (48%) of all presenting M1 PC cases. In addition, more than half (53%) of all PC deaths occurred in men who were age 75 and older at PC diagnosis.

**Conclusion:** Compared to younger patients (<75 years old), older patients were more likely to present with very advanced disease, had a greater risk of death from PC despite higher death rates from competing causes, and contributed almost half of all presenting M1 PC cases and more than half of all PC deaths. Awareness of these issues may improve future outcomes for elderly patients with PC.

**Poster #170**

**CONTEMPORARY TRENDS IN IMAGING USE IN MEN DIAGNOSED WITH PROSTATE CANCER**

Sima Porten¹, Alexandria Smith², Anobel Odisho³, Mark Litwin³, Christopher Saigal³, Peter Carroll¹ and Matthew Cooperberg¹

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(Presented By: Sima Porten)

**Background:** Previous studies have found persistent over-use of imaging for clinical staging of men with low-risk prostate cancer. We aimed to determine contemporary imaging trends in three cohorts of men.

**Methods:** We analyzed imaging trends of men with prostate cancer who were a part of Cancer of the Prostate Strategic Urologic Research Endeavor CaPSURE (1998–2006), were insured by Medicare (1998–2006), or privately insured (Ingenix database, 2002–2006). The rates of computerized tomography (CT), magnetic resonance imaging (MRI), and bone scan (BS) were determined and time trends were analyzed by linear regression. For men in CaPSURE, demographic and clinical predictors of test use were explored using a multivariable regression model.

**Results:** Since 1998, there was a significant downward trend in BS (16%) use in the CaPSURE cohort (N=5,156). There were slight downward trends (2.4% and 1.7% respectively) in use of CT and MRI. Among 54,322 Medicare patients, BS, CT, and MRI use increased by 2.1%, 10.8%, and 2.2% and among 16,161 privately insured patients, use increased by 7.9%, 8.9%, and 3.7%, respectively. In CaPSURE, the use of any imaging test was greater in men with higher risk disease. Additionally, type of insurance and treatment affected the use of imaging tests in this population.

**Conclusions:** There is widespread misuse of imaging tests in men with low-risk prostate cancer, particularly for computerized tomography. These findings highlight the need for re-examination of financial incentives and other factors that drive decision-making with respect to imaging in this setting.

**Funding:** This study was funded by the Urologic Diseases of America Project
Poster #171

GHRELIN RECEPTOR AS A NOVEL IMAGING TARGET FOR PROSTATIC NEOPLASMS
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(Presented By: Ali Al-zahrani)

Background: Ghrelin is a natural growth hormone secretagogue (GHS) that is co-expressed with its receptor GHSR in human prostate cancer cells. Imaging probes that target receptors for ghrelin may delineate prostate cancers from benign disease. The specificity of a novel ghrelin imaging probe for prostate cancer over normal tissue or benign disease was assessed.

Methods: A fluorescein-bearing ghrelin analogue was synthesized (fluorescein-ghrelin(1−18)), and its application for imaging was evaluated in a panel of prostate cancer cell lines and human prostate tissue. Prostate core biopsy samples were collected from fresh surgery specimens of 13 patients undergoing radical prostatectomy. Ghrelin probe signal was detected and quantified in each sample using a hapten amplification technique and associated with pathological features.

Results: The ghrelin probe was taken up by GHSR-expressing LNCaP and PC−3 cells, and not in BPH cells that express low levels of GHSR. Binding was blocked by competition with excess unlabeled probe. The ghrelin probe signal was 4.7 times higher in PCa compared to benign hyperplasia tissue (p=0.0027) and normal tissue (p=0.0093). Furthermore, while the ghrelin probe signal was 1.9 fold higher in PIN compared to benign hyperplasia (p=0.0022) and normal tissue (p=0.0047), there was no significant difference in the signal of benign hyperplasia compared to normal tissue.

Conclusion: The imaging probe fluorescein-ghrelin(1−18) is specific for prostate cancer, and did not associate significantly with benign hyperplasia or normal prostate tissue. This data suggests that ghrelin analogues may be useful as molecular imaging probes for prostatic neoplasms in both localized and metastatic disease.

Poster #172

THE IMPACT OF ROBOTICS ON RADICAL PROSTATECTOMY TRAINING IN UROLOGY RESIDENCY: A SURVEY OF AUA RESIDENT MEMBERS WORLDWIDE
Patrick McDonough and Doug Sutherland
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(Presented By: Patrick McDonough)

Purpose: The impact of robotic surgery on urology resident education is unknown. We set out to determine the current status of radical prostatectomy and robotic surgical training in urology residency.

Materials and Methods: This IRB approved project consisted of a 21 question survey that was intended to assess the state of RP and robotic surgical training in urology residency programs. The survey was sent worldwide via electronic mail to all resident members of the AUA and it was kept open for responses for a three week period in April of 2011.

Results: A total of 2,437 surveys were sent and responses were received by 356 residents for an overall response rate of 15%. Of respondents, 80% were US residents and 20% were international residents. Responses were evenly distributed from each year of urology residency. RARP is the most common approach to prostatectomy reported within U.S. residency programs whereas RRP remains more common abroad. Of respondents, 74% reported no defined robotic training curriculum required prior to performing as console surgeon. A dual console was available to 23% of respondents, 46% reported access to a robot for training purposes, and 24% reported access to a virtual reality robotic simulator. Only 9% of respondents reported having protected time for robotic training built into their residency. Using the ACGME criteria for “Surgeon,” 54% of US residents are exposed to fewer than 25 RRP’s, whereas 61% of US residents report exposure to greater than 25 RARP’s during their training. When participating as “Surgeon,” 42% of US residents agreed that their level of participation was greater during RRP than RARP. Of respondents, 30% agreed that their program’s transition from RRP to RARP has had a negative impact on their education with regard to prostatectomy.
**Conclusions:** RARP is the most common approach to RP within U.S. training institutions, yet a minority of residents report having a defined robotic training curriculum, access to a robot for training, or protected time for robotic training. A significant proportion of residents believe that the emergence of robotic surgery has decreased their participation in RP as learners and has negatively impacted their surgical education. These results suggest a need to improve resident training and participation in RARP.

**Poster #173**

**CIRCULATING INTERLEUKIN 6 AND NERVE GROWTH FACTOR ARE ASSOCIATED WITH PERIPROSTATIC FAT LENGTH AND CANCER DETECTION AMONG NON-OBESE MEN PRESENTING FOR PROSTATE BIOPSY**

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(Presented By: David Margel)

**Background:** In a previous study we demonstrated an association between circulating adipokine levels and prostate cancer. Evidence suggests that visceral fat (i.e. periprostatic fat) has greater metabolic activity than peripheral fat. However the association of serum adipokine with periprostatic fat has not been characterized. To further assess this relationship we correlated serum adipokine levels with both BMI (a measure of peripheral fat) and periprostatic fat (visceral fat) in a population of men who present for prostate biopsy.

**Methods:** The cohort consisted of 200 subjects initially stratified by BMI, 100 were obese (BMI>27) and 100 non–obese (BMI≤27). Of the obese subjects 50 were diagnosed with prostate cancer and were age matched with 50 controls. The same process was used for the non–obese subjects.

Serum samples collected prior prostate biopsy were used to measure adipokines (adiponectin, leptin, PAI, Resistin, HGF, IL−1β, IL−6, IL−8, MCP−1, NGF and TNF−α)using Milliplex Multi−Analyte Profiling kits (Adipokine panels A and B; Millipore; Billerica, MA, USA) Periprostatic fat was measured on a sagittal trans rectal ultrasound image. Clinical data including age, PSA, digital rectal exam, height and weight were collected at time of biopsy. Sample analysis, clinical data recording as well as fat measurements were done blinded to pathology results.

**Statistical analysis−**We used a Pearson correlation analysis to associate serum adipokine levels with periprostatic fat and BMI.

**Results:** No correlation was found between BMI and periprostatic fat.Periprostatic fat pad length was significantly correlated with NGF (r=0.65, p=0.002) and IL−6 (r=0.54, p=0.004) among non−obese subjects with prostate cancer. Conversely periprostatic fat was not correlated with serum adipokine levels among the obese subjects (with or without prostate cancer). BMI was correlated with leptin among obese (r=0.55, p=0.001) and non−obese (r=0.52, p=0.004) only in subjects without prostate cancer. BMI did not correlate with serum adipokine levels among obese or non−obese subjects diagnosed with prostate cancer.

**Conclusions:** We have demonstrated a significant correlation between periprostatic fat and serum levels of NGF and IL−6 among non−obese prostate cancer patients. These findings suggest that adipokines may be differentially secreted from visceral fat. Direct measurement of these molecules in the periprostatic fat would further our knowledge of the role of adipokines in prostate cancer.

**Poster #174**

**DUAL ANTIANGIOGENIC THERAPY USING BEVACIZUMAB AND LENALIDOMIDE WITH DOCETAXEL AND PREDNI-SONE IN PATIENTS WITH METASTATIC CASTRATION-RESISTANT PROSTATE CANCER (MCRPC)**

Bamidele Adesunloye¹, Xuan Huang¹, Yang Ning², Ravi Madan¹, James Gulley¹, Melony Beatson¹, Paul Kluetz², David Adelberg, Philip Arlen¹, Howard Parnes¹, Marcia Mulquin¹, Seth Steinberg¹, John Wright¹, Jane Trepel¹, Nancy Dawson³, Clara Chen², Carol Bassim², Andrea Apolo¹, William Figg¹ and William Dahut¹

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(Presented By: Bamidele Adesunloye)
**Introduction:** Angiogenesis may play a critical role in mCRPC. Previously, we had shown the potent anti-tumor activity of dual antiangiogenic therapy by combining bevacizumab (B) and thalidomide (T) with docetaxel (D) and prednisone (P) in mCRPC (Ning JCO 2010). We hypothesized that combining lenalidomide (L), an analogue of T, with B, D, and P would have a more favorable efficacy/toxicity profile.

**Methods:** All patients (pts) had chemotherapy-naïve mCRPC. 3 pts received R 15 mg daily, 3 pts had 20 mg daily, and the remaining had 25 mg daily for 14 days of every 21-day cycle (C). All pts received D 75 mg/m² and B 15 mg/kg on day 1 with P 10 mg and enoxaparin daily throughout each C. After grade 3 neutropenia was seen in >80% of pts, the protocol was amended to include prophylactic pegfilgrastim on day 2. PSA was assayed each C with imaging after C2 and then after every 3C. Dental exams with mandible CT scan at baseline, after C5, and then every 6C or earlier if indicated.

**Results:** 47 of the planned 51 pts have been enrolled. Median age was 66 (51–82), median Gleason score 8 (70.2% 8–10, 29.8% 5–7), median on-study PSA 91.6 ng/ml (0.15–3520), and median pre-study PSA doubling time 1.43 months (0.52–6.73). Median number of treatment Cs was 14 (1–31) and PFS was 19.3 months as of this analysis. Among 45 pts who have completed ≥2 cycles, 39 (86.7%) and 30 (66.7%) had PSA declines of ≥50% and ≥75%, respectively. Of 29 pts with measurable disease there were 2 CR, 21 PR, and 6 SD (79.3% overall RR). 10/47 pts were taken off study for radiographic disease progression and 5/47 for other reasons. Grade ≥3 toxicities included neutropenia (24/47), anemia (9/47), thrombocytopenia (5/47), weight loss (1/47), hypertension (3/47), and febrile neutropenia (4/47). Other toxicities included perianal fistula (3/47), rectal fissure (1/47), myocardial infarction (1/47), and osteonecrosis of the jaw (ONJ) (16/47, 34.0%). At the time of diagnosis of ONJ, 9/16 pts were on bisphosphonates, 3/16 had used bisphosphonates previously, and 4/16 had no history of bisphosphonate use. Although the incidence of ONJ was higher than the 18.3% reported by Ning, a recent study of carboplatin plus weekly docetaxel reported an incidence of 29.3%.

**Conclusions:** Dual antiangiogenic therapy with, B and L, plus D and P was associated with high PSA (86.7%) and tumor (79.3%) responses in mCRPC, with manageable toxicities. Further studies are underway to explore the high incidence of ONJ.

**Poster #175**

**SMALLER PROSTATE SIZE IS ASSOCIATED WITH GREATER VOLUME OF DISEASE AT PROSTATECTOMY**

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(Presented By: Boris Gershman)

**Introduction and Objectives:** Smaller prostate size is associated with a number of negative prognostic indicators including higher Gleason score and positive surgical margins. We hypothesized that this may be related to longer time to diagnosis for patients with smaller glands and investigated whether gland size is related to volume of disease at prostatectomy.

**Methods:** A retrospective review was performed of patients with Gleason 6–10 prostate cancer who underwent radical prostatectomy from 2001 through 2010. Patients were identified from a prostatectomy tumor bank database. Univariate and multiple logistic regression were performed to determine association between prostate weight and volume of disease at prostatectomy. Number of quadrants with prostate cancer on surgical pathology was used as a surrogate for volume of disease.

**Results Obtained:** A total of 2054 patients underwent radical prostatectomy. Mean age, PSA, and prostate weight were 59.6 ± 6.6 years, 6.0 ± 4.7 ng/ml, and 45.5 ± 17.5 grams, respectively. Gleason score was 6 in 1055 patients (51.4%), 7 in 858 patients (41.8%), and 8–10 in 141 patients (6.9%). Number of quadrants with prostate cancer was distributed as follows: 1 quadrant in 274 patients (13.3%), 2 quadrants in 557 patients (27.1%), 3 quadrants in 464 patients (22.6%), and 4 quadrants in 759 (37.0%). On one-way analysis of variance, increasing number of quadrants with cancer was associated with decreasing prostate weight (p < 0.001). On univariate and multiple logistic regression (Table 1), smaller prostate weight, higher PSA, and higher Gleason score were associated with increasing volume of disease.
Conclusions: Smaller prostate gland size is independently associated with increased volume of disease at prostatectomy. This supports the idea of a delay in diagnosis of prostate cancer for patients with smaller glands.

Background: The ideal treatment strategy for localized prostate cancer has not been determined. Based on a comprehensive review of the published literature, we conducted a lifetime cost–utility analysis comparing men undergoing open, laparoscopic, or robot–assisted radical prostatectomy (ORP, LRP, RARP), 3D conformal or intensity–modulated radiation therapy (3DCRT, IMRT), brachytherapy (BT), or combined external–beam radiation and brachytherapy (EBRT+BT).

Methods: A risk–stratified Markov model was constructed to determine outcomes in lifetime quality–adjusted life years (QALYs). A systematic literature review was conducted to determine event and transition probabilities in the model. Health states included remission, recurrence, metastasis, prostate cancer death, and other–cause death. Utilities were assigned for each health state, and additional disutility penalties accrued for complications and side effects. Salvage local and/or androgen deprivation therapies were allowed. Costs were determined from Medicare fee schedules, and patient time costs were also considered in a sensitivity analysis. Probabilistic Monte Carlo simulation was employed to determine the final QALYs and costs. Extensive one– and multi–way sensitivity analyses also was performed to test the robustness of the findings.

Results: Likelihood of recurrence, progression, and mortality increased with increasing disease risk, as did associated lifetime costs. In most comparisons, surgical modalities were associated with more QALYs than radiation modalities, and there were no significant differences between ORP, LRP, and RARP. For all strata, lifetime costs were significantly lower for surgical patients than for radiation patients, and did not differ substantially across surgical modalities. 3DCRT tended to be less effective than BT, IMRT, or EBRT+BT; QALYs otherwise were similar within each risk stratum among radiation modalities. For low–risk patients BT was the least expensive radiation modality; for high–risk patients BT and 3DCRT were less expensive than BT+EBRT. The findings were robust to an extensive set of sensitivity analyses.

Conclusions: Our analysis found modest differences in QALYs and substantial differences in payer and patient costs across treatment alternatives. These findings may inform future policy discussions regarding strategies to improve efficiency of treatment selection for localized prostate cancer.
DENOSUMAB PROLONGS BONE METASTASIS-FREE SURVIVAL IN MEN WITH CASTRATE-RESISTANT PROSTATE CANCER: A GLOBAL, RANDOMIZED, DOUBLE-BLIND, PHASE 3 TRIAL

Lawrence Karsh¹, Matthew Smith², Robert Coleman³, Neal Shore⁴, Karim Fizazi⁵, Bertrand Tombal⁶, Kurt Miller⁷, Paul Sieber⁸, Ronaldo Damiao⁹, Teuvo Tammela¹¹, Blair Egerdie¹², Hendrik Van Poppel¹³, Joseph Chin¹⁴, Juan Morote¹⁵, Tomasz Borkowski¹⁶, Zhishen Ye¹⁷, Amy Kupic¹⁷, Roger Dansey¹⁷ and Carsten Goessl¹⁷

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(Presented By: Lawrence Karsh)

Introduction: Bone metastases are a major cause of morbidity in men with castrate-resistant prostate cancer (CRPC). Prevention of bone metastasis is a major unmet medical need. This global phase 3 study evaluated the effect of denosumab (XGEVA®), a fully human monoclonal antibody against RANKL, on bone metastasis–free survival in men with non-metastatic CRPC.

Methods: PMen with non–metastatic CRPC at high risk for developing bone metastasis (PSA value ≥8.0 ng/mL and/or PSA doubling time ≤10.0 mos) were randomized 1:1 in a blinded manner to receive monthly subcutaneous (SC) denosumab 120 mg (n=716) or monthly SC placebo (n=716). The first patient was enrolled in February 2006 and the primary analysis cut-off date was July 2010. Stratification was by PSA risk group and prior/current chemotherapy for PC. Daily calcium and vitamin D supplements were strongly recommended. The primary endpoint was bone metastasis–free survival as determined by the time to first bone metastasis or death from any cause. The time to first bone metastasis excluding deaths and overall survival time were also evaluated. Bone metastases were detected by bone scan and confirmed by radiography, CT, or MRI. Images were reviewed by an independent central reading facility in a blinded fashion.

Results: Denosumab significantly increased bone metastasis–free survival by a median of 4.2 mos compared with placebo (29.5 and 25.2 mos, respectively; hazard ratio [HR] 0.85; 95% CI: 0.73, 0.98; P=0.028; risk reduction of 15%), and significantly delayed the time to first bone metastasis compared with placebo (HR 0.84; 95% CI: 0.71, 0.98; P=0.032; risk reduction of 16%). Time to symptomatic bone metastasis was also delayed (HR 0.67; 95% CI: 0.49, 0.92; P=0.01). Overall survival was similar between groups (HR 1.01; 95% CI: 0.85, 1.20; P=0.91). Rates of adverse events (AEs) and serious AEs were similar between groups. Yearly cumulative incidence of osteonecrosis of jaw was similar to rates previously reported for monthly denosumab 120 mg in patients with cancer and bone metastasis (year 1: 1.1%, year 2: 2.9%, year 3: 4.2%), with an overall cumulative rate of 4.6% (n=33). Hypocalcemia occurred in 1.7% (n=12) denosumab and 0.3% (n=2) placebo patients.

Conclusion: In men with CRPC, denosumab significantly prolonged bone metastasis–free survival and delayed time to bone metastasis, including symptomatic bone metastasis. This is the first large randomized study to demonstrate bone metastasis prevention in men with CRPC. Funding was provided by Amgen Inc.

POSTER SESSION II

Poster #178

EFFECT OF THE SIMULTANEOUS BLOCKADE OF ANDROGEN AND ESTROGEN RECEPTORS ON PROSTATE CANCER: PRELIMINARY RESULTS

Rafael Nunez-Nateras and Erik Castle
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(Presented By: Rafael Nunez-Nateras)

Purpose: Androgens and estrogens, via receptors on the prostate, have been shown to play an important role in normal prostate development and function as well as carcinogenesis and development of the castration resistant phenotype of disease. The aim of this study was to evaluate the effect of a simultaneous administration of an androgen receptor antagonist (Bicalutamide) and a selective estrogen receptor modulator (Raloxifene) on both androgen sensitive and androgen insensitive prostate cancer cell lines.
Material and methods: Experiments were performed on LNCaP, PC3 and DU145 cell lines. Western blot was utilized for the identification and relative presence of androgen and estrogen receptors in the cell lines. Drug concentrations required to achieve 50% of cell death (IC 50) were obtained using the MTT assay; such concentrations were identified for the drugs individually and when used in combination. The effect of the drugs on apoptosis was assessed using flow cytometry and based on the IC 50 concentrations identified with the MTT assay.

Results: Androgen receptor was found only on LNCaP cells as expected. Estrogen receptor and were present in the 3 cell lines. Results of the IC 50 for the drugs alone and in combination by each cell line are shown on table 1. An enhanced effect was observed when the drugs were used in combination in all the cell lines (both androgen sensitive and androgen insensitive). It was evident that the combination of the drugs decreased the total drug required to achieve the IC50 decreases considerably. Apoptosis rates were also affected by the simultaneous administration of Bicalutamide and Raloxifene. The synergistic effect of the combination was reflected in the increase of the apoptosis rate in all cell lines.

Conclusions: The simultaneous administration of Bicalutamide and Raloxifene has a synergistic effect on cell death and apoptosis of DU145, PC3 and LNCaP cell lines. The pathway(s) responsible for this observation may be independent of the androgen receptor as both AR negative cell lines were still affected by the combination over the SERM alone. Research is warranted to identify other potential pathways.

<table>
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<tr>
<th>PC3</th>
<th>Bicalutamide alone (uM)</th>
<th>Raloxifene alone (uM)</th>
<th>Bicalutamide alone (uM)</th>
<th>Raloxifene alone (uM)</th>
<th>Bicalutamide alone (uM)</th>
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<tr>
<td>Raloxifene + Bicalutamide at IC50 (uM)</td>
<td>14.5</td>
<td>34.2</td>
<td>0.03</td>
<td>0.03</td>
<td>3.9</td>
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THE CONCORDANCE OF PROSTATE NEEDLE BIOPSY AND RADICAL PROSTATECTOMY AFTER THE 2005 GLEASON SCORE MODIFICATION

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(Presented By: David Margel)

Purpose: At an International Society of Urological Pathology (ISUP) consensus conference in 2005, the old Gleason grading system underwent its first major revision. We determine the difference in concordance of patterns of Gleason grading for prostate needle biopsy and radical prostatectomy (RP) specimens before and after the ISUP modification, as well as differences in correlation of biopsy grade with pathological variables.

Materials and Methods: We correlated needle biopsy and RP Gleason score in 330 consecutive patients (2002–2004) before ISUP 2005 and 690 (2008–2010) after the 2005 Gleason modification. All pathological specimens were reviewed by expert Uro–pathologists at the University of Toronto. Four Gleason grading groups were considered 6, 7 (3+4), 7 (4+3) and 8–10. Also, tumor extension, surgical margins and pathological stage were correlated with the prostate biopsy Gleason score in each cohort.
**Results:** In needle biopsy specimens, Gleason score 6 assignment decreased from 53.6% in the old cohort to 30.7% in the new one ($p=0.03$). Gleason score 7 (3+4) increased from 32.7% to 44.1% in the new and old cohort, respectively ($p=0.055$). The agreement in Gleason between biopsy and RP specimens was 67% and 58% for the old and new cohort, respectively ($p=0.002$). Agreement for Gleason 6 was 71.8% in the old cohort and 50.5 in the new one ($p=0.002$). For Gleason 7 (4+3) and >7 agreement decreased in the new cohort compared to the old one (43% vs 50% ($p=0.4$) and 46.3 vs 70.6 ($p=0.0001$), respectively. On the other hand, agreement for Gleason score 7 (3+4) increased from 64% in the old cohort to 72% in the new one ($p=0.06$).

The most significant change in pathological stage distribution was seen for Gleason 7. Pathological T2 stage increased for Gleason score 7 (3+4) from 50% in the old cohort to 60.5% ($p=0.03$) in the new one associated with fewer diagnosis of pT3 stage. For Gleason 7 (4+3), pT2 stage decreased from 64.3% to 49.5% ($p=0.02$). This was associated with an increase of pT3 stage from 33% to 44% for Gleason 7 (4+3) ($p=0.06$).

**Conclusions:** In a contemporary cohort, a shift of the most frequent Gleason scores from 6 to 7 (3+4) in biopsy specimens is demonstrated. Although overall the degree of concordance between biopsy and RP seems to have decreased, a better concordance was seen in Gleason 7 (3+4) category. In addition, with the new modified Gleason score RP outcomes of p stage, tumor volume and positive surgical margins where better correlated.

**Poster #180**

DEVELOPMENT OF A GENOMIC-CLINICAL CLASSIFIER MODEL FOR PREDICTING CLINICAL RECURRENCE IN PATIENTS WITH LOCALIZED PROSTATE CANCER

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(Presented By: Elai Davicioni)

**Introduction and Objectives:** The efficient delivery of adjuvant and salvage therapy after radical prostatectomy in patients with prostate cancer is hampered by a lack of biomarkers to assess the risk of clinically significant recurrence and progression. Better prognostic and predictive tools are required to guide clinical management.

**Methods:** Patient specimens from the Mayo Clinic Radical Prostatectomy Registry were selected from a nested case–control cohort with 14 years median follow-up. RNA expression levels from FFPE tumor specimens were measured with 1.4 million feature oligonucleotide microarrays. Patients were divided into a training set (n=359) for feature selection using cross–validated elastic–net logistic regression and model building with a Random Forests classifier. A separate validation set (n=186) was used for model evaluation. The final genomic clinical classifier (GCC) consists of 43 expressed biomarkers (from coding and non–coding regions of the genome) in combination with pathologic Gleason score. We compared the performance of the GCC against the multivariate CAPRA–S score, which combines five clinical variables (preoperative PSA, ECE, SVI, LNI and Gleason) and Gleason score alone for predicting clinical recurrence (defined as positive bone CT scans within five years after biochemical recurrence) following prostatectomy. The receiver–operator characteristic area–under–the–curve (AUC) metric was used to compare the discrimination of the models for predicting clinical recurrence.

**Results:** In the validation set, the GCC model had an AUC of 0.75, in comparison to 0.59 and 0.65 for CAPRA–S and Gleason–only models, respectively. However, in contrast to CAPRA–S and Gleason–only models the GCC maintained consistent performance in high–risk (node negative and pT3 and/or positive margin or pT2 with positive margins) patients (n=107). In this group, the GCC had an AUC of 0.78, whereas CAPRA–S improved to an AUC of 0.65 and Gleason–only dropped to an AUC of 0.59.

**Conclusions:** A combined genomic–clinical classifier shows improved performance over multivariate CAPRA–S model and Gleason score alone in the prediction of clinical recurrence, notably in high–risk prostatectomy patients that are the most likely candidates for adjuvant therapy. We are further testing the performance of this classifier and its usefulness in guiding decision–making for the adjuvant therapy setting in additional validation studies.
Poster #181

**IS CLINICAL STAGE T2C PROSTATE CANCER INTERMEDIATE- OR HIGH-RISK DISEASE? RESULTS FROM THE SEARCH DATABASE**

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(Presented By: Abhay Singh)

**Introduction:** Clinical stage T2c is a nebulous factor in the algorithm for prostate cancer risk stratification. According to D’Amico risk stratification cT2c is part of the high-risk category where NCCN guidelines place this stage in intermediate-risk. As cT2c represents a possible decision fork it may influence treatment decisions and it is therefore important to define what risks cT2c portends. Furthermore, as diagnostic work up with the use of MRI continues to escalate clinical staging may become more important. For those reasons we sought to investigate which risk group the clinical behavior of cT2c tumors more closely resembles.

**Methods:** We retrospectively analyzed data from 1089 men who underwent radical prostatectomy (RP) from 1988 to 2009 who did not have low-risk CaP from the SEARCH database. We compared time to biochemical recurrence (BCR) between men with cT2c disease, those with intermediate-risk (PSA 10−20 ng/ml or Gleason sum (GS) =7), and those with high-risk (PSA>20 ng/ml, GS 8−10, cT3) using Cox regression models adjusting for age, race, year of RP, center, and percent cores positive. We also compared predictive accuracy of two Cox models wherein cT2c was considered either intermediate- or high-risk by calculating concordance index c.

**Results:** A total of 68 men (3.4%) had cT2c tumors. After a median follow-up of 47.5 months, there was no difference in BCR risk between men with intermediate-risk CaP and those with cT2c tumors (HR=0.90; p=0.60). In contrast, there was a trend for men with high-risk CaP to have nearly 50% increased BCR risk compared to men with cT2c tumors (HR=1.50; 95% CI=0.97−2.30; p=0.07) which did not reach statistical significance. Concordance index c was higher in the Cox model wherein cT2c tumors were considered intermediate-risk (c=0.6147) than in the model wherein cT2c was considered as high-risk (c=0.6106).

**Conclusions:** BCR risk for patients with clinical stage T2c was more comparable to men who had intermediate-risk disease than men with high-risk CaP. In addition, a model which incorporates cT2c disease as intermediate-risk has better predictive accuracy than one which considers cT2c as high-risk. These findings suggest men with cT2c disease should be offered treatment options for men with intermediate-risk CaP. Additionally, improvement of clinical staging through the rapidly-increasing use of MRI may have the potential to better identify bilateral organ-confined CaP and further establish risk classification.

Poster #182

**MULTIPARAMETRIC MRI & SUBSEQUENT MR/ULTRASOUND FUSION BIOPSY IMPROVES DETECTION OF ANTERIOR PROSTATE CANCER LESIONS**

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¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Philips Research North America, Briarcliff Manor, NY; ³Department of Interventional Oncology, National Institutes of Health, Bethesda, MD; ⁴Department of Pathology, National Institutes of Health, Bethesda, MD; ⁵Molecular Imaging Program, National Institutes of Health, Bethesda, MD

(Presented By: Dmitry Volkin)
**Introduction:** Studies estimate that 21% of prostate cancers (CaP) arise from the anterior portion of the prostate. However, anterior lesions have been notoriously under sampled by standard 12-core trans-rectal ultrasound (TRUS) prostate biopsy due to geometric constraints when aiming for the peripheral zone. This undersampling can lead to multiple clinical dilemmas: 1) patients with anterior lesions that have had multiple negative biopsies in the face of a rising PSA, 2) patients on active surveillance that might harbor more aggressive disease in an anterior lesion. Multiparametric MRI (mpMRI) of the prostate followed by MR/Ultrasound (MR/US) fusion biopsy is useful in the detection of these lesions.

**Methods:** In this retrospective review, all patients undergoing MR/US fusion biopsy between March 2007 and July 2011 were included. Patients received a 3 Tesla mpMRI of the prostate with endorectal coil; scans included T2, dynamic contrast enhanced, diffusion weighted, and spectroscopy images. Lesions were identified and graded for suspicion by 2 GU radiologists. Patients with anterior lesions were selected. All patients then underwent an MR/US fusion biopsy of one or more targeted lesions as well as a 12-core random TRUS sextant biopsy.

**Results:** Of the 373 patients that had a biopsy on fusion platform, 115 (31%) had one or more suspicious anterior lesions identified on mpMRI. 39 of these 115 patients (34%) had a total of 61 anterior lesions that on MR/US fusion biopsy were positive for cancer. Of the 39 patients, 20 of which had previous negative biopsies at an outside institution, 15 (39%) were found to be solely positive on MR targeted biopsy, while 24 (62%) were positive on TRUS random biopsy as well as MR targeted biopsies. Of the 20 patients with previous negative biopsies 19 had at least 2 negative biopsies (95%), 12 (60%) had at least 3 negative biopsies previously, and at least 5 (25%) of these patients had saturation biopsies also negative prior to their MRI/US fusion biopsy at our institution.

On further analysis, 9 of the 24 patients, with CaP on both MR targeted and TRUS random biopsy, were upstaged by the MR targeted biopsy. Four patients were upstaged from low risk (primary Gleason 3) to high risk (Primary Gleason 4), which alters therapeutic decision making.

**Conclusion:** MpMRI and subsequent MR targeted biopsy is capable of detecting anterior lesions that would have been missed by TRUS biopsy alone, which dramatically impacts patient management.
A NOMOGRAM PREDICTING ADT FAILURE FOR MEN STARTING ANDROGEN DEPRIVATION THERAPY BEFORE METASTATIC DISEASE: RESULTS FROM THE SEARCH DATABASE

Christopher Keto¹, Christopher Kane², Martha Terris³, Christopher Amling⁴, William Aronson⁵, Joseph Presti Jr.⁶ and Stephen Freedland⁷
¹Duke University School of Medicine; ²University of California - San Diego, San Diego, CA; ³Georgia Health Sciences University, Augusta, GA; ⁴Oregon Health and Sciences University, Portland, OR; ⁵University of California - Los Angeles, Los Angeles, CA; ⁶Stanford University - Palo Alto, CA
(Presented By: Christopher Keto)

Introduction and Objective: Predictive nomograms exist for many prostate cancer (PC) clinical states. However, predictors of progression to castration resistant PC (CRPC) in men starting androgen deprivation therapy (ADT) before metastases are ill defined. We used the Shared Equal Access Regional Cancer Hospital (SEARCH) Database to identify predictors of CRPC in men treated with ADT for PSA-only recurrence after radical prostatectomy (RP) creating a nomogram to assess 5- and 10-year CRPC risk.

Methods: Retrospective review of 441 men treated with RP and continuous ADT for rising PSA between 1988 and 2010 in the SEARCH Database. We excluded men with radiographic evidence of distant metastases, pre-ADT PSA >100ng/mL, and men with incomplete data leaving 211 men. We assessed potential CRPC risk factors in univariate analyses including pre-ADT PSA, pre-ADT PSA doubling time (PSADT), seminal vesicle invasion (SVI), pathologic Gleason sum (<4+3 vs. ≥4+3), margin status, extracapsular extension, prior external beam radiation, time from RP to ADT, and lymph node status. We combined clinically relevant and statistically significant predictors into a multi-variable proportional hazards model with the start of ADT as time zero and created a nomogram from the results.

Results: During a median follow-up of 73 months after RP and 62 months after starting ADT, 47 men (22%) progressed to CRPC. Median time from start of ADT to CRPC was 55 months (IQR: 27–91). The 5- and 10-year risk of CRPC was 81% and 67%. Risk factors for progression to CRPC were logarithmically-transformed pre-ADT PSA (HR=1.60, p=0.002), logarithmically-transformed pre-ADT PSADT (HR=0.61, p=0.008), SVI (HR=1.88, p=0.032), and pathologic Gleason sum ≥4+3 (HR=2.27, p=0.009). The predictive accuracy of this model (Harrell’s c-index) was 0.75. Based on these results we created a nomogram to predict 5- and 10-year risk of CRPC (Figure 1).

Conclusions: The clinical predictors of progression to CRPC for men starting ADT for non-metastatic PC were higher pre-ADT PSA, shorter pre-ADT PSADT, Gleason sum ≥4+3 and SVI. If validated in future series, this nomogram may help identify high-risk men who should be considered for entry into clinical trials.
THE ASSOCIATION BETWEEN RACE AND PROSTATE CANCER RISK ON INITIAL BIOPSY IN A CONTEMPORARY, MULTIETHNIC COHORT

Alexis Gaines, Christopher Keto, Leah Gerber and Stephen Freedland
Duke University School of Medicine, Durham, NC
(Presented By: Alexis Gaines)

Introduction and Objective: Previous studies have established a link between race and increased prostate cancer (PC) risk on a population level. Data addressing whether race predicts PC after adjusting for clinical characteristics (i.e. all else being equal) is mixed. The Prostate Cancer Prevention Trial found black race was borderline significantly related to PC risk (HR=1.42, p=0.051), but significantly related to high-grade disease (OR=2.61, p<0.001). However, these results were based upon 175 men of which nearly 90% had PSA values <4.0 ng/ml. Thus, we investigated the association between race and risk of PC and high-grade PC in men undergoing initial prostate biopsy in a contemporary, racially diverse cohort.

Methods: Retrospective review of 997 men (49% black, 51% white) from the Durham VA Medical Center undergoing initial prostate biopsy between 2001–2009 with complete data. Baseline characteristics were compared between black vs. white men using chi-squared and rank-sum tests. Age, logarithmically-transformed PSA, prostate volume, and biopsy year were treated as continuous variables. Body mass index (BMI) was treated as a categorical variable (<25, 25–29.9, 30–34.9, and ≥35 kg/m2). Multivariate analysis of race and biopsy outcome was tested using logistic regression adjusting for age, BMI, DRE, year, and PSA. Multinomial logistic regression was used to test the association between race and PC grade (Gleason ≤3+4 vs. ≥4+3) compared to men with a negative biopsy.

Results: Black men were younger at biopsy (p<0.001), and had a higher pre-biopsy PSA (p=0.004). On univariate analysis, black men (n=276, 56%) were more likely to have cancer on biopsy than white men (n=236, 47%, p=0.002). On multivariate analysis, black race was a significant predictor of PC (OR=1.46, p=0.007). Relative to white men, black men had an increased risk of both low (RRR=1.45, p=0.010) and high-grade PC (RRR=1.51, p=0.094). However, this association was significant only in the instance of low-grade disease.

Conclusion: We found black race was associated with greater risk of low-grade, high-grade and overall PC detection on initial biopsy. These data further support the hypothesis that race is associated with increased PC risk and disease severity even when all else is equal. Additional investigation of the mechanisms linking PC risk and aggressiveness in black men is needed.

DO ALL PATIENTS WITH GLEASON 8 PROSTATE CANCER DIE OF THEIR DISEASE?

Sandra Koo and Christopher Porter
Virginia Mason Medical Center
(Presented By: Sandra Koo)

Background: Until very recently, patients with Gleason 8 prostate cancer were considered poor surgical candidates and were treated with external beam radiation therapy with or without androgen deprivation therapy. Some studies suggest that patients may cured by multimodal therapy including radical prostatectomy (RP). Thus, we explored the natural history of a cohort of patients with Gleason 8 prostate cancer and attempted to ascertain predictors of prostate cancer–specific–survival.

Methods: We retrospectively analyzed charts of patients who had pathologic Gleason 8 at time of RP. We then used Cox regression to evaluate clinical and pathologic variables that may predict prostate cancer–specific survival. We determined pathologic outcomes and rates of recurrence, survival, and cancer–specific survival using Kaplan–Meier analysis. Biochemical recurrence (BCR) was analyzed in patients operated after 1988, since systematic PSA follow up was instituted at that time and was defined at 0.1ng/ml.
Results: The cohort consisted of 117 patients. The median age was 65 years (range 49–93). The median PSA and median tumor volume were 9.60 (2–48) and 5.33 cc (0–50), respectively. Of all patients, 27.6% had a family history of prostate cancer, 68.1% were stage pT3 or higher, and 55.9% had positive margins. Of all patients, 40.7% had biochemical recurrence (BCR), 12.7% had metastatic disease, and 13.6% of patients died of prostate cancer. On both univariate and multivariate analysis, only margin status was a significant predictor of prostate cancer–specific survival, and patients were 4 times more likely to die of prostate cancer (HR 4.006; p=0.038). PSA, pathologic stage, family history, and secondary Gleason score were not significant. Kaplan–Meier estimated mean times to BCR and metastases were 16.8 years (14.5–19.1) and 22.7 years (21.0–24.4), respectively. Overall mean actuarial prostate–cancer specific survival was 21.6 years (19.6 –23.7). Patients with positive margin status had significant shorter mean actuarial time to prostate cancer death (19.4 vs. 22.0 years, p=0.016).

Conclusions: In this study, patients with very aggressive prostate cancer had acceptable rates of biochemical recurrence and only 13.6% of patients died of their disease. Moreover, patients that had positive margins were 4 times more likely to die of prostate cancer. This emphasizes the importance of meticulous surgical technique.

Funding: None

Poster #187

BENCHMARKS FOR OPERATIVE OUTCOMES OF ROBOTIC LAPAROSCOPIC AND OPEN RADICAL PROSTATECTOMY BASED ON RESULTS FROM A NATIONWIDE AMERICAN COHORT: THE HEALTH PROFESSIONALS FOLLOW-UP STUDY

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(Presented By: Mehrdad Alemozaffar)

Introduction: Multi−center evaluations of robot−assisted laparoscopic prostatectomy (RALP) and radical retropubic prostatectomy (RRP) operative outcomes have previously been limited to tertiary academic centers whose generalizability to community practice is uncertain, or to claims−based analyses of Medicare cohorts lacking consistent medical record confirmation. We sought to evaluate outcomes of RALP and RRP in a nationwide, community−based cohort to establish generalizable benchmarks for expected outcomes.

Methods: The Health Professionals Follow−up Study (HPFS) cohort of 51,529 men residing in all 50 US states was interrogated to evaluate outcomes of all men who underwent prostatectomy for prostate cancer from 2000 to 2009.

Results: Among all 2899 men diagnosed with prostate cancer from 2000 to 2009, 888 men underwent prostatectomy: 68% RRP (n=604), 26% RALP (n=228), 3% laparoscopic, and 3% perineal. RALP use increased during the study, representing 1% in 2002, and 79% by 2009. RRP patients were more likely to have clinical stage>T2 than RALP (33.1% vs. 18.8%, p<0.0001) and a higher median PSA (5.7ng/dl vs. 5.2, p=0.04); however, biopsy gleason scores and D’Amico risk were similar (p=0.06 and p=0.14, respectively). Peri−operative outcome comparison between RRP and RALP groups demonstrated no difference in rates of nerve−sparing (p=0.44), but RRP patients were more likely to undergo lymphadenectomy (85.6% vs. 48.0%, respectively, p=0.0001), experienced greater mean estimated blood loss (857.3ml vs. 205.7ml, p<0.0001), were more likely to receive blood transfusion (30.4% vs. 5.6%, p<0.0001), and had longer mean hospital stays (2.9 days vs. 1.9, p<0.0001). Oncologic outcomes between RRP and RALP revealed no difference in pathologic stage, gleason score, or rates of positive surgical margins (p=0.89, p=0.20, p=0.46, respectively). 224 patients in the RALP group (98.2%) and 558 patients in the RRP group (92.3%) were followed (mean follow−up 35.5 months and 74.9, respectively) with PSA recurrence noted in 93 (16.7%) of the RRP group and 14 (6.8%) of the RALP group. After adjusting for follow−up time, year of surgery, gleason score and clinical stage, the type of surgery did not predict recurrence (p=0.11).

Conclusion: In this nationwide, community−based cohort that provides broadly generalizable benchmarks of prostatectomy outcomes, RALP was associated with shorter hospital stay and less blood loss than RRP, while yielding similar oncologic outcomes.
**Poster #188**

**EFFECT OF OPEN VERSUS ROBOT-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY ON CANCER CONTROL IN PATIENTS WITH CLINICALLY LOCALIZED PROSTATE CANCER: PROSPECTIVE ANALYSIS OF 1014 CONSECUTIVE PATIENTS**

Adrian Fairey¹, Niels-Erik Jacobsen², Don Voaklander² and Eric Estey²

¹University of Southern California, Los Angeles, CA; ²University of Alberta, Edmonton, AB

(Presented By: Adrian Fairey)

**Introduction and Objectives:** There are limited prospective data comparing outcomes of Open Radical Prostatectomy (ORP) and Robot-Assisted Laparoscopic Radical Prostatectomy (RALRP) for clinically localized prostate cancer. Our aim was to compare ORP and RALRP with respect to cancer control outcomes.

**Methods:** A prospective analysis of data from the University of Alberta Radical Prostatectomy Database was performed. Between September 2007 and August 2010, 1019 consecutive men underwent radical prostatectomy for clinically localized prostate cancer. The surgical approach was selected by the surgeon. The outcomes were biochemical recurrence (BCR) and positive surgical margins (PSM). BCR was defined as a PSA ≥ 0.1 ng/ml followed by a subsequent confirmatory value or initiation of salvage therapy. PSM was defined as the presence of cancer at the inked margin in the radical prostatectomy specimen. The Kaplan-Meier method was used to estimate biochemical recurrence free survival (BCRFS). Univariable and multivariable analyses were used to determine the association between surgical approach and outcomes.

**Results:** Data were evaluable for 1014 out of 1019 patients. 204 patients underwent ORP and 810 patients underwent RALRP. The median follow-up duration was 21 months (IQR 12 to 29). Baseline characteristics were similar between the groups. In univariable analysis, 3-year BCRFS (90.6% versus 88.9%), overall PSM (26.5% versus 28.8%), and stage-stratified PSM (pT2: 19.9% versus 21.8%; pT3: 40.6% versus 49.1%) did not differ between the groups (all comparisons p>0.05). In multivariable analysis, surgical approach was not independently associated with BCR (HR 0.77, 95% CI 0.43 to 1.37, p=0.37) or PSM (OR 1.2, 95% CI 0.80 to 1.67, p=0.44).

**Conclusions:** ORP and RALRP provided comparable short-term oncologic efficacy. Extended follow-up of the prospective cohort is needed to confirm these preliminary findings.

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**Poster #189**

**PHYSICAL ACTIVITY AND PROSTATE CANCER RISK REDUCTION: DOES RACE MATTER?**

Abhay Singh¹, Jodi Antonelli¹, Lee Jones¹, Leah Gerber¹,², Elizabeth Calloway¹,², Kathleen Shuler¹,², Cathrine Hoyol¹, Delores Grant¹, Stephen Freedland¹,² and Lionel Banez¹,²

¹Division of Urology, Duke University School of Medicine, DUMC, Durham, NC; ²Durham Veterans Affairs Medical Center, Durham, NC; ³North Carolina Central University, Durham, NC

(Presented By: Abhay Singh)

**Introduction:** We previously reported that physical activity may reduce prostate cancer (CaP) risk among men undergoing prostate biopsy. However, whether the potential benefit of exercise against cancer differs by race is unclear. We therefore sought to further characterize the link between physical activity and CaP risk by examining these associations as a function of race.

**Methods:** Men undergoing prostate biopsy at the Durham VA Hospital were asked to complete a personal history survey which included an assessment of current exercise behavior. Participants were asked about their frequency of different exercises intensities (mild, moderate and strenuous) as well as the average duration. Total current exercise was calculated by multiplying the frequency of exercise sessions per week within each intensity category by the average reported duration, weighted by an estimate of the metabolic equivalent (MET) and then summed across all intensities with the expressed as average total MET hrs/wk. Specifically, exercise intensities were as follows: mild (3 METs, e.g. easy walking, yoga), moderate (5 METs, e.g. brisk walking, tennis), and strenuous (9 METs, e.g. running, swimming). Quantified exercise was compared between race groups using rank sum test. Associations between exercise and CaP risk was determined using crude and adjusted logistic regression stratified by self-reported race.
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Results: A total of 308 men had complete data for analysis. Of these men, 53% were white and 47% were black. There was no significant difference in the amount of physical activity between race groups ($p=0.11$). Increased amount of exercise was associated with decreased CaP risk for white men in both crude (OR= 0.89; 95% CI=0.81−0.98; $p=0.02$) and adjusted (OR=0.90; 95% CI=0.82−0.99; $p=0.04$) regression models that controlled for age, BMI, DRE, previous biopsy, and family history of CaP. We found no association between exercise and CaP risk among black men in both crude ($p=0.79$) and adjusted regression models ($p=0.87$).

Conclusions: Increased physical activity was associated with CaP risk reduction among white men but not among black men. Further investigations to validate this potential source of CaP race disparity and to identify exercise-specific parameters that influence CaP risk reduction (ex. age-specific or cumulative exercise) are required. Investigating race-specific mechanisms by which exercise modifies CaP risk and why these mechanisms disfavor black men in particular are warranted.

Poster #190

PATIENT PERSPECTIVES ON PSA SCREENING
Nikhil Waingankar, Eric Ghiraldi, Helen Levey, Manish Vira and Lee Richstone
The Arthur Smith Institute for Urology, North Shore-LIJ Health System, New Hyde Park, NY
(Presented By: Nikhil Waingankar)

Introduction: Despite mixed results from large prospective, randomized trials as to whether PSA screening saves lives, the current AUA Best Practice guidelines recommend continued PSA screening in ‘well-informed’ men with greater than a ten–year life expectancy who wish to pursue early diagnosis. The purpose of our study was to assess how well-informed patients are about the risks, benefits, and alternatives of PSA screening.

Methods: Anonymous surveys were created that sought to assess patient knowledge and opinions on prostate cancer screening, and were distributed at a free community prostate cancer screening day. Survey responses were entered into an Excel spreadsheet, relative frequencies were calculated, and Chi-Square and Fischer exact tests were performed where appropriate.

Results: 207 screened patients completed and returned surveys. 96% felt that all men between ages 50 and 75 should have an annual PSA test, and 95% felt it was proven that PSA screening saves lives. 41.9% of screening participants incorrectly responded that a “normal” PSA proves an absence of cancer, while only 56% correctly responded that PSA can be elevated in benign disease. 26% of patients were unaware that their urologist may recommend prostate biopsy based on PSA results, and less than 33% correctly cited that the risks of prostate biopsy include sepsis. 71% and 83% reported that the risks and overall cost, respectively, of screening are not factors that affect their decision-making when considering the potential for finding and treating cancer.

Conclusions: It is evident that many patients lack a complete understanding of the risks, benefits, and alternatives of prostate cancer screening, yet the vast majority would opt for continued PSA checks despite its perceived costs and associated risks. It is thus vital that Urologists spend adequate time educating their patients thoroughly on the sequelae of prostate cancer screening before the first PSA is drawn. Particular attention must be paid to community held PSA screening events, to ensure that patient education precedes screening to ensure patient education.

Poster #191

CLOSE SURGICAL MARGINS AFTER RADICAL PROSTATECTOMY ARE AN INDEPENDENT PREDICTOR OF RECURRENCE
Gregory Wirth¹, Jian Lu¹, Shulin Wu², Douglas Dahl¹, Aria Olumi¹, Robert Young², Scott McDougall¹ and Chin-Lee Wu²
¹Department of Urology, Massachusetts General Hospital, Boston, MA; ²Department of Pathology, Massachusetts General Hospital, Boston, MA
(Presented By: Gregory Wirth)

Background: The term close surgical margin (CSM) refers to a tumor extending to the inked margin of the specimen without reaching it. Current guidelines state that CSM should simply be reported as negative, however, this recommendation remains controversial and relies on limited evidence.
**Objective:** To evaluate the impact of CSM on the long−term risk of biochemical recurrence following radical prostatectomy.

**Design, setting and participants:** We identified 1195 consecutive patients who underwent radical prostatectomy for localized prostate cancer in our institution from 1993 to 1999. In 894 of these patients, associations between margin status and location, Gleason score, pathological stage, pre−operative PSA, prostate weight, and age with the risk of biochemical recurrence were examined.

**Results and limitations:** Six−hundred forty−four of 894 patients (72%) had negative margins. Of these patients, 100 (15.5%) had CSM. In the group with PSA failure, median time to recurrence was 3.5 years. In the group without recurrence, median follow−up was 9.9 years. Cumulative recurrence−free survival differed significantly among the three types of margins (positive, negative and close) (p<0.001). On multivariate analysis, CSM constituted a significant, independent predictor of recurrence (HR 2.23 95%CI 1.08−4.99). Gleason score and positive margins were the strongest prognostic factors.

**Conclusions:** In this cohort, CSM were independently associated with a twofold risk of postoperative biochemical recurrence. Further evaluation of the clinical significance of CSM is indicated, as they might be an indicator of local recurrence and of relevance when considering salvage therapy.

**Poster #192**

**WHAT IS THE PREVALENCE AND IMPACT OF DEPRESSION, ANXIETY, AND DISTRESS IN PATIENTS WITH NEWLY DIAGNOSED LOCALIZED PROSTATE CANCER?**

Sanoj Punnen, Jared Whitson, Matthew Cooperberg, Janet Cowan and Peter Carroll
San Francisco, CA
(Presented By: Sanoj Punnen)

**Introduction:** Despite increased attention towards sexual and urinary outcomes in men with prostate cancer, mental health concerns and their impact on recovery and functional outcomes often go unnoticed. The objective of this study was to determine the prevalence and severity of depression, anxiety, and distress in patients with newly diagnosed prostate cancer, to examine what factors are associated with worse mental health outcomes, and to ascertain if there is an association between mental health and functional outcomes.

**Materials and Methods:** The study population consisted of patients referred to the department of Urology at the University of California, San Francisco who were managed with active surveillance (AS) or radical prostatectomy (RP). Baseline levels of depression, anxiety and distress were ascertained using well−validated questionnaires: Patient Health Questionnaire 9 (PHQ−9), Generalized Anxiety Disorder 7 (GAD−7) and the Distress Thermometer (DT), respectively. Multivariate logistic regression was used to examine the associations between baseline factors and mental health measures. Mixed model repeated measures analysis was used to examine the association between mental health measures and sexual and urinary outcomes.

**Results:** The study cohort consisted of 907 patients. The prevalence at diagnosis of no, mild, or moderate to severe depression and anxiety were 85% and 82%, 11% and 14%, and 4% and 4%, respectively. Low distress was present in 83% while 17% reported having high distress at baseline. There were no significant differences between AS and RP patients in their distribution of PHQ−9, GAD−7 and DT scores at baseline. Increasing International Prostate Symptom Scores (IPSS) and younger age appeared to be associated with increased depression, anxiety and distress levels, while decreased Sexual Health Inventory for Men (SHIM) scores appeared to be associated with increased depression and being single versus in a relationship appeared to be associated with increased distress. Increased levels of depression, anxiety and distress appeared to be associated with worse IPSS. Increased depression and distress were associated with worse urinary bother scores while increased anxiety was associated with worse SHIM scores.

**Conclusion:** Levels of depression, anxiety and distress appeared to be low at baseline. However, these mental health measures do appear to be associated with urinary and sexual outcomes.
**Poster #193**

**EMPIRIC ANTIBIOTICS FOR AN ELEVATED PSA: A RANDOMIZED, PROSPECTIVE MULTI-INSTITUTIONAL TRIAL**
Scott Eggener¹, Michael Large², Glenn Gerber¹, Joseph Pettus³, John Smith⁴, Ofer Yossepowitch¹, Norm Smith¹, Shilajit Kundu⁶ and Jay Ramnan³

¹University of Chicago Chicago, IL; ²University of Chicago Hospitals Chicago, IL; ³Wake Forest University Winston-Salem, NC; ⁴Forsyth Medical Center Winston-Salem, NC; ⁵Tel Aviv University Tel Aviv, Israel; ⁶Northwestern University Chicago, IL; ⁷Penn State Milton S. Hershey Medical Center

(Presented By: Michael Large)

**Introduction and Objective:** We sought to study the impact of an empiric course of antibiotics for a newly elevated PSA in an asymptomatic male.

**Methods:** Men of any age with a PSA > 2.5 ng/ml and normal digital rectal examination undergoing their first prostate biopsy were recruited from six medical centers. Patients with previous biopsy, prostate cancer, urinary tract infection (UTI) or prostatitis within the prior year, antibiotic use within one month, 5-alpha reductase inhibitor use, allergy to fluoroquinolones or clinical suspicion of UTI were excluded. Men were randomized to two weeks of ciprofloxacin 500 mg twice daily or no antibiotic. A PSA was obtained 21−45 days following randomization and immediately prior to prostate biopsy. All patients received institution−specific prophylactic peri−procedural antibiotics. Primary endpoint was change in PSA between baseline and on the day of biopsy. The trial was closed early following an interim analysis and decision rule for futility and early stopping.

**Results Obtained:** Complete data was available on 77 men with a mean age of 60.6 (IQR: 53.8 − 66.7). In the control group (no antibiotic; n=39), mean baseline and pre−biopsy PSA were 6.5 and 6.9 ng/ml, respectively (p=0.8). In men receiving antibiotic (n=38), mean baseline and pre−biopsy (post−antibiotic) PSA were 7.6 and 8.5 ng/ml, respectively (p=0.7). Prostate cancer was detected in 36 (47%) men. Detection rates did not significantly differ between individuals with an increasing PSA or decreasing PSA between the two measurements.

**Conclusions:** Empiric use of antibiotics for an elevated PSA in an asymptomatic patient is not of clinical benefit.

**Poster #194**

**ROBOTIC ASSISTED LAPAROSCOPIC PROSTATECTOMY IN HIGH-RISK PROSTATE CANCER**
Sean Stroup¹, Kerrin Palazzi-Churas², J. Kellogg Parsons² and Christopher Kane²

¹Naval Medical Center San Diego; ²University of California San Diego

(Presented By: Sean Stroup)

**Objective:** Robotic assisted laparoscopic prostatectomy (RALP) is increasingly considered a key component of a multimodal strategy to treat men with high−risk prostate cancer. We evaluated our experience treating men with D’Amico high−risk prostate cancer.

**Methods:** Under an IRB−approved protocol, we analyzed men with D’Amico high−risk prostate cancer who underwent RALP at our institution from February 2006 to July 2011. Clinicopathologic variables and cancer−related outcomes were assessed. Biochemical recurrence (BCR) was defined as PSA >0.2 ng/ml, 2 values at 0.2 ng/ml, or secondary treatment for an elevated PSA. Predictors of PSA recurrence were analyzed using multivariable logistic regression models.

**Results:** Of 503 patients undergoing RALP, 108 had D’Amico high−risk prostate cancer. These men had a mean age of 64 ± 6.7 years, mean BMI of 27.3 ± 4.2 kg/m2, and mean preoperative PSA of 8.5 (IQR 5.9−15.3) ng/ml. Most were high−risk by biopsy Gleason grade alone (≤ 6 – 1.9%, 7 – 6.5%, and ≥ 8 – 88%); and clinical stage suggested localized disease in most cases (cT1a−c – 37%, cT2a−c – 53%, and cT3−4 – 8%). Final pathology was consistent with high risk disease: Gleason grade ≤ 6 – 1.9%, 7 – 37%, and ≥ 8 – 57.4%; T−stage T2a−c – 52%, T3−4 – 48.2%; seminal vesicle invasion – 17.6%; positive margins – 29.6%; lymph node involvement – 2%. On multivariate analysis positive margins were related to larger tumor size (OR = 1.11, 1.06 − 1.163), but not preoperative PSA. At a median of 13.7 months, 26 (24%) men experienced BCR. Lymphovascular invasion on final pathology was the strongest predictor of BCR (OR = 7.771, 2.95 − 20.65).

**Conclusions:** In this cohort, RALP for high−risk prostate cancer was a feasible treatment option that provided robust short−term cure in 76% of patients. Tumor size and lymphovascular invasion were adverse pathologic features associated with increased risk of positive surgical margins and BCR, respectively.
THE EPIGENETIC ANALYSIS OF THE KALLIKREIN GENE FAMILY IN SEARCH FOR NOVEL DIAGNOSTIC AND PROGNOSTIC BIOMARKERS FOR PROSTATE CANCER

Ekaterina Olkhov¹,², Theodorus van der Kwast³, Vaiju Pethe¹, Hilmi Ozcelik¹,², Laurent Briollais¹, Neil E. Fleshner⁴, Eleftherios P. Diamandis¹,², Bharati Bapat¹,² and Alexandre R. Zlotta¹,⁵
¹Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, ON; ²Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, ON; ³University Health Network, Toronto General Hospital, Toronto, ON; ⁴University Health Network, Princess Margaret Hospital, Toronto, ON; ⁵Mount Sinai Hospital, Toronto, ON

(Presented By: Ekaterina Olkhov)

Introduction: Prostate cancer (PCa) is the most common malignancy affecting men in Canada. Currently, a blood test for serum Prostate Specific Antigen (PSA) is used for PCa diagnosis. Although PSA is a useful biomarker, it has a poor sensitivity (70%−80%) and specificity (60%−70%). Therefore, there is a need to identify more effective PCa biomarkers. Evidence suggests that members of the 15−member KLK gene family are likely candidates since many KLKs are aberrantly expressed in primary PCa and PCa derived cell lines. DNA methylation may regulate this aberrant KLK expression. Aberrant DNA methylation is a well recognized hallmark of carcinogenesis and can serve as a diagnostic and prognostic biomarker for many cancers, including PCa.

Methods: In this study, KLK 10 was selected for analysis of DNA methylation based on its significant methylation levels on Agilent Human CpG Island microarrays and EpiTYPER. To investigate whether methylation mediated gene silencing and regulates KLK10 expression, we treated the PCa cell lines PC3 and 22RV1 with the demethylating drug 5−aza−2′deoxycytidine.

Results: Following treatment, 9.5−fold and 6−fold increase in KLK10 transcript expression were observed in PC3 and 22RV1 cells, respectively, establishing that methylation plays a role in regulating gene expression. Subsequently, using quantitative, high−throughput methylation−specific real−time PCR (MethyLight) technology, we evaluated the relationship between KLK10 promoter methylation and clinicopathological parameters in a series of 112 radical prostatectomies and adjacent normal prostate tissue. The prevalence of KLK10 methylation was greater in cancerous tissue (57%) vs. normal (4%). Further, KLK10 methylation was higher in locally advanced pT3a−pT3b (28/39−72%) vs. localized pT2 (36/73−49%).

Conclusion: Therefore, our results suggest that increase in KLK10 methylation may be associated with PCa progression.

EFFICACY OF LOW TEMPERATURE-SENSITIVE LIPOSOME ENCAPSULATED DOCETAXEL COMPARED TO FREE DOCETAXEL IN A XENOGRAFT MURINE MODEL OF PROSTATE CANCER

Dmitry Volkin¹, Nitin Yerram¹, Saurin Chokski¹, Ashish Ranjan², Compton Benjamin¹, Ayele Negussie², Paul Chung¹, Matthew Dreher², W. Marston Linehan¹, Bradford Wood² and Peter Pinto¹
¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Department of Radiology and Imaging Sciences

(Presented By: Nitin Yerram)

Introduction/Objective: Docetaxel is currently the standard of care, first line treatment in castrate resistant prostate cancer (CRPC) despite its clinically significant toxicity for the patient. The objective of this study was to investigate the efficacy of low temperature sensitive liposome (LTSL) encapsulated docetaxel with mild hyperthermia in a murine prostate model.

Methods: Female athymic nude mice with human prostate PC−3M−luciferase cells grown subcutaneously into the right hind leg were randomized into six groups: saline +/- heat, free docetaxel +/- heat, and LTSL docetaxel (provided by Celsion Corp, Columbia, MD) +/- heat. Treatment (15 mg docetaxel/kg) was administered via tail vein once tumors reached a size of 200−300mm³. Mice that underwent hyperthermia were anesthetized and secured in a device that allowed only the leg with tumor to be submerged in 41−42°C water for one hour, which is sufficient to release a drug payload from LTSLs. Mice tumor volumes and body weights were recorded for up to 60 days. Survival was defined as the time when tumor volume was > 5x the treatment volume. Growth delay was also assessed at 5x the treatment volume. Treatment groups were compared for differences in mean survival using log rank test and growth delay using ANOVA followed by Neuman–Keul’s multiple comparison test (p<0.05).
**Results:** The tumor growth delay was (mean±SEM) 8 ± 1 day for LTSL alone, 15 ± 5 days for free docetaxel alone, 34 ± 8 days for free docetaxel with heat, and 36 ± 8 days for LTSL in combination with heat. Adding heat to LTSL or free docetaxel treatment resulted in significantly greater survival and growth delay compared to other treatments (p<0.05). However, these two effective treatments were not significantly different (p>0.05). Adding heat to LTSL docetaxel increased the growth delay 28 days, which was more than adding heat to free docetaxel (19 days), suggesting a benefit of encapsulation.

**Conclusions:** Adding mild hyperthermia to LTSL docetaxel or free docetaxel significantly increased survival over treatments without heat. Future biodistribution and histopathological studies of docetaxel in treatment mice would help elucidate the toxicity profile of free vs. encapsulated drug.

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**Poster #197**

**ROBOTIC RADICAL PROSTATECTOMY: 5 YEAR ONCOLOGIC BIOCHEMICAL RECURRENCE AND ONCOLOGIC OUTCOMES**

Michael Liss, Nima Beheshti, Douglas Skarecky, Blanca Morales, Kathryn Osann and Thomas Ahlering

UC Irvine Orange, CA

(Presented By: Michael Liss)

**Purpose:** Robot assisted radical prostatectomy (RARP) was introduced in California in 2002 and has demonstrated acceptable postoperative and early clinical outcomes. We present oncological outcomes in our initial four hundred cases operated on a minimum of 5 years ago.

**Materials and Methods:** The study cohort consisted of cases #1–400 undergoing RARP between June of 2002 and 2006. Pathological and PSA data was prospectively entered into an encrypted database and retrospectively reviewed for oncological outcomes. BCR was denoted for (1) any postoperative cancer treatment or (2) two persistent PSA values above 0.2 ng/ml. BCR free survival was estimated using Kaplan–Meier survival curves. The log rank test compares the event–time distributions for the comparisons of time to failure. Chi Square statistical analysis with a p value <0.05 were considered significant.

**Results:** Of the 400 patients, 21 died (Prostate 4 (1%), other 17). Of the remaining patients 10% (40 pts) have < 2 years follow up and 4 had none. The mean time since surgery is 6.8 years. The mean and median PSA follow up is 5.3 and 5.5 yrs, respectively. The overall 3 and 5yr–BCRFS is 88.5% and 86.0%. 295 (73.8%) were pT2; 5yr–BCRFS was 94.2% 5yr–PCSM 0.3%. 103 (25.8%) were pT3+: 5yr–BCRFS 52.4%, 5 yr–PCSM 2.9%. The pT2 +SM rate 6.9%; pT3 +SM rate 29/103(28.2%). To date 12 of the 17 pT2 BCRs (71%) have received secondary treatment versus 36/49 (73%) of pT3/4 patients with BCR. Only 1 of the 17 pT2 +SM has suffered a BCR (6.7%).

**Conclusions:** RARP does not compromise oncologic outcomes of patients with localized prostate cancer with evaluation of 5 year biochemical recurrence free survival outcomes. In our experience only one of the 17 pT2 positive surgical margins has developed BCR with 5 years of follow up.
A NOVEL RISK STRATIFICATION SYSTEM FOR CHEMOTHERAPY FAILURE IN TESTICULAR GERM CELL TUMOR (T-GCT)
Jessica Lubahn, Nicholas Cost, Mehrad Adibi, Adam Romman and Vitaly Margulis
Dallas, TX
(Presented By: Jessica Lubahn)

Introduction & Objectives: Patients with advanced T−GCT are successfully managed by a standardized regimen of platinum based systemic chemotherapy (p−CT). However, a few fail to respond adequately to first−line treatment, and could be well−suited for alternative systemic therapies or the clinical trials. We present a novel classification system, which can be easily used to predict failure of first−line p−CT.

Methods: We reviewed an institutional T−GCT database and selected patients who had undergone any CT. CT failures (CT−F) were defined as an inappropriate tumor marker response, tumor marker elevation following normalization, need for salvage CT, or presence of active GCT in post−CT RPLND. CT−F patients were compared to those successfully treated with CT (CT−S). Factors predictive of CT−F in a univariate analysis were used to develop a risk scoring system (RSS). The prognostic ability of the RSS was compared to the International Germ Cell Collaborative Group (IGCCG) classification by constructing Receiver Operating Curves (ROC).

Results Obtained: 205 patients were reviewed: 153 were CT−S and 52 were CT−F. Factors predictive of CT−F included AFP, HCG, number of metastatic locations, N and M status. Non−significant factors included histology (seminoma v non−seminoma), initial treatment modality, and T stage. The RSS, derived from the mean values of the CT−F group, had the following criteria: AFP>3000, HCG>50,000, LDH>800, ≥3 metastatic locations, N3, M1b.

The distribution of scores was obtained for CT−S and CT−F (all p<0.00) respectively: 0:101(69.2%) vs. 12(10.6%), 1: 39(26.7%) vs. 16(32.7%), 2: 4(2.7%) vs. 9(18.4%), ≥3: 2(1.4%) vs. 12(24.5%). The hazard ratios for scores 1,2, and ≥3 were 2.53,6.62, and 22.2 respectively (p<0.00).

The figure depicts time to CT−F, stratified by RSS. The calculated ROC for our RSS had an Area Under the Curve (AUC) of 0.78+/−0.04 (p<0.001) compared with the AUC of 0.72+/−0.48 (p<0.001) for the IGCCG classification.

Conclusions: Pending future validation, this RSS may be used to easily identify patients who would benefit from more aggressive CT regimens and could aid in risk−stratification for the development of future studies.

NOVEL PREDICTORS OF BENIGN PATHOLOGY IN STAGE IA OR IB PATIENTS WITH NON-SEMINOMATOUS TESTICULAR GERM CELL MALIGNANCY UNDERGOING PRIMARY RETROPERITONEAL LYMPH NODE DISSECTION
Mehrad Adibi, Nicholas Cost, Jessica Lubahn, Adam Romman and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

Introduction: There is no consensus on the optimal treatment for Stage I testicular non−seminomatous germ cell tumors (T−NSGCT), partly due to the inaccuracy of clinical staging methods. Prior reports have demonstrated that the presence of embryonal carcinoma (EC), lymphovascular invasion (LVI), and absence of yolk sac tumor (YST) in the orchiectomy specimen are important risk factors predicting occult metastatic disease. We assessed whether a novel combination of the above factors could predict the presence of benign retroperitoneal pathology.
**Poster Session II**

**Methods:** We reviewed an institutional database of patients with T−NSGCT and included all patients with Stage IA or IB NSGCT who underwent primary RPLND. Logistic regression analysis was used to compare patients with benign pathology versus germ cell tumor (GCT). A combination of significant pathologic factors was used as internal validation to predict the presence of benign or GCT pathology. Significance was determined at p<0.05. No financial funding was obtained.

**Results:** Among 55 patients with Stage IA or IB NSGCT managed with primary RPLND, 44(80%) had benign pathology and 11 (20%) had occult GCT in the retroperitoneum. No specimens revealed retroperitoneal teratoma in this cohort. Predictors of benign pathology were higher preorchiectomy alpha−fetoprotein levels (p=0.03), larger percentage of YST (p=0.02), lower embryonal carcinoma to YST (E/Y) ratio (p=0.001), presence of teratoma and absence of LVI in the primary orchiectomy specimen (both p=0.01). Multivariate analysis demonstrated an E/Y ratio ≤ 4 to be a strong predictor of benign pathology in the retroperitoneum, with an area under the receiver operating curve of 0.71 ± 0.08 (p=0.04), and a sensitivity and specificity of 37% (16/43) and 100% (12/12), respectively. In combination with absence of LVI, an E/Y ratio ≤ 4 had a 100%(10/10) positive predictive value for benign pathology on internal validation. Conversely, presence of LVI and an E/Y ratio of ≥ 4 revealed a 64% (7/11) predictive value for GCT.

**Conclusions:** In our cohort, patients with Stage IA or IB NSGCT who had benign pathology on the primary RPLND had a significantly higher proportion of YST to EC in the preorchiectomy specimen. An E/Y cutoff value of ≤ 4 appears to be discriminatory for predicting benign pathology. Emphasis on the proportion of YST in the primary orchiectomy specimen in addition to other previously established risk factors may allow for improved risk stratification.

**Poster #200**

MINIMALLY INVASIVE VERSUS OPEN RETROPERITONEAL LYMPH NODE DISSECTION FOR RESIDUAL MASSES AFTER CHEMOTHERAPY IN NONSEMINOMATOUS GERM CELL TESTIS CANCER

Sandhya R. Rao, Mayer N. Fishman, Wade J. Sexton, Philippe E. Spiess and Julio M. Pow-Sang

Genitourinary Oncology Program, Moffitt Cancer Center, Tampa, FL

(Presented By: Sandhya R. Rao)

**Introduction and Objective:** The role of minimally invasive retroperitoneal lymph node dissection (MI−RPLND) for postchemotherapy (PC) residual masses by laparoscopy or robotic−assisted laparoscopy remains controversial. We compared clinical and oncological outcomes between patients undergoing open RPLND (O−RPLND) and MI−RPLND at our center.

**Methods:** A review of our IRB approved testis cancer database identified 18 men who underwent full template MI−RPLND (14−laparoscopic, 4−robotic) for non seminomatous germ cell testis cancer (NSGCT) between 2005 and 2011. These cases were matched with 18 men who underwent O−RPLND for age, stage and maximum residual mass dimension on imaging studies in the same time period. Surgical and oncologic outcomes were compared.

**Results:** When comparing O−RPLND versus MI−RPLND surgery, median operative time was 360 (range 200−720) minutes versus 359 (238−481) (p=0.3); average EBL was 764(100−2700) ml versus 378 (range 50−1500) ml (p=0.03); median hospital stay was 6 (range 5−13) days versus 3 (range 1−5) days, (p=0.004); average lymph node yield was 21 (range 4−42) versus 17 (range 5−36) nodes (p=0.3) and number of prior chemotherapy cycles 4 versus 3 respectively. Complications in the O−RPLND were one ureteric injury, one bowel injury and one post-operative wound infection. There was one IVC injury in the MI−RPLND group managed by repair at the time of surgery. In the O−RPLND group there was one recurrence within and two outside the retroperitoneum; and four deaths at a median follow up of 75 months; 2 were cause−specific. There has been no recurrence or mortality in the MI−RPLND group at a median follow up of 18 months.

**Conclusions:** MI−RPLND has significantly decreased EBL and shorter hospital stay. Comparison of lymph node yield, morbidity and OR times showed no significant difference. Though short−term oncological outcomes are comparable, longer comparative follow−up is required.
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<td>Singh, Abhay A.</td>
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<td>Poster #164</td>
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<td>Sprenkle, Preston C.</td>
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<td>Stewart, Suzanne B.</td>
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<td>Poster #69</td>
</tr>
</tbody>
</table>
The following urologic oncology fellowship programs have earned the credentials of the Society of Urologic Oncology:

**Division of Urologic Oncology, Fox Chase Cancer Center**
Program Director: David Y.T. Chen, MD
Department of Surgical Oncology
333 Cottman Avenue
Philadelphia, PA 19111
Phone: (215) 728-2548
Email: david.chen@fccc.edu
http://www.fccc.edu/healthProfessionals/fellowships/urologic.html

**Duke University Medical Center**
Program Director: Thomas J. Polascik, MD
Associate Professor, Division of Urologic Surgery
PO Box 2804, Room 1080
Yellow Zone Duke South
Durham, NC 27710
Phone: (919) 684-4946
Email: polas001@mc.duke.edu
http://urology.surgery.duke.edu/education-and-training/fellowship-programs/urologic-oncology

**Glickman Urological and Kidney Institute, Cleveland Clinic**
Program Director: Andrew J. Stephenson, MD
9500 Euclid Avenue – Desk Q10-1
Cleveland, OH 44195-0001
Phone: (216) 445-1062
Fax: (216) 636-4492
Email: stephea2@ccf.org
http://my.clevelandclinic.org/urology/fellowships/urologic_oncology_fellowship.aspx

**Keck School of Medicine – University of Southern California**
Program Director: Eila Skinner, MD – Professor of Clinical Urology
1441 Eastlake Avenue, MS 74, Suite 7416
Los Angeles, CA 90089
Phone: (323) 865-3705
Fax: (323) 865-0120
Email: skinner@hsc.usc.edu

**Mayo Clinic Cancer Center, Mayo School of Graduate Medical Education**
Program Director: Bradley C. Leibovich, MD
Associate Professor of Urology
Mayo Clinic
200 First Street, SW
Rochester, MN 55905-2981
Phone: (507) 284-3981
Email: leibovich.bradley@mayo.edu

**Massachusetts General Hospital**
Program Director: Aria F. Olumi, MD
Associate Professor, Department of Urology
55 Fruit St., Yawkey Building 7E
Boston, MA 02114
Phone: (617) 643-0237
Fax: (617) 643-4019
Email: aulumi@partners.org
http://www.massgeneral.org/urology/Applicant Information

**Moffitt Cancer Center**
Program Director: Wade Sexton, MD
12092 Magnolia Drive
Suite 4035
Tampa, FL 33612
Phone: (813) 745-3131 (Jackie Campbell, Fellowship Coordinator)
Fax: (813) 745-4064
Email: wade.sexton@moffitt.org
  jackie.campbell@moffitt.org

**North Shore Long Island Jewish Health System**
Program Director: Manish Vira, MD
450 Lakeville Road, Suite M41
New Hyde Park, NY 11040
Phone: (516) 734-8500
Fax: (516) 734-8537
Email: mvira@nshs.edu
www.smithinstituteforurology.com
Northwestern University Feinberg School of Medicine
Program Director: Shilajit Kundu, MD
Tarry 16-703
303 E. Chicago Avenue
Chicago IL  60611
Phone: (312) 695-6125
Fax: (312) 908 -7275
Email: skundu@nmff.org

Roswell Park Cancer Institute
Program Director: James L. Mohler, MD
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Buffalo, NY 14263
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Fax: (716) 845-3300
Email: james.mohler@roswellpark.org
http://www.roswellpark.org/

University of Kansas Medical Center
Program Director: Jeffrey M. Holzbeierlein, MD
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Kansas City, KS 66160
Phone: (913) 588-7571
Fax: (913) 588-0603
Email: jholzbeierlein@kumc.edu

University of Pittsburgh Medical Center
Program Director: Benjamin Davies, MD
5200 Center Avenue, Suite 209
Pittsburgh, PA  15232
Phone: (412) 605-3020
Fax: (412) 605-3030
Email: daviesbj@upmc.edu

University of Western Ontario, Uro-Oncology Fellowship Program
Program Director: Jonathan I. Izawa, MD, FRCSC
Associate Professor
Departments of Surgery & Oncology
Divisions of Surgical Oncology & Urology Schulich School of Medicine & Dentistry The University of Western Ontario London Health Sciences Centre-Victoria Hospital
800 Commissioners Road East, Room E2-649 London, Ontario, Canada N6A 4G5
Phone: (519) 685-8550
Fax: (519) 685-8455
Email: jonathan.izawa@lhsc.on.ca

University of Texas Health Science Center, Department of Urology
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Fax: (210) 567-6868
Email: parekhd@uthscsa.edu
Co-Director: Robert S. Svatek, MD, MSCI
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Fax: (210) 567-6868
Email: svatek@uthscsa.edu
Fellowship Coordinator: Stephanie Radassao, MBA
Academic Program Coordinator, Urology
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Fax: (210) 567-5977
Email: radassao@uthscsa.edu

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Fax: (773) 702-1001
Email: gsteinbe@surgery.bsd.uchicago.edu
Fellowship Coordinator: Joanne Swanson
Phone: (773) 702-9757
Email: jswanson@surgery.bsd.uchicago.edu
http://www.ucurology.org/fellowship

University of Toronto - Uro-Oncology Fellowship Program, Division of Urology
Program Director: Neil Fleschner, MD
610 University Avenue, Room 3-120
Toronto, ON M4G 2M9 Canada
Phone: (416) 946-2899
Email: neil.fleschner@uhn.on.ca
http://www.surg.med.utoronto.ca/urooncology/
University of Miami School of Medicine, Department of Urology
Program Director: Mark S. Soloway, MD
PO Box 016960
Miami, FL 33101
Phone: (305) 243-6596
msoloway@med.miami.edu
Program Director: Murugesan Manoharan, MD, FRCS(Eng)
Professor of Urology
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Email: sheinfej@mskcc.org

Urology Department, MD Anderson Cancer Center
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Email: akamat@mdanderson.org

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Email: dlin@u.washington.edu
Assistant Director: Paul H. Lange, MD
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Seattle, WA 98195
Phone: (206) 543-3918
Email: lange@u.washington.edu

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924 Westwood Boulevard
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Email: abelldegrun@mednet.ucla.edu
Fellowship Coordinator: Georgette W. Pagano
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Fax: (310) 794-3513
Email: gpagano@mednet.ucla.edu

Urology Department, University of Michigan
Program Director: David Peter Wood, Jr., MD
Professor of Urology
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3875 Taubman
Ann Arbor, MI 48109
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University of California, San Diego
Comprehensive Cancer Center Urologic Oncology Fellowship
200 West Arbor Drive #8897
San Diego, CA 92103-8897
Program Director: Ithaar Derweesh, MD
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Fax: (619) 543-6573
Email: iderweesh@ucsd.edu
Fellowship Coordinator: Adela Lopez
Email: alopez@ucsd.edu

Urologic Oncology Program, National Cancer Institute
Program Director: Peter Pinto, MD
National Institutes of Health, Bldg. 10, CRC, Room 2-5940
10 Center Drive
Bethesda, MD 20892
Phone: (301) 496-6353
Fax: (301) 402-0922
Email: pintop@mail.nih.gov
The Society of Urologic Oncology (SUO) was created in 1984 to include members interested in the care of patients with malignant genitourinary disease. The SUO develops educational and research initiatives, studies in urologic oncology, and provides physician statements representing state-of-the-art assessments of these issues to other organizations.

For more information, visit www.suonet.org.

The National Cancer Institute (NCI) is the government’s primary agency for conducting and supporting research in cancer causes, diagnosis, prevention, and treatment. In support of the entire community of cancer researchers, NCI employs its funding mechanisms, organizations, and networks to support basic, translational, and clinical research, and to invest in extraordinary opportunities to further progress made possible by previous discoveries.

For more information, visit www.cancer.gov.
SUO-SBUR Joint Meeting at the 2012 AUA Annual Meeting  
May 2012  
Atlanta, GA

SUO at the 2012 AUA Annual Meeting  
May 2012  
Atlanta, GA

SUO 2012 Annual Meeting  
December 2012  
Hyatt Regency Bethesda  
Bethesda, MD
BoD, Committees & Faculty

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### Wednesday November 30, 2011

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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</table>
| 6:30 p.m. – 7:30 p.m. | CME Accredited Dinner Symposium*  
  Location: Grand Ballroom Salon B,C  
  “The Changing Landscape in Castration Resistant Prostate Cancer: Spectrum of Opportunity”  
  Presenters: Philip Kantoff, MD and Celestia S. Higano, MD  
  *CME for this dinner symposium was provided by Penn State College of Medicine. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content. |

### Thursday, December 1, 2011

<table>
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<tr>
<th>Time</th>
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| 6:45 a.m. – 7:45 a.m. | CME Accredited Breakfast Symposium*  
  Location: Grand Ballroom Salon C  
  “Optimizing Integration of Immunotherapy in Prostate Cancer”  
  Presenters: Philip Kantoff, MD and Celestia S. Higano, MD  
  *CME for this breakfast symposium was sponsored by an educational grant provided by Dendreon. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content. |

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<th>Time</th>
<th>Event</th>
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| 12:00 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
  Location: Grand Ballroom Salon B  
  “XGEVA®: Identifying Bone Metastases and Preventing Skeletal-Related Events in Prostate Cancer”  
  Presenter: Neal Shore, MD, FACS |

<table>
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<th>Time</th>
<th>Event</th>
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</table>
| 12:00 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
  Location: Grand Ballroom Salon C  
  “Novel Mechanisms of Androgen Regulation and Modulation in Disease Progression”  
  Presenter: Judd W. Moul, MD, FACS |

### Friday, December 2, 2011

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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| 6:45 a.m. – 7:45 a.m. | CME Accredited Breakfast Symposium*  
  Location: Grand Ballroom Salon B,C  
  “An Advanced Simulation Framework for Optimizing Bladder Cancer Treatment Outcomes”  
  Session Chair: Gary D. Steinberg, MD  
  Moderator: Michael Toscani, PharmD  
  Panelists: Cheryl Lee, MD; Ashish Kamat, MD; Tuan Dinh, PhD  
  *CME for this breakfast symposium was provided by Medical Education Resources (MER). Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content. |

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<th>Time</th>
<th>Event</th>
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</table>
| 12:10 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
  Location: Grand Ballroom Salon B,C  
  “Immunotherapy for the Treatment of Advanced Prostate Cancer”  
  Presenter: Daniel J. George, MD |
The 12th annual scientific meeting in urologic oncology will be held November 30 – December 2, 2011 at the Marriott Bethesda North Hotel & Conference Center. The Society of Urologic Oncology and the World Urological Oncology Federation jointly sponsor this interactive meeting where all attendees participate in the discussions. State-of-the-art topics on prostate, kidney and bladder cancer, as well as, strategies in urologic oncology will be discussed.

Registration/Information Desk Hours
Wednesday, November 30: 2:00 p.m. – 6:00 p.m.
Thursday, December 1st: 6:30 a.m. – 5:00 p.m.
Friday, December 2nd: 6:30 a.m. – 5:00 p.m.

Exhibit Hall Hours
Thursday, December 1st: 7:00 a.m. – 7:30 p.m.
Friday, December 2nd: 7:00 a.m. – 6:00 p.m.

Young Urologic Oncologists (YUO) Dinner
Date: Wednesday, November 30, 2011
Time: 6:00 p.m. – 9:30 p.m.
Location: Grand Ballroom G,H
Membership in the YUO Section of the Society of Urologic Oncology consists of fellows, scientists, and board certified or eligible physicians who are members of the SUO and have some post-residency training in urologic oncology. Membership is limited to the first seven years after completion of fellowship.

Welcome Reception
Date: Thursday, December 1, 2011
Time: 6:30 p.m. – 7:30 p.m.
Location: Grand Ballroom A,D
Attire: Business casual attire is appropriate
Enjoy dinner with friends and colleagues at the Marriott Bethesda North. One ticket is included with full meeting registration.

SUO Dinner
Date: Thursday, December 1, 2011
Time: 7:30 p.m. – 10:00 p.m.
Location: Grand Ballroom B,C
Attire: Business casual attire is appropriate
Enjoy dinner with friends and colleagues at the Marriott Bethesda North. Registration for this is an additional cost of $70.00 per person ($40.00 for fellows, nurses and residents).

2011 Young Urologic Oncologists (YUO) Program
Moderator: Fernando J. Bianco, Jr., MD – Columbia University Division of Urology at Mt. Sinai Medical Center
Date: Friday, December 2, 2011
Time: 8:00 a.m. – 8:30 a.m.
Location: Grand Ballroom E-H

SUO-CTC Board of Directors Meeting
Wednesday, November 30, 2011
3:00 p.m. – 6:00 p.m.
Location: Brookside

SUO Board of Directors Meeting
Wednesday, November 30, 2011
6:00 p.m. – 9:00 p.m.
Location: Forest Glen

Educational Needs & Objectives
Needs
Bladder cancer is one of the most expensive malignancies to manage as related to the need for continuous monitoring and the treatment of recurrence. The use of clinical practice guidelines relying on evidence based medicine in the management of patients with bladder cancer will help to ensure quality of care and cost containment. Urologists need a thorough understanding of the quality of care and cost issues related to bladder cancer including an examination of levels of evidence, implementation and compliance with clinical practice guidelines, the use of standardized reporting methodologies, and comparative effectiveness research.

The 5-year survival for bladder cancer patients with lymph node involvement at the time of surgery is 20–30% and patients with metastatic disease treated with chemotherapy have a median survival of only 15 months. Urologists need to be familiar with the current state of translational research in bladder cancer as related to both early and late stage disease including novel molecular targets and targeted therapeutics, pharmacogenomics to predict response to therapy, and exploring the role for agents targeting angiogenesis.

Randomized data has demonstrated that cytoreductive nephrectomy followed by immunotherapy provides a survival advantage over immunotherapy alone. With the introduction of targeted therapy such as mTOR inhibitors and Tyrosine Kinase Inhibitors, the treatment algorithm is under evolution. Urologists and medical oncologists manage these patients together and as such, an understanding of the role of cytoreductive nephrectomy in metastatic disease is needed to best treat patients.

There is no effective form of therapy for the treatment of patients with advanced forms of kidney cancer. Recent studies have shown that kidney cancer is not a single disease, it is made up of a number of different types of cancer, each with a different histology, a different
clinical course, responding differently to therapy and caused by different genes. Understanding the genes that cause kidney cancer provides the foundation for the development of targeted approaches to therapy. Recent studies reporting whole genome sequencing in kidney cancer have identified a number of new and important targets for therapy in patients with kidney cancer. Recent studies have determined that a number of kidney cancer genes are associated with the development of aerobic glycolysis. Targeting aerobic glycolysis is a new and novel approach to therapy for patients with kidney as well as prostate cancer.

Penile cancer is a rare disease in the United States with most urologists evaluating only a handful of patients throughout their careers. A case based approach will be used to discuss evidence based practices with respect to management of the primary penile tumor and regional lymph nodes to include: Selection of patients for penile preserving strategies versus amputation; Selection of patients with clinically negative inguinal region for inguinal staging procedures; Role of imaging and pathologic factors; Integrating Chemotherapy, Surgery and Radiation in patients with locally advanced penile cancer.

Prostate cancer is the most common non-cutaneous cancer in men in the US, and the second leading cause of male cancer mortality. Intense research has focused on improving primary treatment of prostate cancer, in particular surgical and radiotherapy advances. Still, approximately 20-30% of patients who undergo primary treatment ultimately fail with rising PSA, and patients and physicians continue to struggle with the optimal management of these recurrent patients. An understanding of the treatment options in recurrent prostate cancer and the ideal patients in whom to offer these treatments is important to guide clinical decision-making and patient consultation.

Prostate cancer imaging, in particular for local staging, is not standardized, and imaging guidelines largely are based on imaging for metastatic disease. Recent studies of magnetic resonance imaging (MRI) and nuclear medicine advances in specific radioisotopes have yielded promising results, especially in the detection of low volume disease, including at local, regional, and distant sites. An understanding of the progress in prostate cancer imaging is important, as these imaging modalities may be employed in all stages of the natural history of prostate cancer. In addition, novel techniques to aid in the diagnosis of prostate cancer (e.g. adjuncts to prostate biopsy) may allow for improved detection of primary disease, and an understanding of the evolution of imaging in this area will be crucial to the practicing urologist.

Lastly, it is established that PSA screening has yielded a stage migration with potential overtreatment and over diagnosis. Traditional primary curative therapies (e.g. radical prostatectomy and radiation therapy) can be associated with substantial long-term side effects, and increasing effort worldwide is focused on minimally invasive options, so called “focal therapy”, that may be associated with improved side effect profiles and subsequent decreased impact on health-related quality of life. An overview of the emerging focal therapies will aid clinicians by providing a perspective on available and novel modalities in the focal treatment of clinically localized prostate cancer.

Educational Objectives
1. Review the quality of care and cost issues related to bladder cancer
2. Review the current state of translational research in bladder cancer as related to both early and late stage disease
3. Describe the role of partial nephrectomy versus nephrectomy for patients with localized kidney cancer
4. Report recent advances in the use of immunotherapy for the treatment of patients with advanced kidney cancer
5. Report recent advances in the discovery of new genes that cause cancer of the kidney
6. Report recent advances in systemic therapy for advanced kidney cancer with VEGF inhibitors and with novel agents which target the HIF2, PI3K, mTORC1 and mTORC2 pathway
7. Describe the importance of aerobic glycolysis in cancer and the novel approaches to treatment of cancers characterized by aerobic glycolysis
8. Describe the clinical and surgical management approaches to hereditary forms of kidney cancer
9. Identify the important prognostic factors in the primary penile tumor that allow for organ preserving strategies versus amputation
10. Describe factors within the primary penile tumor, imaging studies and clinical examination that correlate with the risk of inguinal lymph node metastasis
11. Describe the indications for different inguinal surgical staging procedures, their potential benefits and complications.
12. List the indications for multimodal therapy and describe current strategies in the management of locally advanced penile cancer.
13. Describe optimal approach and treatment strategies for recurrent prostate cancer
14. Report recent advances in imaging for prostate carcinoma
15. Assess the role of novel focal therapies for the primary treatment of localized prostate cancer
16. Identify the strengths and weakness of randomized clinical trials in comparative effectiveness research of prostate cancer.
17. Explain the strengths and weaknesses of observational studies in CER of prostate cancer
18. Recognize when it is appropriate to use each study design to address CER questions in prostate cancer

Evaluation of Quality of Activity
The educational quality of the meeting will be assessed with evaluation questionnaires to be filled out by the participants.
ACCREDITATION

CME accreditation Statement
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the University of Oklahoma College of Medicine and the Society of Urologic Oncology. The University of Oklahoma College of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

The University of Oklahoma College of Medicine designates this live activity for a maximum of 11.25 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Conflict Resolution Statement
The University of Oklahoma College Of Medicine, Office of Continuing Professional Development has reviewed this activity’s speaker and planner disclosures and resolved all identified conflicts of interest, if applicable.

Equal Opportunity Statement
The University of Oklahoma is an equal opportunity institution.

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Special Assistance
We encourage participation by all individuals. If you have a disability, advance notification of any special needs will help us better serve you. Call (847) 264-5901 if you require special assistance to fully participate in the meeting.
“Extraordinary Opportunities for Discovery”
12th Annual Meeting of the Society of Urologic Oncology in Conjunction with the World Urological Oncology Federation

*All sessions located in Grand Ballroom E-H unless otherwise noted.*

**WEDNESDAY, NOVEMBER 30, 2011**

2:00 p.m. – 6:00 p.m.  Registration/Information Desk Open
   Location: Grand Ballroom Foyer

3:00 p.m. – 6:00 p.m.  SUO-CTC Board of Directors Meeting
   Location: Brookside

6:00 p.m. – 9:00 p.m.  SUO Board of Directors Meeting
   Location: Forest Glen

6:00 p.m. – 9:30 p.m.  Young Urologic Oncologist Dinner
   Location: Grand Ballroom G,H
   Chair: Fernando J. Bianco, Jr., MD
   6:00 p.m. Hors d’oeuvres
   6:20 p.m. Introduction
   Moderator: Dr. Fernando J. Bianco – YUO President
   6:30 p.m. SUO Outreach and Educational Program: An Opportunity for YUO Members
   Dr. Cheryl Lee
   6:40 p.m. Top YUO Abstracts Presentations
   Podium #1 BLOOD LOSS ASSOCIATED WITH RADICAL CYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY COMPARING IMPACT LIGASURE VERSUS STAPLING DEVICE.
   (Presented By: Ian M. Thompson, III)
   Podium #2 MICRORNA PROFILES IN RADICAL PROSTATECTOMY SPECIMENS: DIFFERENTIAL EXPRESSION BY GLEASON GRADE AND PATHOLOGIC STAGE
   (Presented By: Soroush Rais-Bahrami)
   Podium #3 IDENTIFICATION OF A MULTIPLE PEPTIDE SIGNATURE BY IMAGING MASS SPECTROMETRY WHICH ACCURATELY PREDICTS MORTALITY IN RENAL CELL CARCINOMA
   (Presented By: Samuel D. Kaffenberger)

7:00 p.m.  Round Table Panel: Establishing an Urology Oncology Program
   Drs. Neal Shore, Raj Pruthi, Douglas Sutherland, John Papadopoulos, Daniel Barocas
   • Types of academic environments: the cost of protected time
   • Challenges for non-academic environments.
   • Negotiating Resources in both environments
   • Feasibility of a research program in non academic setting

7:40 p.m.  Round Table Panel: Randomized Clinical Trials
   Drs. Leonard Gomella, Dipen Parekh, Eric Castle, Stephen Boorjian
   • Recent accomplishments
   • Minimal requirements, Structure
   • Collaboration and Funding
   • Tissue Repository and Biomarkers
   • Current Opportunities

8:20 p.m.  Surgical Technique RCTs – Are We Talking Phases, Classes or Something Else?
   Dr. Andrew Vickers

8:30 p.m.  Dr. Douglas Sutherland: Proposal for a Surgical Technique RCT
   Discussion Panel: Drs. Dipen Parekh, Raj Pruthi, Scott Eggener, Andrew Vickers
8:55 p.m. Award to Best RCT presented at YUO
   Dr. Fernando J. Bianco
9:00 p.m. YUO Membership Reception

6:30 p.m. – 7:30 p.m. CME Accredited Dinner Symposium*
   Location: Grand Ballroom Salon B,C
   See Page 3 for Full Details
   *CME for this dinner symposium was provided by Penn State College of Medicine. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.

THURSDAY, DECEMBER 1, 2011
6:30 a.m. – 5:00 p.m. Registration/Information Desk Open
   Location: Grand Ballroom Foyer

6:45 a.m. – 7:45 a.m. CME Accredited Breakfast Symposium*
   Location: Grand Ballroom Salon C
   See Page 3 for Full Details
   *CME for this breakfast symposium was sponsored by an educational grant provided by Dendreon. Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content.

7:00 a.m. – 8:00 a.m. Breakfast in Exhibit Hall
   Location: Grand Ballroom A,D

7:00 a.m. – 7:30 p.m. Exhibit Hall Open
   Location: Grand Ballroom A,D

7:00 a.m. – 4:00 p.m. Speaker Ready Room Open
   Location: Timberlawn

8:00 a.m. – 8:05 a.m. Welcome and Introduction
   Program Chairs

8:05 a.m. – 9:05 a.m. Bladder Cancer Session I
   Session Chair: Matthew I. Milowsky, MD
   Bladder Cancer: Quality of Care at What Cost?
   Moderator: Sam Chang, MD

8:05 a.m. – 8:10 a.m. Introduction
   Sam Chang, MD

8:10 a.m. – 8:18 a.m. Improved Quality of Care Through Standardization of Reporting Methodology
   S. Machele Donat, MD

8:18 a.m. – 8:26 a.m. Improved Patient Care Through Evidence-Based Clinical Practice Guidelines
   Philipp Dahm, MD, MHSc, FACS

8:26 a.m. – 8:34 a.m. Improved Quality and Reducing Costs of Bladder Cancer Care
   John Gore, MD

8:34 a.m. – 9:05 a.m. Panel Discussion
   Panelists: Philipp Dahm, MD, MHSc
              Yair Lotan, MD
              Dipen Parekh, MD
              S. Machele Donat, MD
              John Gore, MD
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| 9:05 a.m. – 9:25 a.m. | State-of-the-Art Lecture  
Novel Kidney Cancer Genes: PbRM1/Histone Modifiers  
Andy Futreal, MD |
| 9:25 a.m. – 9:55 a.m. | Prostate Cancer Session I  
Session Chair: Daniel W. Lin, MD  
Management of Recurrent Prostate Cancer  
Moderator: Peter Carroll, MD |
| 9:25 a.m. – 9:55 a.m. | Salvage Therapies after Radiation Therapy  
9:25 a.m. – 9:40 a.m. | Cryotherapy  
Louis L. Pisters, MD  
9:40 a.m. – 9:55 a.m. | Brachytherapy  
Paul L. Nguyen, MD |
| 9:55 a.m. – 10:10 a.m. | Role of Salvage Surgery  
Karim Touijer, MD |
| 10:10 a.m. – 10:25 a.m. | Case Presentations and Q&A |
| 10:25 a.m. – 10:50 a.m. | Break – Visit Exhibits  
Location: Grand Ballroom A,D |
| 10:50 a.m. – 12:00 p.m. | Kidney Cancer Session I  
Session Chair: W. Marston Linehan, MD  
Translational Science in Kidney Cancer  
10:50 a.m. – 11:05 a.m. | JNK Pathway Factor  
Kevin White, PhD  
11:05 a.m. – 11:15 a.m. | Discussion  
11:15 a.m. – 11:30 a.m. | Fumarate Hydratase- and Succinate Dehydrogenase-Deficient Kidney Cancer  
W. Marston Linehan, MD  
11:30 a.m. – 11:40 a.m. | Discussion  
11:40 a.m. – 11:55 a.m. | Novel Kidney Cancer Targets: Targeting Aerobic Glycolysis  
Ramaprasad Srinivasan, MD, PhD  
11:55 a.m. – 12:00 p.m. | Discussion |
| 12:00 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
Location: Grand Ballroom Salon B  
See Page 3 for Full Details |
| 12:00 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
Location: Grand Ballroom Salon C  
See Page 3 for Full Details |
| 1:15 p.m. – 1:25 p.m. | SUO Huggins Medal Presentation  
Edward M. Messing, MD |
| 1:25 p.m. – 1:45 p.m. | Huggins Medal Lecture  
Paul H. Lange, MD |
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<tr>
<td>1:45 p.m. – 2:30 p.m.</td>
<td><strong>Penile Cancer Session I</strong></td>
<td>Session Chair: Curtis Pettaway, MD&lt;br&gt;<strong>Penile Cancer Management 2011: A Case-Based Approach</strong>&lt;br&gt;Panelists: Juanita Crook, MD, Paul Hegarty, MD, Lance Pagliaro, MD</td>
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<td>2:30 p.m. – 2:45 p.m.</td>
<td><strong>Break – Visit Exhibits</strong></td>
<td>Location: Grand Ballroom A,D</td>
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<td>2:45 p.m. – 3:45 p.m.</td>
<td><strong>Prostate Cancer II</strong></td>
<td>Session Chair: Daniel W. Lin, MD&lt;br&gt;<strong>Current Status of Focal Primary Therapy for Prostate Cancer</strong>&lt;br&gt;Moderator: Samir Taneja, MD</td>
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<td>2:45 p.m. – 2:55 p.m.</td>
<td><strong>Image-Guided Laser Therapy for Solid Tumors</strong></td>
<td>John Trachtenberg, MD</td>
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<td>2:55 p.m. – 3:05 p.m.</td>
<td><strong>Focal Cryotherapy</strong></td>
<td>J. Stephen Jones, MD, FACS, MBA</td>
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<td>3:05 p.m. – 3:15 p.m.</td>
<td><strong>Focal Brachytherapy</strong></td>
<td>Paul L. Nguyen, MD</td>
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<td>3:15 p.m. – 3:25 p.m.</td>
<td><strong>High Intensity Focused Ultrasound</strong></td>
<td>Hashim Ahmed, MRCS(Ed), BM, BCh</td>
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<td>3:25 p.m. – 3:45 p.m.</td>
<td><strong>Q&amp;A with Case Presentations</strong></td>
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<td>4:00 p.m. – 6:00 p.m.</td>
<td><strong>Poster Session I</strong></td>
<td>Location: Grand Ballroom A,D&lt;br&gt;Poster walks (Not CME accredited)</td>
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<tr>
<td>6:30 p.m. – 7:30 p.m.</td>
<td><strong>Welcome Reception</strong></td>
<td>Location: Grand Ballroom A,D</td>
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<tr>
<td>7:30 p.m. – 10:00 p.m.</td>
<td><strong>SUO Dinner</strong></td>
<td>Location: Grand Ballroom B,C</td>
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**FRIDAY, DECEMBER 2, 2011**

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<td>7:00 a.m. – 8:00 a.m.</td>
<td><strong>Breakfast in Exhibit Hall</strong></td>
<td>Location: Grand Ballroom A,D</td>
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<td>7:00 a.m. – 4:00 p.m.</td>
<td><strong>Speaker Ready Room Open</strong></td>
<td>Location: Timberlawn</td>
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<tr>
<td>7:00 a.m. – 6:00 p.m.</td>
<td><strong>Exhibit Hall Open</strong></td>
<td>Location: Grand Ballroom A,D</td>
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<td>6:30 a.m. – 5:00 p.m.</td>
<td><strong>Registration/Information Desk Open</strong></td>
<td>Location: Grand Ballroom Foyer</td>
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| **6:45 a.m. – 7:45 a.m.** | CME Accredited Breakfast Symposium*  
Location: Grand Ballroom Salon B,C  
See Page 3 for Full Details  
*CME for this breakfast symposium was provided by Medical Education Resources (MER). Neither the SUO nor the University of Oklahoma College of Medicine are a joint sponsor or responsible for its content. |
| **8:00 a.m. – 8:30 a.m.** | Young Urologic Oncologists (YUO) Program  
Abstracts selected by the YUO  
Moderator: Fernando J. Bianco, Jr., MD |
| **8:00 a.m. – 8:09 a.m.** | Highlights of YUO Sessions |
| **8:09 a.m.** | Podium #4  
MR-GUIDED LASER FOCAL THERAPY FOR LOW - INTERMEDIATE RISK LOCALIZED PROSTATE CANCER  
(Presented By: Uri Lindner) |
| **8:16 a.m.** | Podium #5*  
ADRENAL NODULAR HYPERPLASIA AS PART OF THE HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CARCINOMA (HLRCC) PHENOTYPE  
(Presented By: Brian Shuch) |
| **8:23 a.m.** | Podium #6  
HOSPITAL READMISSION AFTER RADICAL CYSTECTOMY FOR BLADDER CANCER: RESULTS OF A POPULATION-BASED ANALYSIS FROM THE CALIFORNIA STATE INPATIENT DATABASE  
(Presented By: Kenneth Nepple) |
| **8:30 a.m. – 9:30 a.m.** | Prostate Cancer III  
Session Chair: Daniel W. Lin, MD  
Progress in Prostate Cancer Imaging  
Moderator: Mark Emberton, MD, FACS |
| **8:30 a.m. – 8:33 a.m.** | Introduction  
Mark Emberton, MD, FACS |
| **8:33 a.m. – 8:46 a.m.** | New Magnetic Resonance Technologies in Local Staging  
John Kurhanewicz, MD |
| **8:46 a.m. – 8:59 a.m.** | Nuclear Medicine Techniques in Prostate Cancer Imaging and Follow-Up  
Peter Choyke, MD |
| **8:59 a.m. – 9:12 a.m.** | Imaging Adjuncts to Improve Prostate Biopsy  
Clare Tempany, MD, PhD |
| **9:12 a.m. – 9:30 a.m.** | Q&A and Cases |
| **9:30 a.m. – 10:30 a.m.** | Outcomes Session  
Session Chair: David F. Penson, MD, MPH  
RCTs to Address CER Issues  
Neil Fleshner, MD  
Observational Studies  
Martin G. Sanda, MD  
Outsider Perspective  
Sheldon Greenfield, MD  
Panel Discussion  
Moderator: Daniel A. Barocas, MD  
Martin G. Sanda, MD  
Sheldon Greenfield, MD  
Neil Fleshner, MD |
# Program Schedule

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| 10:30 a.m. – 10:50 a.m. | Break – Visit Exhibits  
*Location: Grand Ballroom A,D* |
| 10:50 a.m. – 11:50 p.m. | **Kidney Cancer Session II**  
Session Chair: W. Kimryn Rathmell, MD, PhD |
| 10:50 a.m. – 11:05 a.m. | Recent Advances in Immunotherapy  
David McDermott, Jr., MD |
| 11:05 a.m. – 11:20 a.m. | VEGF Inhibitors (Axitinib, Tivozanib)  
Robert Motzer, MD |
| 11:20 a.m. – 11:35 a.m. | Novel Kidney Cancer Targets: Targeting the HIF2a Pathway  
Michael Atkins, MD |
| 11:35 a.m. – 11:50 a.m. | Partial Nephrectomy Versus Nephrectomy for Low Stage RCC  
Hendrik Van Poppel, MD |
| 11:50 a.m. – 12:10 p.m. | State-of-the-Art Lecture: Screening and Prevention in 2011: Where Do We Go from Here?  
Gerald L. Andriole, Jr., MD |
| 12:10 p.m. – 1:15 p.m. | Industry Sponsored Lunch Symposium  
*Location: Grand Ballroom Salon B,C*  
See Page 3 for Full Details |
| 1:15 p.m. – 2:15 p.m. | Oral Abstract Session (See page 15 for more information)  
Moderator: Michael Cookson, MD |
| 1:15 p.m.         | Podium 7  |
| 1:25 p.m.         | Podium 8  |
| 1:35 p.m.         | Podium 9*  |
| 1:45 p.m.         | Podium 10  |
| 1:55 p.m.         | Podium 11  |
| 2:05 p.m.         | Podium 12*  
*Not CME Accredited* |
| 2:15 p.m. – 3:15 p.m. | **Bladder Cancer Session II**  
Session Chair: Matthew I. Milowsky, MD |
| 2:15 p.m. – 2:20 p.m. | Introduction  
Colin P.N. Dinney, MD |
| 2:20 p.m. – 2:28 p.m. | Application of Next Generation Sequencing to Targeted Clinical Trials  
David B. Solit, MD |
| 2:28 p.m. – 2:36 p.m. | Personalizing Peri-Operative Chemotherapy for Bladder Cancer Using Germline Markers to Predict Chemotherapy Outcomes  
Peter H. O’Donnell, MD |
| 2:36 p.m. – 3:06 p.m. | Panel Discussion  
Donna Hansel, MD, PhD  
Felix Feng, MD  
Peter O’Donnell, MD  
David Solit, MD |
| 3:06 p.m. – 3:15 p.m. | Q&A |
| 3:15 p.m. – 4:00 p.m. | SUO-CTC Scientific Session  
Moderator: Colin P.N. Dinney, MD |
| 4:00 p.m. – 6:00 p.m. | Poster Session II / Reception  
*Location: Grand Ballroom A,D*  
Poster walk (Not CME accredited) |
Podium #1
BLOOD LOSS ASSOCIATED WITH RADICAL CYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY COMPARING IMPACT LIGASURE VERSUS STAPLING DEVICE.
Ian M. Thompson, III¹, Daniel A. Barocas¹, Carl J. Bischoff¹, Peter E. Clark¹, Michael S. Cookson¹, Stephen F. Kappa², Todd M. Morgan¹, Matthew J. Resnick¹, Joseph A. Smith¹ and Sam S. Chang¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery; ²Vanderbilt University Medical Center, School of Medicine
(Presented By: Ian M. Thompson, III)

Podium #2
MICRORNA PROFILES IN RADICAL PROSTATECTOMY SPECIMENS: DIFFERENTIAL EXPRESSION BY GLEASON GRADE AND PATHOLOGIC STAGE
Soroush Rais-Bahrami¹, Kevin Smith¹, Nikhil Waingankar¹, Michaela Oswald², Houman Khalili², Annette Lee², Peter Gregersen², Theresa Chan³ and Manish Vira¹
¹The Arthur Smith Institute for Urology, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY; ²The Feinstein Institute for Medical Research, Manhasset, NY; ³Department of Pathology and Laboratory Medicine, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY
(Presented By: Soroush Rais-Bahrami)

Podium #3
IDENTIFICATION OF A MULTIPLE PEPTIDE SIGNATURE BY IMAGING MASS SPECTROMETRY WHICH ACCURATELY PREDICTS MORTALITY IN RENAL CELL CARCINOMA
Samuel D. Kaffenberger¹, Todd M. Morgan¹, Erin H. Seeley², Oluwole Fadare³, Richard M. Caprioli² and Peter E. Clark¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University, Department of Biochemistry, Nashville, TN; ³Vanderbilt University Medical Center, Department of Pathology, Nashville, TN
(Presented By: Samuel D. Kaffenberger)
Podium #4
MR-GUIDED LASER FOCAL THERAPY FOR LOW - INTERMEDIATE RISK LOCALIZED PROSTATE CANCER
Uri Lindner, Sean R.H. Davidson, Masoom A. Haider, Eugen Hlasny, Mark R. Gertnre, Walter Kucharczyk and John Trachtenberg
University Health Network, Toronto, ON, Canada
(Presented By: Uri Lindner)

Podium #5*
ADRENAL NODULAR HYPERPLASIA AS PART OF THE HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CARCINOMA (HLRCC) PHENOTYPE
Brian Shuch¹, Cathy Vocke¹, Vladimir Valera², Beatriz Walter Rodriguez², Chris Ricketts¹, Rabindra Gautam¹, Gopal Gupta¹, Peter Pinto¹, Ramaprasad Srinivasan¹, Maria Merino², W. Marston Linehan¹ and Gennady Bratslavsky³
¹NCI Urologic Oncology Branch, Bethesda, MD; ²NCI Translational Surgical Pathology Branch, Bethesda, MD; ³Department of Urology, SUNY Upstate Medical University
(Presented By: Brian Shuch)

Podium #6
HOSPITAL READMISSION AFTER RADICAL CYSTECTOMY FOR BLADDER CANCER: RESULTS OF A POPULATION-BASED ANALYSIS FROM THE CALIFORNIA STATE INPATIENT DATABASE
Kenneth Nepple, Pamela Owens, Seth Strope, Gurdarshan Sanhu, Dorina Kallogjeri and Adam Kibel
Washington University, St. Louis, MO
(Presented By: Kenneth Nepple)

*Not CME Accredited
Podium #7
THE IMPACT OF MIXED HISTOLOGICAL FEATURES ON SURVIVAL FOLLOWING RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA
Simon Kim, Igor Frank, John Cheville, R. Houston Thompson, Christopher Weight, Prabin Thapa and Boorjian Stephen
Mayo Clinic, Rochester, MN
(Presented By: Simon Kim)

Podium #8
PROGNOSTIC SIGNIFICANCE OF CANCER STEM CELL MARKERS IN BLADDER CANCER PATIENT SURVIVAL
Philip Ho¹, Jens-Peter Volkmer², Debashis Sahoo², Robert Chin³, Guilherme Godoy¹, Seth Lerner¹, Matt van de Rijnd, Linda Shortliffe², Irving Weissman² and Keith Chan¹
¹Baylor College of Medicine, Houston, TX; ²Stanford University, Palo Alto, CA
(Presented By: Philip Ho)

Podium #9*
LYCOPENE IN THE PREVENTION OF RENAL CELL CANCER IN THE TSC2 MUTANT EKER RAT MODEL
Brian Cross¹, Kazim Sahin², Nurhan Sahin², Karina Ciccone³, Adeboye Osunkoya³, Viraj Master³, Wayne Harris³, Bradley Carthong, Ramzi Mohammad³, Birdal Bilir³, Daniel Canter³, Karin Wertz³, Daqing Wu³, Carlos Moreno³, Cheryl Walker³ and Omer Kucuk³
¹Winship Cancer Institute, Emory University, Atlanta, GA; ²Department of Animal Nutrition, Veterinary Faculty, Firat University, Elazig, Turkey; ³The University of Sydney Medical School, Sydney, Australia; 4Karmanos Cancer Institute, Wayne State University, Detroit, MI; 5DSM, Basel, Switzerland; 6Department of Systems Biology, The University of Texas MD Anderson Cancer Center, Houston, TX
(Presented By: Brian Cross)

Podium #10
NUCLEAR TRANSLOCATION OF HIF-2ALPHA IN HUMAN KIDNEY CANCER CELLS IS DEPENDENT UPON NADP(H) OXIDASE 4 SUPEROXIDE GENERATION
Guimin Chang, Li Chen and Jodi Maranchie
University of Pittsburgh, Pittsburgh, PA
(Presented By: Jodi Maranchie)

Podium #11
IS PERINEURAL INVASION IN PROSTATE BIOPSIES ASSOCIATED WITH ADVERSE PATHOLOGICAL OUTCOME? OLD PARADIGM REVISITED.
Malik Elharram¹, David Margel¹, Antonio Finelli¹, Alexandre Zlotta¹, John Trachtenberg¹, Andrew Evans² and Neil Fleshner³
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Department of Pathology, Princess Margaret Hospital, University Health Network, Toronto, Canada
(Presented By: David Margel)

Podium #12*
PROSTATE CANCER RISK IN MEN WITH PROSTATE AND BREAST CANCER FAMILY HISTORY: RESULTS FROM THE REDUCE STUDY
Jean-Alfred Thomas, Leah Gerber¹, Daniel Moreira², Robert Hamilton¹, Lionel Bañez¹, Ramiro Castro-Santamaria¹, Gerald Andriole³, William Isaacs¹, Jianfeng Xu¹ and Stephen Freedland⁴
¹Duke Prostate Center, Division of Urological Surgery, Department of Surgery, Duke University School of Medicine, Durham, NC; ²The Author Smith Institute for Urology, New Hyde Park, NY; ³Memorial Sloan-Kettering Cancer Center, New York, NY; ⁴GlaxoSmithKline, Research Triangle Park, North Carolina; ⁵Washington University School of Medicine in St. Louis, St. Louis, Missouri; ⁶Department of Urology, Johns Hopkins Hospital, Baltimore, MD; ⁷Center for Genomics and Personalized Medicine Research, Wake Forest University, Winston-Salem, NC
(Presented By: Jean-Alfred Thomas)

*Not CME Accredited
Poster Session I
Thursday, December 1, 2011
4:00 p.m. – 6:00 p.m.
Poster walks

**Poster #1**
ANTI-IL10-R1 MONOCLONAL ANTIBODY ENHANCES BACILLUS CALMETTE-GUERIN (BCG) INDUCED TH1 AND ANTI-BLADDER CANCER IMMUNE RESPONSES IN VITRO AND IN VIVO
Nathan Bockholt¹, Matthew Knudson¹, Jonathan Henning¹, Peter Weady², George Smith², Michael Eisenbraun², James Fraser², Michael O'Donnell¹ and Yi Luo¹
¹University of Iowa, Iowa City, IA; ²Pfizer, Inc., New York, NY
(Presented By: Nathan Bockholt)

**Poster #2**
PROGNOSTIC SIGNIFICANCE OF CYSTOSCOPY FINDINGS FOLLOWING NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER
Ahmed M. Mansour, Ahmed Eldefrawy, Mark S. Soloway and Murugesan Manoharan
University of Miami, Miller School of Medicine, Miami, Florida
(Presented By: Ahmed M. Mansour)

**Poster #3**
COMPLICATIONS OF SALVAGE CYSTECTOMY AFTER FAILED BLADDER-SPARING THERAPY FOR MUSCLE-INVASIVE BLADDER CANCER
Jairam Eswara¹, Jason Efstathiou², Niall Heney¹, Jonathan Paly², Donald Kaufman³, W. Scott McDougal¹, Francis McGovern¹ and William Shipley²
¹Department of Urology, Massachusetts General Hospital, Boston, MA; ²Department of Radiation Oncology, Massachusetts General Hospital – Boston, MA; ³Division of Hematology/Oncology, Massachusetts General Hospital, Boston, MA
(Presented By: Jairam Eswara)

**Poster #4**
WHAT IS EVALUATION OF HEMATURIA BY PRIMARY CARE PHYSICIAN’S: USE OF ELECTRONIC MEDICAL RECORDS TO ASSESS PRACTICE PATTERNS?
Casey Seideman¹, Ramy Youssef¹, Anna Buteau¹, Robert Svatek², Gaurab Chakrabarti¹, Gary Reed¹, Deepa Bhat¹ and Yair Lotan¹
¹University of Texas Southwestern Dallas, TX; ²University of Texas Health Science Center at San Antonio, San Antonio, TX
(Presented By: Casey Seideman)

**Poster #5**
A COMPARATIVE ANALYSIS OF ONCOLOGIC OUTCOMES IN PATIENTS WITH VARIANT HISTOLOGY BLADDER CANCER
Sanjay Patel, Vivek Patel¹, Kirk Keegan², Dan Barocas², David Penson², Michael Cookson², Sam Chang², Peter Clark², Joseph Smith² and Todd Morgan²
¹Duke University; ²Vanderbilt University Department of Urology
(Presented By: Sanjay Patel)
Poster #6
EXTRANODAL EXTENSION IS A POWERFUL PROGNOSTIC FACTOR IN BLADDER CANCER PATIENTS WITH LYMPH NODE METASTASIS
Eugene Cha¹, Harun Fajkovic¹, Claudio Jeldres², Thomas Chromecki¹, Brian Robinson¹, Robert Svatek³, Derya Tilki⁴, Patrick Bastian⁴, Pierre Karakiewicz², Giacomo Novara⁵, Hans-Martin Fritsche⁶, Maximilian Burger⁶, Guru Sonpavde⁴, Siamak Daneshmand⁸, Yair Lotan⁹, Douglas Scherr¹ and Shahrokh Shariat¹
¹Weill Cornell Medical College, New York, NY; ²University of Montreal Health Center, Montreal, Canada; ³University of Texas San Antonio, San Antonio, TX; ⁴Ludwig-Maximilians-Universitat Munchen, Munich, Germany; ⁵University of Padua, Padua, Italy; ⁶University of Regensburg, Regensburg, Germany; ⁷Baylor College of Medicine, Houston, TX; ⁸University of Southern California, Los Angeles, CA; ⁹University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Eugene Cha)

Poster #7
HEAT SHOCK PROTEIN 70 (HSP70) AS A RECURRENTER MARKER FOR PT1 BLADDER CANCER
Oleksandr Stakhovskyi¹, David Margel¹, Theodoros van der Kwast², Bas van Rhijn¹, Peter Bostrom¹, John Thoms², Neil Fleshner¹, Michael Jewett¹, Bapat Bharati² and Alex Zlotta¹
¹Division of Urology, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada.; ²Department of Pathology, University Health Network, Toronto, ON, Canada.; ³Department of Radiation Oncology, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada, ⁴Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, ON, Canada; ⁵Division of Urology, Mount Sinai Hospital, Toronto, ON, Canada
(Presented By: Oleksandr Stakhovskyi)

Poster #8
OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY USING THE NEW AJCC PATHOLOGIC CLASSIFICATION FOR SUBEPITHELIAL PROSTATIC INVASION
Amit Patel, Joshua Cohn, Sandip Prasad, Mike Large, Norm Smith, Gladell Paner and Gary Steinberg
University of Chicago Medical Center, Chicago, IL
(Presented By: Amit Patel)

Poster #9
PSYCHOMETRIC CHARACTERISTICS OF A CONDITION-SPECIFIC HEALTH-RELATED QUALITY OF LIFE SURVEY: THE FACT-V ANDERBILT CYSTECTOMY INDEX
Christopher Anderson¹, Irene Feurer², Michael Large³, Gary Steinberg³, Daniel Barocas⁴, Michael Cookson¹ and David Penson⁴
¹Department of Urologic Surgery, Vanderbilt University Medical Center, Nashville, TN; ²Departments of Surgery and Biostatistics, Vanderbilt University Medical Center, Nashville, TN; ³Section of Urology, University of Chicago Medical Center, Chicago, IL; ⁴Department of Urologic Surgery and the Center for Surgical Quality and Outcomes Research, Vanderbilt University Medical Center, Nashville, TN
(Presented By: Christopher Anderson)

Poster #10
VOLUME-OUTCOMES IN CYSTECTOMY: IS IT THE SURGEON OR THE SETTING?
Todd M. Morgan, Daniel A. Barocas, Kirk A. Keegan, Michael S. Cookson, Sam S. Chang, Peter E. Clark, Shenghua Ni, Joseph A. Smith, Jr. and David F. Penson
Vanderbilt University
(Presented By: Todd M. Morgan)

Poster #11
THE IMPACT OF ACCURATE STAGING ON BLADDER CANCER SURVIVAL: A PROCESS-OUTCOMES LINK.
Karim Chamie¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Meryl Leventhal², Dennis Deapen² and Mark S. Litwin¹
¹UCLA, Los Angeles, CA; ²Cancer Surveillance Program, Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, CA
(Presented By: Karim Chamie)
IMPACT OF PARTNER STATUS AND DIVERSION TYPE ON SEXUALITY IN WOMEN UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER: A PILOT SURVEY
Tullika Garg¹, Jeanne Carter¹, Peter Langenstroer², William See² and Margarita Kressin³
¹MSKCC, New York, NY; ²Medical College of Wisconsin, Milwaukee, WI; ³Medical and Surgical Associates of Corsicana, Corsicana, TX
(Presented By: Tullika Garg)

DOES PATIENT AGE IMPACT SURVIVAL AFTER RADICAL CYSTECTOMY?
David Horovitz¹, Polat Turker¹, Peter J. Bostrom¹, David Margel¹, Tuomas Mirtti², Martti Nurmi², Neil E. Fleshner¹, Antonio Finelli¹, Michael A. Jewett¹ and Alexandre R. Zlotta¹
¹University Health Network, Princess Margaret Hospital, Toronto, ON; ²Turku University Hospital, Turku, Finland; ³Helsinki University Hospital, Helsinki, Finland; ⁴Mount Sinai Hospital, Toronto, ON
(Presented By: David Margel)

EXTERNAL VALIDATION OF A BIOMARKER BASED PRE-CYSTECTOMY ALGORITHM TO PREDICT NON-ORGAN CONFINED UROTHELIAL CANCERS
David Margel¹, Peter Bostrom¹, Jack Baniel², Ofer Yossepowitch², Alexandre Zlotta¹ and Neil Fleshner⁰
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Institute of Urology, Rabin Medical Center- Beilinson, Petach Tikva, Israel
(Presented By: David Margel)

TREATMENT PATTERNS AND SURVIVAL OUTCOMES OF PATIENTS 50 YEARS OLD AND YOUNGER DEFINITIVE TREATMENT FOR BLADDER UROTHELIAL CELL CARCINOMA
Sanjay Patel, Vivek Patel¹, Kirk Keegan², Daniel Barocas², David Penson², Michael Cookson², Sam Chang², Peter Clark², Joseph Smith² and Todd Morgan²
¹Duke University, Durham NC; ²Vanderbilt Department of Urologic Surgery
(Presented By: Sanjay Patel)

OBESITY IS ASSOCIATED WITH WORSE ONCOLOGICAL OUTCOMES IN PATIENTS TREATED WITH RADICAL CYSTECTOMY
Thomas Chromecki¹, Michael Rink¹, Eugene Cha¹, Harun Fajkovich¹, Behfar Ehdai¹, Robert Svatek², Pierre Karakiewicz³, Yair Lotan⁴, Derya Tilki⁵, Patrick Bastian⁶, Siamad Daneshmand⁷, Wassim Kassouf⁸, Giacomo Novara⁹, Hans-Martin Fritsche¹⁰, Maximilian Burger¹¹, Jonathan Izawa¹², Yves Fradet¹³, Marek Babjuk¹⁴ and Shahrokh F. Shariat¹
¹Weill Medical College of Cornell University, New York, NY, USA; ²University of Texas Health Science Center San Antonio, San Antonio, TX, USA; ³University of Montreal, Montreal, Quebec, Canada; ⁴University of Texas Southwestern Medical Center, Dallas, TX, USA; ⁵Ludwig-Maximilians-University Munich, Klinikum Grosshadern, Munich, Germany; ⁶University of Southern California Keck School of Medicine and Norris Comprehensive Cancer Center, Los Angeles, CA, USA; ⁷McGill University Health Centre, Montreal, Quebec, Canada; ⁸University of Padua, Padua, Italy; ⁹Caritas St. Josef Medical Center, University of Regensburg, Regensburg, Germany; ¹⁰University of Western Ontario, London, Ontario, Canada; ¹¹Laval University, Quebec City, Quebec, Canada; ¹²Charles University, Praha, Czech Republic
(Presented By: Michael Rink)
Poster #17
THE IMPACT OF SERUM ALBUMIN ON EARLY COMPLICATION AND SURVIVAL RATE OF PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER
Hooman Djaladat¹, Adrian Fairey¹, Gus Miranda², Jie Cai², Anne Schuckman³, Eila Skinner⁴ and Siamak Daneshmand⁵
¹Urologic Oncology Fellow, Norris Cancer Center, USC, Los Angeles, CA; ²Urology department, USC, Los Angeles, CA; ³Assistant professor of Urology, Urology department, USC, Los Angeles, CA; ⁴Professor of Urology, Urology department, USC, Los Angeles, CA; ⁵Associate professor of Urology, Urology department, USC, Los Angeles, CA
(Presented By: Hooman Djaladat)

Poster #18
CLINICAL UTILITY OF NMP22 FOR THE SURVEILLANCE OF PATIENTS WITH RECURRENT BLADDER CANCER: A MULTI-CENTER CROSS-SECTIONAL STUDY
Eugene Cha¹, Christopher Barbieri¹, Thomas Chromecki¹, Allison Dunning¹, Yair Lotan², Michael Rink¹, Douglas Scherr¹, Pierre Karakiewicz³, Madhu Mazumdar¹ and Shahrokh Shariat¹
¹Weill Cornell Medical College, New York, NY; ²University of Texas Southwestern Medical Center, Dallas, TX; ³University of Montreal, Montreal, Canada
(Presented By: Eugene Cha)

Poster #19
URINARY AMINOPEPTIDASE ACTIVITIES AS FUNCTIONAL BIOMARKERS OF BLADDER CANCER
Jennifer Taylor¹, Mariana Yaneva², Kevin Velasco², Hediye Erdjument-Bromage², John Philip², Yongbiao Li², Hans Lilja¹, Bernard Bochner¹ and Paul Tempst²
¹Urology Service, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Protein Center, MSKCC, New York NY; ³Urology Service, MSKCC, New York, NY
(Presented By: Jennifer Taylor)

Poster #20
VALIDATION OF NEW STAGING SYSTEM FOR PATIENTS WITH INVASIVE UROTHELIAL CARCINOMA OF THE PROSTATE
Ahmed Abd El Latif¹, Ranko Miocinovic¹, Hosni Salem², Amr Massoud², Andrew J. Stephenson¹ and Donna Hansel¹
¹Cleveland Clinic, Cleveland, Ohio; ²Cairo University, Cairo, Egypt
(Presented By: Ahmed Abd El Latif)

Poster #21
MICRORNA 200C EXPRESSION LEVEL PREDICTS OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY
Neema Navai, Matthew Wszolek, David McConkey, Adam Liana and Colin Dinney
MD Anderson Cancer Center Houston, TX
(Presented By: Neema Navai)

Poster #22
PROGNOSTIC VALUE OF APOPTOTIC MARKERS IN SQUAMOUS CELL CARCINOMA OF THE BLADDER
Ramy Youssef¹, Payal Kapur¹, Tyler Arendt¹, Ahmed Mosbah², Hassan Abol-Enein², Mohamed Ghoniem² and Yair Lotan¹
¹UT Southwestern medical center, Dallas, TX; ²Urology and Nephrology center, Mansoura University, Mansoura, Egypt
(Presented By: Ramy Youssef)
Poster #23
REGIONAL DIFFERENCES IN PRACTICE PATTERNS AND OUTCOMES FOR UPPER TRACT UROTHELIAL CARCINOMA IN CANADA: OUTCOMES FROM THE CANADIAN UPPER TRACT COLLABORATION
Michael Metcalfe¹, Wassim Kassouf², Ricardo Rendon³, David Bell³, Jonathon Izawa¹, Joseph Chin¹, Anil Kapoor⁵, Edward Matsumoto⁶, Jean-Baptiste Lattouf⁸, Fred Saad⁵, Louis Lacombe⁷, Yves Fradet¹, Adrian Fairey⁸, Niels-Erik Jacobsen⁹, Darrel Drachenberg³, Ilias Caggiano¹⁰, Simon Tanguay¹, Alan So¹ and Peter Black¹
¹University of British Columbia, Vancouver, BC, Canada; ²McGill University, Montreal, QC, Canada; ³Dalhousie University, Halifax, NS, Canada; ⁴University of Western Ontario, London, ON, Canada; ⁵McMaster University, Hamilton, ON, Canada; ⁶University of Montreal, Montreal, QC, Canada; ⁷Laval University, Laval, QC, Canada; ⁸University of Alberta, Edmonton, AB, Canada; ⁹University of Manitoba, Winnipeg, MB, Canada; ¹⁰University of Ottawa, Ottawa, ON, Canada
(Presented By: Michael Metcalfe)

Poster #24
CLINICAL NODAL STAGING SCORES FOR BLADDER CANCER: A PROPOSAL FOR PREOPERATIVE RISK ASSESSMENT
Michael Rink¹, Shahrokh Shariat¹, Eugene Cha¹, Behfar Ehsdai¹, Robert Svatke², Thomas Chromecki¹, Giacomo Novara³, Siamak Daneshmand⁴, Yves Fradet¹, Yair Loto¹, Arthur Sagalowsky³, Patrick Bastian¹, Wassim Kassouf⁶, Hans-Martin Fritsche⁶, Maximilian Burger⁹, Jonathan Izawa¹⁰, Derya Tilkı⁷, Firas Abdollahi¹¹, Felix Chun¹², Guru Sonpavde¹³, Pierre Karakiewicz¹¹, Douglas Scherr¹ and Mithat Gonen¹⁴
¹Weill Cornell Medical College, New York, NY; ²University of Texas San Antonio, San Antonio, TX; ³University of Padua, Padua, Italy; ⁴University of Southern California, Los Angeles, CA; ⁵Laval University, Quebec, Canada; ⁶University of Texas Southwestern Medical Center, Dallas, TX; ⁷Ludwig-Maximilians-Universitat Munchen, Munich, Germany; ⁸McGill University Health Center, Montreal, Quebec; ⁹University of Regensburg, Regensburg, Germany; ¹⁰University of Western Ontario, London, Canada; ¹¹University of Montreal, Montreal, Canada; ¹²University Medical Center Hamburg-Eppendorf, Hamburg, Germany; ¹³Baylor College of Medicine, Houston, TX; ¹⁴Memorial Sloan-Kettering Cancer Center
(Presented By: Michael Rink)

Poster #25
USE OF PELVIC LYMPHADENECTOMY IN RADICAL CYSTECTOMY FOR BLADDER CANCER: 10-YEAR EXPERIENCE AT A SINGLE-INSTITUTION
Stephen F. Kappa¹, Todd M. Morgan², Roxelyn G. Baumgartner², Sam S. Chang³, Michael S. Cookson², Peter E. Clark², Rodney Davis², David F. Penson², Joseph A. Smith², Chaochen You² and Daniel A. Barocas²
¹Vanderbilt University Medical Center, School of Medicine; ²Vanderbilt University Medical Center, Department of Urologic Surgery
(Presented By: Stephen F Kappa)

Poster #26
BLADDER CANCER PREDICTIVE NOMOGRAM FOR OVERALL SURVIVAL FOLLOWING RADICAL CYSTECTOMY
Ahmed Abd El Latif, Steve Campbell, Michael C. Gong, Tianming Gao, Michael W. Kattan and Amr Fergany
Cleveland Clinic, Cleveland, Ohio
(Presented By: Ahmed Abd El Latif)

Poster #27
EVALUATION OF ANTICIPATORY FISH POSITIVE ASSAYS IN BLADDER CANCER SURVEILLANCE PATIENTS
Casey Seideman, Michael Posch, Ramy Youssef and Yair Lotan
University of Texas Southwestern Dallas, TX
(Presented By: Casey Seideman)
Poster #28
EFFICACY OF COMBINED BEVACIZUMAB AND EGFR INHIBITION IN METASTATIC PAPILLARY RENAL CELL CARCINOMA (RCC) ASSOCIATED WITH HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER (HLRCC)
Eric A. Singer, Daniel Marchalik, Julia C. Friend, Geri Hawks, Sarah Fowlwer, Peter A. Pinto, Adam R. Metwalli, Gennady Bratslavsky, W. Marston Linehan and Ramaprasad Srinivasan
Urologic Oncology Branch, Center for Cancer Research, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Eric A. Singer)

Poster #29
PHASE I TRIAL OF THE HDAC INHIBITOR LBH589 IN COMBINATION WITH SORAFENIB IN PATIENTS WITH RENAL CELL CARCINOMA, NON SMALL CELL LUNG CANCER AND SOFT TISSUE SARCOMAS.
Charles Butler, Lydia Laboccetta, Alan Brisendine and Harry Drabkin
Medical University of South Carolina Urology, Charleston, SC
(Presented By: Lydia Laboccetta)

Poster #30
UISS RISK STRATIFICATION MAY BE USEFUL TO IDENTIFY PATIENTS LESS LIKELY TO BENEFIT FROM CYTOREDUCITIVE NEPHRECTOMY IN THE TARGETED THERAPY ERA.
Edward Rampersaud¹, Frederic Birkhaeuser¹, Joshua Logan¹, Geoffrey Sonn¹, Yvonne Chan², Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Nazy Zomorodian¹, Fairooz Kabbnavar¹, Allan Pantuck¹ and Arie Beldegrun¹
¹Institute of Urologic Oncology, Los Angeles, CA; ²David Geffen School of Medicine at UCLA
(Presented By: Edward Rampersaud)

Poster #31
COMPARISON OF RATES AND RISK FACTORS FOR DEVELOPMENT OF HYPERLIPIDEMIA AFTER RADICAL OR PARTIAL NEPHRECTOMY
Ryan Kopp¹, Reza Mehrazin², Jeffrey Woldrich¹, Aditya Bagrodia¹, Robert Wake³, Anthony Patterson², Jim Wan² and Ithaar Derweesh¹
¹UCSD Division of Urology, San Diego, CA; ²Department of Urology, University of Tennessee Health Science Center, Memphis, TN
(Presented By: Ryan Kopp).

Poster #32
COMPLICATIONS OF RENAL RADIOFREQUENCY ABLATION WITH PYELOPERFUSION
Jairam Eswara¹, Colin Cantwell², Raul Uppot², Peter Mueller² and Francis McGovern¹
¹Department of Urology, Massachusetts General Hospital, Boston, MA; ²Division of Abdominal Imaging and Interventional Radiology, Massachusetts General Hospital, Boston, MA
(Presented By: Jairam Eswara)

Poster #33
SPECKLE-TYPE POZ PROTEIN CYTOPLASMIC MISLOCALIZATION AND OVEREXPRESSION PROMOTE TUMOR GROWTH IN AN ORTHOTOPIC MURINE RENAL CELL CANCER MODEL
Sandip Prasad¹, Jiang Liu², Subhradip Karmakar¹, Yi Cai¹, Donald Yangerfriend¹, Scott Eggener¹ and Kevin White¹
¹University of Chicago, Chicago, IL; ²Beijing Institute of Genomics, Chinese Academy of Sciences, Beijing, China
(Presented By: Sandip Prasad)

Poster #34
LONG-TERM DURABLE ONCOLOGIC OUTCOMES AFTER RADIOFREQUENCY ABLATION FOR T1 RENAL CELL CARCINOMA
Sarah Psutka, Francis McGovern, Peter Mueller, W. Scott McDougal, Debra Gervais and Adam Feldman
Massachusetts General Hospital, Boston, MA
(Presented By: Sarah Psutka)
Poster Session I

Poster #35
A COMPARISON OF KU0063794, A DUAL MTORC1 AND MTORC2 INHIBITOR, AND TEMSIROLIMUS IN PRECLINICAL RENAL CELL CARCINOMA MODELS
Hao Zhang, Dror Berel, Yanping Wang, Robert Figlin and Hyung Kim
Cedars-Sinai Medical Center
(Presented By: Hyung Kim)

Poster #36
CLEAR CELL RENAL CELL CARCINOMA: CAN TISSUE BIOMARKERS PREDICT PROGNOSIS?
Oussama Darwish, Ramy Youssef, Payal Kapur, Aditya Bagrodia, Michael Belsante, Feras Alhalabi, Yair Lotan and Vitaly Margulis
UT Southwestern Dallas TX
(Presented By: Oussama Darwish)

Poster #37
LAPAROSCOPIC PARTIAL NEPHRECTOMY VERSUS IMAGE-GUIDED PERCUTANEOUS RENAL CRYOABLATION FOR SMALL (<4CM) RENAL MASSES: FUNCTIONAL AND ONCOLOGIC OUTCOMES.
Zhamshid Okhunov, Soroush Rais-Bahrami, Michael Blute, Arvin George, Manish Vira, Lee Richstone and Louis Kavoussi
Hofstra North Shore LIJ School of Medicine
(Presented By: Zhamshid Okhunov)

Poster #38
INCIDENCE AND MORTALITY OF KIDNEY CANCER IN DEVELOPING AND DEVELOPED COUNTRIES
Amit Patel, Sandip Prasad, Ya-Chen Tina Shih and Scott Eggener
University of Chicago, Chicago, IL
(Presented By: Amit Patel)

Poster #39
RESPONSE OF THE HUMAN KIDNEY TO CLAMP ISCHEMIA
Barbara Ercole¹, Kathleen Torkko², William Hilton³, Manjeri A Venkatachalam⁴, Joel M Weinberg⁵ and Dipen J Parekh⁶
¹Cleveland Clinic Florida, Weston, FL; ²University of Colorado, CO; ³University of Texas HSC San Antonio, TX; ⁴University of Michigan, MI
(Presented By: Barbara Ercole)

Poster #40
NOVEL RENAL CELL CARCINOMA BIOMARKER IDENTIFICATION FROM URINARY EXOSOMES
Todd M. Morgan, Kevin L. Schey, David L. Hachey, Salisha Hill and Peter E. Clark
Vanderbilt University
(Presented By: Todd M. Morgan)

Poster #41
COMPARISON OF RATES AND RISK FACTORS FOR DEVELOPMENT OF ERECTILE DYSFUNCTION AFTER RADICAL OR PARTIAL NEPHRECTOMY
Ryan Kopp¹, Jonathan Silberstein², Reza Mehrazin³, Aditya Bagrodia³, Robert Wake³, Anthony Patterson³, Jim Wan³ and Ithaar Derweesh⁴
¹UCSD Division of Urology, San Diego, CA; ²Department of Urology, Memorial-Sloan Kettering Cancer Center, New York, NY; ³Department of Urology, University of Tennessee Health Science Center, Memphis, TN
(Presented By: Ryan Kopp)

Poster #42
THE ASSOCIATION BETWEEN RENAL TUMOR SCORING SYSTEMS AND ISCHEMIA TIME
Luke T. Lavallée¹, Darren Desantis², Fadi Kamal¹, Brian Blew¹, James Watterson¹, Ranjeeta Mallick², Dean Ferguson², Christopher Morash¹, Ilias Cagiannos¹ and Rodney H. Breau¹
¹Division of Urology, University of Ottawa; ²Ottawa Hospital Research Institute
(Presented By: Luke T. Lavallée)
Poster #43
NATURAL HISTORY OF UNTREATED RENAL CELL CARCINOMA WITH VENOUS TUMOR THROMBUS
Adam Reese¹, Jared Whitson² and Maxwell Meng³
¹James Buchanan Brady Urological Institute, The Johns Hopkins Medical Institution, Baltimore, MD; ²Kaiser Permanente, Sacramento, CA; ³UCSF Hellen Diller Family Comprehensive Cancer Center
(Presented By: Adam Reese)

Poster #44
METHODOLOGY FOR EVALUATING URINE NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN (UNGAL) LEVELS IN PATIENTS UNDERGOING PARTIAL NEPHRECTOMY, RADICAL NEPHRECTOMY, AND NON-RENAL SURGICAL PROCEDURES.
Preston Sprenkle, Sun Cho, Martin Fleisher, Andrew Feifer, Tarek Ghoneim, Guido Dalbagni, Jonathan Coleman, Karim Touijer and Paul Russo
Memorial Sloan-Kettering Cancer Center, NY, NY
(Presented By: Preston Sprenkle)

Poster #45
RENA L FUNCTIONAL PRESERVATION: A BENEFIT OF ACTIVE SURVEILLANCE OF THE SRM
Jose Reyes¹, Daniel Canter², Marc Smaldone¹, Jay Simhan¹, Alexander Kutikov³, Rosalia Viterbo², David Y.T. Chen², Richard E. Greenberg² and Robert G. Uzzo³
¹Temple University School of Medicine, Department of Urology, Philadelphia, PA; ²Division of Urologic Oncology, Department of Surgical Oncology, Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Jose Reyes)

Poster #46
FACTORS AFFECTING RENAL FUNCTIONAL DEGENERATION AFTER OPEN NEPHRON SPARING SURGERY: A COMPARISON OF COLD, WARM, AND NON-ISCHEMIC APPROACHES
Seth Cohen¹, Samuel Park¹, Reza Mehrza n², Ryan Kopp¹, Caroline Colangelo¹, Anthony Patterson², Kerrin Palazzi-Churas¹ and Ithaar Derweesh¹
¹Division of Urology, University of California San Diego School of Medicine, La Jolla, California; ²Department of Urology, University of Tennessee Health Science Center, Memphis, Tennessee
(Presented By: Seth Cohen)

Poster #47
RELATIONSHIP OF BMI AND GENDER TO SURGICAL COMPLEXITY OF PARTIAL NEPHRECTOMY
Manger Jules, Jennifer Davila-Aponte, Lorna Herbert, Noah Schenkman and Tracey Krupski
University of Virginia Department of Urology
(Presented By: Manger Jules)

Poster #48
ABO BLOOD TYPE IS AN INDEPENDENT PREDICTOR OF OVERALL SURVIVAL IN PATIENTS WITH RENAL CELL CARCINOMA
Samuel Kaffenberger¹, Todd Morgan¹, Kelly Stratton¹, Adu Boachie², Daniel Barocas¹, Sam Chang¹, Michael Cookson¹, Duke Herrell¹, Joseph Smith, Jr.¹ and Peter Clark¹
¹Department of Urology, Vanderbilt University Medical Center, Nashville, TN; ²Meharry Medical College, Nashville, TN
(Presented By: Kelly Stratton)
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Paul Russo¹, Robert Uzzo², William Lowrance³, Aviva Asnis-Alibozek⁴, Norman LaFrance⁵, John Libertino⁶, Daniel Pryma⁷ and Chaitanya Divgi⁷
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Fox Chase Cancer Center, Temple University School of Medicine, Philadelphia, PA; ³University of Utah, Huntsman Cancer Institute; ⁴IBA Molecular, Dulles, VA; ⁵Lahey Clinic, Burlington, MA; ⁶University of Pennsylvania, Philadelphia, PA; ⁷Kreitchman PET Center, Columbia University Medical Center, New York, NY
(Presented By: William Lowrance)

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The University of Texas M.D. Anderson Cancer Center, Houston, TX
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Moffitt Cancer Center, Tampa, FL
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Hofstra North Shore LIJ School of Medicine
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Seth Cohen¹, Sean Stroup², Ryan Kopp², Kerri Palazzi-Churas², James L’Esperance³ and Ithaar Derweesh⁴
¹University of California San Diego; ²University of California San Diego, La Jolla, CA; ³Naval Medical Center San Diego, San Diego, CA
(Presented By: Seth Cohen)

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L. Spencer Krane¹, Ted Manny² and Ashok Hemal²
¹Wake Forest University School of Medicine, Winston Salem NC; ²Wake Forest University, Winston Salem NC
(Presented By: L. Spencer Krane)
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Aditya Bagrodia, Ramy Youssef, Chase Cannon, Oussama Darwish, Michael Belsante, Payal Kapur, Yair Lotan and Vitaly Margulis
UT Southwestern, Dallas,TX
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¹UT Southwestern medical center, Dallas, TX; ²Weill Cornell Medical College, New York-Presbyterian Hospital, New York, NY; ³UT M.D. Anderson Cancer Center, Houston, TX.; ⁴Medical University of Graz, Graz, Austria; ⁵Vita-Salute University, Milan, Italy;⁶Mannheim Medical Center, University of Heidelberg, Mannheim, Germany
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Jay Simhan¹, Marc Smaldone¹, Daniel Canter¹, Jose Reyes¹, Fang Zhu¹, Russell Starkey¹, Karyn Stitzenberg², Robert Uzzo¹ and Alexander Kutikov¹
¹Fox Chase Cancer Center, Temple University School of Medicine, Philadelphia, PA; ²University of North Carolina Hospitals, Chapel Hill, NC
(Presented By: Jay Simhan)

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Isuru Jayaratna¹, Rachel Schwartz², Anirban Mitra¹, Jie Cai¹, Yanling Ma³, David Quinn⁴, Tanya Dorff⁴ and Anne Schuckman¹
¹USC Institute of Urology, Los Angeles, CA; ²USC Keck School of Medicine, Los Angeles, CA; ³USC Department of Pathology, Los Angeles, CA; ⁴USC Department of Medical Oncology, Los Angeles, CA
(Presented By: Isuru Jayaratna)

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Eugene Cha¹, Harun Fajkovic¹, Michael Rink¹, Claudio Jeldres², Thomas Chronecki¹, Vitaly Margulis³, Giacomo Novara⁴, Yair Lotan⁵, Jay Raman⁶, Wassim Kassouf⁶, Alon Weizer⁶, Pierre Karakiewicz⁷, Douglas Scherr⁷, Shahrokh Shariat¹ and for the UTUC Collaboration¹
¹Weill Cornell Medical College, New York, NY; ²University of Montreal, Montreal, Canada; ³University of Texas Southwestern Medical Center, Dallas, TX; ⁴University of Padua, Padua, Italy; ⁵Penn State Milton S. Hershey Medical Center, Hershey, PA; ⁶McGill University, Montreal, Canada; ⁷University of Michigan, Ann Arbor, MI
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HPV STATUS IN RELATION TO CLINICOPATHOLOGICAL CHARACTERISTICS IN PENILE CANCER PATIENTS AT LOS ANGELES COUNTY-USC (LAC-USC) MEDICAL CENTER
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¹USC Institute of Urology, Los Angeles, CA; ²USC Department of Molecular Microbiology and Immunology, Los Angeles, CA; ³USC Department of Pathology, Los Angeles, CA; ⁴USC Norris Comprehensive Cancer Center, Los Angeles, CA
(Presented By: Anne K. Schuckman)
A PHASE I STUDY OF TRC105 (ANTI-CD105 [ENDOGLIN] ANTIBODY) IN METASTATIC CASTRATION RESISTANT PROSTATE CANCER (MCRPC).
Fatima Karzai, Andrea Apolo, David Adelberg, Ravi Madan, James Gulley, Philip Arlen, Howard Parnes, Ann Pierpoint, David Kohler, Jane Trepel, Douglas Price, Seth Steinberg, William Figg and William Dahut
National Cancer Institute, Bethesda, Maryland
(Presented By: Fatima Karzai)

CELL CYCLE PROGRESSION GENES DIFFERENTIATE INDOLENT FROM AGGRESSIVE PROSTATE CANCER
Steven Stone¹, Jack Cuzick², Julia Reid³, David Mesher³, Henrik Møller³, Gabrielle Fisher², Jerry Lanchbury¹, Alexander Gutin¹ and Greg Swanson⁴
¹Myriad Genetics, Inc., Salt Lake City UT; ²Cancer Research UK Department of Epidemiology, Mathematics and Statistics, Wolfson Institute of Preventive Medicine, London, EC1M 6BQ, UK; ³King’s College London, Thames Cancer Registry, London, SE1 3QD.UK; ⁴Departments of Radiation Oncology, Urology and Radiology, University of Texas Health Science Center San Antonio, San Antonio, TX USA.
(Presented By: Steven Stone)

DISTINGUISHING BENIGN PROSTATE HYPERPLASIA FROM PROSTATE CANCER BASED ON REACTIVE STROMA RESPONSE BY NANODEVICE THAT IDENTIFIES FUNCTIONAL PROTEIN BIOMARKERS
Elizabeth Singer¹, Jennifer Linehan², Ashraf Imam³, David Smith¹, Sofia Loera¹, Timothy Wilson¹ and Steven Smith¹
¹City of Hope, Duarte CA; ²Urologic Oncology, City of Hope, Duarte CA; ³Huntington Medical Research Institute, Pasadena CA
(Presented By: Jennifer Linehan)

PERCENT CARCINOMA DEMONSTRATES BETTER PREDICTIVE VALUE THAN SURGICAL MARGINS FOR BIOCHEMICAL RECURRENCE AFTER ROBOTIC ASSISTED RADICAL PROSTATECTOMY
Jennifer Linehan¹, Nora Ruel², David Smith², Steven Smith² and Timothy Wilson²
¹Urologic Oncology, City of Hope, Duarte CA; ²City of Hope, Duarte CA
(Presented By: Jennifer Linehan)

PATHOLOGICAL AND ONCOLOGIC OUTCOMES FOR MEN WITH POSITIVE LYMPH NODES AT RADICAL PROSTATECTOMY: 30-YEAR EXPERIENCE FROM A SINGLE
Phillip Pierorazio, Ashley Ross, Edward Schaeffer, Misop Han, Alan Partin and Trinity Bivalacqua
Brady Urological Institute, Johns Hopkins University; Baltimore, MD
(Presented By: Ashley Ross)

IMPACT OF PROSTATE MRI ON DISEASE RECLASSIFICATION AMONG ACTIVE SURVEILLANCE CANDIDATES - A PROSPECTIVE COHORT STUDY
David Margel¹, Stanley Yap¹, Nathan Lawrencehuck¹, Laurence Klotz², Antonio Finelli¹, Alexandre Zlotta¹, John Trachtenberg¹ and Neil Fleshner¹
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Sunnybrook Health Science Centre, Toronto, Ontario, Canada
(Presented By: David Margel)
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Christopher Anderson¹, Amy Pyle², Alison Woodworth², Michael Cookson¹, Joseph Smith, Jr. ¹and Daniel Barocas³
¹Department of Urologic Surgery, Vanderbilt University Medical Center, Nashville, TN; ²Department of Pathology, Vanderbilt University Medical Center; ³Department of Urologic Surgery and the Center for Surgical Quality and Outcomes Research, Vanderbilt University Medical Center, Nashville, TN
(Presented By: Christopher Anderson)

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PCA3 TEST AS AN ADJUNCT IN DIAGNOSIS OF PROSTATE CANCER
Vladimir Yutkin¹, Ali Al-zaharni¹, Andrew Williams¹, Guy Hidas², Carlos Martinez¹, Jonathan Izawa¹, Dov Pode² and Joseph Chin¹
¹University of Western Ontario, Uro-Oncology Fellowship Program, London, Canada; ²Hadassah and Hebrew University Medical Center, Jerusalem, Israel
(Presented By: Vladimir Yutkin)

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POST-PROGRESSION TREATMENT WITH APC8015F MAY HAVE PROLONGED SURVIVAL OF SUBJECTS IN THE CONTROL ARM OF SIPULEUCEL-T PHASE 3 STUDIES
Daniel George¹, Leonard Gomella², Chadi Nabhan², James Whitmore⁴ and Mark Frohlich⁵
¹Duke University Medical Center, Durham, NC; ²Jefferson Kimmel Cancer Center, Philadelphia, PA; ³Advocate Lutheran General Hospital, Park Ridge, IL; ⁴Dendreon, Seattle, WA
(Presented By: Daniel George)

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MULTINATIONAL VALIDATION OF UCSF CANCER OF THE PROSTATE RISK ASSESSMENT-POSTSURGICAL SCORE FOR PREDICTION OF RECURRENTNESS POST RADICAL PROSTATECTOMY
Sanoj Punnen, Stephen Freedland¹, Jospeh Presti², Christopher Amling³, Martha Terris⁴, William Aronson⁵, Christopher Kane⁶, Peter Carroll⁷ and Matthew Cooperberg⁸
¹Durham, North Carolina; ²Palo Alto, California; ³Portland, Oregon; ⁴Augusta, Georgia; ⁵Los Angeles, California; ⁶San Diego, California; ⁷San Francisco, California
(Presented By: Sanoj Punnen)

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Baris Turkbey¹, Haresh Mani², Omer Aras¹, Ardeshir Rastinehad¹, Vijay Shah³, Marcelino Bernardo¹, Thomas Pohida², Dagane Daar³, Compton Benjamin¹, Yolanda McKinney¹, Marston Linehan⁴, Bradford Wood⁴, Maria Merino², Peter Choyke¹ and Peter Pinto³
¹Molecular Imaging Program, NCI, NIH, Bethesda, MD, USA; ²Laboratory of Pathology, NCI, NIH, Bethesda, MD, USA; ³Urologic Oncology Branch, NCI, NIH, Bethesda, MD, USA; ⁴VirtualScopics, Rochester, NY, USA; ⁵Division of Computational Bioscience, Center for Information Technology, NCI, Bethesda, MD, USA; ⁶Center for Interventional Oncology, NCI and Radiology and Imaging Sciences, Clinical Center, NIH, Bethesda, MD, USA
(Presented By: Baris Turkbey)

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Christopher Keto¹, William Aronson², Martha Terris³, Joseph Presti³, Christopher Kane³, Christopher Amling⁴ and Stephen Freedland⁷
¹Duke University School of Medicine; ²University of California, Los Angeles; ³Georgia Health Sciences University, Augusta, GA; ⁴Stanford University Medical Center; ⁵University of California, San Diego; ⁶Oregon Health and Science University; ⁷Duke University School of Medicine, Durham, NC
(Presented By: Christopher Keto)
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Anup Vora¹, Heinric Williams², Sam Khadoury¹, Jochen Kreuker³, Carey Buckner², Baris Turkbey⁵, Gennady Bratslavsky², Bradford Wood³
and Peter Pinto²
¹Georgetown University Hospital, Washington DC; ²National Institutes of Health, Bethesda, MD; ³Phillips Engineering, Briarcliff Manor, NY
(Presented By: Anup Vora)

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Muhammad Bulbul¹ and Ayman Tawil²
¹American University Medical Center, Beirut, Lebanon; ²American University of Beirut, Beirut, Lebanon
(Presented By: Muhammad Bulbul)

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Suzanne Biehn Stewart¹, John Madden², Leah Gerber¹, Thomas Polascik¹, Cary Robertson¹, Philip Walther¹, Stephen Freedland¹², Judd Moul¹
and Lionel Banez¹
¹Division of Urology, Duke University Medical Center, Durham, NC; ²Department of Pathology, Duke University Medical Center, Durham, NC
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Weill Cornell Medical College, Department of Urology, New York, NY
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William Rogers, Daniel Rothschild, Jason Bylund, Ramakrishna Venkatesh, John Demos, Stephen Strup, David Preston and Paul Crispen
Veterans Affairs Medical Center and University of Kentucky, Lexington KY
(Presented By: William Rogers)

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Mayo Clinic
(Presented By: Rafael Nunez-Nateras)

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Abhinav Khanna¹, Jim C. Hu²³, Xiangmei Gu¹ and Ganesh Palapattu¹
¹Baylor College of Medicine, Houston TX; ²Division of Urologic Surgery, Brigham and Women’s Hospital, Boston MA; ³Center for Surgery and Public Health, Brigham and Women’s Hospital, Boston MA; ²Department of Urology, Methodist Hospital, Houston TX
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Eric Klein¹, Mike Kiefer², Michael Crager², Cristina Magi-Galuzzi¹, Sara Falzarano¹, Robert Pelham², Diana Cherbavaz², Joffre Baker², Steven Shak² and Mark Lee²
¹Cleveland Clinic, Cleveland, OH; ²Genomic Health, Inc., Redwood City, CA
(Presented By: Eric Klein)

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BLOCKADE OF TGF-BETA ENHANCES CYTOTOXICITY OF GENETICALLY MODIFIED HUMAN T CELLS TARGETED AGAINST PROSTATE SPECIFIC MEMBRANE ANTIGEN
Stephen Poon¹, Christopher Kloss², Jason Plotkin² and Michel Sadelain²
¹Urology Service, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Center for Cell Engineering, Molecular Pharmacology and Chemistry Program, Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Stephen Poon)

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MULTIPARAMETRIC MAGNETIC RESONANCE IMAGING DETECTS PROSTATE CANCER IN PATIENTS WITH PRIOR NEGATIVE TRUS BIOPSIeS
Nitin Yerram¹, Dmitry Volkin¹, Jeffery Nix¹, Anthony Hoang¹, Faisal Ahmed¹, Gopal Gupta¹, Ardeshir Rastinehad¹, Jochen Kruecker², Samuel Kadoury², Julia Locklin³, Stacey Gates³, Sheng Xu¹, Maria Merino¹, W. Marston Linehan¹, Baris Turkbey², Peter Choyke², Bradford Wood¹ and Peter Pinto²
¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Philips Research North America, Briarcliff Manor, NY; ³Department of Interventional Oncology, National Institutes of Health, Bethesda, MD; ⁴Laboratory of Pathology, National Institutes of Health, Bethesda, MD; ⁵Molecular Imaging Program, National Institutes of Health, Bethesda, MD
(Presented By: Nitin Yerram)

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ROLE OF ENDORECTAL MRI FUSION PROSTATE BIOPSY IN TREATMENT OF LOCALIZED PROSTATE CANCER BEFORE AND AFTER HIGH-INTENSITY FOCUSED ULTRASOUND (HIFU) THERAPY
Anup Vora¹, Heinric Williams², Douglass Chinn³, Baris Turkbey², Peter Choyke², Sam Khadoury⁴, Jochen Kreuker¹, Bradford Wood², Gennady Bratslavsky² and Peter Pinto²
¹Georgetown University Hospital, Washington DC; ²National Institutes of Health, Bethesda, MD; ³Chinn & Chinn Associates, Arcadia, CA; ⁴Phillips Engineering, Briarcliff Manor, NY
(Presented By: Anup Vora)

Poster #85
SMALLER PROSTATE SIZE IS INDEPENDENTLY ASSOCIATED WITH BIOCHEMICAL RECURRENCE IN GLEASON 7 PROSTATE CANCER
Boris Gershman, Francis McGovern, Niall Heney, W. Scott McDougal and Chin-Lee Wu
Massachusetts General Hospital, Boston, MA
(Presented By: Boris Gershman)

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COMPARATIVE OUTCOME ANALYSIS OF OPEN VERSUS LAPAROSCOPIC VERSUS ROBOTIC-ASSISTED RADICAL PROSTATECTOMY MATCHED BY D’AMICO RISK CATEGORY IN A LARGE, MULTINATIONAL, MULTI-INSTITUTIONAL DATABASE
Prasanna Sooriakumaran, Abhishek Srivastava, Matthieu Durand, Danielle Brooks, Daniel Sagalovich, Adam Calaway, Samarpit Rai, Shahrokh Shariat and Ashutosh Tewari
Weill Cornell Medical College, Department of Urology, New York, NY
(Presented By: Prasanna Sooriakumaran)
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CD117 EXPRESSION IN CIRCULATING CELLS AS POTENTIAL PREDICTOR OF ADVANCED PROSTATE CANCER
Bethany Kerr, Ranko Miocinovic, Katherine Watts, Donna Hansel, Eric Klein, Jihad Kaouk and Tataliana Byzova
Cleveland Clinic, Cleveland, OH
(Presented By: Bethany Kerr)

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Jeffrey Mullins, Toby Cornish, Adam Reese, Joel Fradin, Lynda Mettee, Frederic Akin, Angelo DeMarzo, Jonathan Epstein and Christian Pavlovich
Johns Hopkins Medical Institutions, Brady Urological Institute, Baltimore, MD
(Presented By: Jeffrey Mullins)

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THE QUALITY OF PROSTATE CRYOTHERAPY INFORMATION ON THE INTERNET
Ankur Manvar¹, Raj Kurpad², Ian Udell², Angela Smith², Michael Woods², Matt Raynor², Eric Wallen², Matthew Nielsen² and Raj Pruthi²
¹Medical College of Georgia, Augusta, GA; ²University of North Carolina, Chapel Hill, NC
(Presented By: Raj Kurpad)

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Brooke Edwards¹, Louis Pisters², Steve Jones³ and Robert Given⁴
¹Eastern Virginia Medical School, Norfolk, VA; ²MD Anderson Cancer Center, Houston, TX; ³Cleveland Clinic, Cleveland, OH; ⁴Urology of Virginia, Norfolk, VA
(Presented By: Brooke Edwards)

Poster #91
LOCAL FAILURE AFTER WHOLE-GLAND SALVAGE THERAPY WITH SONABLATE HIGH INTENSITY FOCUSED ULTRASOUND IN RADIO-RECURRENT PROSTATE CANCER
Ana Maria Autran-Gomez¹, Alejandro Lazo-Langner², Ali Alzaharan³, Jonathan Izawa¹ and Joseph Chin¹
¹Division of Urology and Surgical Oncology University of Western Ontario, London ON. Canada; ²Division of Hematology and Epidemiology and Biostatistics, University of Western Ontario, London ON. Canada
(Presented By: Ana Maria Autran-Gomez)

Poster #92
SALVAGE ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY: A SINGLE INSTITUTION FIVE-YEAR EXPERIENCE
Samuel D. Kaffenberger¹, Kirk A. Keegan¹, Todd M. Morgan¹, Dominic H. Tang¹, Neil K. Bansal², Daniel A. Barocas¹, David F. Penson¹, Rodney Davis¹, Peter E. Clark¹, Sam S. Chang¹, Michael S. Cookson¹, S. Duke Herrell¹ and Joseph A. Smith¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University School of Medicine, Nashville, TN
(Presented By: Samuel D. Kaffenberger)

Poster #93
WAITING TILL THEY COME TO US; THE IMPACT OF VOIDING COMPLAINTS ON CANCER DETECTION RATES IN THE INNER CITY
Clifford Georges, Nicholas Karanikolas, Llewelyn Hyacinthe, Fernado Cabrera-Piquer and Semyon Gurgov
SUNY Downstate Department of Urology
(Presented By: Clifford Georges)
Poster #94
COST-EFFECTIVENESS OF STANDARD VERSUS INTENSIVE ANTIBIOTIC REGIMENS FOR TRANS-RECTAL ULTRA-SOUND GUIDED PROSTATE BIOPSY PROPHYLAXIS
Mehrad Adibi, Margaret Pearle and Yair Lotan
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

Poster #95
DOES INTRAOPERATIVE SHEDDING OF PROSTATE CANCER CIRCULATING TUMOR CELLS OCCUR DURING ROBOTIC PROSTATECTOMY?
Eric Kauffman¹, Min Jung Lee², Sylvia Alarcon², Sunmin Lee², Jane Trepel² and Peter Pinto¹
¹Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Medical Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Eric Kauffman)

Poster #96
RISK OF PROSTATE CANCER ON THIRD PROSTATE BIOPSY FOLLOWING DIAGNOSIS OF ATYPICAL GLANDS SUSPICIOUS FOR CARCINOMA ON REPEAT BIOPSY
Brandon Isariyawongse, Ahmed El-Shafei and J. Stephen Jones
Glickman Urological and Kidney Institute, Cleveland Clinic Foundation, Cleveland, OH
(Presented By: Brandon Isariyawongse)

Poster #97
HISTOPATHOLOGICAL FEATURES IN LOCAL RADIO-RECURRENT PROSTATE CANCER FOLLOWING HIGH INTENSITY FOCUS ULTRASOUND AS WHOLE-GLAND SALVAGE THERAPY
Ana Maria Autran-Gomez¹, Susanne Chan², Jose Gomez-Lemus², Linda Lee¹, Jonathan Izawa¹ and Joseph Chin¹
¹Division of Urology and Surgical Oncology University of Western Ontario, London ON, Canada; ²Department of Pathology University of Western Ontario London ON, Canada
(Presented By: Ana Maria Autran-Gomez)

Poster #98
INCREASED NUMBER OF NODES REMOVED AT RETROPERITONEAL LYMPH NODE DISSECTION IMPROVES OVER-ALL- AND CANCER-SPECIFIC SURVIVAL IN PATIENTS WITH TESTICULAR CANCER
Dan Lewinshtein, Sandra Koo and Christopher Porter
Virginia Mason Medical Center, Seattle, WA
(Presented By: Dan Lewinshtein)

Poster #99
A DESCRIPTIVE ANALYSIS OF SEX CORD STROMAL TUMORS USING A NATIONAL DATABASE
Kunj Sheth, John Cashy and Shilajit Kundu
Northwestern University Feinberg School of Medicine, Department of Urology, Chicago, IL
(Presented By: Kunj Sheth)

Poster #100
THE IMPACT OF SURGICAL OR SYSTEMIC THERAPY FOR TESTICULAR GERM CELL MALIGNANCY ON RENAL FUNCTION
Nicholas Cost, Mehrad Adibi, Jessica Lubahn, Adam Romman, Ganesh Raj, Arthur Sagalowsky and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, Texas
(Presented By: Nicholas Cost)
Poster Session II

Friday, December 2, 2011
4:00 p.m. – 6:00 p.m.
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Poster #101
RECURRENT AND TREATMENT PATTERNS IN PATIENTS WITH NON-MUSCLE-INVASIVE BLADDER CANCER
Karim Chamie¹, Mark S. Litwin¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Julie Lai², Jan M. Hanley³, Badrinath R. Konety³, Christopher S. Saigal¹ and the Urologic Diseases in America Project²
¹UCLA, Los Angeles, CA; ²RAND, Santa Monica, CA; ³University of Minnesota, Minneapolis, MN
(Presented By: Karim Chamie)

Poster #102
USING GEOGRAPHIC INFORMATION SYSTEMS TO IDENTIFY CHANGES IN BLADDER CANCER MORTALITY “HOT SPOTS” IN THE UNITED STATES
Sandip Prasad, Amit Patel, Aria Razmaria, Kyle Kiriluk, Alexandre Rosen, Todd Schuble, Chieko Maene, Brandon Pierce, Gary Steinberg and Norm Smith
University of Chicago, Chicago, IL
(Presented By: Sandip Prasad)

Poster #103
THE HISTOPATHOLOGIC CHARACTERISTICS OF BLADDER CANCER AFTER PROSTATE RADIOTHERAPY
Michael Abern¹, Ann Dude² and Christopher Coogan³
¹Duke University Medical Center, Urology, Durham, NC; ²Duke University Medical Center Durham, NC; ³Rush University Medical Center Chicago, IL
(Presented By: Michael Abern)

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Daniel A. Barocas¹, Jack Gallagher², Danielle Colayco³, Brent Schwartz³, Kylee Heap² and Denise Globe³
¹Vanderbilt University Medical School; ²Clarity Pharma Research, Spartanburg, SC; ³Allergan, LLC, Irvine, CA
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Sepehr Salem¹, Abdolrasoul Mehrsai², Farid Kosari¹ and Gholamreza Pourmand³
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¹Mayo Clinic, Rochester, MN; ²Michigan State; ³Cleveland Clinic, Cleveland, OH
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Robert Uzzo¹, Jian Yu¹, Paul Russo¹, David Chen¹, Joseph O’Donoghue², Roman Bartz², Paul Bevan³, Norman LaFrance⁴ and Chaitanya Divgi⁵
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UT Southwestern, Dallas, TX
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Jonathan Silberstein¹, Ari Adamy¹, Alexandra Maschino¹, Behfar Ehdaie¹, Tullika Garg¹, Ricardo Favaretto¹, Tarek Ghoneim¹, Robert Motzer² and Paul Russo¹
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Marc Smaldone¹, Jay Simhan¹, Daniel Canter², Russell Starkey³, Fang Zhu¹, Karyn Stitzenberg⁴, Alexander Kutikov¹ and Robert Uzzo¹
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Wake Forest University School of Medicine, Winston Salem NC
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Andrew Windsperger, Moben Mirza, Jeffrey Holzbeierlein and Peter Van Veldhuizen
University of Kansas Medical Center, Kansas City, KS
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¹Naval Medical Center San Diego; ²University of California San Diego
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Daniel Canter¹, Katherine Mallin², Robert G. Uzzo¹, Marc C. Smaldone¹, Gennady Bratslavsky³ and Alexander Kutikov⁴
¹Fox Chase Cancer Center, Philadelphia, PA; ²National Cancer Data Base, American College of Surgeons, Chicago, IL; ³SUNY Upstate Medical University, Syracuse, New York
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¹Weill Cornell Medical College, New York, NY; ²University of Texas Southwestern Medical Center, Dallas, TX; ³University of Padua, Padua, Italy; ⁴Penn State Milton S. Hershey Medical Center, Hershey, PA; ⁵McGill University, Montreal, Canada; ⁶CHU Pontchaillou, Rennes, France; ⁷University of Michigan, Ann Arbor, MI
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¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Urology Service, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan-Kettering Cancer Center, New York, NY, USA; ³Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY, USA; ⁴Department of Psychiatry and Behavioral Sciences, Memorial Sloan-Kettering Cancer Center, New York, NY, USA; ⁵Department of Urology and Division of Medical Oncology, Weill Cornell Medical College, New York-Presbyterian Hospital, New York, NY, USA
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¹University of Southern California, Los Angeles, CA; ²University of Alberta, Edmonton, AB
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Weill Cornell Medical College, Department of Urology, New York, NY
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¹George Washington University, Washington DC; ²Division of Surgical & Interventional Science, University College London, London; ³Department of Histopathology, University College London Hospitals Trust, London.; ⁴Department of Uroradiology, University College London Hospitals Trust, London
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¹Washington University School of Medicine, St. Louis, Missouri; ²Cleveland Clinic, Cleveland, Ohio
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Christopher Anderson¹, Shenghua Ni², David Penson² and Daniel Barocas²
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¹University of California, San Francisco, CA; ²RAND Corporation; ³University of California, Los Angeles
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(Presented By: Lawrence Karsh)

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(Presented By: Elai Davicioni)

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(Presented By: Abhay Singh)
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Mehrdad Alemozaffar¹, Martin Sanda¹, Derek Yecies², Meir Stampfer¹ and Stacey Kenfield²
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¹University of Southern California, Los Angeles, CA; ²University of Alberta, Edmonton, AB
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University of Texas Southwestern Medical Center, Dallas, TX
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Sandhya R. Rao, Mayer N. Fishman, Wade J. Sexton, Philippe E. Spiess and Julio M. Pow-Sang
Genitourinary Oncology Program, Moffitt Cancer Center, Tampa, FL
(Presented By: Sandhya R. Rao)
Podium #1

BLOOD LOSS ASSOCIATED WITH RADICAL CYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY COMPARING IMPACT LIGASURE VERSUS STAPLING DEVICE.
Ian M. Thompson, III¹, Daniel A. Barocas¹, Carl J. Bischoff², Peter E. Clark¹, Michael S. Cookson¹, Stephen F. Kappa², Todd M. Morgan¹, Matthew J. Resnick¹, Joseph A. Smith¹ and Sam S. Chang¹
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(Presented By: Ian M. Thompson, III)

Introduction and Objectives: To compare blood loss associated with two different devices (GIA Stapler versus Impact Ligasure) used to provide hemostasis during radical cystectomy (RC) for bladder cancer.

Methods: Eighty (80) patients undergoing RC for bladder cancer were randomized to either use of a GIA Stapler or Impact Ligasure device. Operative parameters, outcomes and costs were compared. Data were analyzed with Wilcoxon rank sum test and Welch two sample t-test.

Results: There were no significant demographic or preoperative clinical differences between the groups. Mean estimated blood loss was not significantly different between the Ligasure and GIA Stapler arms (687 mL vs. 708 mL, p=0.85). There were no significant differences between groups when comparing operative times and transfusion requirement. There was a significant increase in the mean number of adjunctive suture ligatures used in the stapling device arm (3.0 vs. 1.5, p=0.047). Total device cost was significantly lower with the Ligasure compared to the GIA Stapler ($665.10 vs. $1464.60, p<0.01). There were no complications attributable to either device.

Conclusions: This prospective randomized study demonstrates no significant difference in blood loss, transfusion requirement or safety between the Ligasure and GIA Stapler. The Ligasure device, however, is significantly cheaper than the GIA Stapler and required fewer additional measures for hemostasis.

Podium #2

MICRORNA PROFILES IN RADICAL PROSTATECTOMY SPECIMENS: DIFFERENTIAL EXPRESSION BY GLEASON GRADE AND PATHOLOGIC STAGE
Soroush Rais-Bahrami¹, Kevin Smith¹, Nikhil Waingankar¹, Michaela Oswald², Houman Khali³, Annette Lee³, Peter Gregersen³, Theresa Chan³ and Manish Vira¹
¹The Arthur Smith Institute for Urology, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY; ²The Feinstein Institute for Medical Research, Manhasset, NY; ³Department of Pathology and Laboratory Medicine, Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY
(Presented By: Soroush Rais-Bahrami)

Objectives: MicroRNA (miRNA) have been implicated in cell proliferation, differentiation, and carcinogenesis via their role in regulating gene expression. In prostate cancer, miRNA expression is under investigation to elucidate potential as biomarkers of aggressive disease and risk of metastatic progression.

Methods: RNA was extracted from foci of prostate cancer as well as areas of benign glandular architecture from paraffin embedded radical prostatectomy specimens from 47 patients. Foci of prostate cancer were outlined during secondary review by a uropathologist. Subsequently, miRNA expression profiles for 675 miRNA were analyzed using Taqman OpenArray which employs quantitative PCR methodology. Data analysis was performed using the limma package for “R,” and p-values were corrected for multiple hypothesis testing using the Benjamini–Hochman method, and considered significant if p<0.05.
Results: 307 miRNAs were present in at least 50% of benign and cancer foci. Of these, 57 miRNA demonstrated significantly different expression profiles in cancer areas: 23 up-regulated and 13 down-regulated with a minimum 2-fold change. Figure#1 displays the fold change in miRNA expression for the 36 miRNA of interest. Furthermore, analysis of miRNA expression based upon pathologic Gleason grade demonstrated mir-885-5p levels to be significantly higher (p=0.02) by over 179 fold-change (FC) in specimens with primary Gleason pattern 4 compared to primary Gleason score 3. Evaluation of pathologic stage revealed multiple miRNA expression profiles differing between organ−confined, pT2 disease compared to pT3a or pT3b disease, most dramatically mir-519b−3p (FC>100,000, p<0.0001) and mir−520h (FC>143, p<0.001).

Conclusions: We have identified 36 specific miRNAs for which expression varies greater than 2−fold from areas of cancerous glands compared to benign glands in patients with prostate cancer. Of these miRNA, expression of some are significantly elevated in higher grade and staged disease by over a hundred fold. Further investigation of these miRNA may uncover both role as a biomarker of aggressive disease and more importantly, role in molecular pathophysiology of progression.

Podium #3
IDENTIFICATION OF A MULTIPLE PEPTIDE SIGNATURE BY IMAGING MASS SPECTROMETRY WHICH ACCURATELY PREDICTS MORTALITY IN RENAL CELL CARCINOMA

Samuel D. Kaffenberger¹, Todd M. Morgan¹, Erin H. Seeley², Oluwole Fadare³, Richard M. Caprioli² and Peter E. Clark¹
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(Presented By: Samuel D. Kaffenberger)

Introduction: Imaging mass spectrometry (IMS) offers substantial promise for biomarker identification given its ability to obtain detailed peptide expression data while retaining spatial information in situ. Here, we sought to determine whether IMS could be used to identify peptide signatures associated with increased mortality risk after nephrectomy for renal cell carcinoma (RCC).

Methods: We constructed a tissue microarray with 2 matched tumor and normal cores from nephrectomy specimens of 35 patients with clear cell RCC. After deparaffinization and antigen retrieval, trypsin digestion was performed directly on the tissue. Samples were analyzed utilizing an AutoFlex Speed matrix assisted laser desorption ionization (MALDI) time−of−flight mass spectrometer. For this study, only the tumor cores were analyzed. Additionally, this approach requires dichotomous survival analysis, and patients were categorized as short (overall survival <24 months; n=14 patients) or long survivors (>24 months; n=21 patients). Data analysis was performed with ClinProTools 2.2 and FlexImaging 2.1 software. Peptide peaks differentially expressed in short vs long survivors were used to develop a peptide signature associated with mortality risk after nephrectomy.

Results: A signature consisting of 22 peptides was developed that accurately discriminated between short and long−term survivors. An average of 11 different spots were assayed within each core, and when classifying each core in its entirety, the peptide signature predicted survival (short vs long) with an accuracy of 88.5% (Figure).
Conclusions: MALDI IMS was able to identify and map specific peptides that accurately stratified patients with RCC by survival. While there are currently no prognostic biomarkers utilized in the care of patients with RCC, this approach offers substantial promise by simultaneously assessing and localizing a vast range of protein expression patterns while maintaining the spatial orientation within tissue. Further work is required to validate the accuracy of this pattern of peptide expression and to characterize these differentially expressed peptides.

Funding: Award Number K08 CA113452 (PEC) from the NIH, Vanderbilt CTSA grant UL1 RR024975 from NCRR/NIH

Podium #4

MR-GUIDED LASER FOCAL THERAPY FOR LOW - INTERMEDIATE RISK LOCALIZED PROSTATE CANCER
Uri Lindner, Sean R.H. Davidson, Masoom A. Haider, Eugen Hlasny, Mark R. Gertnre, Walter Kucharczyk and John Trachtenberg
University Health Network, Toronto, ON, Canada
(Presented By: Uri Lindner)

Focal therapy is a promising prospective therapy for localized prostate cancer (PCa). New technologies are being investigated and require evaluation. Magnetic Resonance Imaging (MRI) guided laser focal therapy for the targeted ablation of PCa has been developed at our institution. This is the largest cohort description of this technique.

Purpose: To ascertain the feasibility and safety of MRI−guided targeted laser focal therapy for localized PCa.

Methods: Twenty three patients with biopsy proven low−intermediate risk PCa underwent MR−guided interstitial laser ablation of the cancer. The area of interest was confirmed and targeted using MRI. All the procedures were performed in a 1.5T GE system. The patients were placed in a low lithotomy, MR was used to guide 1−4 laser fibers. Fiber position was chosen using in house developed planning and guidance software. Thermal ablation was monitored using MR thermal mapping sequence and real time ablation size was calculated using Visulase Inc. workstation. Questionnaires were used to assess the effect on voiding symptoms and erectile function. Adverse events were recorded.

Results: MR−guided focal laser ablation was technically feasible to perform on an outpatient basis. We have progressed from 1−2 fiber insertion to 3−4 fiber insertion. The average burn created during the first ten patients was 2.4 cc whereas for the last ten patients it was 7.3 cc, without greater morbidity. The treatment created an identifiable hypovascular defect immediately post−treatment which coincided with the targeted prostatic lesion. Mean targeted volume was 0.77 cc and mean ablated volume was 5.5 cc. There were no peri−operative complications and minimal morbidity. All patients that were potent prior to the procedure maintained potency following the procedure. Continence levels were not compromised. Procedure time has gone down even though we have increased the number of fibers inserted and lesion size ablated. We are awaiting oncological results.

Conclusions: MR−guided focal laser ablation of low−intermediate risk PCa is feasible as an outpatient procedure. Early clinical response suggest that the targeted region can be ablated with minimal adverse effects and that larger volumes can be ablated without incurring side effects. It may represent an alternate treatment approach in carefully selected patients. Oncological results are pending and further trials are required to demonstrate the effectiveness of this treatment concept.
Podium #5

ADRENAL NODULAR HYPERPLASIA AS PART OF THE HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CARCINOMA (HLRCC) PHENOTYPE

Brian Shuch¹, Cathy Vocke¹, Vladimir Valera², Beatriz Walter Rodriguez², Chris Ricketts¹, Rabindra Gautam¹, Gopal Gupta¹, Peter Pinto¹, Rama-prasad Srinivasan¹, Maria Merino², W. Marston Linehan¹ and Gennady Bratslavsky³

¹NCI Urologic Oncology Branch, Bethesda, MD; ²NCI Translational Surgical Pathology Branch, Bethesda, MD; ³Department of Urology, SUNY Upstate Medical University

(Presented By: Brian Shuch)

Purpose: Hereditary leiomyomatosis and renal cell carcinoma (HLRCC) is characterized by cutaneous leiomyomas, uterine fibroids, and aggressive papillary renal cell carcinoma (RCC). We have also observed that some HLRCC patients had adrenal nodules and sought to characterize this finding as a possible new part of the HLRCC phenotype.

Methods: A prospectively collected database of all HLRCC patients was reviewed for patients with adrenal masses on radiographic imaging. Patient data, imaging studies, endocrine manifestations, management, and pathologic findings were reviewed. Available cases were further studied to look for a loss of heterozygocity (LOH) in the fumarate hydratase gene (FH) by florescence in situ hybridization (FISH) and polymerase chain reaction (PCR).

Results: Twenty of 255 HLRCC patients (7.8%) were identified as having a primary adrenal pathology. Among these, three had bilateral adrenal lesions and four demonstrated multiple nodules. Two patients had hypercortisolism on endocrine workup. Radiographic findings of 27 adrenal lesions were reviewed. Eight (29.6%) of these lesions were not characterized as an adenoma or hyperplasia by non−contrast CT criteria. PET imaging was performed in 10 cases and was positive in 7 (70%). Due to concern for possible malignancy, ten adrenal glands were resected and pathology demonstrated macronodular adrenal hyperplasia in all specimens. PCR and FISH demonstrated that the majority of cases did not demonstrate LOH of FH.

Conclusions: Unilateral and bilateral adrenal micro and macronodular hyperplasia appears to be part of the HLRCC phenotype, currently believed related to haploinsufficiency due to germline loss of FH. A functional endocrine workup should be performed as patients can have hypercortisolism. Imaging frequently demonstrates lesions that are not typical of adenomas or hyperplasia on non−contrast CT and can be positive on PET imaging. To date, no patient has demonstrated malignancy and close adrenal surveillance may be feasible in select patients.

Podium #6

HOSPITAL READMISSION AFTER RADICAL CYSTECTOMY FOR BLADDER CANCER: RESULTS OF A POPULATION-BASED ANALYSIS FROM THE CALIFORNIA STATE INPATIENT DATABASE

Kenneth Nepple, Pamela Owens, Seth Strope, Gurdarshan Sanhu, Dorina Kallogjeri and Adam Kibel

Washington University, St. Louis, MO

(Presented By: Kenneth Nepple)

Introduction: Hospital readmission is a potential marker of surgical quality. However, single institution reports do not capture readmission at other institutions nor assess the outcomes at low volume hospitals. We sought to report the incidence and predictors of hospital readmission after radical cystectomy (RC) using a data source which captures all readmissions to any hospital within the state.

Methods: The study cohort was drawn from the California State Inpatient Database, a statewide discharge−based administrative database that includes all payers and age ranges. Revisit files allow single patients to be tracked across multiple admissions within the state. For the years 2005 to 2009, patients were identified who underwent RC for the diagnosis of bladder cancer with known type of urinary diversion. Hospital readmission rates were evaluated using Kaplan Meier analysis. Risk adjusted hazard ratios (HR) for readmission were assessed with multivariable logistic regression.
Results: 3000 patients were identified who underwent extirpative surgery for bladder cancer, of which urinary diversion was ileal conduit in 2669 (89.0%) and continent diversion in 331 (11.0%). Patients with continent diversion were more likely to be male, white, and from higher income areas compared with ileal conduit (all p<0.02). Medical comorbidity was more common in patients with ileal conduit diversion (p<0.05 for deficiency anemia, COPD, and renal insufficiency). Median hospital stay was 9 days for each type of urinary diversion. Mortality during the surgical admission for ileal conduit (2.3%) and continent diversion (3.0%) were not statistically different (p=0.38). The overall hospital admission rate was 27.1% at 30 days and 38.0% at 90 days (Figure). On multivariable analysis, predictors (p<0.05) of readmission were age (HR 1.01 per year), CHF (HR 1.41), depression (HR 1.60), diabetes (HR 1.34), psychoses (HR 1.82), renal insufficiency (HR 1.36), and continent diversion (HR 1.30).

Conclusions: In a large comprehensive state inpatient database, 38.0% of patients were readmitted to the hospital within 90 days after RC. Predictors of hospital readmission included increased age, medical comorbidity, and continent urinary diversion.
THE IMPACT OF MIXED HISTOLOGAL FEATURES ON SURVIVAL FOLLOWING RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA

Simon Kim, Igor Frank, John Cheville, R. Houston Thompson, Christopher Weight, Prabin Thapa and Boorjian Stephen
Mayo Clinic, Rochester, MN
(Presented By: Simon Kim)

Introduction and Objective: The presence of mixed histological features (MH) in patients with urothelial carcinoma (UC) of the bladder has been associated with locally–advanced disease at radical cystectomy (RC), and has been suggested to predict response to neoadjuvant chemotherapy. The impact of MH on survival, however, remains to be defined. Here, then, we investigated comparative clinical and pathologic outcomes of patients undergoing RC for pure UC versus those with UC and MH.

Methods: We identified 1,150 patients who underwent RC at Mayo Clinic between 1980–2007, including 827 (72%) with pure UC and 323 (28%) with UC and MH. MH patients included those with squamous differentiation (n=132), glandular differentiation (n=41), or both (n=13); micropapillary features (n=67); nested variant of UC (n=49); and UC with sarcomatoid histology (n=21). All specimens were re–reviewed by a single genitourinary pathologist. Cancer specific survival (CSS) was estimated using the Kaplan–Meier method and compared with the log–rank test. The association of MH with death from UC was evaluated using multivariable Cox proportional hazard regression analysis.

Results: Median follow–up after RC was 8.4 years (interquartile range 3.0, 13.5). Patients with UC and MH were more likely to have pT3–T4 tumors (69.3% vs 38.7%; p<0.0001) and pN+ disease (26.3% vs 15.4%; p<0.0001) compared to patients with pure UC. However, postoperative 10–year CSS did not significantly differ between patients with UC and MH and patients with pure UC (47% vs 51%; p=0.18). Moreover, after adjusting for clinicopathologic features (Table), the presence of MH was associated a decreased risk of death from UC (HR 0.82; p=0.05).

Conclusions: Patients with UC and MH at RC were more likely to have extravesical tumors and node–positive disease. Nevertheless, we found that these patients did not have adverse CSS compared to patients with pure UC. In fact, the presence of MH was associated with a nearly 20% lower risk of death from UC on multivariate analysis. Additional studies are needed to confirm these findings and further define prognostic factors for bladder tumors with MH.

Funding: None

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PROGNOSTIC SIGNIFICANCE OF CANCER STEM CELL MARKERS IN BLADDER CANCER PATIENT SURVIVAL

Philip Ho¹, Jens-Peter Volkmer², Debashis Sahoo², Robert Chin², Guilherme Godoy¹, Seth Lerner¹, Matt van de Rijn², Linda Shortliffe², Irving Weissman² and Keith Chan¹

¹Baylor College of Medicine, Houston, TX; ²Stanford University, Palo Alto, CA

(Presented By: Philip Ho)

Introduction/Objective: Prognosis in bladder cancer currently relies primarily on pathologic stage and grade. Recently, we and others have isolated cancer stem cells (CSCs) from bladder cancer and demonstrated their functional role in driving tumor initiation. A biologically supervised computational approach was employed to better define keratin markers representing early (Keratin 14, K14 → Keratin 5, K5) to late differentiation stages (Keratin 20) in bladder cancer. However, the clinical impact of CSC frequency in bladder cancer has not been explored. We therefore investigated whether the presence of CSCs was associated with survival and other clinicopathologic variables.

Methods: K14 is a primitive marker for bladder CSCs. Three independent published bladder cancer gene expression datasets (n= 667 patients) were used to determine possible associations between K14 expression and patient survival. These results were further evaluated at the protein level by immunohistochemistry using formalin fixed paraffin-embedded specimens of urothelial carcinoma in two independent cohorts from Baylor College of Medicine (117 patients) and Stanford University (159 patients). Survival probability was determined by Kaplan–Meier analysis, and univariate and multivariate Cox regression analyses were performed using R software.

Results: Expression levels of K14 were strongly associated with worse survival in all three gene expression datasets. Furthermore, in one dataset, K14 expression was independently associated with survival by multivariate analysis (p=0.0077) when controlled for stage, grade, gender and age. Similarly, K14 protein expression by immunohistochemistry was associated with worse overall survival by univariate and multivariate analysis in both datasets (p=0.012 and p=0.015). K14 gene expression was also associated with worse overall survival (p=0.035), recurrence–free survival (p=0.019) and progression–free survival (p=0.034) probabilities in patients with pTa urothelial tumors.

Conclusion: The expression of the primitive CSC marker K14 identifies a subpopulation of high–risk bladder cancer patients with poor clinical outcomes. This may help identify patients who would benefit from early definitive therapy.

LYCOPENE IN THE PREVENTION OF RENAL CELL CANCER IN THE TSC2 MUTANT EKER RAT MODEL

Brian Cross¹, Kazim Sahin², Nurhan Sahin², Karina Ciccone³, Adeboye Osunkoya¹, Viraj Master¹, Wayne Harris¹, Bradley Carthon¹, Ramzi Mohammad¹, Birdal Bilir¹, Daniel Canter¹, Karin Wertz¹, Daqing Wu¹, Carlos Moreno¹, Cheryl Walker⁶ and Omer Kucuk¹

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(Presented By: Brian Cross)
**Introduction and Objectives:** Dietary lycopene has been associated with a decreased risk of developing renal cell carcinoma (RCC). This preventive activity is thought to be due to its anti-oxidant and anti-inflammatory effects. Eker rats represent a unique animal model to study RCC, as these rats develop spontaneous renal tumors, which may be due to tuberous sclerosis 2 (TSC2) mutation resulting in the activation of the mammalian target of rapamycin (mTOR) pathway. This study examines the role of lycopene in the development of RCC in the TSC2 mutant Eker rat model.

**Methods:** Ten-week old female Eker rats (n=90) were assigned in equal numbers to receive 200 mg/kg (group A), 100 mg/kg (group B) or 0 mg/kg (group C) of lycopene with their daily diet. After 18 months the rats were sacrificed and the kidneys were removed. Immunohistochemical staining with antibodies against mTOR, phospho-S6 and epidermal growth factor receptor (EGFR) were performed, as well as hematoxylin-eosin staining for histologic examination of the tumors. Spontaneously developing tumors were counted and measured in individual kidneys. The presence and number of tumors were subjected to cross-tabulation with level of dietary lycopene for Chi-square analysis. The mean size and length of tumors were analyzed using one-way ANOVA. Contrast options were built to evaluate the effect of lycopene (0 vs. average of 100 and 200 mg/kg) as well as dose-response relationship.

**Results:** In group A 13 of 20 (65%) rats, in group B 15 of 20 (75%) rats, and in group C 15 of 16 (94%) rats had tumors. Group A had a mean number of 2.85 tumors (± 2.99) per rat, compared to 3.65 (± 2.62) in group B and 6.71 (± 6.13) in group C, with a linear effect of lycopene (p<0.003). Average tumor size was 3.45 mm, 3.31 mm and 3.44 mm in groups A, B and C, respectively. Total tumor size per rat was 11.29 mm (± 13.36 mm) in group A, compared to 10.00 mm (± 10.04 mm) in group B and 26.14 mm (± 24.27 mm) in group C, with a linear effect of lycopene (p<0.03). All tumors showed strong staining against mTOR, phospho-S6 and EGFR.

**Conclusions:** Dietary lycopene attenuates the development of renal cell cancers in the TSC2 mutant Eker rat model. These results suggest that lycopene may play a role in the prevention of RCC.

**Acknowledgement:** Supported in part by funds from DSM, Basel, Switzerland, and Georgia Cancer Coalition Carpenter Fellowship (Karina Ciccone). Dr. Omer Kucuk is a Georgia Cancer Coalition Distinguished Cancer Scholar.

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**NUCLEAR TRANSLOCATION OF HIF-2ALPHA IN HUMAN KIDNEY CANCER CELLS IS DEPENDENT UPON NADP(H) OXI- DASE 4 SUPEROXIDE GENERATION**

Guimin Chang, Li Chen and Jodi Maranchie
University of Pittsburgh, Pittsburgh, PA

(Presented By: Jodi Maranchie)

**Introduction:** Loss of von Hippel Lindau is an early event in sporadic clear cell kidney cancer (RCC) resulting in accumulation of HIF-α. We reported that generation of reactive oxygen species by the NADPH oxidase, Nox4, is critical for HIF2-α expression and activation. However, the mechanism of Nox4 regulation of HIF-2α is not known. Activation of HIF-α is a multi-step process that involves nuclear translocation, dimerization with HIF-β, binding of transcription co-activators and DNA promoter binding. To determine if Nox4 is required for HIF-2α nuclear translocation, we used confocal microscopy to localize HIF-2α following Nox4 silencing or induction or inhibition of superoxide in 786-o and RCC4 kidney cancer cells.

**Methods:** 786-o or RCC4 cells expressing specific Nox4 shRNA (KD) or control, non-targeting shRNA (NS) were grown 16 hours at normal oxygen or 1% O2 to 50% confluence on cover slips in DMEM with 10% FBS, then fixed with 4% paraformadehyde and permeableized with 0.1% TritonX-100. Cells were probed with anti-HIF-2α antibody, counterstained with DAPI nuclear stain and subjected to confocal microscopy. For intracellular induction of superoxide, cells were pre-treated for 4 hours with DTT (2mmol) prior to fixation. Tempol 20 mmol served as an inhibitor of endogenous superoxide. Western blot of nuclear fraction cell lysates were used to quantitate HIF-2α protein.

**Results:** Both cell lines expressing control expression vector demonstrated marked nuclear translocation following exposure to hypoxia. Nuclear translocation was not observed in KD cell in either normoxia or hypoxia. DTT induced nuclear translocation of HIF-2α under all conditions in NS and KD cells. Tempol superoxide inhibition blocked hypoxic nuclear translocation to the same degree as Nox4 knockdown. Inhibition of nuclear accumulation of HIF-2α was confirmed by Western blot.

**Conclusions:** Nuclear translocation of HIF-2α requires Nox4 generation of superoxide under both normoxic and hypoxic conditions. This further supports an oncogenic role for Nox4 in kidney cancer and suggests that specific Nox4 targeting may have therapeutic efficacy against RCC.

**Funding:** American Cancer Society
IS PERINEURAL INVASION IN PROSTATE BIOPSIES ASSOCIATED WITH ADVERSE PATHOLOGICAL OUTCOME? OLD PARADIGM REVISITED.

Malik Elharram¹, David Margel¹, Antonio Finelli¹, Alexandre Zlotta¹, John Trachtenberg¹, Andrew Evans² and Neil Fleshner¹
¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Department of Pathology, Princess Margaret Hospital, University Health Network, Toronto, Canada

(Presented By: David Margel)

**Purpose:** The prognostic significance of perineural invasion is uncertain. We aim to explore the role of PNI on prostate biopsy in predicting adverse findings at radical prostatectomy in a recent cohort of screen detected prostate cancer.

**Methods:** From September 2008 to January 2010, 1041 consecutive patients were available from our prospective database for analysis. 470 patients were diagnosed with prostate cancer on needle biopsy, and 138 of these patients underwent radical prostatectomy. Pathological specimens were examined, and perineural invasion was identified as carcinoma tracking along or around a nerve in the perineural space. We investigated the predictive value of PNI on biopsy with PNI on radical prostatectomy as well as the ability of PNI on prostate biopsy to predict adverse findings at radical prostatectomy.

**Results:** Perineural invasion was present in 124 (26%) of biopsy specimens diagnosed with prostate cancer and 38 (27%) of those who chose radical prostatectomy. Perineural invasion on prostate needle biopsy was not predictive of radical prostatectomy Gleason score (p = 0.377), pathological stage (p = 0.852), extraprostatic extension (p = 0.258), surgical margin (p = 0.079), lymphovascular invasion (p = 0.499), and upgrading (p = 0.514) or downgrading (p = 0.208) at radical prostatectomy. The sensitivity, specificity, positive predictive value, and negative predictive value of PNI on biopsy for PNI on radical prostatectomy were 32%, 82%, 79%, and 37% respectively. The Cohen’s Kappa correlation coefficient was 0.11.

**Conclusions:** Perineural invasion on prostate needle biopsy is not predictive of radical prostatectomy outcome. Furthermore, perineural invasion on biopsy has limited predictive value for perineural invasion at radical prostatectomy.

PROSTATE CANCER RISK IN MEN WITH PROSTATE AND BREAST CANCER FAMILY HISTORY: RESULTS FROM THE REDUCE STUDY

Jean-Alfred Thomas, Leah Gerber¹, Daniel Moreira², Robert Hamilton¹, Lionel Bañez¹, Ramiro Castro-Santamaria³, Gerald Andriole³, William Isaacs³, Jianfeng Xu⁴ and Stephen Freedland¹
¹Duke Prostate Center, Division of Urological Surgery, Department of Surgery, Duke University School of Medicine, Durham, NC; ²The Author Smith Institute for Urology, New Hyde Park, NY; ³Memorial Sloan-Kettering Cancer Center, New York, NY; ⁴GlaxoSmithKline, Research Triangle Park, North Carolina; ⁵Washington University School of Medicine in St. Louis, St. Louis, Missouri; ⁶Department of Urology, Johns Hopkins Hospital, Baltimore, MD; ⁷Center for Genomics and Personalized Medicine Research, Wake Forest University, Winston-Salem, NC

(Presented By: Jean-Alfred Thomas)

**Background:** To what degree the associations between PCa risk and family history of prostate cancer (PCa) and/or breast cancer (BCa) are attributable to screening biases is unclear. We examined these questions within the REDUCE study, where biopsies were largely independent of PSA minimizing screening biases.

**Methods:** Data were from REDUCE, which tested dutasteride 0.5 mg daily for PCa risk reduction in men with PSA 2.5–10.0 ng/mL and a negative pre-study biopsy. Among men undergoing at least one on-study biopsy with complete data (n = 6,415; 78.1%), the association between family history and PCa risk was tested using multivariate logistic regression adjusting for clinicodemographic characteristics.
**Results:** A family history of PCa alone was associated with increased PCa diagnosis (OR 1.47, 95% CI: 1.22–1.77). In North America, PCa family history was not related to PCa diagnosis (OR: 1.02, 95% CI: 0.73–1.44), whereas outside North America, PCa family history was significantly related to diagnosis (OR: 1.72, 95% CI: 1.38–2.15) (p–interaction=0.01). A family history of both PCa and BCa (OR 2.54, 95% CI: 1.72–3.75) but not BCa alone (OR 1.04, 95% CI: 0.84–1.29) was associated with increased PCa risk versus no family history and irrespective of geographical region.

**Conclusions:** In REDUCE, PCa family history was significantly related with PCa diagnosis, though only for men outside North America. The presence of both PCa and BCa family history significantly increased risk versus PCa family history alone, irrespective of geographical region. Ultimately, our observations may support the need for changes in how we address family history in terms of both risk of PCa diagnosis and general risk stratification.
ANTI-IL10-R1 MONOCLONAL ANTIBODY ENHANCES BACILLUS CALMETTE-GUERIN (BCG) INDUCED TH1 AND ANTI-BLADDER CANCER IMMUNE RESPONSES IN VITRO AND IN VIVO
Nathan Bockholt¹, Matthew Knudson¹, Jonathan Henning¹, Peter Weady², George Smith², Michael Eisenbraun², James Fraser², Michael O'Donnell¹ and Yi Luo¹
¹University of Iowa, Iowa City, IA; ²Pfizer, Inc., New York, NY
(Presented By: Nathan Bockholt)

Introduction: Proper induction of Th1 immunity is required for effective BCG immunotherapy of bladder cancer. IL−10 down−regulates the Th1 response and is associated with BCG failure. We propose that blocking IL−10 receptor (IL−10R) can inhibit IL−10 signaling, thus enhancing BCG−induced antitumor response.

Methods: Splenocytes were incubated with BCG alone or in combination with control IgG, anti−IL−10R1 mAb, or anti−IL−10 neutralizing mAb for 24 hours, followed by ELISA analysis of IFN−γ production. Bladder RNAs were extracted after intravesical (i.b.) BCG plus intraperitoneal (i.p.) control IgG or anti−IL−10R1 mAb and analyzed by qPCR. Urine was collected and analyzed by ELISA. Mice bearing luciferase−expressing MB49 orthotopic tumor were treated with i.b. BCG plus i.p. control IgG or anti−IL−10R1 mAb. Tumor response was assessed using bioluminescence imaging.

Results: BCG plus anti−IL−10R1 mAb induced significantly higher IFN−γ than BCG plus anti−IL−10 neutralizing mAb (5.9−17.5 vs. 0.95−6.9 fold increases at 0.004−1 μg/ml). BCG plus anti−IL−10R1 mAb also induced substantially higher IFN−γ in both urine and bladder than BCG plus control IgG. Mice treated with PBS, BCG plus control IgG, or BCG plus anti−IL−10R1 mAb showed 0% tumor free with a 20% death rate, 20% tumor free with a 20% death rate, and 40% tumor free with a 0% death rate, respectively.

Conclusions: Anti−IL−10R1 mAb is more potent than anti−IL−10 neutralizing mAb for enhancing BCG−induced IFN−γ production in vitro. Anti−IL−10R1 mAb also enhances BCG−induced Th1 and antitumor immunity in vivo. This mAb could serve as an effective agent for treating bladder cancer when combined with BCG.

PROGNOSTIC SIGNIFICANCE OF CYSTOSCOPY FINDINGS FOLLOWING NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER
Ahmed M. Mansour, Ahmed Eldefrawy, Mark S. Soloway and Murugesan Manoharan
University of Miami, Miller School of Medicine, Miami, Florida
(Presented By: Ahmed M. Mansour)

Aim: To evaluate the potential significance of cystoscopy findings following neoadjuvant chemotherapy (NAC) as prognostic indicator in patients undergoing radical cystectomy for muscle−invasive bladder cancer (MIBC).

Patients and Methods: We analyzed our prospectively maintained database for patients who received neoadjuvant chemotherapy (NAC) prior to radical cystectomy for MIBC. Patients were divided into two groups according to cystoscopy performed after 2 cycles of NAC; Respondents (patients who had no evidence of tumor or decreased tumor volume) and Non respondents (patients who had tumor volume progression). We investigated the prognostic significance of the cystoscopy findings and its correlation with the final pathological and survival outcomes. Univariate analysis with the Pearson chi−square was done to analyze associations between observed response to chemotherapy on follow up cystoscopy and pT stage, pT stage downgrading (pathological response) and pN stage (N0 and greater than N0). A Kaplan−Meier estimator curve with the log rank test and a Cox proportional hazard model were used to test whether observed response to chemotherapy predicted overall survival.

Results: 101 patients received NAC for MIBC. 60 (59%) patients were identified as respondents to NAC based upon cystoscopy. There was no significant difference in patient demographics between the 2 groups. Univariate analysis showed statistically significant association between observed cystoscopic response to chemotherapy and pT stage, T stage downgrading and pN stage (each <0.001) Furthermore, multivariate regression modeling revealed that non−response to NAC was an independent predictor of extravesical extension.
There was a distinct survival benefit in NAC respondent group (p < 0.001). Figure 1. On multivariate analysis, response to NAC was an independent predictor of survival in patients with MIBC (p < 0.001), HR 0.298 (0.162–0.549).

**Conclusion:** Observed response to NAC on follow up cystoscopy is associated with favourable pathological and survival outcomes in patients undergoing radical cystectomy for MIBC. This correlation may have implications for preoperative patient counseling and should be incorporated in prognostic nomograms.

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**COMPLICATIONS OF SALVAGE CYSTECTOMY AFTER FAILED BLADDER-SPARING THERAPY FOR MUSCLE-INVASIVE BLADDER CANCER**

Jairam Eswara¹, Jason Efstathiou², Niall Heney¹, Jonathan Paly², Donald Kaufman³, W. Scott McDougal¹, Francis McGovern¹ and William Shipley²

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(Presented By: Jairam Eswara)

**Introduction:** Radical cystectomy has been the standard for muscle-invasive bladder cancer. Combined-modality-therapy (CMT) involving transurethral resection of bladder tumor (TURBT), external-beam radiation, and chemotherapy is an effective alternative to cystectomy in selected patients. Salvage cystectomy is reserved for those failing CMT. We characterized complications associated with salvage cystectomy.

**Methods:** From 1986–2007 of 348 patients undergoing bladder-sparing therapy, 102 patients (29%) underwent salvage cystectomy, 91 performed at Massachusetts General Hospital following CMT for T2–T4aNxM0 bladder cancer. Patients underwent TURBT followed by chemoradiation (40Gy). Early assessment was performed by cystoscopy/rebiopsy. Patients with complete response continued with consolidation chemoradiation (total dose 64Gy). Immediate salvage cystectomy (50/91) was performed for persistent disease, while delayed salvage cystectomy (41/91) was performed for an invasive recurrence. Medical records were reviewed classifying complications using the Clavien system.

**Results:** Median age was 69.4yrs (27.5–88.9); median living–patient follow–up was 12 years (0–23). 99% (90/91) underwent ileal diversion. 69% (63/91) had complications of any grade <90 days. 16% (15/91) experienced major complications <90 days. 21% (19/91) required readmission <90 days. 90–day mortality was 2.2% (2/91). Significant cardiovascular/hematologic complications [PE, MI, DVT, transfusion] <90 days were more common in the immediate cystectomy group (37% vs. 15%, p=0.02). Tissue–healing complications [fascial dehiscence, wound infection, ureteral stricture, anastomotic stricture, stoma/loop revisions] were more common in the delayed group (35% vs. 12%, p=0.05).

**Conclusions:** Salvage cystectomy is associated with acceptable morbidity, though complication rates are slightly higher than for other cystectomy series. Immediate cystectomies have more cardiovascular/hematologic complications, while delayed cystectomies have more tissue–healing complications.
WHAT IS EVALUATION OF HEMATURIA BY PRIMARY CARE PHYSICIAN’S: USE OF ELECTRONIC MEDICAL RECORDS TO ASSESS PRACTICE PATTERNS?

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(Presented By: Casey Seideman)

Background: To determine whether patients found to have hematuria by their primary care physicians are evaluated according to best practice policy.

Methods: The University of Texas Southwestern Medical Center has an institutional outpatient EMR that is used by all providers in all specialties. We conducted an IRB approved chart review of patients who were found to have more than 5 red blood cells/high power field between 3/09 and 2/10.

Results: There were 448 patients of which the majority were female (82%), caucasian (39%) with microscopic hematuria (MH) (85%), 57% were initially symptomatic, 29% had history of smoking and 29% had documented UTI. Evaluation was limited including imaging (36%), cystoscopy (9%) and cytology (4%). A UTI was found in 50% and 26% of patients with gross and MH, respectively (p <0.001) and 39% of patients with MH did not have a repeat urinalysis (UA). Only 18% of patients were referred to urologists and tumors were diagnosed in 16 patients (3.6%). No abnormality was found in 25% and 48% of patients with gross and MH, respectively (p=0.002). There was no impact of age, smoking history, type of provider, symptoms on referral rates which were higher among males and patients with gross hematuria (p <0.05).

Conclusions: While urinalysis remains a common routine diagnostic tool, the majority of cases of microscopic hematuria are not fully evaluated according to guidelines. Use of cystoscopy, cytology and upper tract imaging is limited. Further studies will be needed to determine the extent of the problem and impact on survival.

A COMPARATIVE ANALYSIS OF ONCLOGIC OUTCOMES IN PATIENTS WITH VARIANT HISTOLOGY BLADDER CANCER

Sanjay Patel, Vivek Patel¹, Kirk Keegan², Dan Barocas³, David Penson³, Michael Cookson³, Sam Chang³, Peter Clark³, Joseph Smith³ and Todd Morgan²
¹Duke University; ²Vanderbilt University Department of Urology
(Presented By: Sanjay Patel)

Introduction: Nonurothelial bladder cancer accounts for approximately 5–10% of all bladder malignancies. While a number of these variant histologies have been studied individually, there have been no comparative analyses assessing the multiple variant histologies and their impact on oncologic outcomes. We sought to evaluate the relative prognostic impact of the most common variant histologies on long–term survival in patients undergoing radical cystectomy (RC).

Methods: The SEER database was used to identify patients who underwent RC for bladder cancer from 1990–2007. Histologic subtype was obtained from ICD–O–3 codes, and patients with urothelial cell carcinoma (UCC), squamous cell carcinoma (SCC), adenocarcinoma (AC), sarcoma (Src), small cell carcinoma (SmC), signet ring carcinoma (SgRn), and spindle–cell carcinoma (SpnC) were included in the study. The primary outcome was disease–specific survival (DSS), and covariates included age, race, year of diagnosis, pT stage, pN stage, and marital status. Multivariable analysis was performed using Cox proportional hazards model. Mortality rates were estimated using the Kaplan–Meier product limit method.

Results: A total of 14,130 patients met inclusion criteria with the following histologies: UCC (90.1%), SCC (4.6%), AC (2.3%), Src (0.8%), SmC (0.8%), SgRn (0.5%), and SpnC (0.9%). Three–year DSS was most favorable in patients with UCC (63.7%; 95%CI [62.9%–64.8%]) and AC (65.3% [59.3%–70.6%]) while 3–year DSS was the least favorable for SmC (41.6% [31.3%–51.6%]) and Src (45.4% [35.1%–55.1%]). In the multivariable analysis, independent predictors of DSS were age, marital status, grade, T stage, N stage, and variant histology (Table). With respect to UCC, there was an increased risk of disease–specific death associated with all variants except AC. Src and SpnC were associated with the highest risk of death.
**Conclusions:** With the exception of AC, the most common variant bladder cancer histologies are all independently associated with worse DSS relative to UCC in patients undergoing RC. Further research is needed to identify more effective neoadjuvant and/or adjuvant treatment measures to improve the long-term outcomes in patients with variant bladder cancer histologies.

**EXTRANODAL EXTENSION IS A POWERFUL PROGNOSTIC FACTOR IN BLADDER CANCER PATIENTS WITH LYMPH NODE METASTASIS**

Eugene Cha¹, Harun Fajkovic¹, Claudio Jeldres², Thomas Chromecki¹, Brian Robinson¹, Robert Svatek¹, Derya Tilki³, Patrick Bastian⁴, Pierre Karakiewicz², Giacomo Novara¹, Hans-Martin Fritsche⁶, Maximilian Burger⁶, Guru Sonpavde⁸, Siamak Daneshmand⁸, Yair Lotan⁹, Douglas Scherr¹ and Shahrokh Shariat¹

¹Weill Cornell Medical College, New York, NY; ²University of Montreal Health Center, Montreal, Canada; ³University of Texas San Antonio, San Antonio, TX; ⁴Ludwig-Maximilians-Universitat Munchen, Munich, Germany; ⁵University of Padua, Padua, Italy; ⁶University of Regensburg, Regensburg, Germany; ⁷Baylor College of Medicine, Houston, TX; ⁸University of Southern California, Los Angeles, CA; ⁹University of Texas Southwestern Medical Center, Dallas, TX

(Presented By: Eugene Cha)

**Background:** The prognosis of patients with invasive urothelial carcinoma of the bladder (UCB) treated with radical cystectomy is closely related to the pathologic stage of the primary tumor and the presence of lymph node metastasis (LNM). The aim of the current study was to assess the prognostic value of extranodal extension (ENE) and to test whether it improves the performance of predictive models constructed without ENE.

**Methods:** We performed a retrospective analysis of 748 patients with LNM treated with radical cystectomy (RC) and lymphadenectomy for UCB without neoadjuvant therapy at 12 centers in the US and Europe. Microscopically, each LNM was evaluated for the presence or absence of ENE, which was defined as a clear-cut perforation of lymph node capsule by tumor.
Results: Overall, 375 patients (50.1%) had ENE. The median number of lymph nodes removed, number of positive lymph nodes, and lymph node density were 15, 2, and 15%, respectively. The rate of ENE increased with advancing pT stage (p<0.001). Within a median follow-up of 27 months (mean 39.8 ± 41.8; IQR 44), disease recurrence occurred in 420 patients (56.1%), and 353 died of UCB (47.2%). Addition of ENE to multivariable models for prediction of disease recurrence and cancer-specific mortality increased their predictive accuracies from 70.3 to 77.8% (p<0.001) and 71.8 to 77.8% (p=0.007), respectively.

Conclusions: ENE is an independent predictor of both cancer recurrence and cancer-specific mortality in RC patients with LNM. Incorporation of ENE into multivariable predictive models increases accuracy of prediction of clinical outcomes.

HEAT SHOCK PROTEIN 70 (HSP70) AS A RECURRENCE MARKER FOR PT1 BLADDER CANCER

Oleksandr Stakhovskyi¹, David Margel¹, Theodorus van der Kwast², Bas van Rhijn¹, Peter Bostrom¹, John Thoms¹, Rob Bristow³, Neil Fleshner¹, Michael Jewett¹, Bapat Bharati⁴ and Alex Zlotta⁵

¹Division of Urology, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada.; ²Department of Pathology, University Health Network, Toronto, ON, Canada.; ³Department of Radiation Oncology, Princess Margaret Hospital, University Health Network, Toronto, ON, Canada; ⁴Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, ON, Canada; ⁵Division of Urology, Mount Sinai Hospital, Toronto, ON, Canada

Introduction: Heat shock proteins (HSPs) expression is increased when cells are exposed to stress conditions such as high or low temperature, hypoxia or irradiation. HSPs are overexpressed in a wide range of human cancers and are implicated in tumor cell proliferation, differentiation, invasion, metastasis, death, and recognition by the immune system. Several HSPs are implicated with the prognosis of specific cancers. HSPs, and especially HSP60 and HSP90, have been proposed as prognostic factors for bladder cancer (BC). Because HSPs proteins are among the most immunogenic reported molecules and BCG therapy is immune dependent, the role of HSPs in patients with BC treated with BCG warrants investigation. Previously our group showed that in primary T1 BC treated with BCG, FGRF3 mutation and protein overexpression were associated with a decreased risk of tumor progression. In this project we evaluated HSP70 expression levels and their relationship to pathological and clinical parameters in the same selected group of previously untreated primary T1 BC treated with BCG.
Materials and Methods: 69 patients with newly diagnosed primary T1 BC treated at the University Health Network, Toronto were included in the study. Microarrays were built and HSP70 protein expression was determined by standard immunohistochemistry. Slides were co-reviewed with an uro-pathologist with staining scores dependent on the expression and intensity of the marker. HSPs expression was correlated with pathological, clinical outcomes and with the expression of FGFR3. FGFR3 mutation status was examined by multiplex PCR–SNaPshot analysis. Kaplan–Meier method and multivariate Cox–regression analysis were used for data analysis.

Results: Mean age of patients was 71.1 years (±8.5). HSP70 was found to be expressed in 29/53 (55%) high–grade tumors and in 9/14 (64%) low–grade tumors. Kaplan–Meier survival analysis demonstrated that the lack of HSP70 expression was a significant predictor for disease recurrence (p<0.05) but did not affect progression. In a multivariate model adjusting for grade, size and concomitant CIS, lack of HSP70 expression remained a significant predictor for recurrence (HR of 1.952, 95% CI 1.02–3.75; p = 0.045). HSP70 was shown to correlate with FGFR3 expression and mutation (p<0.05).

Conclusion: HSP70 is a promising marker in T1 BC treated with BCG. Both HSP70 and FGFR3 may play an important prognostic role in T1 BC identifying a group at lower risk of recurrence.

OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY USING THE NEW AJCC PATHOLOGIC CLASSIFICATION FOR SUBEPITHELIAL PROSTATIC INVASION

Amit Patel, Joshua Cohn, Sandip Prasad, Mike Large, Norm Smith, Gladell Paner and Gary Steinberg
University of Chicago Medical Center, Chicago, IL
(Presented By: Amit Patel)

Introduction and Objectives: In 2010, the AJCC reclassified primary staging for bladder cancer to exclude subepithelial invasion of the prostatic urethra and prostatic stroma as T4 staging status. We sought to determine whether the changes were reflective of overall survival between T4 disease and the newly classified T2 prostatic stromal invasion.

Methods: We retrospectively extracted patients in our institutional cystectomy database with T4 disease. Additionally, we queried the pathology database for all cystectomy specimens with prostatic urethral involvement. We systematically reclassified patients according to the new AJCC staging guidelines and divided the cohort into 2 groups: T4 and reclassified T2. Our primary endpoint was overall survival. We examined demographic factors and pathologic factors for each group.

Results Obtained: The two groups did not differ with respect to age, race, Charlson comorbidity index, or tumor size. However, the reclassified T2 group compared to the T4 group had a lower rate of lymph node involvement (15% vs 55%, p =0.002) and positive margins (30% vs 62%, p = 0.008). Median overall survival for reclassified T2 versus T4 was 18 months versus 8.6 months, p = 0.026 (Figure).

Conclusions: The new AJCC staging for urothelial carcinoma prostatic stromal invasion corresponds to a difference in pathologic outcomes as well as in overall survival for our population. Our results support continued use of the new AJCC staging system for bladder cancer.

Poster #8

OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY USING THE NEW AJCC PATHOLOGIC CLASSIFICATION FOR SUBEPITHELIAL PROSTATIC INVASION

Amit Patel, Joshua Cohn, Sandip Prasad, Mike Large, Norm Smith, Gladell Paner and Gary Steinberg
University of Chicago Medical Center, Chicago, IL
(Presented By: Amit Patel)
Objective: Radical cystectomy (RC) for bladder cancer can be associated with significant morbidity and alterations in health−related quality of life (HRQOL). The FACT−VCI is a condition−specific HRQOL survey for patients undergoing RC and urinary diversion (UD) for bladder cancer. This study evaluates the reliability, validity and responsiveness of the VCI.

Methods: The FACT−VCI was administered to patients with bladder cancer undergoing RC and UD (n=190) at two major cancer centers. Statistical methods included principal components analysis, Cronbach’s coefficient alpha and non−parametric correlation coefficients. The FACT−G was used to test criterion−related validity and a linear mixed model tested the effects of time and diversion type on longitudinal VCI scores.

Results obtained: A single summary score of 15 gender−neutral items (VCI−15) represented the optimum solution for post−operative data, which was internally consistent (α=0.85), had strong re−test reliability (rho=0.891) and was associated with all FACT−G scales and total score (rho≥0.38, p<0.001). Pre−operatively, the VCI−15 was internally consistent (α=0.77) and was associated with the FACT−G physical and functional scales and total score (rho≥0.41, p<0.001). While VCI−15 scores at post−operative year one did not differ from pre−operative values overall (p=0.145), they did differ by diversion type (p=0.027) with no substantive change after orthotopic neobladder (40±9 vs. 39±10) but a clinically significant improvement after an ileal conduit (39±11 vs. 44±11).

Conclusion: The VCI−15 is a reliable and valid condition−specific HRQOL survey for patients with bladder cancer undergoing RC and UD. Future studies of RC patients should measure HRQOL using validated, condition−specific forms such as the FACT−VCI.
Poster #10

VOLUME-OUTCOMES IN CYSTECTOMY: IS IT THE SURGEON OR THE SETTING?
Todd M. Morgan, Daniel A. Barocas, Kirk A. Keegan, Michael S. Cookson, Sam S. Chang, Peter E. Clark, Shenghua Ni, Joseph A. Smith, Jr. and David F. Penson
Vanderbilt University
(Presented By: Todd M. Morgan)

Background: Hospital and surgeon volumes (HV and SV) predict important outcomes after radical cystectomy (RC). These quality indicators may be surrogates for one another or for other structural factors and processes of care. Thus, we sought to characterize the relationship between SV, HV, and mortality, while accounting for quantifiable processes of care, such as use of chemotherapy and extent of lymphadenectomy.

Methods: The Surveillance, Epidemiology, and End Results–Medicare linked database was used to identify 5,676 patients with urothelial bladder carcinoma who underwent RC from 1992–2006. HV and SV were ascertained and categorized by tertiles. The primary outcome was overall survival, and we tested the effect of HV, SV, lymph node count and chemotherapy in an iterative series of Cox regression analyses, controlling for age, Charlson comorbidity index, stage, grade node density, number of positive nodes, urinary diversion, and year of surgery.

Results: There were 74% men and 26% women, with a mean age of 75 and a median follow up of 31 months. When either SV or HV was included in the multivariate model, a significant volume–survival relationship was observed (Table). However, when both HV and SV were included in the model, the SV–survival relationship was attenuated and not statistically significant while the HV–survival relationship persisted (HR 1.23, 95%CI 1.12–1.35 for low vs. high volume). In the full model, which also included node count, low HV continued to be associated with increased mortality (HR 1.21, 95%CI 1.10–1.33) while the SV–outcome was further attenuated (HR 1.01, 95%CI 0.92–1.12, low vs. high volume).

Conclusions: When controlling for patient and disease characteristics, the relationship between SV and survival after RC may be accounted for by HV and by processes of care, such as extent of lymphadenectomy. This suggests that evidence–based care and HV may have a greater impact than surgeon case volume. In contrast, the HV–survival relationship remained significant, suggesting that perioperative processes of care at high volume hospitals can impact long–term outcomes post–RC.

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*Controls for all variables shown plus age, pT stage, grade, Charlson comorbidity index, diversion, lymph node density, number of positive nodes, and year of surgery.*
THE IMPACT OF ACCURATE STAGING ON BLADDER CANCER SURVIVAL: A PROCESS-OUTCOMES LINK.
Karim Chamie¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Meryl Leventhal², Dennis Deapen² and Mark S. Litwin¹
¹UCLA, Los Angeles, CA; ²Cancer Surveillance Program, Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, CA
(Presented By: Karim Chamie)

Introduction and Objectives: Detrusor muscle at diagnostic TURBT is often used as a surrogate of resection quality. We examined the association of surgical and pathology quality in reference to the initial diagnostic resection with survival among subjects diagnosed with non-muscle-invasive bladder cancer.

Methods: We retrospectively reviewed the medical records of all individuals age 18 or older with an incident diagnosis of urothelial non-muscle-invasive bladder cancer between 2004 and 2005 within the confines of the Los Angeles SEER Registry. We recorded patient age, gender, race, marital status, socioeconomic and insurance status, tumor histology, grade, and stage, operating urologist and reporting pathologist volume, institution type, the presence/mention of detrusor muscle in the initial resection specimen, and vital status. After adjusting for confounding using a propensity score-weighted approach competing-risks regression analysis, we determined whether surgical and pathology quality were associated with cancer-specific survival.

Results: We identified 1,865 individuals, 335 urologists, and 278 pathologists. The cohort was comprised of 1,180 (63.3%) individuals with low-grade and 685 (36.7%) with high-grade disease. We identified 33 (2.8%) bladder cancer-related deaths among those with low-grade and 94 (13.7%) among those with high-grade disease. Muscle was reported as present in 972 (52.1%), reported as absent in 564 (30.2%), and not mentioned in 329 (17.7%) of the initial pathology reports. The incidence of detrusor muscle sampling did not differ according to grade or stage. Among subjects with high-grade disease, a higher hazard of cancer-specific mortality was found with advancing age (76–85), stage (Tis and T1), and among those where detrusor muscle was absent (HR 1.65; 95% CI 1.05–2.59) or not mentioned (HR 2.87; 95% CI 1.44–5.72) in the initial diagnostic pathology report. The 5-year cancer-specific mortality was 8.0%, 13.0%, and 21.5% among those where muscle present, absent, and not mentioned, respectively.

Conclusion: Inadequate staging and poor pathology reporting are associated with a higher risk of bladder cancer-related deaths among those with high-grade disease. Since urologists were unable to discern between high or low grade, we contend that all patients with bladder cancer should undergo a complete endoscopic resection with detrusor muscle sampling (and appropriate pathology reporting) at diagnosis.

IMPACT OF PARTNER STATUS AND DIVERSION TYPE ON SEXUALITY IN WOMEN UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER: A PILOT SURVEY
Tullika Garg¹, Jeanne Carter¹, Peter Langenstroer², William See² and Margarita Kressin³
¹MSKCC, New York, NY; ²Medical College of Wisconsin, Milwaukee, WI; ³Medical and Surgical Associates of Corsicana, Corsicana, TX
(Presented By: Tullika Garg)

Introduction: The mainstay of treatment for invasive bladder cancer is neoadjuvant chemotherapy and radical cystectomy (RC), which, in women, is an extirpative procedure involving removal of gynecologic organs. Though counseling practices and sexual function are well-studied in men, little is known about the impact of surgery on women. The objective of this study was to assess sexual counseling practices, sexual function, and sexual distress in women who have undergone RC.

Patients and Methods: After IRB approval, we identified all surviving female patients who received RC for bladder cancer at our institution from 2002–2007. Surveys consisted of a general medical questionnaire, the Female Sexual Function Index (FSFI), and Sexual Distress Scale (SDS). Surveys were returned de-identified. Subjects were stratified by partner status and diversion type.

Results: Twenty-two patients were identified and 14 returned surveys (response rate 64%). Subjects with ileal conduits (IC) and without partners had more comorbidities. IC and subjects without partners received less sexual counseling, but had a high demand for counseling. Those with partners and those with IC felt that sexual function changed after surgery. Continent diversions and presence of a partner were associated with higher FSFI scores in every domain. Subjects with a partner who was unable to engage in sexual activity had the highest mean SDS scores (21.8). Subjects with IC also had mean SDS scores in the distressed range (16).

Conclusion: RC is associated with sexual dysfunction and distress in women, particularly those with IC and lack of partner. Sexual counseling is underutilized in this cohort. More research is needed to improve sexual quality of life in female bladder cancer survivors.
Poster #13

DOES PATIENT AGE IMPACT SURVIVAL AFTER RADICAL CYSTECTOMY?
David Horovitz¹, Polat Turker¹, Peter J. Bostrom¹, David Margel¹, Tuomas Mirtti²,³, Martti Nurmi², Neil E. Fleshner¹, Antonio Finelli¹, Michael A. Jewett¹ and Alexandre R. Zlotta¹,⁴

¹University Health Network, Princess Margaret Hospital, Toronto, ON; ²Turku University Hospital, Turku, Finland; ³Helsinki University Hospital, Helsinki, Finland; ⁴Mount Sinai Hospital, Toronto, ON

(Presented By: David Margel)

Objective: To analyze the impact of patient age on survival after radical cystectomy (RC).

Patients and Methods: Advanced age is a known risk factor for the development of bladder cancer (BC) and with the increased longevity seen in the population, urologists now treat an increasing number of senior patients with this disease. Two ethics approved databases of BC patients undergoing RC at University Heath Network, Toronto, Canada (1992−2008) and University of Turku, Turku, Finland (1986−2005) were retrospectively analysed. Six hundred thirty five patients who underwent this procedure between June 1985 and March 2010 were included. Patients were categorically divided into four age groups: ≤59, 60−69, 70−79, ≥80. Demographic, clinical and pathological data were compared, as well as recurrence−free survival (RFS), disease−specific survival (DSS) and overall survival (OAS).

Results: Compared to younger patients (age ≤79 years), elderly patients (age ≥80 years) had higher ASA scores (p=0.002), lower pathological N stage (p=<0.0001), a greater number of lymph nodes removed during surgical dissection (p=0.01), and they underwent less adjuvant treatment (p=0.01). Choice of urinary diversion differed between groups with ileal conduit being used for all patients ≥80 years (p<0.0001). No differences were noted between age groups with respect to RFS (p=0.59) or DSS (p=0.23). OAS decreased with increasing age (p<0.0001).

Conclusion: Although RC is an operation with significant morbidity, it is a viable treatment option for carefully selected elderly patients. Senior patients (≥80 years) should not be denied RC if they are deemed fit to undergo surgery. Senior adults do not suffer from adverse histopathological features as compared to younger patients either.

Poster #14

EXTERNAL VALIDATION OF A BIOMARKER BASED PRE-CYSTECTOMY ALGORITHM TO PREDICT NON-ORGAN CONFINED UROTHELIAL CANCERS
David Margel¹, Peter Bostrom¹, Jack Baniel², Ofer Yossepowitch², Alexandre Zlotta¹ and Neil Fleshner¹

¹Division of Urology, Department of Surgical Oncology, Princess Margaret Hospital, University Health Network, Toronto, Canada; ²Institute of Urology, Rabin Medical Center- Beilinson, Petach Tikva, Israel

(Presented By: David Margel)

Background: The role of neoadjuvant chemotherapy prior to surgery in patients with muscle invasive bladder cancer remains debated. The need for tools to identify patients who would benefit from chemotherapy is pertinent. We have previously published a preoperative algorithm to predict non−organ confined disease. This algorithm included tumor markers (CEA, CA−125 and CA 19 9) as well as clinical parameters. Our aim was to validate the accuracy of this algorithm in an independent, external cohort.

Patients and Methods: We used the Toronto, Bio−bank to measure preoperative serum levels of CEA, CA 125 and CA 19−9 in 76 consecutive patients with clinically organ confined bladder cancer (cT2 or less) that underwent radical cystectomy. Clinical parameters were retrieved from our prospective bladder information system database and incorporated into our marker−based algorithm. A numeric score was generated for each patient and a previously published cut−off was used to predict the presence non−organ confined disease. The accuracy of the model was quantified with the area under the curve (AUC) and the positive and negative predictive values were calculated.

Results: On pathologic evaluation, 38 patients (50%) were found to have non organ−confined tumors. The AUC of the algorithm was 0.79 (95% CI, 0.69−0.89). The positive and negative predictive values were 79% (95% CI, 71%−87%) and 74% (95% CI, 66%−82%), respectively.

Conclusions: We have externally validated a precystectomy model to predict pathological stage. The algorithm may possibly aid in selecting patients who would benefit from neoadjuvant chemotherapy prior to cystectomy.
TREATMENT PATTERNS AND SURVIVAL OUTCOMES OF PATIENTS 50 YEARS OLD AND YOUNGER DEFINITIVE TREATMENT FOR BLADDER UROTHELIAL CELL CARCINOMA

Sanjay Patel, Vivek Patel¹, Kirk Keegan², Daniel Barocas², David Penson², Michael Cookson², Sam Chang², Peter Clark², Joseph Smith² and Todd Morgan²

¹Duke University, Durham NC; ²Vanderbilt Department of Urologic Surgery

(Presented By: Sanjay Patel)

Introduction: Urothelial cell carcinoma (UCC) of the bladder is a disease that most commonly afflicts those in the 7th and 8th decades of life. To this end, the majority of research has focused on this older age group and may be less applicable to younger individuals with bladder UCC. In particular, few series have addressed the ≤50 age group. We sought to evaluate the treatment patterns in patients ≤50 years old undergoing definitive treatment for bladder UCC and to assess the oncologic outcomes in those undergoing radical cystectomy (RC).

Methods: The Surveillance, Epidemiology, and End Results database was used to identify patients ≤50 years old who underwent definitive treatment for bladder UCC from 1990–2007. Patients were categorized by treatment type as bladder–sparing (radiation therapy or partial cystectomy) or non–bladder sparing (RC). Univariate and multivariate analysis was performed to identify risk factors for treatment type. Univariate and multivariate survival analysis for disease–specific survival (DSS) was performed for the RC group.

Results: A total of 1191 patients met inclusion criteria (9.6% radiation, 12.0% partial cystectomy, 78.4% RC) with a mean age of 45 years (SD 4.6 yrs). When controlling for age, sex, marital status, and race, multivariate predictors of radical surgery included increasing year of diagnosis (HR 1.09 per year, 95%CI [1.05–1.12], p<0.001) and location (referent Northeast; Central: HR 2.13 [1.27–3.58], p=0.004; West: HR 1.75 [1.16–2.65], p=0.008). Among patients undergoing RC, while also controlling for age and grade, independent predictors of DSS were T stage, N stage, and year of diagnosis (HR 0.96 [0.93–0.99]) (Table). Marital status (HR 0.78 [0.60–1.00] for married vs. unmarried) also approached statistical significance.

Conclusions: We found substantial differences by region in the utilization of RC in patients ≤50 with bladder UCC and determined that radical surgery was more likely with each successive year of diagnosis. Interestingly, year of diagnosis was also an independent predictor of DSS in RC patients. Further work is needed to understand whether the increasing use of radical surgery in this young population has played a role in the observed improvement in long–term survival.
Poster #16

OBESITY IS ASSOCIATED WITH WORSE ONCOLOGICAL OUTCOMES IN PATIENTS TREATED WITH RADICAL CYSTECTOMY

Thomas Chromecki¹, Michael Rink¹, Eugene Cha¹, Harun Fajkovich¹, Behfar Ehdaie¹, Robert Svatek², Pierre Karakiewicz³, Yair Lotan⁴, Derya Tilki⁵, Patrick Bastian⁶, Siamad Daneshmand⁷, Wassim Kassouf⁷, Giacomo Novara⁸, Hans-Martin Fritsche⁹, Maximilian Burger⁹, Jonathan Izawa¹⁰, Yves Fradet¹¹, Marek Babjuk¹² and Shahrokh F. Shariat¹

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(Presented By: Michael Rink)

Introduction: Obesity has been associated with carcinogenesis and progression in various malignancies. We investigated the association between body mass index (BMI) and oncological outcomes in patients following radical cystectomy (RC) for urothelial carcinoma of the bladder (UCB) in a large multi-institutional series.

Material and Methods: Data were collected from 4,118 patients treated with RC and pelvic lymphadenectomy for UCB. No patient received preoperative chemotherapy and/or radiotherapy. Cox regression analysis tested the effect of BMI on disease recurrence, cancer-specific mortality, and overall mortality. BMI was analyzed as a continuous and categorical variable (less than 25 versus 25 to 29 versus 30 and higher kg/m²).

Results: Median BMI was 28.8 kg/m² (IQR 7.9); 25.3% had a BMI <25 kg/m², 32.5% between 25−29.9 kg/m², and 42.2% ≥30 kg/m². Patients with a higher BMI were older (p<0.001), had higher tumor grade (p<0.001), and were more likely to have positive soft tissue surgical margins (p=0.006) compared to patients with lower BMI. In multivariable analyses that adjusted for the effects of standard clinicopathologic features, BMI over 30 was associated with higher risk of disease recurrence (HR 1.67, 95% CI 1.46−1.91, p<0.001), cancer-specific mortality (HR 1.43, 95% CI 1.24−1.66, p<0.001), and overall mortality (HR 1.81, CI 1.60−2.05, p<0.001). The main limitation is the retrospective design of the study.

Conclusions: Obesity is associated with worse cancer-specific outcomes in patients treated with RC for UCB. Focusing on patient modifiable factors such as BMI may have significant individual and public health implications in patients with invasive UCB.

Poster #17

THE IMPACT OF SERUM ALBUMIN ON EARLY COMPLICATION AND SURVIVAL RATE OF PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR BLADDER CANCER

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(Presented By: Hooman Djaldat)

Introduction and Objective: Serum albumin is a well-known marker of nutritional status. We evaluated the impact of preoperative serum albumin level on early complication rate and survival of patients who underwent radical cystectomy and urinary diversion for bladder cancer.

Methods: 1964 patients with primary bladder cancer underwent radical cystectomy and urinary diversion between 1971 and 2008 at the University of Southern California. Preoperative serum albumin level was available in 1471 patients; low albumin was defined as <3.4 g/dL. Post cystectomy early complication was defined as any surgery related/unrelated event leading to lengthening hospital stay or patient re-admission within 90 days of surgery. Recurrence free survival (RFS) and overall survival (OS) of this cohort were reviewed and compared with normal serum albumin patient group using a Kaplan-Meier and Cox proportional hazards models.
Results: 137 patients (9%) had low serum albumin level. Their demographic data is presented in table 1. The median follow up was 12.4 years (0 – 36.6 yrs). Low serum albumin level was associated with higher early complication rate (43% vs. 33%) (P= 0.03). In multivariable analysis, serum albumin level was an independent predictor of RFS (HR 1.35, 95% CI 1.00–1.81) and OS (HR 1.62, 95% CI 1.29–2.04).

Conclusion: Low serum albumin is independently predictive of post cystectomy recurrence and decreased overall survival. It potentially could be used in nomograms to predict postoperative prognosis in patients undergoing radical cystectomy.

CLINICAL UTILITY OF NMP22 FOR THE SURVEILLANCE OF PATIENTS WITH RECURRENT BLADDER CANCER: A MULTI-CENTER CROSS-SECTIONAL STUDY

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Objective: To employ decision curve analysis to determine the impact of NMP22 on clinical decision−making for the surveillance of bladder cancer patients using data from a prospective trial.

Methods: The study included 668 patients with a history of non−muscle−invasive bladder cancer who underwent cystoscopy, urine cytology, and measurement of urinary NMP22 levels. We constructed several prediction models to estimate risk of bladder cancer. The base model was generated using patient characteristics (age, gender, race, and history of intravesical therapy); cytology and NMP22 were added to the base model to determine effects on predictive accuracy. Clinical net benefit was calculated by summing the benefits and subtracting the harms and weighting these by the threshold probability at which a patient or clinician would opt for cystoscopy.

Results: Ninety−seven patients were found to have recurrence of bladder cancer (14.5%). In univariable analyses, NMP22 was the strongest predictor of bladder cancer presence (predictive accuracy 66.0%), followed by cytology (56.5%) and history of intravesical therapy (56.4%). In multivariable prediction models, NMP22 improved the predictive accuracy of the base model by 11.5% (AUC 59.2% to 70.7%, p<0.0001) and that of the base model plus cytology by 6.4% (AUC 64.3% to 70.7%, p=0.036). Decision curve analysis revealed that adding NMP22 to other models increased clinical benefit, particularly at higher threshold probabilities.

Conclusions: NMP22 is a strong, independent predictor of bladder cancer in patients undergoing surveillance. Addition of NMP22 improves the accuracy of standard predictors by a statistically and clinically significant margin. Decision curve analysis suggests that integration of NMP22 into clinical decision−making helps spare unnecessary cystoscopies, with minimal increased risk of missing a bladder cancer recurrence.
URINARY AMINOPEPTIDASE ACTIVITIES AS FUNCTIONAL BIOMARKERS OF BLADDER CANCER
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(Presented By: Jennifer Taylor)

Introduction: Proteases have been implicated in cancer progression and invasiveness. Differential panels of blood–based exopeptidase activities have been observed in cancer patients, providing a distinction based on enzymatic function. We investigated the activities of urinary aminopeptidases as potential biomarkers for bladder cancer.

Methods: The unique urinary proteomes of males and females were profiled by LC−MS/MS from pooled specimens of healthy subjects, establishing the presence of a set of aminopeptidases in urine. Samples were collected from patients with bladder cancer and healthy control subjects. We developed aminopeptidase activity assays through studies with recombinant enzymes, establishing enzyme specificity through substrate and inhibitor selection; the assay employs substrates with fluorogenic groups susceptible to cleavage by specific target enzymes. The activities of five aminopeptidases—ANPEP, ENPEP, DPP4, DPP7, and CTSC—were assayed in pooled samples. We then screened urine samples from 16 healthy men and 16 men with muscle–invasive (stage T2−T4) bladder cancer. The activity profiles of each individual were compared using support vector machine (SVM) modeling to predict presence of malignancy. Multiple SVM models were considered, varying the number of candidate enzymes, SVM kernel and its corresponding parameters.

Results: Following immunodepletion of highly abundant proteins, analysis of the pooled urine samples by MS identified ~700 unique proteins, including 19 exopeptidases. In our preliminary screen of pooled samples from 9 bladder cancer patients and 5 gender–matched control subjects, specific activities in pooled samples were found to be consistently higher for ENPEP (p=0.0002) and DPP7 (p=0.0006); lower for ANPEP (p=0.0001) and CTSC (p=0.001) and unchanged for DPP4 (p=0.153) in cancer samples as compared to controls. When optimized for total accuracy, SVM modeling with a linear kernel, using a combination of ANPEP, ENPEP, and DPP7, classified samples well, achieving 87.5% sensitivity and 87.5% specificity, for an overall accuracy of 87.5%.

Conclusion: This investigation established a reliable urinary protein inventory, for men and women separately. We developed a novel functional assay which characterizes aminopeptidase activities in urine specimens, with high technical reproducibility. With further testing, it may yield a valuable biomarker test for bladder cancer detection or prognostication.

VALIDATION OF NEW STAGING SYSTEM FOR PATIENTS WITH INVASIVE UROTHELIAL CARCINOMA OF THE PROSTATE
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(Presented By: Ahmed Abd El Latif)

Introduction: To investigate whether the outcome of patients undergoing radical cystectomy (RC) with contiguous involvement of the prostatic urethra by urothelial cancer of the bladder (UCB) varies by the extent of ductal/stromal invasion, and to verify the changes in the new staging system.

Materials and Methods: A retrospective review identified 103 consecutive patients who underwent RC at two high−volume hospitals who were found to have contiguous involvement of the prostatic urethral ducts +/− stroma with UCB. Patients were divided into two groups according to extent of prostatic invasion: 1) superficial N=48 (ductal involvement [N=6], glandular invasion [N=7] or focal stromal invasion [N=35]), and 2) deep N=55 (deep stromal invasion [N=32], extra capsular invasion or seminal vesicles invasion [N=23]). Multivariable Cox proportional hazards model was used to determine the association of extent of prostatic involvement with mortality after controlling for age, institution, pathological stage, surgical margin status, and lymph node status.
Results: The median follow-up was 18 months (IQR: 8–37). Lymph node metastasis was observed in 27% and 40% of patients in groups 1 and 2, respectively. The 5-year overall survival for groups 1 and 2 was 63% and 40%, respectively (p=0.02). In multivariable analysis, patients with deep stromal invasion had a significantly worse mortality than those with superficial involvement of the prostatic urethra/stroma (HR: 2.6; 95% CI: 1.2–5.9).

Conclusion: Patients with superficial involvement of the prostate by contiguous UCB have a significantly improved survival in comparison to deep invasion. This supports the recent changes in staging system in which patients with ductal and focal stromal invasion are classified as pT2 stage.

Poster #21

MICRORNA 200C EXPRESSION LEVEL PREDICTS OVERALL SURVIVAL AFTER RADICAL CYSTECTOMY
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(Presented By: Neema Navai)

Introduction and Objectives: Bladder cancer is the 4th most common non-cutaneous malignancy in men and is the most costly cancer from diagnosis to death. It is often a chemoresistant cancer with poor clinical outcome. Frequently clinical staging fails to recognize patients who ultimately succumb to disease and may benefit from neoadjuvant chemotherapy. microRNAs (miRNA), short non-coding nucleic acids with function analogous to known RNA-interference pathways have shown promise in both prognostication and treatment of numerous cancers. We hypothesize that miRNA-200c can be used to predict clinical outcome in patients who undergo radical cystectomy.

Methods: From a prospectively maintain institutional database of all cystectomy patients we identified 89 who received radical cystectomy from 2000 – 2010 and had tumor specimens available for RNA analysis. Salient pre-surgical and oncologic variables were retrospectively obtained from patient charts. miRNA analysis was done by quantitative RT-PCR. miR200c expression was normalized to the lowest expressing sample. Survival was analyzed with the Kaplan-Meier method and significance was determined by the Log-rank test or, when appropriate, the Gehan-Breslow-Wilcoxon test.

Results Obtained: 89 patients were identified from an institutional tumor bank with specimens available for RNA analysis. For the purpose of survival analysis invasive was defined as T2 or greater. Average age was 67 years with average follow up of 35 months. Fig. 1 demonstrates overall survival in the total cohort. Patient with low miR200c showed a non-significant trend towards longer survival. In subgroup analysis of non-invasive patients high miR200c was significantly associated with longer survival (p < 0.05, HR 4.9). A non significant trend was also seen in the invasive patients with low miR200c being associated with longer survival.

Conclusion: miRNA 200c can be used to predict post radical cystectomy overall survival. It appears that miRNA 200c is most useful in patients with clinically T1 or less disease at time of diagnosis.
**Poster #22**

**PROGNOSTIC VALUE OF APOPTOTIC MARKERS IN SQUAMOUS CELL CARCINOMA OF THE BLADDER**

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(Presented By: Ramy Youssef)

**Objectives:** We evaluated the association of Cleaved Caspase−3, Bax, COX−2, and p53 expression with pathologic features and clinical outcomes in patients with squamous cell carcinoma (SCC) of the urinary bladder.

**Methods:** Immunohistochemistry for Cleaved Caspase−3, Bax, COX−2, and p53 was performed on tissue microarray sections of radical cystectomy specimens with pure SCC from 1997–2003. The relationship between the expression of these markers and pathological features was assessed. A prognostic marker score (PS) was defined as favorable if ≤2 biomarkers were altered; unfavorable if >2 biomarkers were altered and was correlated to oncological outcomes.

**Results:** The study included 151 patients (98 men and 53 women, mean age 52 years, 122 (81%) associated with bilharziasis). The pathological stage was T2 in 50%, T3 in 38%, T1 and T4 in 6% each; low grade in 53%; lymph node metastasis in 30.5% and lymphovascular invasion in 16% of patients. Median follow up was 63.2 months. Advanced stage was associated with COX−2, p53, Cleaved Caspase−3 alterations and high grade was associated with COX−2 alterations (p < 0.05). The total number of altered markers and unfavorable PS were associated with both disease recurrence and bladder cancer−specific mortality in Kaplan Meier analyses (P < 0.05). Unfavorable PS was an independent predictor of disease recurrence (HR 2.694, 95% CI 1.386–5.235, p=0.003) and bladder cancer−specific mortality (HR 2.868, 95% CI 1.209–6.802, p=0.017) in multivariable Cox regression analysis.

**Conclusions:** Markers of apoptosis pathways may play an important role in the prognosis of bladder SCC. An increased number of altered markers and an unfavorable prognostic score may identify patients who might benefit from multimodal therapies.
REGIONAL DIFFERENCES IN PRACTICE PATTERNS AND OUTCOMES FOR UPPER TRACT UROTHELIAL CARCINOMA IN CANADA: OUTCOMES FROM THE CANADIAN UPPER TRACT COLLABORATION

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(Presented By: Michael Metcalfe)

Introduction:
Upper tract urothelial carcinoma (UTUC) is a potentially aggressive malignancy that is associated with a poor prognosis. Diagnosis and management of UTUC is poorly defined in Canada and elsewhere. Nephroureterectomy is recognized as the gold standard for localized disease; however, there is considerable variance in how this is performed. We aim to delineate regional differences in practice patterns in Canada and relate these to patient outcomes.

Materials and Methods:
Ten institutional radical nephroureterectomy databases containing information on UTUC patients treated between 1994 and 2009 were obtained from academic centers in Canada. Data were collected on 1029 patients and combined into a relational database formatted with demographic, clinical and pathologic characteristics, recurrence status, and survival status. The centers were divided as being from 1. the West, 2. Ontario, and 3. the East. Outcome measures were overall survival (OS), disease-specific survival (DSS), and recurrence-free survival (RFS). Multivariate linear regression analysis was used to determine the association between regional differences in practice patterns and clinical outcomes.

Results:
There was a significant difference between the three regions within Canada for multiple parameters including time from diagnosis to surgery date (p=0.001), type of surgery (open vs. laparoscopic; p<0.01), and management of distal ureter (0.001). Five-year DSS (p=0.0053) and OS (p=0.0006), but not RFS (0.98) were different between the three regions. Multivariate linear regression analysis demonstrated that smoking, tumor location, stage and grade, and the use of salvage radiation therapy were significant in association with overall survival, but region of treatment was not an independent predictor of outcome.

Conclusion:
In the treatment of UTUC, there is a significant disparity between practice patterns as well as survival between regions within Canada. However, there is no association between the disparities seen in practice patterns and overall survival when demographic, clinical and pathological data are considered.

CLINICAL NODAL STAGING SCORES FOR BLADDER CANCER: A PROPOSAL FOR PREOPERATIVE RISK ASSESSMENT

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(Presented By: Michael Rink)
Background: Radical cystectomy (RC) with pelvic lymph node dissection (LND) is the standard of care for refractory non−muscle−invasive and muscle−invasive bladder cancer. Although a consensus exists on the need for LND, its extent is still debated. We sought to develop a model that allows preoperative determination of the number of nodes needed to be removed at RC.

Methods: Data from 4,335 patients treated with RC and pelvic LND without neoadjuvant chemotherapy at 12 academic centers located in the US, Canada, and Europe were collected. We estimated the sensitivity of pathologic nodal staging using a beta−binomial model and developed clinical (preoperative) nodal staging scores (cNSS), which represent the probability that a patient has tumor metastasis to lymph nodes as a function of the number of examined nodes.

Results: Overall, the probability of missing a positive lymph node decreases with an increasing number of nodes examined (52% if three nodes examined, 40% if five examined, and 26% if ten examined). A cNSS of 90% can be achieved by examining six nodes for clinical Ta–Tis tumors, nine nodes for cT1 tumors, and 25 nodes for cT2 tumors. In contrast, examination of 25 nodes provides only 77% cNSS for cT3–T4 tumors.

Conclusions: The minimum number of examined lymph nodes for adequate staging depends preoperatively on the clinical T stage. Predictive tools can give a preoperative estimation of the likelihood of nodal metastasis and thereby allow tailored decision−making regarding the extent of LND at RC.

Poster #25

USE OF PELVIC LYMPHADENECTOMY IN RADICAL CYSTECTOMY FOR BLADDER CANCER: 10-YEAR EXPERIENCE AT A SINGLE-INSTITUTION

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Introduction and Objectives: Increasing evidence supports a positive association between extent of pelvic lymph node dissection (PLND) and survival after radical cystectomy (RC) for bladder cancer. We sought to determine the utilization and yield of PLND at a high−volume tertiary care center and to identify predictors of the performance of PLND and lymph node yield in patients undergoing RC for bladder cancer.

Methods: We studied 1040 consecutive patients who underwent RC for urothelial bladder cancer from January 2001 to December 2010. Use of PLND and node count ≥10 were both determined by year of surgery. Baseline characteristics (age, race, sex, Charlson comorbidity index [CCI], body mass index [BMI], albumin level, clinical stage, surgeon and year of surgery) were compared between those who received PLND and/or node count ≥10 and those who did not. A multivariable model was fit for predictors of PLND and node count ≥10, controlling for factors that were significant on univariate analysis.
Results: Mean age was 67.9 years and 20.1% were female. Overall, 955 (92.9%) patients underwent PLND, and 515 (49.5%) patients had ≥10 nodes counted. Use of PLND increased from 80 (87.9%) patients in 2002 to 109 (95.6%) patients in 2010 (Figure). On univariate analysis, age, CCI, year of surgery, and surgeon were associated with both PLND and node count ≥10. Additionally, BMI was associated with node count ≥10. Multivariate analysis revealed that CCI (OR 0.72, 95%CI 0.62–0.84), year of surgery (OR 1.13, 95%CI 1.03–1.26), and surgeon predict PLND. CCI (OR 0.79, 95%CI 0.71–0.88), year of surgery (OR 1.25, 95%CI 1.17–1.34), and surgeon also predicted node count ≥10.

Conclusions: Over the past 10 years, the proportion of patients undergoing PLND and lymph node yield have steadily risen. These results provide a benchmark for our institutional performance and demonstrate that both patient and provider factors predict the performance and yield of PLND in individuals undergoing RC. Continued efforts aimed at implementation of evidence–based processes of care and identification of barriers to their implementation may facilitate improvements in the care of bladder cancer patients.

Poster #26

BLADDER CANCER PREDICTIVE NOMOGRAM FOR OVERALL SURVIVAL FOLLOWING RADICAL CYSTECTOMY
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(Presented By: Ahmed Abd El Latif)

Introduction and Objectives: Nomograms provide individualized risk predictions for patients as opposed to staging–based group risk predictions. The goal of the present study is to build a prediction model for bladder cancer patient survival after radical cystectomy (RC).

Methods: From 2004 until 2008 we retrospectively identified 482 patients who underwent RC for urothelial carcinoma of the bladder (UBC). The pool of predictors identified includes: age at RC, gender, time between diagnosis and RC, smoking, American Society of Anesthesia (ASA) Score, chemotherapy (neoadjuvant, adjuvant), initial treatment 3 categories (RC or intravesical BCG or intravesical chemotherapy), path T, path N, surgical margins (SM), lymphovascular invasion (LVI), lymph node density (LND = percentage of positive to total LN), path carcinoma in situ (CIS), total LN, total positive LN, LN dissection Type (standard or extended), path subtypes. We compared models with different predictors from a pool of predictors of interest by their prediction performance, and then chose the model with the highest concordance index (the best prediction performance). Restricted cubic splines were used for all continuous predictors to account for possible non–linear effect of the predictors.
**Results:** The outcome is all-cause mortality after RC for urothelial carcinoma of the bladder (UBC). The final model with the highest concordance index includes: age at RC, smoking, initial treatment 3 categories, path T, pathology subtypes, SM, LND, LVI. This was internally validated by bootstrap and cross-validation. The concordance index of the final model is 0.74. The nomogram for the final model is shown in (FIG1).

**Conclusions:** We believe that this nomogram is the first to use initial treatment and pathological subtypes. They had substantial effects on the survival of patients with UBC who underwent RC. External validation of the nomogram would be helpful.

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**Poster #27**

**EVALUATION OF ANTICIPATORY FISH POSITIVE ASSAYS IN BLADDER CANCER SURVEILLANCE PATIENTS**

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(Presented By: Casey Seideman)

**Background:** Previous reports have suggested that patients undergoing bladder cancer surveillance who have a positive Urovysion assay are more likely to recur than patients with a negative FISH assay. This has been termed an “anticipatory positive” test. The goal of this study was to determine the clinical significance of a positive Urovysion FISH assay in bladder cancer surveillance.

**Methods:** An IRB approved, retrospective chart review was performed to identify all patients undergoing surveillance for urothelial carcinoma at a single institution between December 2005 –2010. A reflex Urovysion FISH assay was performed in patients with atypical cytology. Patients with cystoscopic evidence of tumor were excluded, as well as any tumors diagnosed within 3 months. Pathology, follow-up cystoscopy, cytology, and FISH data were analyzed. Our endpoint was cancer recurrence, defined by biopsies and pathology. Statistical analyses were performed using Fisher’s exact test as a 1-tailed test, and chi-square test with significance at 0.05.

**Results:** 141 patients were included for analysis. Of these 109 were male (77%), mean age was 67.8 (range 23–92 years). 75 (53%) patients were followed for Ta UCC, 39 (27%) for T1, 21(15%) for CIS, and 6 (5%) patients without reports from outside facilities. 48 (34%) had low grade UCC, 86 (61%) high grade UCC, and 7 (5%) unknown. Average follow-up was 25 months (range 1–69 mo).

The FISH assay was negative in 104(73.8%), positive in 22(15.6%) and indeterminate in 15(10.6%) patients. Cystoscopy was normal in 107 (76%) and 37(24%) had an erythematous lesion. Biopsy proven recurrences occurred in 41(29%) patients, 1 was treated for recurrence based on positive cytology and FISH. Mean time to recurrence was 17.5 months. Of the patients with a recurrence, 15 (36%) had an erythematous lesion on cystoscopy, and 12 (27%) had a positive FISH. FISH had a positive predictive value of 54.5%, negative predictive value of 74%.
Univariate analysis identified cystoscopy findings of an erythematous patch, and positive FISH analysis to be associated with recurrence (p<0.05). No association was found between stage, grade, intravesical therapy and likelihood of recurrence. No variable was an independent predictor of recurrence on multivariate analysis.

**Conclusions:** The role of FISH studies in bladder cancer surveillance remains poorly understood. It is unclear whether patients with a positive Urovysion assay need a different surveillance strategy.

**Poster #28**

**EFFICACY OF COMBINED BEVACIZUMAB AND EGFR INHIBITION IN METASTATIC PAPILLARY RENAL CELL CARCINOMA (RCC) ASSOCIATED WITH HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER (HLRCC)**

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(Presented By: Eric A. Singer)

**Introduction and Objectives:** The evaluation of families with inherited forms of RCC has allowed the identification of genetic changes associated with papillary RCC. HLRCC is a familial condition resulting from germline alterations in the gene for the Krebs cycle enzyme fumarate hydratase (FH) and is characterized by a propensity for the development of an aggressive form of papillary RCC. Loss of FH leads to upregulation of hypoxia inducible factors (HIF) and their downstream transcriptional targets such as vascular endothelial growth factor (VEGF) and transforming growth factor–alpha / epidermal growth factor receptor (EGFR). As a result of an impaired Krebs cycle, FH −/− kidney cancer cell lines rely on aerobic glycolysis for energy production (Warburg effect) and exhibit increased glucose dependence. We hypothesized that combined VEGF and EGFR–pathway blockade would constrain glucose delivery to tumors and inhibit critical HIF–driven downstream targets.

**Methods:** We queried a prospectively maintained kidney cancer database to identify patients with advanced HLRCC–associated RCC treated at our institution on IRB–approved protocols. Demographic, clinical, pathologic, and treatment data were collected by chart review. Response to combined VEGF/EGFR blockade was determined by RECIST. Responses to other therapies were based on the clinical assessment of the referring oncologist. This study was funded by the NCI Intramural Research Program.

**Results Obtained:** Twenty patients with advanced RCC were treated between 1998 and 2008; 7/20 pts received combined VEGF/EGFR blockade (bevacizumab 10mg/Kg IV every two weeks plus either erlotinib [N=6] or gefitinib [N=1]). The remaining patients received a variety of agents including VEGFR targeted tyrosine kinase inhibitors, IL–2, and cytotoxic chemotherapy. Patients receiving VEGF/EGFR blockade had an overall response rate of 71% (5/7), including one patient with a complete response (14%) and 4 patients with a partial response (57%). Responses were durable, with one patient remaining disease free 57 months after treatment initiation. Combined VEGF/EGFR blockade resulted in significantly improved overall survival (median 51 months vs. 14 months; P=0.004) compared to other treatment regimens.

**Conclusions:** Combined VEGF/EGFR blockade has significant activity in metastatic papillary RCC associated with HLRCC. A phase II trial using this combination (NCT01130519) is ongoing at the NCI to further examine the efficacy of this regimen.
**Poster 29**

**PHASE I TRIAL OF THE HDAC INHIBITOR LBH589 IN COMBINATION WITH SORAFENIB IN PATIENTS WITH RENAL CELL CARCINOMA, NON SMALL CELL LUNG CANCER AND SOFT TISSUE SARCOMAS.**

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(Presented By: Lydia Laboccetta)

**Introduction:** LBH589 is a novel histone deacetylase inhibitor (HDACi) that induces apoptosis of tumor cells. In RCC and NSCLC cell lines, the combination of sorafenib and HDACi was found to have synergistic inhibition, which correlated with the induction of an ER stress response. In this phase I study, we evaluated the combination of LBH589 and sorafenib in previously treated patients with renal cell carcinomas (RCC) (9pts), soft tissue sarcomas (1pt), and non–squamous–non small–cell lung cancers (6pts). The trial was designed to determine the safety profile and maximum tolerated dose of LBH589 and sorafenib when administered concurrently.

**Methods:** Patients were dosed with either i.v. (Days 1,8, and 15) or oral LBH 589 (three times per week, continuously) every twenty eight days in combination with standard daily dose sorafenib (400 mg bid). The dose escalation was based on a “3+3” algorithmic design. LBH was initially administered at an i.v. dose of 5 mg/m2 with escalation to 10 mg/m2. Due to the manufacturer’s phase−out of the i.v. formulation, this was then changed to an oral formulation administered three times a week (doses 15 mg, 20 mg, and 25 mg). Patients on the 5 mg/m2 and 10 mg/m2 i.v. dose were transitioned to the 15 mg and 20 mg, respectively, of the oral preparation.

**Results:** Sixteen patients, median age 57 years, have been treated. Dose limiting toxicities were observed with grade 4 thrombocytopenia in two patients at the oral dose of 25 mg. There were no other grade 4 events. Grade 3 events included fatigue (2 pts), hypophosphatemia (2 pts), hypertension (1 pts), anemia (1 pt), rash (1 pt) and hand–foot erythroderma (1 pt). Common toxicities for the combination were fatigue (81%), weight loss (62%), loss of appetite (56%), diarrhea (56%), rash (50%), thrombocytopenia (31%), and hand–foot erythroderma (25%). No patients had significant QT prolongation. There was 1 partial response in a patient with lung cancer (31 weeks). Stable disease was noted in seven patients with RCC (78+, 48, 47, 31, 21, 17, and 10+ weeks). Stable disease was noted in the patient with sarcoma, but was taken off of trial as patient preference because of side effects. Seven patients had progressive disease.

**Conclusions:** The administration of oral LBH589 at a dose of 20 mg was found to be well tolerated and will be used in the expansion phase of the trial. Prolonged stable disease was observed in patients previously treated with sorafenib alone, sunitinib and axitinib.

**Poster 30**

**UISS RISK STRATIFICATION MAY BE USEFUL TO IDENTIFY PATIENTS LESS LIKELY TO BENEFIT FROM CYTOREDUC TIVE NEPHRECTOMY IN THE TARGETED THERAPY ERA.**

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(Presented By: Edward Rampersaud)

**Objective:** The role of cytoreductive nephrectomy (CRN) in the targeted therapy (TT) era is ill−defined. We sought to examine the factors associated with survival outcomes in patients presenting with metastatic renal cell carcinoma (mRCC) in the TT era.

**Methods:** The UCLA Kidney Cancer Program database containing records of over 2000 patients, including 232 patients treated with TT since 2003, was queried. Of 154 patients treated with FDA−approved TT agents, 71 presented with synchronous metastatic disease. 60 underwent CRN followed by TT (CRN group), while 11 received TT only (No CRN group). We compared the clinicopathologic factors and survival outcomes between these two groups.
Results: The two groups were balanced for baseline demographic variables including gender, race, BMI, tumor size, T-stage, ECOG performance status, and UCLA Integrated Staging System (UISS) risk category. Median DSS for No CRN vs CRN was 15.0 vs 27.0 months, p=0.079. Of the 60 CRN patients, 12 received a regimen comprised of IL-2 based immunotherapy followed by TT upon progression (IMT/TT), whereas 48 were treated with TT-only. Among patients receiving TT-only, median DSS for No CRN vs CRN was 8.0 vs 21.0 months, p=0.02. The subset of patients treated sequentially with IMT followed by TT had a median survival of 82.0 months. Median DSS based on UISS risk stratification (high, intermediate, low) was 11.0, 25.0, and 63.0 months, p<0.004. Survival of UISS high-risk patients undergoing CRN was no better than patients treated with primary tumor in place (p=0.383).

Conclusion: CRN remains a standard of care for appropriately selected mRCC patients presenting with primary in place. However, patients in high-risk groups do not appear to demonstrate a survival benefit from CRN compared to those treated by immediate systemic therapy without surgery. When these high-risk patients are identified preoperatively, treatment consideration should be directed at upfront TT.

Poster #31

COMPARISON OF RATES AND RISK FACTORS FOR DEVELOPMENT OF HYPERLIPIDEMIA AFTER RADICAL OR PARTIAL NEPHRECTOMY

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(Presented By: Ryan Kopp)

Introduction and objectives: Nephron Sparing Surgery (NSS) has emerged as a preferred option for the management of small renal masses, comparing favorably with radical nephrectomy (RN) from the standpoint of long-term oncologic efficacy and conferring superior renal functional preservation. Lipid metabolism may be affected by nephron loss and resultant renal endocrine dysfunction. We examined the incidence and risk factors for development of hyperlipidemia (HL) in patients who underwent RN and NSS.

Methods: Multi-center retrospective review of 905 patients (610 RN/295 NSS, mean age 57.5 years, mean follow-up 5.8 years) who underwent RN or NSS for renal tumors at two institutions from 7/1987 to 6/2007. Demographics and disease characteristics, renal function and metabolic parameters [Body mass index (BMI), estimated Glomerular Filtration Rate (mL/min/1.73m², GFR), serum creatinine] and history of preoperative and postoperative HL were recorded. De novo HL was defined as diagnosis of hyperlipoproteinemia, hypercholesterolemia, or hypertriglyceridemia at least 6 months after surgery with laboratory values meeting National Cholesterol Education Program ATP III definitions. Data were analyzed within subgroups based on treatment (RN vs. NSS). Multivariate analysis (MVA) was conducted to elucidate risk factors for development of HL following surgery.

Results obtained: There were no significant differences with respect to mean follow-up, age, race, sex, or BMI. Tumor size (cm) was significantly larger for RN (RN 7.0 vs. NSS 3.7, p<0.001). Preoperative GFR<60 mL/min/1.73m² (p=0.123) and HL (p=0.144) was similar between groups. Significantly greater postoperative GFR<60 mL/min/1.73m² for RN vs. NSS cohort (45.7% vs. 18%, p<0.001) was noted. Postoperatively, significantly more de novo HL developed in RN vs. NSS (23% vs. 6.4%, p<0.001). MVA demonstrated RN (OR 2.93, p=0.0107), preoperative (OR 1.98, p=0.037) and postoperative (OR 1.89, p<0.001) GFR<60 mL/min/1.73m² as significantly associated with HL development after surgery.

Conclusions: Patients who underwent RN had significantly higher incidence of de novo HL compared to a contemporary, well-matched cohort that underwent NSS. In addition to RN, preoperative and postoperative eGFR<60 were also significantly associated with development of HL. Further investigation on effects of nephron loss on lipid metabolism is requisite.
COMPLICATIONS OF RENAL RADIOFREQUENCY ABLATION WITH PYELOPERFUSION

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(Presented By: Jairam Eswara)

Introduction: Radiofrequency ablation (RFA) is an effective means of renal tumor ablation. The ablation of masses adjacent to the ureter risks ureteral injury and stricture, however, placement of a ureteral catheter and retrograde pyeloperfusion with dextrose 5% in water (D5W) has been used to reduce ureteral injury.

Methods: From 2005−2010, 46 patients (52 ablations) required pyeloperfusion to protect the ureter. Patients were selected for pyeloperfusion during RFA if the tumor was located within 1.5cm of the ureter. Pyeloperfusion was performed by insertion of a 5Fr ureteral catheter and instillation of D5W. Tumors were classified as central, exophytic, or mixed according to the Gervais classification system.

Results: 52 ablations with pyeloperfusion were performed in 46 patients with an effectiveness rate of 87%. Median tumor diameter was 3.3 cm. 14 /46 (30%) patients had major complications, but only 2 patients (4%) developed ureteral stricture managed with ureteral stenting. 5 patients (10%) had significant hematuria, 2 (4%) had urinomas requiring IR drainage, and 1 had a pseudoaneurysm requiring angioembolization. Notably, 2 patients (4%) had delayed abscesses: 1 patient underwent IR drainage of the abscess, and 1 underwent nephrectomy for what was thought to be recurrent tumor, but was found on pathology to be a delayed abscess with no evidence of malignancy.

Conclusions: RFA for renal masses is generally well−tolerated. Pyeloperfusion for ablations adjacent to the ureter led to only 2 ureteral strictures but also 2 delayed abscesses. Our complication rate is slightly higher than that of other contemporary RFA series.

SPECKLE-TYPE POZ PROTEIN CYTOPLASMIC MISLOCALIZATION AND OVEREXPRESSION PROMOTE TUMOR GROWTH IN AN ORTHOTOPIC MURINE RENAL CELL CANCER MODEL

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(Presented By: Sandip Prasad)

Introduction and objectives: Effective diagnosis and management of kidney cancer remain elusive goals for clinicians as renal tumors are radiographically indistinct, typically insensitive to radiotherapy and chemotherapy, and are not associated with any known serum tumor markers. In this study, we tested whether mislocalization of Speckle−type POZ protein (SPOP), an ubiquitin E3 ligase complex factor overexpressed in renal cell carcinomas, can promote tumorigenesis in an orthotopic murine model.

Methods: Human embryonic kidney (HEK293) cells transfected with a cytoplasmic SPOP−variant (SPOP−NN) created by deleting the nuclear localization signal were implanted subcutaneously and into the renal capsule of BALB/c nude mice. Control injections were performed using HEK293 cells and HEK293 cells transfected with an empty pcDNA3 vector (pcDNA3). In vivo tumor growth was monitored weekly using micro−ultrasound.

Results obtained: Tumor formation occurred in 17/20 (85%) SPOP−NN implantation sites compared with 1/20 (5%) HEK293 and 0/20 (0%) pcDNA3 sites (p<0.001). Tumor mass 6 week post−injection was a median of 3.03±1.54g, and histopathologic analysis displayed carcinoma. Downregulation of Daxx, DUSP6, DUSP7 and PTEN were observed by immunohistochemical staining, while upregulation of Gli−2, VEGF, SPOP and HIF−α were seen in the SPOP−NN group.

Conclusions: Cytoplasmic mislocalization of SPOP is a potent promoter of tumorigenesis in HEK293 cells. SPOP appears to generate these oncogenic phenotypes by mediating the ubiquitination and degradation of the anti−proliferative phosphatases PTEN, DUSP6 and DUSP7, as well as pro−apoptotic protein Daxx and the transcription factor Gli−2. This process upregulates the biological function of VEGF in vivo and supports further clinical development of SPOP as a therapeutic target for renal cell cancer.
Poster #34

LONG-TERM DURABLE ONCOLOGIC OUTCOMES AFTER RADIOFREQUENCY ABLATION FOR T1 RENAL CELL CARCINOMA
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(Presented By: Sarah Psutka)

Introduction: Long-term oncologic outcomes for radiofrequency ablation (RFA) of renal cell carcinoma (RCC) are limited. The objective of this study was to assess the long-term oncological efficacy of RFA for treatment of renal cell carcinoma.

Methods: Between 1998 and 2008, 311 biopsy-proven RCC were treated with RFA in 274 patients. Exclusion criteria included history of prior RCC or known metastatic RCC at time of RFA (n=92). 26 patients were lost to follow-up prior to their 6-month imaging study. We retrospectively reviewed the long-term oncologic outcomes for 193 patients. Mean follow-up was 4.6 yrs (range 1−12, SD 2.3).

Results: Median age was 71 years (IQR: 63 – 79 years). Median Charlson Score was 5.46 (IQR: 5–6). Median size of tumor treated was 3 cm (IQR: 2–3.9 cm, range 1–7.1cm) and 64 of these tumors (33%) were endophytic. Tumor breakdown by stage was T1a: n=153 (79%), T1b: n=37 (19%), and T2: n=3 (2%). Initial treatment success rate was 89%. There were 6 local recurrences (3%) in 4 patients with T1b disease and 2 patients with T2 disease with an average time-to-recurrence of 2.9 years (SD 0.7). 95% of patients with T1a RCC were disease free at last follow-up, in comparison to 81% of those with T1b and 33% of those with T2 disease (p=0.008). At last follow-up 178 (92%) patients were disease-free. 16 (8.2%) developed metastatic disease and 4 patients (2%) died of RCC. Mean disease-free survival was 4.3 years (SD 2.4).

Conclusions: In patients who are poor surgical candidates, RFA results in durable local control and a low risk of disease recurrence in T1 RCC. Higher stage, however, correlates with a decreased disease free survival and alternate treatments should be considered when counseling these patients.

Poster #35

A COMPARISON OF KU0063794, A DUAL MTORC1 AND MTORC2 INHIBITOR, AND TEMSIROLIMUS IN PRECLINICAL RENAL CELL CARCINOMA MODELS
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(Presented By: Hyung Kim)

Introduction: Rapamycin analogs, temsirolimus and everolimus, are approved for the treatment of advance renal cell carcinoma (RCC). Currently approved agents inhibit mammalian target of rapamycin (mTOR) complex 1 (mTORC1). However, the mTOR kinase exists in two distinct multiprotein complexes, mTORC1 and mTORC2, and both complexes may be critical regulators of cell metabolism, growth and proliferation. Furthermore, it has been proposed that drug resistance develops due to compensatory activation of mTORC2 signaling during treatment with temsirolimus or everolimus.

Methods: We evaluated Ku0063794, which is a small molecule that inhibits both mTOR complexes. Ku0063794 was compared to temsirolimus in preclinical models for renal cell carcinoma.

Results: Ku0063794 was effective in inhibiting the phosphorylation of signaling proteins downstream of both mTORC1 and mTORC2, including p70 S6K, 4E-BP1 and Akt. Ku0063794was more effective than temsirolimus in decreasing the viability and growth of RCC cell lines, Caki−1 and 786–O, in vitro by inducing cell cycle arrest and autophagy, but not apoptosis. However, in a xenograft model there was no difference in the inhibition of tumor growth by Ku0063794 or temsirolimus. A potential explanation is that temsirolimus has additional effects on the tumor microenvironment. Consistent with this possibility, temsirolimus but not Ku0063794 decreased tumor angiogenesis in vivo and decreased the viability of HUVEC cells in vitro at pharmacologically relevant concentrations.

Conclusion: Ku0063794 was effective in targeting both mTORC1 and mTORC2 in RCC cell lines. When compared with temsirolimus, Ku0063794 was more effective in inhibiting tumor growth in vitro but not in a xenograft model. A possible explanation is that temsirolimus has a greater antiangiogenic effect than Ku0063794.
**CLEAR CELL RENAL CELL CARCINOMA: CAN TISSUE BIOMARKERS PREDICT PROGNOSIS?**

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(Presented By: Oussama Darwish)

**Introduction and Objectives:** Mammalian target of rapamycin (mTOR) and hypoxia induced factor (HIF) pathways play an important role in ccRCC tumorgenesis. We investigated the prognostic role of pmTOR (phosphorylated mTOR), HIF and pTEN in nonmetastatic ccRCC.

**Methods:** Tissue microarray immunohistochemistry of pmTOR, HIF and pTEN was performed on ccRCCs of patients treated with radical or partial nephrectomy from 1997 to 2010. The relationship between these markers (separately or in combination) and aggressive pathological features as well as disease recurrence was assessed.

**Results:** The study included 409 non−metastatic ccRCC patients, 240 males (59%) and 169 females (39%), with mean age 57 years (range, 17−85). Median follow up was 25 months (Range 0−150). The tumors were non−confined (pT3−T4) in 78 (19%) patients and high grade (3−4) in 125 (31%) patients. Both HIF and pTEN were associated with high grade (p =0.001), while HIF alone was associated with advanced stage (p =0.001) and tumor necrosis (p = 0.017). Presence of multiple marker alteration (2 or 3) versus no or single marker alteration was associated with disease recurrence (Fig.1) in Kaplan–Meier univariate analysis (p=0.009) and was independent predictor of disease recurrence in multivariate Cox regression analysis (Hazard ratio=2.1 and p=0.05).

**Conclusions:** Multiple alterations among pmTOR, HIF and pTEN are associated with aggressive pathological features of ccRCC and worse oncological outcome. Alteration of biomarkers should be considered among prognostic tools used in treatment decision−making of high risk patients.

**Funding:** None
LAPAROSCOPIC PARTIAL NEPHRECTOMY VERSUS IMAGE-GUIDED PERCUTANEOUS RENAL CRYOABLATION FOR SMALL (<4CM) RENAL MASSES: FUNCTIONAL AND ONCOLOGIC OUTCOMES.

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(Presented By: Zhamshid Okhunov)

**Introduction:** We compared perioperative, short-term functional and oncologic outcomes of laparoscopic partial nephrectomy (LPN) and percutaneous renal cryoablation (PCA) in patients with small (<4cm) renal masses (SRM).

**Methods:** A retrospective analysis was performed of all patients undergoing PCA and LPN from July 2005 to February 2010. Demographic, radiographic, peri- and postoperative complications and outcomes were analyzed. Local recurrence was defined as a progression in tumor size and/or contrast enhancement beyond 6 months after the procedure. Follow up computed tomography scans with contrast were performed 3, 6, 12 months after surgery and annually thereafter.

**Results:** Patient demographics, operative data are demonstrated in table 1. A total of 526 patients were included in the study. In the LPN group, there were 2 (0.9%) recurrences. Both patients are under active surveillance with no evidence of disease progression. In the PCA cohort, there were 10 (7%) patients with recurrences. All were managed with repeated ablation or extirpative surgery. No cancer-specific deaths recorded in either group. There was a significant difference in immediate post-operative creatinine between PCA and clamped LPN patients, as well as between clamped and unclamped LPN patients. Clamped LPN patients (mean 1.17, 95% CI: 1.12 to 1.23) had significantly higher immediate post-operative creatinine levels than PCA patients (mean 1.03, 95% CI: 0.98 to 1.10) (P < 0.0009). Clamped LPN patients had higher immediate post-operative creatinine levels than unclamped LPN patients (mean 1.03, 95% CI: 0.97 to 1.09) (P < 0.0006). There was no significant difference in immediate post-operative creatinine between PCA and unclamped LPN patients. No other significant functional differences between the three groups at 3 and 6 months.

**Conclusions:** LPN and PCA represent effective minimally invasive treatment options for SRMs. LPN offers superior oncologic results with fewer local recurrences. In the immediate post-procedural period, PCA is associated with lower serum creatinine compared with on-clamp, but not off-clamp, LPN. Although statistically significant, long term follow up is necessary to determine if this is clinically significant.
INTRODUCTION AND OBJECTIVES: Global incidence and mortality rates for various genitourinary malignancies have been described, but similar data on kidney cancer are lacking. Our goal was to describe worldwide contemporary age-standardized incidence and mortality rates for kidney cancer and their association with social and economic development metrics.

METHODS: We obtained gender-specific, age-standardized incidence (ASIR) and mortality (ASMR) rates for 172 countries and 16 major world regions from the GLOBOCAN 2008 database. We compared incidence and mortality rates on a regional level in males and females. The mortality-to-incidence ratio (MIR) was calculated and the United Nations’ Human Development Index (HDI) was used to estimate each country’s level of development. MIR was calculated for each country. Linear regression modeling was used to describe the relationship of MIR to HDI.

RESULTS OBTAINED: ASIR varied 20-fold worldwide, with highest ASIR in North America (11.8 per 100,000) and lowest in Africa (1.2) and South-Central Asia (1.0). Geographic distribution of ASMR was similar to ASIR, with the highest rates in Europe (3.1 per 100,000) and North America (2.6) and lowest rates in Asian and African regions (0.6 – 1.5). ASIR and ASMR were 4.5 and 2.8 times higher, respectively, in more developed countries compared to developing countries. However, MIR was highest in Africa and Asia (0.6 – 0.8) and lowest in North America (0.2). There was a strong inverse relationship between HDI and MIR (R2 = 0.59). Results are constrained by inherent limitations from the GLOBOCAN dataset and HDI data.

CONCLUSIONS: Kidney cancer incidence and mortality rates vary widely throughout the world. Mortality-to-incidence ratios are highest in less developed nations. These observations suggest significant health care disparities and may reflect differences in risk factors, health care access, quality of care, diagnostic modalities used, and treatment options available.

RESPONSE OF THE HUMAN KIDNEY TO CLAMP ISCHEMIA
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(Presented By: Barbara Ercole)

INTRODUCTION: Structural changes in tubule cells during clamp ischemia are well characterized for animal models, but their timing and extent in the human kidney has not been established and may differ significantly. To better define the human response, we biopsied uninvolved areas of kidney in patients undergoing open partial nephrectomy (PN) for renal masses.

MATERIAL AND METHODS: Biopsies of 40 patients undergoing PN were obtained at specified time intervals: before renal artery clamping, then during periods ranging from 15 to 60 min. of warm and cold ischemia (80% >30 min.), and then after 5 minutes of reflow. These biopsies were assessed for ultrastructure (N=39) and for immunofluorescence and rhodamine phalloidin staining (N=22).

RESULTS: During the clamp period, apical membrane structure was remarkably well preserved with only patchy brush border clubbing, fragmentation, desquamation and blebbing and not in all patients. Mitochondria developed progressive swelling, which paradoxically was more prominent in distal than proximal tubule cells. This resolved during the 5 minutes of reflow in most cells in most patients, but persistence of swelling and development of matrix condensation occurred occasionally. Using a composite 0–5 scale covering the full spectrum of ultrastructural changes, average scores were: Preclamp 1.02±0.07, End clamp 2.18±0.07, Post clamp 1.86±0.09. Consistent with the ultrastructure, staining for F–actin with rhodamine phalloidin was well preserved. Immunostaining for phosphoryrosine, which reflects cellular ATP content was decreased in 68.4% of the clamp biopsies and 52.6% of the postclamp biopsies with larger changes in proximal tubules, however B1 integrin was decreased in only one post clamp biopsy. ICAM–1 expression in peritubular capillaries was increased in 46.7% of the clamp biopsies and 66.7% of post clamp biopsies. None of the patients developed acute kidney injury.

CONCLUSION: These data provide the first detailed analysis of the structural response of the human kidney to clamp ischemia and document many of the expected structural alterations based on prior animal work, but indicate a greater than expected resistance to injury in this commonly used clinical application of clamp ischemia.
NOVEL RENAL CELL CARCINOMA BIOMARKER IDENTIFICATION FROM URINARY EXOSOMES
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(Presented By: Todd M. Morgan)

Introduction: Proteomic technologies have shown great promise in the identification of biomarkers, however these efforts in renal cell carcinoma (RCC) have been hampered by technical limitations. We have developed a novel approach utilizing lipid microvesicles, termed exosomes, to circumvent many of the obstacles to urinary biomarker identification. We sought to test whether shotgun proteomics of urinary exosomes can be utilized to identify candidate biomarkers of RCC.

Methods: Urine was obtained from 8 patients with clear cell RCC prior to nephrectomy and from 12 patients without malignancy undergoing non–urologic surgery. Exosomes were isolated by ultracentrifugation and proteins were analyzed by multidimensional protein identification technology (MudPIT). Differentially expressed peptides were identified by quasi–likelihood Poisson regression modeling using a false discovery rate <0.05. As an exploratory and validation measure, angiotensin converting enzyme (ACE) immunohistochemistry (IHC) was performed on a tissue microarray containing 139 matched RCC and normal cores.

Results: An average of ~1,500 proteins were identified in each of the 22 patient samples. There were 14 differentially expressed proteins identified with a p<0.05 between RCC and control samples, as well as 2 additional proteins that approached statistical significance. Six were upregulated in RCC and 10 were downregulated compared to controls. In order to validate our approach, we focused our attention on those that have been previously proposed as cancer biomarkers (Table). Since ACE has been associated with RCC in a prior study, we tested this by IHC. Consistent with the results by MudPIT, we found no expression in 69/70 RCC cores and high expression in 69/69 matched normal cores.

Conclusions: Rich in cell–specific protein signatures, exosomes are upregulated in several cancers and provide a unique source for urinary biomarkers. We utilized a novel proteomic approach to evaluate urinary exosomes and identified a number of putative biomarkers, suggesting this novel approach may be an effective approach to biomarker discovery in RCC. Further work is ongoing to evaluate the urinary expression of these candidate markers in patients with RCC.
COMPARISON OF RATES AND RISK FACTORS FOR DEVELOPMENT OF ERECTILE DYSFUNCTION AFTER RADICAL OR PARTIAL NEPHRECTOMY

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(Presented By: Ryan Kopp)

Objectives: Nephron Sparing Surgery (NSS) has emerged as a preferred treatment option for small renal masses, comparing favorably with radical nephrectomy (RN) from the standpoint of oncologic efficacy and conferring superior renal functional preservation. Erectile function may be affected by declining renal function. We examined the incidence of and risk factors for development of erectile dysfunction (ED) in patients who underwent RN and NSS.

Methods: Retrospective review of 432 patients (264 RN/168 NSS, mean age 58 years, mean follow-up 5.8 years) who underwent RN or NSS for renal tumors at two institutions from 1/1998 to 12/2007. Demographics and disease characteristics, metabolic parameters [estimated GFR, serum creatinine, hyperlipidemia, diabetes mellitus (DM)], pre- and postoperative ED (Sexual Health Inventory for Men score <22) and response rate to 5-phosphodiesterase inhibitor therapy (5-PDEi) were recorded in sexually active men. Data were analyzed within subgroups based on treatment (RN vs. NSS). Multivariate analysis (MVA) was conducted to elucidate risk factors for development of de novo ED.

Results obtained: RN and NSS groups had similar demographics and comorbidities. Tumor size (cm) was significantly larger for RN (RN 7.0 vs. NSS 3.7, p=0.001). No significant differences were observed for preoperative eGFR, hypertension, and DM. Significantly more preoperative ED existed in NSS vs. RN (p=0.042). Postoperatively, significantly higher rates of de novo DM (11.4% vs. 4.2%, p=0.015), eGFR<60 mL/min/1.73m² (33.0% vs. 9.8%, p<0.001), and ED (29.5% vs. 9.5%, p<0.001) developed in RN vs. NSS cohorts, respectively. Overall response rate to 5-PDEi was 63% without significant difference between the two groups (p=0.896). MVA demonstrated RN (OR 3.56, p<0.001), hypertension (OR 2.32 p = 0.014), postoperative DM (OR 2.93, p<0.001), preoperative (OR 8.77, p<0.001) and postoperative (OR 2.64, p<0.001) eGFR <60mL/min/1.73m² were significantly associated with de novo ED.

Conclusions: Patients undergoing RN had significantly higher de novo ED compared to a contemporary, well-matched cohort undergoing NSS. RN, DM, and eGFR<60 were associated with development of ED. Further investigation on effects of nephron loss on ED is requisite.

THE ASSOCIATION BETWEEN RENAL TUMOR SCORING SYSTEMS AND ISCHEMIA TIME

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(Presented By: Luke T. Lavallée)

Introduction and Objective: To evaluate the association between renal tumour scoring systems and partial nephrectomy ischemia time.

Methods: A historical cohort of partial nephrectomy patients at The Ottawa Hospital between 2002–2009. Pre-operative patient characteristics (age, gender, pre-operative renal function, diabetes, hypertension, smoking history, heart disease) and ischemia time were abstracted from the medical record. Pre-operative computed tomography (CT) images were reviewed, and tumour characteristics determined for all components of each scoring model. Linear regression was used to determine the association between scoring systems and ischemia time.

Obtained Results: 94 patients were included in the study. Median R.E.N.A.L. score was 7 (IQR 5–8), median PADUA score was 8 (IQR 7–9.8) and mean C index was 3.9 (SD 2.1). Mean ischemia time was 24 (SD 10.5) minutes. Individual tumour characteristics (diameter, nearness to collecting system, anterior/posterior location, and medial/lateral location) were strongly associated with ischemia time (p<0.05). Adjusting for potential confounders, C index (−1.2 minutes per c-index unit 95%CI −2.3, −0.13, p=0.03) and PADUA score (1.8 minutes per PADUA unit 95%CI 0.2, 3.4, p=0.03) were significantly associated with ischemia time. R.E.N.A.L. Nephrometry score was associated with ischemia time, but this association was not statistically significant (0.9min per R.E.N.A.L. unit 95%CI −0.4, 2.2, p=0.2).

Conclusions: Renal tumour characteristics are associated with ischemia time. The proposed scoring systems are useful descriptors of surgical complexity and should be used when describing partial nephrectomy patients. Prospective evaluation of scoring systems are indicated to clarify which of the scoring system should be universally applied.
NATURAL HISTORY OF UNTREATED RENAL CELL CARCINOMA WITH VENOUS TUMOR THROMBUS

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(Presented By: Adam Reese)

Introduction and Objectives:
Nearly 20% of patients with renal cell carcinoma (RCC) and venous tumor thrombus (VTT) are unfit for surgery or elect to be managed non-operatively. As there are no published multi-institutional series in the literature investigating untreated RCC with VTT, the natural history of this disease is poorly characterized. In the current study, we describe the natural history of RCC with VTT in the largest and only multi-institutional series reported to date, and identify prognostic factors associated with disease-specific survival in this patient group.

Methods: We identified patients in the Surveillance, Epidemiology, and End Results (SEER) database with untreated renal cell carcinoma and venous tumor thrombi. Disease-specific median and one-year survival rates were determined, and disease-free survival curves were plotted using the Kaplan-Meier method. Multivariable Cox regression analyses were performed to identify factors associated with disease-specific and overall survival in this patient group.

Results: Of 2,265 patients with RCC and VTT in the SEER database, 390 (17%) underwent no treatment. 278 (71%) patients died during follow-up in whom 243 deaths (87%) were due to RCC. Median and 1-year disease specific survival for this group was 5 months and 29%, respectively. A Kaplan-Meier curve of DSS with patients stratified by tumor stage and the presence or absence of distant metastases is shown in the figure. On multivariable analysis, the extent of tumor thrombus (HR 1.7 for T3c vs. T3b, 95% CI 1.0 – 2.7) and the presence of metastases (HR 3.1 for M+ vs. M0, 95% CI 1.7 – 5.5) were most strongly associated with disease specific mortality.

Conclusions: Prognosis is poor for the majority of untreated patients with RCC and VTT. Supradiaphragmatic thrombi and distant metastases are adverse prognostic factors in this patient group. This information is important when counseling patients as to the risk and benefits of surgical versus non-operative management of RCC and VTT.
METHODOLOGY FOR EVALUATING URINE NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN (UNGAL) LEVELS IN PATIENTS UNDERGOING PARTIAL NEPHRECTOMY, RADICAL NEPHRECTOMY, AND NON-RENAL SURGICAL PROCEDURES.

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(Presented By: Preston Sprenkle)

Objectives: Develop a reproducible methodology for measuring uNGAL in clinical patients to determine effect of partial nephrectomy on uNGAL levels.

Introduction: NGAL is a biomarker for acute kidney injury (AKI) that has been demonstrated to increase proportionally to severity and duration of renal injury. uNGAL has not previously been studied as a marker of acute kidney injury AKI in renal surgery patients. Partial nephrectomy, with direct and ischemic injury to the kidney, should demonstrate higher levels of uNGAL than radical nephrectomy or non-renal surgery controls.

Methods: The uNGAL ELISA assay was internally evaluated and validated in our clinical laboratory. After IRB approval was attained, a prospective observational study was initiated with interim accrual of 227 patients. At least six timed specimens are required for each patient to be included in analysis: (1) preop, (2) arrival to the post anesthesia care unit (PACU), (3−5) every four hours until 12hrs after arrival to PACU, and (6) POD #1. Specimens are immediately sent to the clinical laboratory, centrifuged, aliquoted and frozen at −80°C for future analysis. Specimens require freezing within 24hrs for reliable results. In the initial pilot study 144 patients were enrolled but only 60 (42%) had six complete specimens. To improve specimen collection rates a computer based orders system was utilized to prompt timed specimen collection; this change resulted in complete specimen collection for 54 of 73 patients (74%).

Results: uNGAL/uCr ratio is elevated upon arrival to PACU in patients who underwent partial nephrectomy compared to patients who underwent radical nephrectomy or thoracic surgery. Detailed analysis of clinical characteristics associated with higher post operative NGAL levels is ongoing, including but not limited to duration of ischemia, nephrometry score, cold or warm ischemia, ebl, patient age, pre-existing hypertension and/or diabetes.

Conclusion: A reproducible and streamlined methodology for specimen collection and evaluation with an internally validated uNGAL assay has been developed. Preliminary analysis suggests that uNGAL may be a very early marker of renal injury in patients undergoing renal surgery evident upon patient arrival to PACU.

RENAL FUNCTIONAL PRESERVATION: A BENEFIT OF ACTIVE SURVEILLANCE OF THE SRM
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(Presented By: Jose Reyes)

Introduction: Active surveillance (AS) of the incidental, localized, enhancing small renal mass (SRM) is an option in select patients including the elderly, infirmed and/or those with chronic kidney disease (CKD). Here we compare the renal functional kinetics of patients with renal tumors under AS with those undergoing delayed intervention.

Materials and Methods: We identified patients with localized renal masses managed with an initial course of AS from our prospective kidney cancer database. Demographic and clinical characteristics were compared between patients managed with continued AS for a minimum of 12 months versus those undergoing delayed intervention (DI) using descriptive statistics. Renal function at baseline and at the time of last follow up was assessed using estimated glomerular filtration rate (eGFR) calculated by MDRD.
Results: 162 patients (77 AS; 85 DI) with 195 masses (84 AS; 111 DI) met study inclusion criteria. While median patient age was significantly younger in patients undergoing definitive therapy (64 vs. 75 years; \( p<0.0001 \)), there were no significant differences between groups with respect to Nephrometry score, baseline eGFR, or comorbidity measured by Charlson Comorbidity Index. CKD III (eGFR <60 ml/min) or higher was present in 40% and 41% of the AS and DI group, respectively. For patients undergoing DI, nephron sparing surgery was performed for 72% of lesions (28% MIS), while 19% and 9% of SRMs were managed with nephrectomy and ablation respectively. Comparing eGFR at baseline and at the conclusion of AS, there was a statistically significant decrease in patients who progressed to treatment (66.3 vs. 61.7 ml/min, \( p=0.02 \)), while no significant change was demonstrated in patients managed expectantly (62.4 vs. 65.0 ml/min, \( p=0.3 \)).

Conclusion: The long–term negative health effects of diminished renal function have increasingly become a quality of care issue in patients with enhancing renal masses. While the short term oncologic safety of AS is being documented, our data confirms AS is associated with preservation of renal function in the absence of primary renal disease. This finding may underscore the use of AS in older and/or co–morbid patients in whom preservation of renal function is important.

Poster #46

FACTORS AFFECTING RENAL FUNCTIONAL DEGENERATION AFTER OPEN NEPHRON SPARING SURGERY: A COMPARISON OF COLD, WARM, AND NON-ISCHEMIC APPROACHES
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(Presented By: Seth Cohen)

Introduction: Renal functional recovery after nephron sparing surgery may be impacted by a variety of different factors. We examined renal functional recovery after open partial nephrectomy performed using warm, cold, and non–ischemic technique.

Methods: Multicenter analysis of 352 open partial nephrectomies performed between 1988 and 2011 (216 men/136 women); patient demographics, nephrometry scores, pathologic, and perioperative outcomes were analyzed. Patients were divided into three groups: warm ischemia (n=248), cold ischemia (n=32), and no–ischemia (n=72). Independent t–test, Chi2, ANOVA, Mann–Whitney U, Kruskal–Wallis tests were utilized for comparative analysis. Primary outcome variable was development of de novo Stage III CKD, defined as eGFR < 60 ml/min/1.73 m², as estimated by the MDRD equation, with median follow up 17 months (IQR 3.9–39.7). Multivariate analysis was performed to determine significant predictors of post–operative renal function.

Results: Cohorts were similar in age (\( p=0.230 \)), gender (\( p=0.187 \)), BMI (\( p=0.330 \)), smoking history (\( p=0.315 \)), diabetes (\( p=0.462 \)), clinical stage (T1 versus T2+, \( p=0.276 \)), and pathology (malignant versus benign, \( p=0.184 \)). The cold ischemia cohort (median 45 minutes (min), IQR 38–60) had longer ischemia times than warm ischemia (median 25 min, IQR 21–27, \( p=0.001 \)). Mean nephrometry scores for cold (8.1, ±1.8) were higher than warm ischemia (6.9, ±1.7, \( p=0.012 \)) and no–ischemia (6.4 ±1.6, \( p=0.001 \)). There were no significant differences in percentage of patients with de novo post–operative eGFR< 60 (warm 15.5%, cold 23.1%, and no–ischemia 6.1%, \( p=0.061 \)). Multivariate analysis found advancing age (OR 1.06, CI 1.02–1.09, \( p=0.002 \)), ischemia time ≥30 min (OR 3.12, CI 1.14–8.46, \( p=0.026 \)), and increasing nephrometry score (OR 1.86, CI 1.38–2.51, \( p=0.001 \)) to be significant predictors of postoperative de novo eGFR<60. Subset multivariate analysis performed separately on those patients with ischemia times of <30 versus ≥30 minutes did not find mode of ischemia to be a significant predictor of de novo eGFR<60.

Conclusion: In this evolving analysis of renal functional recovery, a combination of demographic, tumor based, and technical factors impacted renal functional recovery after open nephron sparing surgery. Further investigation is requisite to identify differential impact of these factors.
**Poster #47**

**RELATIONSHIP OF BMI AND GENDER TO SURGICAL COMPLEXITY OF PARTIAL NEPHRECTOMY**
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(Presented By: Manger Jules)

**Introduction:** Americans are increasingly obese and increased patient adiposity has been shown to affect outcomes following abdominal surgery. We tested the hypothesis that higher BMI correlates with surgical difficulty in partial nephrectomy. Further, we postulated that this correlation would be stronger in women as opposed to men due to gender−specific patterns of fat deposition.

**Methods:** In this retrospective study, we employed an institutional review board approved database of partial nephrectomy performed for oncologic indications at a single institution from 2005−2010. We performed univariate and multivariate logistic regression analysis to assess the relationship between BMI and surgical difficulty. We used operating room time (ORT), estimated blood loss (EBL), and clamp time (Tc) as indicators of surgical complexity.

**Results:** Of 139 patients undergoing partial nephrectomy, 43% were female. The mean age was 53 years−old and 32.3 kg/sq m was the mean BMI. In univariate and multivariate analysis, BMI was significantly associated with EBL (p= 0.037 and p=0.011, respectively). BMI was not significantly associated with ORT or Tc. Among the independent variables, female sex was associated with increased blood loss (OR 1.99, 95% CI 1.01−3.96, p= 0.048).

**Conclusions:** BMI was significantly correlated with some, but not all of the examined indicators of surgical difficulty, showing a small but significant association with EBL. Interestingly, gender was more strongly associated with EBL irrespective of BMI. This finding may reflect the differing patterns of abdominal fat distribution in women and men.

**Poster #48**

**ABO BLOOD TYPE IS AN INDEPENDENT PREDICTOR OF OVERALL SURVIVAL IN PATIENTS WITH RENAL CELL CARCINOMA**
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(Presented By: Kelly Stratton)

**Introduction:** Evidence from non−urologic malignancies suggests that ABO blood type may be a risk factor for both cancer incidence and mortality. For example, breast cancer patients with O blood type appear to have significantly better overall survival than those with non−O blood types. We sought to determine whether ABO blood type is associated with overall survival in patients undergoing nephrectomy for renal cell carcinoma (RCC).

**Methods:** Analysis of a prospectively collected RCC database identified 923 consecutive patients who underwent radical or partial nephrectomy for locoregional RCC from 1997−2008. The primary outcome measure was overall survival (OS). Covariates included age, gender, race, ASA classification, tumor stage, Fuhrman grade, lymph node status, pre−operative anemia, transfusion status, hypoalbuminemia, and blood type (O vs. non−O). Univariate analysis found age, ASA classification, tumor stage, grade, nodal disease, anemia, hypoalbuminemia, and blood group met inclusion criteria (p<0.1). In the multivariate analysis, non−O blood type was independently associated with worse overall survival (HR 1.68, 95%CI 1.18−2.39, p=0.04) after correcting for other covariates.

**Conclusion:** This study suggests that ABO blood type is a predictor of overall survival in patients undergoing partial or radical nephrectomy for RCC. In particular, patients with non−O blood type have worse overall survival. This is the first report of a relationship between blood type and RCC survival. A number of potential molecular mechanisms may explain this relationship and further studies will be needed to understand the biology behind this association.
Poster #49

ASSESSMENT OF THE INCIDENCE OF BENIGN VERSUS MALIGNANT RENAL TUMORS IN SELECTED STUDIES
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(Presented By: William Lowrance)

Introduction and Objectives: Advances in cross-sectional imaging have increased the frequency with which small renal tumors are discovered, leading to the presentation of more patients with early-stage renal cell carcinoma (RCC) as well as incidental benign or indolent renal neoplasms. Histopathology after surgical resection is the definitive method for characterizing renal tumors. Stage migration of renal masses creates uncertainty about the percentage of resected masses that will be benign versus malignant. Our objective was to better define these proportions through an in-depth review of the contemporary medical literature.

Methods: PubMed and select oncology congresses were searched for publications that identify the histologic classification of resected renal masses in a representative sample from the contemporary literature: [search] incidence AND (renal cell carcinoma AND benign); incidence AND (renal tumor AND benign); percentage AND (renal cell carcinoma AND benign); limit: 2003–2011.

Results: The representative studies were published in the past 10 years (Table) and most included procedures conducted in the mid-1990s through the mid-to-late 2000s. Studies were conducted in the United States (n=8), Korea (n=3), China, Japan, Germany, Austria, Australia, multisite (Israel/France/US) (all n=1). Only 8 studies had n≥500 (range, n=70–10,404). The proportion of benign masses ranged from 7.1% to 33%, with nearly half of the studies reporting values between 16% and 17%. The majority found that benign tumors were more likely to be smaller in size (<4 or <7 cm, depending on study) than malignant tumors. 11 studies reported the percentage of RCC subtype (indolent vs ccRCC) diagnosed from patients with malignant tumors (range in ccRCC diagnosis, 45.7%–83%).

Conclusions: Benign tumors are relatively common (~15% of resected renal tumors) and are more prevalent among small masses. Further, nearly a quarter of resected lesions are benign or indolent and may not require surgery. Preoperative differentiation between aggressive and less aggressive renal masses would be an important clinical advance that could allow clinicians greater diagnostic confidence and guide patient management.

Funding: Wilex AG/IBA Molecular
**Poster #50**

**NODAL DISEASE IN THE SETTING OF METASTATIC RENAL CELL CARCINOMA: CAN A LYMPH NODE DISSECTION POTENTIALLY ALTER PATIENT OUTCOMES?**

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(Presented By: Brian F. Chapin)

**Introduction:** The impact of lymph node dissection (LND) in patients with metastatic renal cell carcinoma (mRCC) undergoing cytoreductive nephrectomy (CN) is unclear. The aims of this study were to determine if clinical node status is an independent predictor of overall survival (OS) in patients treated with CN in the targeted therapy era, and if LND increases the morbidity of CN.

**Methods:** We performed a retrospective review of all patients with mRCC treated with CN at a single institution between 2004–2010. Patients participating in open or unpublished trials were excluded leaving 173 patients for analysis. Lymph nodes >1cm by long axis diameter were considered clinically positive (cN+). OS was calculated using COX proportional hazard regression. Complications were classified using the modified Clavien system.

**Results:** Sixty-five (37.6%) patients were clinically node positive (cN+). Median OS was significantly worse for the cN+ patients compared to cN0 patients [17.45 vs 29.1 months (HR 1.84;(1.28−2.63)]. Clinical node status remained an independent predictor of OS on multivariate analysis [HR 1.74;CI 1.14−2.65]. LND was performed in 61/65 (93.4%) cN+ patients and in 56/108 (52%) of cN0 patients. Patients undergoing concomitant LND were more likely to have Grade 4 tumors, symptoms, cT−stage >2 and less likely to have >1 metastatic site. Confirmed pathologic node positive disease (pN+) was more common in cN+ compared to cN0 patients (75% vs. 23%,p <0.001). pN+ patients had worse median OS than pN0 patients [16.0 v 35.5 mos;HR 2.34(1.51−3.63)]. Among pN+ patients (n=54), complete resection of all identifiable nodal disease was associated with an improved OS compared to patients with unresectable nodal disease (n=4) [16.0 v 5.6 months;HR 2.92(1.02−8.33)].

On univariate analysis LND patients were significantly more likely to have any post-operative complication (64% vs 43%,p=0.008) and more specifically chylous ascites (12 v 0,p=0.01). Despite this association, LND did not reach statistical significance when multivariate analysis was performed [OR 1.9;(0.94−3.81)].

**Conclusions:** Among patients undergoing CN, the presence of clinically positive nodes is associated with worse OS. Likewise, pN+ patients have worse OS than pN0 patients. LND is associated with higher morbidity than CN alone. Further efforts are needed to determine removal of pathologic nodes alters the natural history of the disease, and if the benefit offsets the increased morbidity.

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**Poster #51**

**ROBOTIC PARTIAL NEPHRECTOMY AND THE INTERNET: IS THE INFORMATION EVIDENCED-BASED?**

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(Presented By: Raj Kurpad)

**Introduction and Objectives:** It is becoming more common for patients to refer to the Internet to supplement information from their physicians concerning their healthcare. In fact, it has been estimated that over 80% patients utilize the Internet as a primary source of oncology–related information. We sought to evaluate the current web–based information regarding robotic partial nephrectomy.

**Methods:** Two common search engines (Google and Yahoo) were used to search the term “robotic nephrectomy.” The top 50 sites from each search engine were analyzed in regards to type of site and information regarding robotic nephrectomy (surgical outcomes, oncologic outcomes, kidney function outcomes, and recovery outcomes). In addition, the use of information from the Intuitive site, references, information regarding cost, and if the site mentioned laparoscopic partial nephrectomy as an alternative were evaluated.

**Results:** Of the 100 sites, 64 were surgeon/provider sites, 20 links to publications, 5 medical news sites, 3 patient support sites, 1 meeting program, 5 were other, and 2 were the Intuitive site. Analysis of all 64 surgeon/provider sites showed that a significant number of sites made non–evidence–based claims regarding surgical outcomes (44%), oncologic outcomes (11%), kidney function outcomes (9%), and recovery (41%). Laparoscopic partial nephrectomy was not mentioned in 44% of surgeon/provider sites. In regards to information from Intuitive used by provider sites, 3% had links, 6% verbatim information, and 6% information with similar wording. Only 8% of provider sites had listed any references. Zero surgical/provider sites and only one site (medical news) made any comparison of cost between the different surgical options.

**Conclusions:** These findings suggest that surgeons provide the majority of Internet information, but often do not use evidence–based information. The claims regarding robotic surgery are often over–stated. Other surgical options and cost are frequently omitted. This highlights the need for providers to provide evidenced–based information to the public.
Poster #52

R.E.N.A.L. NEPHROMETRY SCORING SYSTEM IS NOT PREDICTIVE OF THE FUNCTIONAL EFFICACY OF NEPHRON-SPARING SURGERY IN THE SOLITARY KIDNEY.

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(Presented By: David Buethe)

Introduction: Recently, the R.E.N.A.L. nephrometry scoring system was introduced to objectively describe renal masses with respect to size, the degree to which they are exo/endophytic, the nearness to the collecting system, whether they are anterior or posterior and the location relative to polar lines. However, it is unknown whether the novel scoring system is predictive of renal function loss after nephron-sparing surgery (NSS).

Objective: To evaluate the R.E.N.A.L. nephrometry scoring system as a predictor of the functional efficacy of NSS in the solitary kidney.

Methods: We evaluated 42 patients presenting with either an anatomic (32) or functionally solitary (10) kidney undergoing partial nephrectomy. Each renal unit was assigned a R.E.N.A.L. nephrometry score utilizing pre-operative cross-sectional imaging. The CKD-EPI equation was applied to serum creatinine levels to generate the corresponding estimated glomerular filtration rate (eGFR). The difference between the eGFR at baseline and at post-operative time points served as a measurement of renal function loss attributed to partial nephrectomy.

Results: Forty-two patients underwent open (41) or robotic (1) partial nephrectomy with mean preoperative eGFR of 61.5 mL/min/1.73m². The median total nephrometry score was 8, ranging from 4–10. Twenty-eight (66.7%) of the renal lesions were ≤ 4 cm, 13 (31%) were between 4 and 7 cm, and 1 (2.4%) was >7 cm in diameter. The majority (54.8%) of the patients had tumors with more than 50% of tumor burden lying outside the expected renal border whereas 3 patients (7.1%) had tumors considered to be completely endophytic. Twenty-seven (64.3%) were within 4 mm of the collecting system. Tumor locations defined as: completely polar, interpolar, and completely central were assigned to 11, 15, and 16 lesions respectively. Two patients required temporary hemodialysis and there was one perioperative death attributed to gastrointestinal related sepsis. By post-operative month 6, the overall average eGFR of 53.9 mL/min/1.73m² was significantly less (p = 0.0293) than the pre-operative value. However, we were unable to correlate change in post-operative eGFR with pre-operative total or individual R.E.N.A.L. scoring parameters.

Conclusions: Neither the individual components of the R.E.N.A.L. nephrometry scoring system nor the total nephrometry score correlated with realized functional loss as assessed by eGFR in patients with a solitary kidney undergoing NSS.

Poster #53

PERCUTANEOUS CT-GUIDED RENAL RADIOFREQUENCY ABLATION: 3 YEAR FOLLOW

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(Presented By: Zhamshid Okhunov)

Introduction: The aim of our study was to evaluate the efficacy of percutaneous radiofrequency ablation (RFA) for renal masses.

Methods: We retrospectively evaluated our database for patients undergoing percutaneous RFA from April 2004 to September 2010. Incomplete ablation was defined as the absence of contrast enhancement in the ablation area within 6 months of the procedure. Local recurrence was defined as a local progression in size and/or contrast enhancement after 6 months of the procedure. Follow up consisted of computed tomography scans with contrast at 3, 6, 12 months after ablation and annually thereafter.

Results: A total of 30 patients were included in the study. There were 21 (70%) males and 9 (30%) females with the mean age of 69 years (range 47–87). Mean ASA was 2.5 (1–3). Mean tumor size was 2.5 cm (1–4). There were 12 right side and 18 left side tumors. There were 2 (6%) complications, including postoperative hemorrhage that required transfusion and perinephric hematoma with no intervention. With the mean follow up 36 months, there were 5 (16.7%) recurrences. All patients successfully underwent percutaneous cryoablative. In following imaging studies there were no evidence of disease. Overall and cancer-specific was 98% and 100% respectively.
**Conclusions:** Radiofrequency provided successful treatment of renal masses with low recurrence rate at mean follow up of 3 years. Durable follow up required in order to determine long term efficacy.

**Poster #54**

**RENAL NEPHROMETRY SCORE IS ASSOCIATED WITH OPERATIVE MODALITY FOR PARTIAL NEPHRECTOMY**

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(Presented By: Seth Cohen)

**Introduction:** The RENAL nephrometry score seeks to quantify anatomical characteristics of renal tumors. Although preliminary studies have shown this system to be relatively reproducible, data is lacking regarding its clinical utility for surgical planning. We sought to identify if an association exists between nephrometry score and selected partial nephrectomy (PN) modality.

**Methods:** Multicenter, retrospective cohort analysis of patients who underwent PN for cT1 renal masses from 3/2000 for 6/2010. Partial nephrectomy modalities included open (OPN), laparoscopic (LPN), and robotic (RPN). Demographic, operative, and clinicopathological characteristics were compared between groups. Nephrometry sum was compared between groups by category (simple 4−6, intermediate 7−9, complex ≥10; and <8 vs. ≥8). Factors associated with treatment modality selection were entered into a multivariate model.

**Results:** Of 153 OPN, 100 LPN and 26 RPN patients evaluated, there were no significant differences with respect to demographic factors. Median tumor size (cm) was significantly larger in the open group (OPN 4.2 vs. LPN 2.4 vs. RPN 2.0, p<0.001). Warm ischemia time (min) were shorter in the open group (OPN 190 and 25 vs. LPN 200 and 29 vs. RPN 196 and 30, p=0.027 and p<0.001). High−grade Clavien complications occurred more often in the open surgery group (OPN 22% vs. LPN 7% vs. RPN 8%, p=0.004). Mean RENAL nephrometry score was highest in the open group (OPN 8+2 vs. LPN 6.3+1.8 vs. RPN 6.7+1.7, p<0.001). Complex lesions including those with Radius ≥7 cm, Nearness to the collecting system <4 mm, Posterior location, Location spanning polar line, and Hilar involvement were more likely to undergo OPN (p<0.001 in all). On multivariate analysis, there was no difference in the odds of undergoing laparoscopic or robotic surgery based on nephrometry score. Simple and intermediate lesions were more likely to be treated with LPN and RPN vs. OPN (OR 13.6 and 3.5, p<0.005), whereas complex lesions were more likely treated with open surgery.

**Conclusions:** RENAL score is useful in quantifying anatomical features of renal tumors and helps standardize terminology. Nephrometry score correlated with complexity of surgical excision and renorrhaphy of kidney tumors and was associated with the type of surgical approach (open vs. laparoscopic/robotic). RENAL score may offer clinical utility as a decision making instrument for treatment approach.

**Poster #55**

**DOES NEAR INFRARED FLUORESCENCE REAL TIME IMAGING USING INDOCYANINE GREEN IMPACT PERIOPERATIVE OUTCOMES DURING SURGEON CONTROLLED ROBOTIC PARTIAL NEPHRECTOMY: INITIAL CLINICAL EXPERIENCE OF 31 CASES**

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(Presented By: L. Spencer Krane)

**Purpose:** Surgeon controlled robotic partial nephrectomy (SCRPN) is gaining acceptance as an alternative to laparoscopic or open surgery for T1 renal tumors, due to technical ease in dissection, intracorporeal suturing and possible decrease in warm ischemia time. We evaluated the utility of near infrared fluorescence (NIRF) of intravenously injected indocyanine green (ICG) in performing SCRPN.

**Methods:** The fluorescence−capable da Vinci Si HD vision system is used white light and near infrared fluorescence imaging. Prior to hilar clamping or dissection 2mL of ICG was injected intravenously. Subsequently near infrared imaging was used to assess the renal vasculature in selective clamping of renal vessel and excision of the renal tumor in 31 patients. We used surgeon controlled bulldog clamps. multilayer primary suture closure was used for hemostasis and renorrhaphy.
Results: Thirty-one patients underwent SCRPN, utilizing a single dose of 2 mL ICG injection for NIRF imaging to demonstrate the vascular anatomy in all cases. Nephrometry scores were low (6/7) in 24 (77%) patients and moderate (8–10) in 7 (23%) patients. Mean warm ischemia time was 10 minutes with 10 (32%) of patients completing the procedure with zero ischemia time. The median hospital stay was 2 days. Mean radiologic tumor size was 2.9 cm. Pathology revealed clear cell renal cell carcinoma in 17, papillary renal cell carcinoma in 4, chromophobe in 3, and benign lesions in 7 patients. All surgical margins were negative on final pathology except for 1 patient with a pT1a Furham grade 2 clear cell tumor. Follow-up ranged from 1 – 4 months.

Conclusions: SCRPN utilizing NIRF imaging with ICG is a safe, feasible and effective method to delineate the renal vasculature and to differentiate renal tumors from surrounding normal parenchyma. In this study, this technique helped in only two steps of the procedure: identifying renal vessels, and maintaining normal renal parenchyma all around the tumor in order to decrease the positive margins. These advantages must be weighed against its cost.

Poster #56

PROSPECTIVE EVALUATION OF CELL CYCLE BIOMARKERS FOR PREDICTION OF CANCER-SPECIFIC MORTALITY IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA
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(Presented By: Aditya Bagrodia)

Introduction and Objective: There is a paucity of information regarding patient and pathological characteristics that accurately predict clinical outcomes for patients with upper tract urothelial carcinoma (UTUC). The purpose of the present study is to prospectively evaluate whether a biomarker panel of cell–cycle regulators can be used for prediction of cancer–specific mortality (CSM) in patients with UTUC.

Methods: Between 1/2007 and 6/2011, 71 patients underwent nephroureterectomy for biopsy–proven high grade UTUC. Patient and tumor characteristics were recorded, and primary tumors were prospectively evaluated for immunohistochemical expression of a panel including 4 biomarkers: p21, p27, p53, Ki–67/pRb. Unfavorable biomarker profile was defined as >2 altered markers. Multivariate Cox regression analysis (MVA) integrating the following pathologic features was performed: 1) non−organ confined disease (>T2 and/or N+), 2) lymphovascular invasion (LVI), 3) unfavorable biomarker panel. CSM was evaluated using the Kaplan–Meier method.

Results: Mean age and follow−up were 69 years (range 38–89) and 12.4 months (range 1–42), respectively. p21, p27, p53, and Ki–67 and/or pRb were altered in 14 (20%), 35 (49%), 32 (45%), and 62 (87%) patients, respectively. 51% (n=36) of tumors were organ confined (T stage <2, N=0), 31% (n=22) had LVI, and 32% (n=23) had an unfavorable panel. At the time of analysis, 18 (25%) patients had disease progression and 14 (20%) died from UTUC. On MVA, non−organ confined disease (HR=14.26, p<0.05) and unfavorable marker profile (HR= 3.1, p<0.05) were significantly associated with CSM. Patients with a favorable marker profile demonstrated improved CSM, compared to those with unfavorable score (73% vs 47%, p=0.03, Figure 1).

Conclusions: The urothelial carcinoma biomarker panel is a promising clinical tool for accurate identification of patients at high risk of adverse oncologic outcomes from UTUC. Incorporating this panel into clinical practice may allow for enhanced patient counseling, individualized (neo) adjuvant chemotherapy recommendations, and patient–specific surveillance regimens.
UROTHELIAL CARCINOMA AT THE URETERO-ENTERIC JUNCTION: MULTI-CENTER EVALUATION OF ONCOLOGIC OUTCOMES AFTER RADICAL NEPHROURETERECTOMY

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(Presented By: Ramy Youssef)

Objectives: The natural history of urothelial carcinoma arising at the uretero-enteric junction (UEJ) is poorly defined, and the data guiding clinical management of these patients is limited. Therefore, we evaluated oncological outcomes of patients treated for urothelial carcinoma at the UEJ.

Methods: Utilizing a multi-institutional database of patients treated with radical nephroureterectomy (RNU), we assessed the clinico-pathological parameters and oncologic outcomes of UEJ tumors compared to other upper tract urothelial carcinomas (UTUC). Survival analyses were performed to determine independent predictors of disease recurrence and cancer-specific mortality after RNU.

Results: The study included 1363 patients, 921 men and 442 women with 36 months median follow up after RNU. Compared to UTUC in the kidney or ureter, UEJ tumors (n=22) were more likely to demonstrate features of advanced disease which were proved to be independent predictors of disease recurrence and cancer specific mortality after RNU. The 5 year disease free survival (DFS) and cancer specific survival (CSS) rates were 25% and 39% in those with UEJ tumors versus 69% and 73% in those with UTUC in the kidney or ureter (P=0.001 and P=0.008, respectively).

Conclusions: UEJ tumors harbor features of locally advanced disease, associated with high risk of systemic recurrence and death from cancer after RNU. Our findings suggest the need for integration of systemic therapy into the management paradigm of these patients.
CENTRALIZATION OF ADRENAL SURGERY TO HIGH VOLUME HOSPITALS
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(Presented By: Jay Simhan)

Introduction: Although centralization of surgical procedures to high volume centers has been described previously, patterns of care for adrenal surgery are unknown. We investigated trends in regionalization of care for patients undergoing adrenalectomy using hospital discharge data from 3 Northeastern states.

Materials and Methods: Using 1996−2009 hospital discharge data from NY, NJ and PA, all patients ≥ 18 years undergoing adrenalectomy were identified. Hospital volume status was assigned by quintiles based on number of procedures performed on a per hospital basis in 1996 and divided as very low volume hospital (VLVH), low (LVH), moderate (MVH), high (HVH) and very high (VHVH). Outcome variables were examined by hospital volume status over time using logistic regression models.

Results: From 1996 to 2009, 8,338 patients underwent adrenalectomy with a significant shift towards regionalization to VHVHs (17 to 42%, p<0.001). For each successive year, odds of having surgery performed at a VHVH increased by 9% (OR 1.09 [CI 1.08−1.10]). There were significant differences in patient age, race, geographic location, and payer group (p<0.0001) comparing VLVHs to VHVHs. Patients at VHVHs were less likely to be ≥55 years (OR 0.76 [CI 0.72−0.80]), insured through Medicaid (OR 0.59 [CI 0.40−0.85]), or be uninsured (OR 0.30 [CI 0.21−0.43]). Controlling for year treated, patients were less likely to die in the hospital if treated at a VHVH (OR 0.38 [CI 0.19−0.75]).

Conclusions: These data demonstrates centralization of adrenalectomy to VHVHs since 1996 with improved clinical outcomes. Inequities in access to care to higher volume centers appear to exist and require further investigation.

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(Presented By: Isuru Jayaratna)

Introduction: Penile squamous cell carcinoma (PSCC) is a disfiguring and deadly disease. USC data has shown an increased incidence in specific US minority communities.

Objectives: We sought to determine the characteristics of our patient population at USC, and evaluate any correlation of these factors with stage and grade.

Methods: After IRB approval, a retrospective review of patients treated for PSCC at LAC-USC Medical Center, USC University Hospital, and Norris Comprehensive Cancer Center from 1991 – 2011 was completed. Patient characteristics were evaluated with descriptive statistics and contingency analyses.

Results: Of 69 patients identified with PSCC, 64 had surgical staging information available. Median follow up was 18 months (range 0 − 161). Median age at diagnosis was 50 (range 23−86), with 50.7% of patients ≥50 and 49.3% <50 at diagnosis. Hispanic patients represented 71% (n=44) of our cohort. 44 patients underwent partial penectomy, 10 total penectomy and 8 had a diagnostic biopsy. T stage distribution was Tis: 7.8% (n=5), T1: 39.1% (n=25), T2: 29.7% (n=19), T3: 18.8% (n=12), T4: 1.6% (n=1) and unknown: 3.1% (n=2). 38 groins were surgically evaluated, and 14 pelvic lymph node dissections were performed. Of the 24 patients who underwent a surgical lymph node evaluation. The N stage distribution was N1: 41.7% (n=10), N2: 12.5% (n=3) and N3: 45.8% (n=11). Median lymph node yield in groin dissections was 11, with a lymph node positivity rate of 49%. 30.8% (n=20), 41.5% (n=27), 12.3% (n=8) and 15.4% (n=10) of patients had well, moderately, poorly differentiated PSCC or unknown grade, respectively. There was no association of age (p=0.16) or race (p=0.24) with clinical stage. Stage was significantly associated with grade (p=0.049), with 75% of poorly differentiated tumors being Stage 4, compared with 21.4% of well−moderately differentiated tumors.
Conclusions: In our cohort, we found a primarily Hispanic ethnic prevalence, which is reflective of our patient population, as well as a markedly younger age at diagnosis in contrast to previously published reports. We observed a higher average stage in both T and N stages in our population compared with national averages. It is noted that the small sample size limits our power to draw conclusions, however this initial description of our population suggests variation in the disease process that may be related to demographic factors.

Poster #60

PROGNOSTIC VALUE OF EXTRANODAL EXTENSION IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA
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(Presented By: Eugene Cha)

Background: The aim of the current study was to assess the prognostic value of extranodal extension (ENE) and other lymph node (LN) parameters in a large multicenter cohort of patients with LN metastasis (LNM) following radical nephroureterectomy (RNU).

Methods: We performed a retrospective analysis of 222 patients with LNM treated with RNU for upper tract urothelial carcinoma (UTUC) without neoadjuvant therapy. Microscopically, each LN metastasis was evaluated for presence of ENE.

Results: The median number of LNs removed, number of positive LNs, and LN density were 4 (IQR: 8), 2 (IQR: 2), and 51.3% (IQR: 71.7%), respectively. Overall, 110 patients (49.5%) had ENE. Presence of ENE was associated with more advanced pT stage (p=0.026) and presence of necrosis in the primary tumor (p=0.023). In multivariable analyses, ENE was associated with disease recurrence (p=0.01) and cancer−specific mortality (p=0.013). LN density, when stratified by 30% cutoff, was associated with disease recurrence and cancer−specific mortality (p=0.048 and p=0.049) in univariable, but not in multivariable analyses. Addition of ENE to a multivariable model including pT stage and tumor architecture improved predictive accuracy for disease recurrence from 70.3% to 74.5% (p<0.001). Addition of ENE to a multivariable model including age, pT stage, and tumor architecture improved predictive accuracy for cancer−specific mortality from 70.6% to 74.4% (p<0.001).

Conclusions: ENE is a powerful predictor of clinical outcomes in UTUC patients with LNM. While other LN parameters seem to have limited clinical value, ENE could help risk stratify UTUC patients with LNM for better counseling and clinical trial design.

![Log Rank (Mantel-Cox) p < 0.001](image)
**Poster #61**

**HPV STATUS IN RELATION TO CLINICOPATHOLOGICAL CHARACTERISTICS IN PENILE CANCER PATIENTS AT LOS ANGELES COUNTY-USC (LAC-USC) MEDICAL CENTER**

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**Introduction:** Penile squamous cell carcinoma (PSCC) is a disfiguring and deadly disease. US cancer registry reports an increased incidence in certain US minority communities including those over-represented at LAC–USC. Human papilloma virus (HPV) infection is strongly associated with PSCC. This study examined correlations of HPV presence and subtype with PSCC patient clinicopathological characteristics at a tertiary referral center.

**Methods:** A retrospective review of PSCC patients at LAC–USC Medical Center between 1996–2010 was performed. Presence and genotype of HPV was detected from primary tumors of 33 PSCC patients by genomic DNA PCR amplification followed by reverse line blot hybridization. Associations with patient and tumor characteristics were examined by contingency analyses. Funding from USC Institute of Urology.

**Results:** 20 (60.6%) patients were HPV+, and 85% of all HPV+ cases harbored at least one high-risk viral strain (80% of all positive cases had HPV 16, 5% HPV 31, 10% HPV 66). 20% of all positive cases harbored low-risk HPV 11; HPV strains 6 or 35 were not detected in any specimen. 3 patients were positive for multiple strains. Overall median age at diagnosis was 53 (range: 24−77) yrs. Median age was 56 yrs and 49 yrs for HPV+ and HPV− patients, respectively. HPV infection trended towards being more prevalent in patients beyond the fifth decade of life, although this did not reach statistical significance (p=0.10). 22 (66.7%) patients were Hispanic; this ethnicity comprised 60% and 77% of HPV+ and HPV− cases, respectively (p=0.31). This cohort included Stage 0 (n= 1, n= 0), Stage 1 (n= 4, n=2), Stage 2 (n=4, n= 4), Stage 3 (n=5, n= 1), and Stage 4 (n= 4, n= 5) HPV+ and HPV− patients, respectively. Neither HPV status nor presence of nodal metastasis was significantly associated with stage (p=0.50, p=0.52 respectively). Tumor grade was available for 30 (90.9%) cases; while HPV+ cases tended to have higher proportion of moderately–poorly differentiated tumors than HPV− cases (77.8% vs. 58.3%), this was not statistically significant (p=0.32).

**Conclusions:** This cohort’s median age was considerably lower than prior reports. An overwhelming majority of HPV+ cases harbored at least one high–risk viral strain. Several interesting associations of HPV status with age and grade were noted, although the study was underpowered to note any significant differences. Further analysis will examine correlations of survival and therapy response with HPV status.

**Poster #62**

**A PHASE I STUDY OF TRC105 (ANTI-CD105 [ENDOGLIN] ANTIBODY) IN METASTATIC CASTRATION RESISTANT PROSTATE CANCER (MCRPC).**

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**Introduction:** Pre–clinical and clinical evidence demonstrates an important role for angiogenesis in mCRPC biology. CD105 (endoglin) is a transmembrane protein expressed on the surface of proliferating vascular endothelial cells. The expression of CD105 is required for the formation of new blood vessels. CD105 expression is increased during hypoxia and protects hypoxic endothelial cells from apoptosis. TRC105 is a human/murine chimeric IgG1 kappa monoclonal antibody that binds to human CD105 (endoglin). It inhibits angiogenesis and tumor growth through inhibition of endothelial cell proliferation, antibody–dependent cellular cytotoxicity, and induction of apoptosis. CD105, acting as an accessory protein, modulates the effects of TGF– β.

**Objectives:** The primary objective is to evaluate safety and identify the maximum tolerable dose (MTD) of TRC105. Secondary objectives include the assessment of TRC105 pharmacokinetics, PSA response rate, evaluation of progression free survival (PFS), overall response rate (ORR) and overall survival (OS).
**Methods:** Patients with an ECOG performance status (PS) ≤ 2, progressive mCRPC and either chemotherapy-naïve or post-docetaxel treatment were eligible. Five cohorts of patients, on escalating dose levels, receive TRC105 intravenously at doses of 1, 3, 10 or 15 mg/kg IV every 2 weeks (cohorts 1, 2, 3, and 5) or 10 mg/kg IV weekly (cohort 4) on a 4 week cycle. Response is assessed with imaging studies every 2 months for the first four months and then every 3 months thereafter.

**Results:** Sixteen patients are enrolled in cohorts 1–5. Median age is 65 (range 48–87), median ECOG PS is 1 (range 0–2), median Gleason score is 8 (range 6–10), median on-study PSA is 147.5 (range 0.1–3373), and median number of prior (non-hormonal) therapies is 3 (range 0–6). Median time on study is 16 weeks (range 8–28 weeks). One patient experienced a dose limiting toxicity (grade 4 vasovagal episode) in cohort 5. PSA declines were seen in 6 patients ranging from 20% to 57% from baseline. Ten out of 12 patients with measurable soft tissue disease achieved stable disease for at least two cycles. Four patients remain on study (one in cohort 4 and three in cohort 5).

**Conclusion:** TRC105 is tolerated up to 15 mg/kg every two weeks with early evidence of clinical activity in mCRPC. Accrual is ongoing to evaluate ORR, PFS, and OS in the phase II portion of this study.

**Funding:** Provided by the National Cancer Institute and TRACON pharmaceuticals.

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**CELL CYCLE PROGRESSION GENES DIFFERENTIATE INDOLENT FROM AGGRESSIVE PROSTATE CANCER**

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(Presented By: Steven Stone)

**Background:** The natural history of prostate cancer is highly variable and difficult to predict accurately. Improved tools are needed to match treatment more appropriately to a patient’s risk of progression. Therefore, we developed an expression signature composed of genes involved in cell cycle progression (CCP) and tested its utility in prostate cancer.

**Methods:** Using publically available expression data, we developed an expression signature composed of 31 CCP genes and 15 housekeepers. An expression score was derived as the mean of all CCP genes. The signature was tested in a retrospective cohort of 366 patients from the U.S. who had undergone radical prostatectomy; and in two retrospective UK cohorts of 337 men diagnosed by a transurethral resection (TURP) and 349 men diagnosed by needle biopsy both with clinically localized prostate cancer and managed conservatively.

**Results:** The cell cycle progression signature was a highly significant predictor of outcome in all three cohorts. After prostatectomy, the CCP score predicted biochemical recurrence in univariate ($\chi^2 = 34.0, 1\text{df}, p = 5.6 \times 10^{-9}$) and multivariate analysis ($\chi^2 = 21.65, 1\text{df}, p = 3.3 \times 10^{-6}$). The CCP score and PSA were the dominant variables in the best predictive model and were much more significant than any other clinical measure. In the TURP cohort, the CCP score was the dominant variable for predicting death from prostate cancer in both univariate ($\chi^2 = 92.7, 1\text{df}, p = 6.1 \times 10^{-22}$) and multivariate analyses ($\chi^2 = 42.2, p= 8.2 \times 10^{-11}$), where it was much stronger than all other prognostic factors. Finally, in the needle cohort CCP score was a better univariate predictor of prostate cancer death than any other variable ($\chi^2 = 37.6, 1\text{df}, p = 8.6 \times 10^{-10}$) and in a final multivariate analysis, which included Gleason and PSA, CCP dominated (HR for one unit increase = 1.65, 95% CI (1.31, 2.09) $\chi^2=17.7, p = 2.6 \times 10^{-5}$) with Gleason score ($\chi^2=12.1, p=5 \times 10^{-4}$) and baseline PSA ($\chi^2=5.7, p=0.017$) providing significant, but smaller additional contributions.

**Conclusions:** A CCP expression signature predicts prostate cancer outcome in multiple patient cohorts and diverse clinical settings. In all cases, it provides information beyond clinical and pathological variables to help differentiate aggressive from indolent disease.
DISTINGUISHING BENIGN PROSTATE HYPERPLASIA FROM PROSTATE CANCER BASED ON REACTIVE STROMA RESPONSE BY NANODEVICE THAT IDENTIFIES FUNCTIONAL PROTEIN BIOMARKERS
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(Presented By: Jennifer Linehan)

Introduction and Objective: Reactive stroma has been shown to be a predictor of biochemical free recurrence in prostate cancer (Ayala et al. 2003; 9:2003), however molecular markers of the stromal response have not yet been successfully applied in prognosis. We recently demonstrated that a thioredoxin–targeted nanodevice selectively binds to reactive stroma in frozen tumor sections (Singer et al. Nanomedicine 2011; 6:659). Thioredoxin was used as the targeting ligand because it is involved in numerous reductive pathways associated with the wound response mounted by the stroma. Our objective was to compare the stromal binding of the Thioredoxin–targeted nanodevice in (BPH) versus PCa to determine whether or not they could be distinguished using a stromal marker.

Methods: The nanodevice is a self-assembling system composed of DNA methyltransferase–thioredoxin fusion proteins covalently linked to a three-arm DNA scaffold. Robotic-Assisted radical prostatectomy tissue for frozen sections was obtained from 29 patients. Serial sections were incubated with varying concentrations of nanodevice in PBS and 1% BSA. Binding fluorescence was observed at 100x with a Zeiss Observer microscope and images of the entire tumor section were obtained by raster–tiling of individual pictures. A numerical grading system was given as the level of nanodevice fluorescence in the stroma. 1− was a lightly visible signal, 2− was a moderately intense visible signal and 3− was a bright and intense signal within the reactive stroma. Slides where then reviewed by a blinded pathologist for and histology and diagnosis.

Results: Fluorescent images of frozen exposed to the nanodevice were collected and graded. Although the specimens originated from 29 different patients with Gleason sums ranging from 6–to–10, seventeen of the slides analyzed were found to contain BPH only. Twelve slides contained PCa. We found a correlation between the intensity of Nanodevice binding to the stroma and the presence of PCa (Figure 1).

Conclusion: Thioredoxin–linked reductive pathways associated with the wound response may provide useful biomarkers of prostate cancer.
PERCENT CARCINOMA DEMONSTRATES BETTER PREDICTIVE VALUE THAN SURGICAL MARGINS FOR BIOCHEMICAL RECURRENTNESS AFTER ROBOTIC ASSISTED RADICAL PROSTATECTOMY

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(Presented By: Jennifer Linehan)

Introduction and Objectives: The impact of positive surgical margins (PMs) on biochemical recurrence after robot-assisted laparoscopic radical prostatectomy (RARP) is largely debated. Several nomograms and studies have focused on the prognostic value of tumor volume or tumor size in predicting biochemical recurrence (BCR). We demonstrated correlation between tumor size as percent carcinoma (%TI) in the prostate specimen with PMs and their link to predicting BCR after RARP.

Methods: We reviewed over 3,000 robotic-assisted radical prostatectomies for pathologic variables, PMs, %TI, and BCR. Two matched cohorts were created and adjusted for clinicopathologic variables differing only on %TI. Median follow-up was 18 months. To test the hypothesis, we analyzed the prognostic utility of both PMs and %TI on BCR. The probability of recurrence was estimated as a time-to-event endpoint with the Kaplan-Meier method and tested using the log-rank test. The predictive utility of our regressions on surgical margins by constructing ROC curves and estimating the area under the curve (AUC) resulting from each analysis.

Results and Limitations: 3,006 total patients of which 727 patients had PMs and 2,279 had negative margins (NMIs). Percent tumor in RARP specimens was shown to be a significant single predictor of PMs as the AUC was 0.71 (95% CI: 0.69–0.73). In our matched analysis, we found that %TI was a predictor of PMs and BCR. Biochemical free survival (BFS) was predicted in patients with varying amounts of %TI: ≤5% was 93%, ≤10% was 85% and when > 30% dropped to 58% (95% CI: 91%–95%). This is a retrospective study with limited follow-up and biochemical recurrence may have not yet occurred.

Conclusion: There is a relationship between PMs and %TI of the prostate. Both can function as predictors of BCR but given their relationship, %TI is a much stronger predictor of BCR and should be considered when discussing adjuvant therapy post prostatectomy.
Poster #66

PATHOLOGICAL AND ONCOLOGIC OUTCOMES FOR MEN WITH POSITIVE LYMPH NODES AT RADICAL PROSTATECTOMY: 30-YEAR EXPERIENCE FROM A SINGLE
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(Presented By: Ashley Ross)

Introduction: Lymph node (LN) metastases at radical prostatectomy (RP) are a poor prognostic indicator with regards to oncologic outcomes. We report the 30-year experience of a single institution with regard to LN metastases in men with clinically localized prostate cancer.

Methods: The Johns Hopkins Radical Prostatectomy Database (1982–2011) was queried for men with node-positive adenocarcinoma of the prostate (N+PC). 505 (2.5%) of 19,633 men were identified. Survival analysis was completed using the Kaplan–Meier method and proportional hazard regression models were created to identify predictors of outcome in this cohort.

Results: Median age was 59.5 years (range 38–76) and the majority of patients were Caucasian (452, 89.5%). Median PSA was 10.1 ng/mL (0.4–129), only 153 (30.3%) and 79 (15.6%) had clinical stage T2b and T2c/T3 respectively; 56 (11.1%), 38 (7.7%) and 4 (0.8%) men had Gleason 8, 9 and 10 at biopsy. At pathologic evaluation, 85 (16.9%), 115 (22.9%) and 2 (0.4%) had Gleason 8, 9 and 10 respectively. Median total and positive nodes were 13.2 (1–41) and 1.7 (1–12) respectively. 135 patients had a dominant nodule localized to one side of the prostate; in these patients 80 (59.3%) demonstrated positive LN on the ipsilateral side, 28 (20.7%) had contralateral positive LN and 15 (11.1%) had bilateral positive LN. 15-year biochemical-recurrence free, metastases-free and cancer-specific survival were 7.1%, 41.5% and 57.5% respectively. Predictors of biochemical-recurrence, metastases and death from prostate cancer in multivariable analysis included Gleason sum at RP and percent of positive LN; notably total LN dissected did not predict outcome.

Conclusions: In this highly-selected RP cohort, men with N+PC at RP can experience a durable long-term metastases-free and cancer-specific survival. Predictors of survival include Gleason sum and percentage of positive LN. While total number of LN dissected did not predict outcome, upwards of 30% of men with N+PC will have positive LN contralateral to the primary prostatic lesion highlighting the importance of a thorough, bilateral pelvic LN dissection.

Poster #67

IMPACT OF PROSTATE MRI ON DISEASE RECLASSIFICATION AMONG ACTIVE SURVEILLANCE CANDIDATES - A PROSPECTIVE COHORT STUDY
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(Presented By: David Margel)

Purpose: To report MRI findings among unselected men with low-risk prostate cancer (PCa) prior to active surveillance (AS).

Patients and methods: We prospectively enrolled men with low-grade, low risk, localized PCa. All patients underwent multiparametric endorectal coil MRI scanning and offered a confirmatory biopsy within one year of MRI. The primary outcome was the accuracy of MRI in identifying patients reclassified as no longer fulfilling AS criteria by a confirmatory biopsy. We further aimed to identify clinical parameters associated with reclassification. Cohort was stratified as follows: normal MRI; cancer on MRI concordant with initial biopsy (less than 1 cm); cancer on MRI larger than 1 cm. We performed a univariate analysis to assess differences in clinical parameters between groups.

Results: MRI did not detect cancer in 23 (38%) while MRI and initial biopsy were concordant in 24 patients (40%). MRI detected a 1 cm or larger lesion in 13 patients (22%). The positive and negative predictive values for MRI predating reclassification were 83% (95% CI, 73%–93%) and 81% (95% CI, 71%–91%), respectively. PSA density was elevated among patients with larger than 1 cm MRI lesions compared to those with no cancer on MRI (medians of 0.15 vs 0.07 ng/ml/cc, respectively p=0.016).

Conclusions: MRI appears to have a high accuracy in predicting reclassification among men choosing AS. Upon confirmation of our results MRI may be used to better select and guide patients before AS.
Poster #68

SPURIOUS ELEVATION OF SERUM PROSTATE-SPECIFIC ANTIGEN AFTER CURATIVE TREATMENT FOR PROSTATE CANCER: CLINICAL CONSEQUENCES AND THE ROLE OF HETEROPHILIC ANTIBODIES
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(Presented By: Christopher Anderson)

Objectives: Various interferences can cause spurious results for common laboratory tests. Although rare, heterophilic antibodies may produce false elevations in PSA that could prompt unnecessary treatment. The aim of our study was to determine the prevalence of small, spurious PSA elevations after curative treatment for prostate cancer and determine the role of heterophilic antibodies.

Methods: Phase I: All PSA tests drawn between 10/27/08 and 10/26/10 at our institution were analyzed (n=17,133). Patients who had been treated for prostate cancer with PSA values that changed from undetectable to detectable were then selected. Phase II: Patients who had a PSA <0.5 ng/mL measured between 10/24/2010 and 1/19/2011 were studied prospectively (n=1,288). If any patient had a previously undetectable value, their PSA test was subjected to analysis for heterophilic antibody interference.

Results obtained: Phase I: Eleven men had a spuriously elevated PSA after curative treatment for prostate cancer (0.3%). Mean time to PSA elevation was 3.4±5.5 years and mean elevation in PSA was 0.33±0.28 ng/mL. Each patient’s PSA was undetectable after being repeated and no patient went on to unnecessary treatment. Phase II: Twelve men with a history of prostate cancer and a newly detectable PSA had their test repeated with heterophilic antibody blocking reagent and each patient tested negative for interfering heterophilic antibodies.

Conclusions: In a large cohort, we estimate the prevalence of spuriously elevated PSA values after curative therapy for prostate cancer to be 0.3%. No patient was subjected to unnecessary diagnostic evaluation or treatment. On prospective evaluation of PSA conversion to low detectable levels, no patient had evidence of interfering heterophilic antibodies. When using PSA for post−treatment surveillance, it is crucial to confirm all concerning values and to consider the presence of laboratory error if the PSA value does not correlate with the clinical scenario.

Poster #69

PCA3 TEST AS AN ADJUNCT IN DIAGNOSIS OF PROSTATE CANCER
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(Presented By: Vladimir Yutkin)

Introduction: Early diagnosis of prostate cancer is conventionally done with serum prostate specific antigen (PSA) test and digital rectal examination, but these tests lack specificity. Many men worldwide undergo repeated, sometimes unnecessary prostate biopsies due to suspicious or rising PSA levels. A urine test PCA3 is gaining popularity, predominantly in the field of managing patients with suspicious PSA and previous benign biopsies.

Methods and Patients: In this multi−national study we assessed the performance of the PCA3 urine test in patients who were candidates for prostate biopsies due to high or rising PSA’s. The PCA3 scores were determined in urine samples in these men. A PCA3 scores of 35 or higher were considered higher probability of cancer. Subsequent biopsy was performed as per current best practice and at the discretion of the urologist in concert with the patient. To retrospectively assess the performance of PCA3, we used multiple logistic regression analysis and ROC curves were constructed to evaluate PCA3 as a prognostic factor compared with PSA and evaluated the influence of PCA3 testing on the decision making.
Results: 401 patients had PCA3 score available. The most common indication was rising or high PSA after previous negative biopsies – in 256 patients (63.8%), followed by the finding of high grade prostatic intraepithelial neoplasia (HGPIN) or atypical small acinar proliferation (ASAP) on previous biopsy – in 101 patients (25.2%). Forty four subjects (11%) did not undergo prostate biopsy prior to PCA3 testing. PCA3 scores were significantly lower in patients without malignancy using a cutoff score of 35 (OR 2.99 (95%CI) (1.42, 6.30), p=0.004). On Receiver Operating Curve analysis PCA3 AUC of 0.722 was significantly greater than PSA (0.4837). Sensitivity and specificity of PCA3 score using the 35 cutoff were 63.6% and 63.0%, respectively. When a cutoff score of 20 was used, the sensitivity and specificity of PCA3 score were 86.4% and 41.3%, respectively. The PCA3 test influenced the clinical course of the patient in 73.5% of cases.

Conclusion: in this multinational study we demonstrate that urine PCA3 score test out-performs PSA in decision making in men facing possibility of repeat prostate biopsy. We recommend that the PCA3 results should be integrated with other relevant data and rather be used in continuous fashion, and not with certain cutoff value.

Poster #70

POST-PROGRESSION TREATMENT WITH APC8015F MAY HAVE PROLONGED SURVIVAL OF SUBJECTS IN THE CONTROL ARM OF SIPULEUCEL-T PHASE 3 STUDIES
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(Presented By: Daniel George)

Introduction and Objectives: Sipuleucel−T is an autologous cellular immunotherapy approved by the FDA for the treatment of asymptomatic or minimally symptomatic metastatic castrate resistant (hormone refractory) prostate cancer.

Methods: After disease progression, subjects in the control arms of 3 randomized controlled trials (RCT) of sipuleucel−T were offered 3 infusions of APC8015F, an autologous immunotherapy made from cells cryopreserved at the time of control generation.

Results Obtained: 165/249 (66.3%) of the control group received APC8015F. Median time from randomization to first APC8015F infusion was 5.2 months (range 1.8 to 33.1), and from objective disease progression to first infusion was 2.2 months (range 0.5 to 14.6). 145 subjects (87.9%) received all 3 infusions. APC8015F−treated subjects had improved post−progression survival relative to untreated controls (HR = 0.52 [95% CI: 0.37, 0.73]; unadjusted Cox regression; P = 0.0001, log rank test), with median survival times of 20.0 and 9.8 months, respectively. APC8015F−treated subjects had more favorable prognostic features than untreated controls. To account for these differences, a Cox regression model was fit using backward selection, and included the following independent predictors of post−progression survival: lactate dehydrogenase, alkaline phosphatase, ECOG status, age, number of bone metastases, and hemoglobin. In addition, the model included post−randomization salvage treatment and docetaxel use as time dependent covariates. This analysis revealed a positive docetaxel effect (HR = 0.86 [95% CI: 0.60, 1.22]; P = 0.40), and a positive APCF8015F treatment effect (HR = 0.78 [95% CI: 0.54, 1.11]; P = 0.17).

In subjects who received at least one infusion of APC8015F, the cumulative product lot release characteristics of CD54 upregulation and total nucleated cell counts were correlated with survival after salvage treatment (p=0.03 and p=0.04, respectively).

Conclusions: Post−progression treatment with APC8015F may have extended survival of subjects, potentially reducing the magnitude of survival difference observed between sipuleucel−T and controls in RCT.

This abstract was previously presented at ASCO 2011 Annual Congress in Chicago, IL. Updated analyses will be presented.
MULTIINSTITUTIONAL VALIDATION OF UCSF CANCER OF THE PROSTATE RISK ASSESSMENT-POSTSURGICAL SCORE FOR PREDICTION OF RECURRENCE POST RADICAL PROSTATECTOMY

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(Presented By: Sanoj Punnen)

Introduction: The UCSF cancer of the prostate risk assessment – postsurgical (CAPRA−S) is a novel risk assessment tool that uses postoperative pathological data to predict the risk of recurrence post radical prostatectomy. The objective of this study was to validate its use in a large external database.

Methods and Materials: The Shared Equal Access Regional Cancer Hospital (SEARCH) database is a registry of men who underwent radical prostatectomy at 4 Veterans Affairs and 1 active military medical center. Of the 2,211 men in the SEARCH database, 2078 (94%) had full data available to calculate a CAPRA−S score. The CAPRA−S is determined by adding up to 3 points each for PSA and pathological Gleason score, 2 points each for positive surgical margins and seminal vesicle invasion and 1 point each for extra−capsular extension and lymph node involvement. Performance of the CAPRA−S score was assessed and compared to the Stephenson nomogram using proportional hazards regression, the concordance (c) index, calibration plots and decision curves analysis.

Results: Among this cohort, the mean age was 62 (SD 6.3) years and 33.3 % of the men recurred. The median follow up time of men who did not recur was 60.7 months. The hazard ratio (HR) for each one−point increase in the CAPRA−S score was 1.42 (95%CI 1.37−1.46). The 5−year recurrence free survival for those patients with a CAPRA−S score of 0–2, 3–6 and 7–10 were 74%, 45%, and 18%, respectively. The CAPRA−S c−index was 0.74 in this validation set, compared to a c−index of 0.77 for the original development set and 0.73 for the Stephenson nomogram. The CAPRA−S score performed better then the Stephenson nomogram on both calibration plots and decision curves analysis (FIG 1).

Conclusion: The CAPRA−S score accurately predicted recurrence after radical prostatectomy in this large cohort of men. This validates its use as an effective prognostic tool to stratify men with prostate cancer for risk of recurrence post surgery.

![CAPRA-S vs Stephenson Nomogram](image-url)
Purpose: The biology of prostate cancer may be influenced by the index lesion. Definition of index lesion’s volume is important for appropriate decision making, especially for image guided focal treatment. The purpose of this study was to determine accuracy of MRI for determining index tumor volume (ITV) compared with volumes derived from histopathology.

Material and method: We evaluated 135 patients (mean age 59.3 years) with a mean PSA of 6.74 ng/dL, who had multiparametric 3T endorectal coil MRI of prostate, subsequent radical prostatectomy. ITV was determined prospectively, independently by MRI, histopathology. Ellipsoid formula was applied to determine histopathology tumor volume (HTV), whereas manual tumor segmentation was used to determine magnetic resonance tumor volume (MRTV). HTV was correlated with age, PSA, MRTV by Pearson correlation, linear regression (LR) methods. Additionally, predictive power of MRTV, PSA, age for estimating HTV (>0.5 cm³) was assessed by ROC analysis.

Results: There was a positive correlation between HTV, MRTV (Pearson coefficient=0.633, p<0.0001) but a weak correlation between PSA, HTV (Pearson coefficient=0.237, p=0.003). At LR analysis, HTV and MRTV were correlated (R²=0.401, p<0.00001). At ROC analysis, area-under-curve values for MRTV, PSA, age in estimating tumors >0.5 cm³ at histopathology were 0.949 (p<0.000001), 0.685 (p=0.001), 0.627 (p=0.02), respectively.

Conclusion: MRI can accurately estimate ITV as determined by histology. MRI has better accuracy in predicting HTV in tumors >0.5 cm³ than PSA, age. ITVs as determined by MRI may be helpful in treatment planning, specifically in identifying tumor margins for image guided focal therapy, possibly selecting better active surveillance candidates.
Poster #73

PSA NADIR DURING ANDROGEN DEPRIVATION THERAPY PREDICTS ADVERSE PROSTATE CANCER SPECIFIC OUTCOMES: RESULTS FROM THE SEARCH DATABASE

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(Presented By: Christopher Keto)

Introduction and Objective: Traditionally, a PSA nadir on androgen deprivation therapy (ADT) >4 ng/ml has been correlated with poor outcome. More recently, a PSA nadir >0.2 ng/ml has been associated with prostate cancer (PC) specific mortality (PCSM). However, whether all men with nadir values <0.2 ng/ml have similar outcomes is untested. We examined the predictive value of PSA nadir including small but detectable nadir values during ADT on PC specific outcomes in men treated with early ADT for PSA–only recurrence after radical prostatectomy (RP) within the Shared Equal Access Regional Cancer Hospital (SEARCH) cohort.

Methods: We retrospectively reviewed data from 2892 men treated with RP between 1988 and 2010 within the SEARCH database to identify men treated with early ADT, defined as no evidence of metastatic disease at the start of ADT. PSA nadir on ADT was defined as the lowest PSA value during continuous ADT. PSA nadir was analyzed as a continuous variable and was also categorized to three groups: 0, 0.01−0.2, and >0.2ng/mL. Cox proportional hazards models were used to examine the link between PSA nadir and castrate resistant PC (CRPC), metastatic disease, and PCSM with the date of PSA nadir on ADT as time zero.

Results: During a median follow-up of 73 months after RP, 405 men (14%) were treated with early ADT. Of these men, 322 had complete data for analysis with a median follow-up after ADT nadir of 51 months. When examined as a continuous variable, higher PSA nadir on ADT was associated with progression to CRPC (HR=2.5, p<0.0001), development of metastatic disease (HR=2.1, p=0.001) and PCSM (HR=1.8, p=0.020). Men with a PSA nadir between 0.01−0.2 ng/mL were more likely to progress to CRPC (HR=4.1, p=0.001), develop metastases (HR=3.3, p=0.027) and ultimately die of prostate cancer (HR=4.5, p=0.011) than men with an undetectable nadir. Finally, relative to men with an undetectable nadir, those with a nadir >0.2ng/mL were at the greatest risk of progression to CRPC (HR=29.0, p=0.001), development of metastases (HR=13.1, p=0.001) and PCSM (HR=9.3, p<0.0001).

Conclusions: A detectable PSA nadir on ADT of any level is associated with increased risk for CRPC, metastases, and PCSM. Men who do not achieve an undetectable PSA nadir during ADT are at a dramatically increased risk of disease progression and therefore, should be considered for clinical trials.

Poster #74

APICAL UNDERSAMPLING OF THE PROSTATE ON TWELVE CORE TRANSRECTAL ULTRASOUND (TRUS) BIOPSY DETECTED BY MRI-GUIDED ELECTROMAGNETIC MAPPED FUSION BIOPSY

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(Presented By: Anup Vora)

Introduction: Transrectal ultrasound plays a central role in the diagnosis of prostate cancer, however, false negative rates have been reported as high as 30%. Mapping of radical prostatectomy specimens have shown undersampling of the peripheral zone with standard TRUS biopsy techniques, including the apical lateral horns. With development of a 3D–image fusion model which tracks biopsy location in real–time, we report our apical prostate sampling rate during standard twelve core TRUS biopsy.
Materials & Methods: Twenty patients underwent 3T endorectal coil multiparametric prostate MRI prior to biopsy and 3D TRUS images were obtained. An electromagnetic positioning device was attached to the TRUS probe in order to track the position of each needle pass. The 3D−TRUS image documenting the location of each biopsy was recorded and compared to its intended site.

Results: Twenty patients (median age 66) with a median PSA of 5.63 ng/ml and median prostatic volume of 43 cc underwent MRI fusion biopsy with electromagnetic tracking. Out of eighty total intended apical biopsies, the prostatic apex was successfully biopsied only 71% of the time with 29% of biopsies incorrectly targeting the prostatic mid–gland.

Conclusions: In our series, standard TRUS biopsy led to a significant undersampling of the apical prostate. Approximately 30% of the identified biopsies of the prostatic apex on transrectal ultrasound incorrectly sampled the prostate mid gland. The large false negative rate of TRUS should be considered as alternative imaging and diagnostic modalities, such as MRI, are being developed and may provide more reliable sampling of the prostate.

Poster #75

CLINICAL AND HISTOLOGICAL PROSTATITIS IN PATIENT UNDERGOING RADICAL PROSTATECTOMY FOR LOCALIZED PROSTATE CANCER
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(Presented By: Muhammad Bulbul)

Introduction: Few patients (pts) with prostate cancer (CaP) report past history of prostatitis, yet the association between them is gaining more interest. Whether prostatitis is a precursor for or protector against CaP is unclear. We examined the relationship between prostatitis and cancer and the effect on tumor parameters in pts with localized prostate cancer treated with radical prostatectomy.

Methods: 104 pts with localized CaP underwent radical retropubic prostatectomy. PSA ranged between 2.0 and 35 ng/ml. only three pts reported history consistent with chronic prostatitis in the past and five pts developed acute prostatitis following the needle biopsy at time of diagnosis. Pathological evaluation of the specimen focused on Gleason score, tumor volume (as a percentage of total gland volume), resection margins and presence of inflammation – focal or diffuse. The inflammation was labeled as focal when the acute and/or chronic inflammation constituted up to 10% of total prostatic volume and lacked any secondary architectural changes. Diffuse inflammation included more prostatic volume or showed evidence of glandular invasion or parenchymal destruction.

Results: 68/104 pts (66%) had concomitant inflammation (Group 1−GI) ; 35 focal (GIA), they include the 3 pts with history of chronic prostatitis and 33 diffuse (GIB), they include the 5 pts with post biopsy infection. In 36/104 pts (34%) inflammation with cancer was not seen (Group 2−GII). Median preoperative PSA for GI was 7.16 ng/ml (range: 1.76 to 35.0) with medians of 6.74 ng/ml for Gla and 7.16 ng/ml for Glb while median PSA for GII was 5.26 ng/ml (range: 2.3 to 19.3) (p = 0.13). Median Gleason score was 7 in both groups (range: GI 4−9, GII 5−9). Median percent tumor volume was 8% in GI (Gla 10%, Glb 5%) and 15% in GII. 18/68 pts (26%) of GI had positive surgical margins (11/35 pts in Gla and 7/33 pts in Glb) compared to 12/36 pts (34%) of GII.

Conclusion: History of clinical prostatitis is not common in pts with localized CaP but concomitant histologic prostatitis is common (Up to 66%). The presence of inflammation does not affect tumor grade but there is tendency for lower tumor volume. Organ confined disease is seen more in patients with inflammation. Possible explanation is that high PSA of patients with inflammation contributes to diagnosis of cancer at a lower volume and more confined disease.
DOES THE EXTENT OF POSITIVE SURGICAL MARGINS INFLUENCE BIOCHEMICAL RECURRENCE FOLLOWING RADICAL PROSTATECTOMY? – RESULTS FROM THE DUKE PROSTATE CENTER

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(Presented By: Suzanne Biehn Stewart)

Introduction and Objective: Postoperative radiotherapy improves outcomes in patients with high-risk pathological features following radical prostatectomy (RP). However, both the timing and the strict indication to administer this therapy, specifically for those patients with positive surgical margins (PSM), remain uncertain. Although there is agreement that PSMs portends worse risk of biochemical recurrence (BCR), the impact of the number of sites or specific location of PSMs remains variable in the literature. In addition, the degree of PSM severity and its consequent impact on disease progression has not been established. We therefore sought to better define the influence of PSM on BCR using actual measurements of tumor extension at surgical margins obtained during pathological assessment of RP specimens.

Methods: We retrospectively analyzed data from 1453 RP cases from the Duke Prostate Center from 2005 to 2009. PSM extension was analyzed both as a continuous and categorical variable using a priori defined ranges: <5mm, 5−10mm, >10mm. The impact of PSM extent on risk of BCR was evaluated using crude and adjusted Cox regression models.

Results: PSMs were identified in 445 (31%) patients following RP. After adjustment for clinicopathological covariates, greater PSM extension was significantly associated with increased BCR risk in all RP patients (HR 1.8, 95%CI 1.6−2.1, p<0.001) as well as among only those with positive margins (HR 1.4, 95%CI 1.1−1.7, p=0.005). Specifically, men with PSM extension >10mm experienced a shorter time to BCR compared to lower PSM extension groups (Figure 1). After controlling for potential confounders, a PSM extension >10mm continued to show an increased risk of BCR compared to men with PSM extension < 10mm (HR 2.5, 95%CI 1.4−4.4, p=0.002). There was no difference in BCR risk among men with PSM extension of 5−10mm and <5 mm (all p>0.115).

Conclusion: A greater extent of PSM does increase the likelihood of BCR among men who underwent RP. Specifically, a PSM >10mm was found to carry the greatest risk of recurrence. Use of PSM >10mm may serve as part of a more explicit criterion by which to identify high-risk patients who are likely to benefit from adjuvant radiotherapy.

![Risk of BCR among PSM Extension Groups](image-url)
**Poster #77**

**BIOCHEMICAL FAILURE IN D'AMICO LOW RISK PATIENTS WITH GLEASON SUM UPGRADING FOLLOWING RADICAL PROSTATECTOMY IN A MULTI-NATIONAL, MULTI-INSTITUTIONAL DATABASE**

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(Presented By: Danielle Brooks)

**Objectives:** We investigated the risk of BCR in D'Amico low risk patients with differing extents of upgrading as well as other clinicopathologic factors that might be independent predictors.

**Methods:** 7080 out of 22,403 men who underwent radical prostatectomy at more than 15 institutions were categorized as D'Amico low risk patients. Kaplan–Meier survival analysis was performed to compare BCR rates in patients with different extents of upgrading. Cox proportional hazard analysis was done to identify independent predictors of BCR. The median follow-up period for the selected patients was 30.6 months (IQR: 14.5–51.5).

**Results:** GS upgrading to 3+4, 4+3, and ≥8 was present in 35.6%, 8.5%, and 1.6% of patients on final histopathology, respectively. 96.8% of men with no GS upgrading remained free of BCR, while the percentages of patients who remained free of BCR with GS upgrading to 3+4, 4+3, and ≥8 were 95.8%, 90.1%, and 84.4%, respectively. Cox proportional hazard regression modeling identified preoperative PSA (OR=1.18; p<0.001), upgrading to Gleason 4+3 (OR=2.21; p<0.001), upgrading to GS≥8 (OR=3.60; p<0.001), positive margins (OR=3.29; p<0.001), EPE (OR=1.61; p=0.004), and SVI (OR=3.17; p<0.001) as significant independent predictors of BCR.

**Conclusions:** Patients classified as D'Amico low-risk upgraded to GS≥8 and 4+3 are at increased risk of BCR. Patients upgraded to 3+4 are not at higher risk of BCR. Preop PSA, positive margins, ECE, and SVI are also important independent predictors of BCR in this cohort.

**Poster #78**

**IMPACT OF STATIN THERAPY ON PSA KINETICS DURING ACTIVE SURVEILLANCE OF PROSTATE CANCER**

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(Presented By: William Rogers)

**Introduction and Objectives:** Statin therapy has been associated with decreased serum PSA levels in men undergoing prostate cancer screening, lower rate of adverse pathologic features in radical prostatectomy specimens and decreased risk of biochemical recurrence following prostatectomy. Here we evaluate the impact of statin therapy on PSA kinetics during active surveillance of prostate cancer.

**Methods:** A retrospective review of patients diagnosed with prostate cancer at our institution between the years 2000 and 2009 was performed. Patients undergoing at least 12 months of active surveillance were identified. PSA velocity and percentage change in PSA per year were compared between patients receiving and not receiving statin therapy during active surveillance. Subgroup analysis was performed on low risk patients (prebiopsy PSA 10 or less, Gleason score 6 or less, cT2 or less).

**Results Obtained:** We identified 81 patients meeting our inclusion criteria, 43% (35/81) were on statin therapy during active surveillance. Prebiopsy PSA was significantly lower in patients receiving statin therapy (6.0 ng/ml) compared to controls (8.3 ng/ml), p = 0.005. There was no difference in duration of active surveillance, PSA velocity, and percentage change in PSA per year based on statin use in all patients. When evaluating the 41 low risk patients, 54% (22/41) were on statin therapy. Duration of active surveillance was similar between low risk patients receiving statin therapy (35 months) and controls (41 months), p=0.13. Prebiopsy PSA was lower in low risk patients receiving statin therapy (4.9 ng/ml) compared to controls (6.4 ng/ml), p=0.055. PSA velocity was significantly lower in low risk patients (0.02 ng/ml/year) compared to low risk controls (0.89 ng/ml/year), p=0.024. Percentage change in PSA per year was significantly lower in low risk patients receiving statin therapy (−1.7%/year) compared to low risk controls (11.6%/year), p=0.05. The percentage of low risk patients receiving definitive therapy following a period of active surveillance on statin therapy was 9% (2/22) compared to 26% (5/19) in controls, p = 0.14.

**Conclusions:** PSA kinetics during active surveillance appear to be significantly altered by statin therapy in low risk patients. Further evaluation of the impact of statin therapy on PSA kinetics and clinical outcomes of men undergoing active surveillance for prostate cancer are warranted.
CREATION OF A COMPREHENSIVE OUTCOMES ANALYSIS UNIT AND BIOSPECIMENS REPOSITORY FOR ROBOT ASSISTED RADICAL PROSTATECTOMY

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(Presented By: Rafael Nunez-Nateras)

Purpose: To present our experience with an IRB approved research effort dedicated to outcomes analysis and the development of a biospecimen repository for prostate cancer. Both initiatives are intimately linked and establish a foundation for further research in patients undergoing robot assisted radical prostatectomy (RARP).

Materials and Methods: One full time coordinator for biospecimen collection and one part time coordinator for outcomes analysis have been designated to this project. RARP patients are invited to participate. Patient consent is obtained during the pre−op visit or mailed to patients not captured pre−operatively. A series of workflow steps are performed to ensure samples and QOL data are collected at established time points: 1. Preoperatively: blood (plasma, buffy coat, and serum) and urine, 2. Time of surgery: Pathology obtains a prostate tissue sample from gross tumor or based on the location from the preoperative biopsy. The sample is frozen for storage along with unique coding linking to the clinical database. A mirror image of this tissue is processed with the routine pathology exam to confirm the presence of malignancy. 3. Postoperatively: Same as pre−op at 3, 6, 12, 18, 24, 36, 48 and 60 months. Surveys (EPIC, SHIM and AUA−SS) are sent by mail at the following time points: Pre−op, 6 weeks, 3, 6, & 9 months, 1, 1 ½, and 2 years postoperatively. Clinical variables extracted from the electronic medical record are also captured.

Results: The program has been in practice for 12 months. During this time, obstacles have been identified and addressed, leading to 225 patients (60% of patients undergoing RARP for 1 year) currently contributing to the biospecimen repository. Samples stored yielded a 74% rate of cancer in the specimen. Regarding the outcome analysis, surveys have been sent to 382 patients with a response rate of 65%.

Conclusion: A comprehensive biorepository and quality of life collection can be challenging but feasible. This requires coordination between the departments of urology, pathology, laboratory services, and data coordinators to be accomplished efficiently and effectively. Identifying pitfalls and obstacles can help further future efforts in our institution as well as others across the country.

CERTIFICATE OF NEED PROGRAMS AND IMRT UTILIZATION FOR PROSTATE CANCER: AN EFFECTIVE CONTROL?

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(Presented By: Abhinav Khanna)

Introduction and Objectives: Certificate of Need (CON) designation, which requires state approval before the purchase of medical equipment or the establishment of health facilities, purportedly controls IMRT utilization and costs. We compared IMRT utilization and prostate cancer cost in regions with and without active CON programs.

Methods: Surveillance Epidemiology and End Results (SEER)–Medicare linked data was used to identify men diagnosed with prostate cancer during 2002 through 2007. SEER registries were designated CON Yes versus CON No based on whether the state in which they are located required CON for IMRT during the study period. IMRT utilization was assessed relative to all radiation and surgical therapies for prostate cancer. A Mantel–Haenszel test was performed to compare IMRT utilization in CON Yes vs. CON No regions. Wilcoxon rank−sum test compared median cost of prostate cancer therapy in the year following diagnosis.
Results: 45,636 men with a prostate cancer diagnosis were identified, including 16,840 men in 6 CON No regions and 28,796 patients in 10 CON Yes regions. Utilization of IMRT increased in all regions during the study period. There was a 73.1% (95% CI: 69.3%, 77.1%) increase in the odds of IMRT usage increasing per year in CON Yes regions, as compared with a 53.9% (95% CI: 49.3%, 58.7%) increase in the odds of IMRT usage increasing per year in CON No regions. Conversely, use of surgery decreased, with no difference in the odds of surgery utilization declining per year between CON Yes (8%; CI 6%, 10%) and CON No (9%; CI 7%, 12%) groups. CON designation was not associated with variation in greater prostate cancer costs over time.

Conclusions: Greater IMRT utilization was observed in CON Yes vs. No regions, and CON designation did not attenuate prostate cancer costs. Our findings suggest that alternative mechanisms may be necessary to check the rapid adoption of costly technology with limited comparative effectiveness outcomes.

Poster #81

IDENTIFICATION OF PROSTATE CANCER-EXPRESSED MICRORNAS ASSOCIATED WITH CLINICAL RECURRENCE AND PROSTATE CANCER SPECIFIC SURVIVAL FOLLOWING RADICAL PROSTATECTOMY

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(Presented By: Eric Klein)

Background: We have previously reported the identification of messenger RNAs (mRNAs) whose expression in prostate cancer can distinguish between aggressive and indolent disease. Representing multiple key genomic pathways, these mRNAs are significantly associated with clinical recurrence (cR) after radical prostatectomy (RP) as well as prostate cancer-specific survival (PCSS), providing prognostic information beyond PSA, cT stage and Gleason Score (Klein SUO 2010; Klein ASCO GU 2011 #39). We evaluated expression of microRNAs in the same specimens for association with cR and PCSS.

Methods: As previously described, all pts with cT1/cT2 prostate cancer treated with RP at Cleveland Clinic from 1987–2004 were identified(n=2,600), of which 127 patients with cR and 374 pts without cR after RP were randomly selected using cohort sampling. RNA was purified from 2 macrodissected, fixed paraffin-embedded (FPE) tumor specimens per pt. Expression of 76 test and 5 reference miRs was quantified with Taqman® RT-PCR assays. Cox regression and control of the false discovery rate (FDR) was used to assess reference-normalized microRNA and mRNA expression for association with cR and PCSS.
Results: 106 pts with cR and 310 without cR had sufficient RNA and successful assays for microRNAs. Analysis of primary Gleason pattern tumor tissue for each pt identified 21 microRNAs associated with cR and 13 microRNAs associated with PCSS, with FDR at 10%; 8 microRNAs were associated with both endpoints. Similar analysis of highest Gleason pattern tumor tissue for each pt identified 22 microRNAs associated with cR (17 overlapping with those for the primary Gleason pattern) and 7 microRNAs associated with PCSS, with FDR at 10%; 4 were associated with both endpoints. miR−1, miR−21, miR−93, and miR−106b were associated with both cR and PCSS in the primary and highest Gleason pattern specimens. The 76 microRNAs in this study tended to have lower standardized hazard ratios and weaker association with cR and PCSS than the 732 mRNAs. In multivariate analyses, mRNAs and microRNAs provided prognostic information beyond baseline PSA, clinical T−stage, and biopsy Gleason score. MicroRNAs co−express more frequently with each other than with mRNAs, which may indicate distinct biological regulation.

Conclusions: Expression of some microRNAs assayed in FPE prostate tumor tissue was associated with cR and PCSS after RP in this study, and may retain prognostic value in the face of tumor heterogeneity.

Poster #82

BLOCKADE OF TGF-BETA ENHANCES CYTOTOXICITY OF GENETICALLY MODIFIED HUMAN T CELLS TARGETED AGAINST PROSTATE SPECIFIC MEMBRANE ANTIGEN

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(Presented By: Stephen Poon)

Introduction: Phase I clinical trials utilizing genetically modified T cells for the treatment of metastatic prostate cancer (PCa) are currently underway. We have created a 2nd generation chimeric antigen receptor (CAR) P28z against prostate specific membrane antigen (PSMA). Thus, P28z CAR+ T cells receive an activating CD3 zeta chain signal and CD28 costimulatory signal when PSMA expressing tumors are encountered. However, tumors have adopted a number of mechanisms to evade the host immune response. PCa is known to secrete high levels of TGFBeta that has a direct immunosuppressive effect. We hypothesized that blocking TGFBeta signaling would enhance T cell function.

Methods: We created three gamma retroviral bicistronic vectors expressing the P28z CAR and 1) a dominant negative mutant (DNR) with a truncated version of the TGFBeta Receptor II (TBR2), 2) a soluble TBR2 (sTBR2) or 3) a neutral protein (LNGFR) as a control [see figure]. Human T cells from healthy donors were transduced with virus and cultured with or without the presence of TGFBeta1. These three groups were compared. Cytotoxicity was assayed by a chromium release assay. In vitro proliferation and cytokine expression were tested by weekly stimulation of CAR+ T cells on LNCaP PCa cells. A systemic xenograft PCa model was established by injecting TGFBeta1 secreting PSMA+ PC3 PCa cells into immunodeficient (NSG) mice. Engineered T cells were given intravenously. In vivo anti−tumor activity was determined by bioluminescent imaging to assess tumor burden and animal survival.

Results: Transduced T cells with the DNR and sTBR2 were more resistant to TGFBeta than T cells with LNGFR. DNR+ and sTBR2+ T cells exhibited increased cytotoxicity against PSMA+ EL4 target cells and increased secretion of effector cytokines (IL2, GM−CSF, and IFNy) after stimulation. Elevated levels of TGFBeta were detected in the serum of NSG mice with PC3 metastases, and transduced T cells were effective in eradicating these PCa tumors.

Conclusions: TGFBeta signaling blockade can successfully be incorporated into viral vectors via the DNR or sTBR. These modifications enhance the function of P28z CAR+ T cells against PCa tumors.

Funding: T32 CA082088−11 (SP); P01 CA059350−17 (MS)
MULTIPARAMETRIC MAGNETIC RESONANCE IMAGING DETECTS PROSTATE CANCER IN PATIENTS WITH PRIOR NEGATIVE TRUS BIOPSIES

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(Presented By: Nitin Yerram)

Introduction: Patients with multiple negative trans–rectal ultrasound (TRUS) biopsies, a rising prostate specific antigen (PSA) and high clinical suspicion for prostate cancer create a diagnostic dilemma. The ability of multiparametric (mp) MRI to detect distinct lesions within the prostate and it’s increased sensitivity as compared with TRUS biopsy alone, may make MR/US guided biopsy an effective tool in this select group of patients.

Methods: A retrospective review was performed on all patients undergoing MR/US fusion biopsy from March 2007 to July 2011. All patients had one or more previous negative biopsies at an outside institution. Patients underwent 3 Tesla mpMRI of the prostate with endorectal coil, consisting of T2, dynamic contrast enhanced, diffusion weighted and spectroscopy images. All prostate MRI lesions were graded by number of positive parameters into low, moderate, and high risk for prostate cancer. Patients had both a 12 core TRUS biopsy and targeted MRI tracked biopsies of any concerning lesions. Patients with all negative previous biopsies followed by a positive biopsy at the NIH were selected and analyzed.

Results: Of 119 patients with previous negative biopsies, 47 (39%) had positive initial biopsies on our current MR fusion protocol. Of these 47, 11 (23%) were positive on random US biopsy only, 21 (45%) were positive on MR targeted biopsy and TRUS biopsy, and 15 (32%) were positive on MR targeted biopsy only. Mean age at biopsy was 62.2 years (range 40–80), mean number of previous biopsy sessions in these patients was 2.5 (range 1–9), mean PSA was 20.84 ng/ml (range 2.57–64.1), and mean prostate volume was 50cc (range 26–124).

Of the 36 patients identified by MR targeted biopsy, there were 66 lesions positive for prostate cancer after biopsy. Upon review by an experienced GU pathologist, 25 of these lesions were characterized as high risk prostate cancer (Gleason primary 4) and 41 were lower risk prostate cancer (Gleason primary 3).

Conclusions: Multiparametric MRI, in conjunction with a MR/US fusion biopsy platform, is a novel diagnostic tool for detecting prostate cancer in patients with previously negative TRUS biopsies in the face of a persistent clinical suspicion for cancer. Furthermore, a sizeable percentage of these patients harbor aggressive disease which otherwise may go undetected, without the addition of fusion biopsy.
ROLE OF ENDORECTAL MRI FUSION PROSTATE BIOPSY IN TREATMENT OF LOCALIZED PROSTATE CANCER BEFORE AND AFTER HIGH-INTENSITY FOCUSED ULTRASOUND (HIFU) THERAPY

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¹Georgetown University Hospital, Washington DC; ²National Institutes of Health, Bethesda, MD; ³Chinn & Chinn Associates, Arcadia, CA; ⁴Phillips Engineering, Briarcliff Manor, NY
(Presented By: Anup Vora)

Introduction: Transrectal high-intensity focused ultrasound (HIFU) is becoming increasingly utilized despite its lack of availability in the USA. As treatment guidelines are not established, we report our experience with multiparametric MRI (mpMRI) and image guided fusion biopsy technology in the perioperative detection of occult malignancy in patients undergoing HIFU.

Materials & Methods: Eleven patients were referred to the NIH for 3T-endorectal coil mpMRI, with areas suspicious for malignancy sampled via a MRI/TRUS fusion biopsy platform. Three patients were being considered for primary HIFU treatment (median PSA 4.97, Gleason 6) and eight patients were post HIFU ablation (median time 41 months) with a rising serum PSA (median 4.3) and prior negative TRUS biopsies.

Results: Of the three patients undergoing preablative evaluation, our standard TRUS biopsy revealed similar patterns of prostate cancer as their outside institution. However, in two of these patients (67%), MRI targeted fusion−biopsy of suspicious lesions identified new areas of Gleason 6 disease. Of the eight patients who presented with biochemical recurrence post−HIFU, four patients (50%) had residual malignancy detected on the MRI targeted biopsy and not on the standard TRUS.

Conclusions: In this series, our mpMRI and image−fusion biopsy platform was able to identify occult malignancy in patients who have had biochemical recurrence after HIFU. New areas of malignancy were also identified in pre−HIFU planning when compared to standard−TRUS. MR imaging may be useful in delineating the burden of disease in patients being selected for HIFU as primary therapy or in managing patients with post HIFU ablation failure.

SMALLER PROSTATE SIZE IS INDEPENDENTLY ASSOCIATED WITH BIOCHEMICAL RECURRENCE IN GLEASON 7 PROSTATE CANCER

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(Presented By: Boris Gershman)

Introduction and Objectives: Prostate size is associated with a number of negative prognostic indicators. We evaluated the effect of prostate size on biochemical recurrence following radical prostatectomy.

Methods: We conducted a retrospective review of patients with Gleason 6–10 prostate cancer who underwent radical retropubic prostatectomy at the Massachusetts General Hospital from 1993 – 1999. Patients were excluded if they received neoadjuvant therapy, had less than 8 weeks of follow-up, or PSA did not fall below 0.2 ng/ml post-operatively. Biochemical recurrence was defined as a PSA rise to 0.2 ng/ml or greater with a confirmatory value if available. Cox proportional hazards models were used to evaluate for association between variables and biochemical recurrence.
Results Obtained: A total of 877 patients underwent surgery with a mean follow-up of 7.5 ± 4.5 years (range 0.2 – 16.3). Mean age, PSA, and prostate weight were 61.0 ± 6.9 years, 7.3 ± 5.5 ng/ml, and 46.7 ± 19.1 grams, respectively. Gleason score was distributed as follows: 6 in 422 patients (48.1%), 7 in 372 patients (42.4%), and 8–10 in 83 patients (9.5%). Using univariate Cox proportional hazards models, older age, higher PSA, higher Gleason score, presence of pT3 or pT4 disease, positive margins, and smaller prostate weight were associated with biochemical recurrence (p < 0.05 for each). After stepwise addition of each variable in a multivariate Cox model, prostate weight lost significance only when Gleason score was included in the model. To assess for effect modification, multivariate Cox models were stratified by Gleason score (Table 1). In this analysis, prostate weight was associated with biochemical recurrence only for Gleason 7 disease, but margin status was associated with recurrence for Gleason 6 disease.

Conclusions: Smaller prostate size is independently associated with biochemical recurrence for Gleason 7 disease while a positive surgical margin is associated with biochemical recurrence for Gleason 6 disease. These results have implications in the management of patients with small prostate glands.

| Table 1: Multivariate Cox proportional hazards model stratified by Gleason score. HR represents unit odds ratio for continuous variables. n represents number of events / total number of patients in Gleason category. |
|-------------|-------------|-------------|-------------|
|             | Gleason 6 (n=40/368) | Gleason 7 (n=123/315) | Gleason 8-10 (n=45/68) |
| Age (years) | HR | p-value | HR | p-value | HR | p-value |
| 1.01        | 0.657 | 1.02 | 0.993 | 0.778 |
| PSA (ng/mL) | 1.04 | 0.312 | 1.05 | <0.001 | 1.02 | 0.485 |
| Prostate weight (grams) | 0.985 | 0.147 | 0.986 | 0.023 | 1.01 | 0.355 |
| pT3+ vs pT2 | 0.675 | 0.410 | 1.42 | 0.076 | 1.39 | 0.302 |
| Positive Margin | 3.06 | <0.001 | 1.43 | 0.054 | 0.799 | 0.406 |

Poster #86

COMPARATIVE OUTCOME ANALYSIS OF OPEN VERSUS LAPAROSCOPIC VERSUS ROBOTIC-ASSISTED RADICAL PROSTATECTOMY MATCHED BY D’AMICO RISK CATEGORY IN A LARGE, MULTINATIONAL, MULTI-INSTITUTIONAL DATABASE

Prasanna Sooriakumaran, Abhishek Srivastava, Matthieu Durand, Danielle Brooks, Daniel Sagalovich, Adam Calaway, Samarpit Rai, Shahroksh Shariat and Ashutosh Tewari
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(Presented By: Prasanna Sooriakumaran)

Introduction and Objectives: We report a comparison of the biochemical recurrence rates (BCR) of ORP, LRP, and RARP in a large multinational, multi-institutional series.

Methods: 22,403 patients with prostate cancer underwent RP from January 2000 onwards by 40 surgeons at 15 institutions. 10,092 patients underwent ORP with a median follow up of 32.2 months; 7873 patients underwent LRP with a median follow up of 32.3 months; 4438 patients underwent RARP with a median follow up of 22.3 months. BCR was stratified by D’Amico risk. Cox regression was used to identify independent predictors of BCR.
**Results:** 7543 patients were D’Amico low risk, 7387 patients were intermediate risk, and 2969 patients were high risk. The percentage of patients that remained free of BCR was 95.4% ORP, 93.0% LRP, and 97.8% RARP for low risk; 80.1% ORP, 82.1% LRP, and 94.2% RARP for intermediate risk; and 57.3% ORP, 68.0% LRP, and 86.4% RARP for high risk. Cox regression analysis identified preop PSA, RP Gleason 7, RP Gleason ≥ 8, positive margins, ECE, and SVI as independent predictors of BCR for all risk categories. LRP was also identified as an independent predictor of BCR for D’Amico low risk, and RARP was identified as a negative predictor for D’Amico intermediate (OR=0.64) and high (OR=0.68) risk groups.

**Conclusions:** RARP appears to be at least non–inferior to ORP and LRP in terms of short to medium term BCR rate, regardless of D’Amico risk categorization.

**Poster #87**

**CD117 EXPRESSION IN CIRCULATING CELLS AS POTENTIAL PREDICTOR OF ADVANCED PROSTATE CANCER**

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(Presented By: Bethany Kerr)

**Introduction:** Recent evidence suggests that cancer stem cells (CSCs) may be responsible for the initiation, maintenance, and relapse of tumors. We investigated the presence/concentration of two CSC markers, CD117+ and CD133+, and their potential prognostic capability in the blood of patients undergoing surgical treatment for localized prostate cancer.

**Methods:** Whole blood samples were collected immediately pre–operatively, at 1 and 12 weeks post–operatively from 115 consecutive prostate cancer patients undergoing surgery between 2008 and 2011. The lymphocyte layer was isolated for evaluation by flow–cytometry. Immunohistochemical staining for the two markers was performed on final pathological specimens. We evaluated the correlation between the blood concentrations of CD117 and CD133 markers in the pre– and post–operative period with the stage of disease, Gleason score, PSA, and disease recurrence/progression.

**Results:** The median patient follow–up was 11 months (range, 2–30). Prostate cancer recurrence was observed in 11 (10%) patients. Only circulating CD117 marker, and not CD133, was increased in patients with higher stage cancers pT3 (3.6%±0.4) in comparison to lower stage pT2 disease (2.6%±0.2). The decline in circulating marker levels after tumor removal was only observed with the CD117 marker, and only in patients with higher stage pT3 disease (T2: 2.3%±0.2 vs T3: 1.8%±0.2). CD117 expression did not decrease at 3 months post–operatively in patients with subsequent biochemical recurrence in comparison to patients without evidence of disease. Immunohistochemical staining showed that both CD133 and CD117 were significantly increased in high grade tumors in comparison to benign tissues (3.9 and 3.5 fold, respectively).

**Conclusion:** CD117 expression in circulating cells may be predictive of high grade, clinically significant prostate cancers. It may play an important role in identifying patients likely to have future recurrence and metastatic disease.

**Poster #88**

**ULTRA HIGH-RESOLUTION TRANSRECTAL ULTRASOUND: A NOVEL TECHNIQUE FOR ENHANCED PROSTATE CANCER IMAGING**

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Johns Hopkins Medical Institutions, Brady Urological Institute, Baltimore, MD
(Presented By: Jeffrey Mullins)

**Introduction and Objectives:** Prostate cancer is the only solid malignancy for which no reliable imaging modality exists. Ultra high–resolution transrectal ultrasound (UHR−TRUS) provides enhanced image definition by utilizing a unique transducer with a center frequency of 21 MHz. We report the initial experience with UHR−TRUS in the detection of human prostate cancer.
Methods: 25 men with prostate cancer scheduled for radical prostatectomy (RP) are being prospectively recruited into a clinical trial comparing ultra high-resolution and low-resolution TRUS. Patients with glands <60gm are imaged transrectally using both modalities in an attempt to identify foci of altered echogenicity ≥ 5mm in maximum diameter in each sextant area of the prostate. Actual areas of prostate cancer > 5mm in maximal diameter at sagittally-sectioned RP specimen are correlated to abnormal foci previously noted on sagittal LR− and UHR−TRUS cine−loops. Complications, adverse events, and pain scores using LR−TRUS or UHR−TRUS are recorded. Sensitivity and specificity analysis are performed for each imaging modality. Ultrasound equipment was provided by Imagistx Inc.

Results Obtained: 20 men have been enrolled to date. There have been no complications or adverse events. Pain scores using the LR− and UHR−probes were not significantly different. Imaging and RP pathologic data analysis has been completed for 15 patients. Among the 42 pathologically identified cancerous foci, LR−TRUS identified 16 and missed 26. HR−TRUS identified 28 and missed 14. Sensitivity was 38.1% for LR−TRUS and 66.7% for UHR−TRUS. Specificity was 54.2% for LR−TRUS and 72.9% for UHR−TRUS. Agreements between LR−TRUS vs. pathology and UHR−TRUS vs. pathology were compared using McNemar’s test; UHR−TRUS was significantly superior to LR−TRUS (p = 0.034) for cancer detection.

Conclusions: UHR−TRUS appears to be a safe and promising imaging modality for prostate cancer detection. Our initial experience suggests superiority to LR−TRUS in the detection of cancerous foci. Completion of our pilot study is likely to support larger scale clinical trials of this novel ultrasound technology.

THE QUALITY OF PROSTATE CRYOTHERAPY INFORMATION ON THE INTERNET
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(Presented By: Raj Kurpad)

Introduction and Objectives: It is becoming more common for patients to refer to the Internet to supplement information from their physicians concerning their healthcare. In fact, it has been estimated that over 80% patients utilize the Internet as a primary source of oncology−related information. We sought to evaluate current information on the Internet that relates to cryotherapy for prostate cancer.

Methods: Two top search engines, Google and Yahoo, were used to search the term “cryotherapy for prostate cancer” and obtain the top 50 websites for each. The provider sites were analyzed with regard to presence and accuracy of evidence−based (EB) information on three outcome measures; procedural efficacy, functional outcomes and side effects from cryotherapy for prostate cancer. (The AUA Best Practice Statement (2008), Cochrane Database Systematic Review (2007), along with peer−reviewed literature was used as the primary reference to evaluate the information from these sites.)

Results: Of the 100 websites, 43 were from private provider sites, 17 from academic institutions, 19 news articles, 18 links to published manuscripts, 2 programs and 1 support group. Analysis of the 60 provider sites showed that 57% posted EB information concerning efficacy of cryotherapy, 30% had non−EB information, 5% had both, and 8% had no information at all. With regard to functional outcomes, 44% had EB information, 43% had non−EB information, 3% had both, and 10% had no information. With regard to side effects from cryotherapy, 43% had EB information, 40% had non−EB information, 5% had both, and 12% had no information. No website listed the AUA guidelines as a primary reference to evaluate the information from these sites.

Conclusions: These findings suggest that physicians/providers, both private and academic, are responsible for a majority of the information online about cryotherapy for prostate cancer, but do not always present evidence−based literature. Non−EB information is provided almost as often as EB information with regard to oncologic and functional outcomes. This highlights the importance for providers to offer factual and evidence−based information to the public and avoid unproven claims.
Poster #90

A LOWER PSA AT THE TIME OF TREATMENT WITH SALVAGE CRYOABLATION OF THE PROSTATE RESULTS IN IMPROVED FREEDOM FROM BIOCHEMICAL FAILURE
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(Presented By: Brooke Edwards)

Introduction: Curative treatment options for recurrent prostate cancer (PCA) after radiation therapy (RT) include salvage prostatectomy and salvage cryoablation of the prostate (SCAP). SCAP has previously been reported to be generally well tolerated with disease free survival rates similar to salvage prostatectomy.

Objectives: We sought to evaluate the effect of stratifying by preoperative PSA values on freedom from biochemical failure with SCAP using the Cryo On Line Database (COLD) registry.

Methods: Using the COLD registry, we retrospectively reviewed 604 patients who underwent SCAP for recurrent PCA after RT. We stratified patients by preoperative PSA in the following groups: PSA < 5 (266 patients), PSA 5−10 (192 patients), and PSA >10 (146 patients). The groups were compared for biochemical failure rates defined as the Phoenix criteria using PSA nadir + 2, as well as by functional outcomes.

Results: The groups, though not a matched cohort being a registry, were surprising evenly matched by age (mean 70), Gleason score, and stage. The freedom from biochemical failure by the Phoenix criteria at the 4 year mark for PSA < 5, PSA 5−10, and PSA > 10 was 62.3%, 50.3%, and 39.8% respectively. The comparison of function outcomes was similar in pad use (defined as any) of 12%, 10%, and 14%; postoperative urinary retention of 13%, 11.5%, and 10%; and fistula rate of 1.1%, 2.6%, and 0.7% respectively. The ability to have intercourse in those with preoperative potency (only 61 patients in total cohort) was 35%, 59%, and 28% respectively. Overall 75 of the 604 patients have had a follow up prostate biopsy with the positive biopsy rate being 20%, 30%, and 24% for the groups respectively.

Conclusions: Salvage cryoablation of the prostate offers a reasonable freedom from biochemical failure with good functional outcomes. Stratifying patients by PSA < 5, PSA 5−10, and PSA > 10 does provide improved freedom from biochemical failure in the patients with lower PSA’s with no apparent effect on functional outcomes. Therefore earlier detection and treatment of recurrent prostate cancer after radiation therapy is warranted in patients deemed candidates for curative intent.

The COLD registry is sponsored by an unrestricted research grant from Endocare/HealthTronics. Data are held and analyzed by Watermark, an independent research company under the direction of an independent physician board.

Poster #91

LOCAL FAILURE AFTER WHOLE- GLAND SALVAGE THERAPY WITH SONABLATE HIGH INTENSITY FOCUSED ULTRASOUND IN RADIO-RECURRENT PROSTATE CANCER
Ana Maria Autran-Gomez¹, Alejandro Lazo-Langner², Ali Alzaharani¹, Jonathan Izawa¹ and Joseph Chin¹
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(Presented By: Ana Maria Autran-Gomez)

Introduction and Objective: An estimated 20−30% of patients with localized (PCa), presented fail after radiation therapy (RT) where the patients with local recurrence may benefit from a local salvage therapy. Salvage HIFU therapy, has emerged as a new alternative. The aim was to determine the ability of HIFU as a salvage therapy in local radio− recurrent prostate cancer (PCa) following external beam radiotherapy (EBRT) or Brachytherapy (BT) and to analyses the effects adverse following the therapy in terms of morbidity and QoL on short−term.

Material and Methods: From 2006 to 2010. 55 patients with biopsy proven recurrent PCa after EBRT or BT, clinical stage T1−T3, PSA level ≤10ng/ml, pre Gleason score ≤8, and no distant metastasis, were subjected to salvage HIFU using Sonablate®500. PSA and IPSS, IIEF−5, QoL and Adverse events (CTCAE) questionnaires were assessed at 45, 90, 180 days and 12 months. Follow−up biopsy was done at 180 days after HIFU.
Results: 47 pts (85%) had EBRT and 8(15%)BT. Age 69 (57−79)yr, Prostate volumen 21(13−56)cc, PSA 3.61 (0.10−10.80). Mean follow−up was 25 (5−56) months 14(25%) pts presented local relapse at 180 days. Post−salvage PSA nadir 0.19(0.02−3.30) ng/ml. The Erectile Dysfunction increased after salvage HIFU therapy, from 42% pretreatment to 65% at 1 year (p=0.005). Prostate volume (p=0.010), IPSS (p=0.002), showed statistical difference at 12 months compared with the basal values. No statistically differences were observed (p=0.064) in the QoL evaluation in pre−HIFU and post therapy at 1 year. Rectourethral fistula occurred in 2(3%) pts, moderate stress urinary incontinence in 2(3%), and 25 pts (45%) presented any AEs . Clinical stage for T3vsT1 ( OR: 0.09; p=0.017) and Gleason score 6vs7(OR): 4.64; p=0.028) were associated with increased risk of AES. There was no difference in complications between EBRT and BT pts.

Conclusions: Our preliminary results using HIFU salvage showed a low rate of complications with acceptable oncologic results at short−term, being comparable to the reported literature. HIFU is a viable salvage treatment option. A prospective FDA−sponsored multicenter controlled trial is underway to confirm its utility.

Poster #92

SALVAGE ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY: A SINGLE INSTITUTION FIVE-YEAR EXPERIENCE
Samuel D. Kaffenberger¹, Kirk A. Keegan¹, Todd M. Morgan¹, Dominic H. Tang¹, Neil K. Bansal², Daniel A. Barocas¹, David F. Penson¹, Rodney Davis¹, Peter E. Clark¹, Sam S. Chang¹, Michael S. Cookson¹, S. Duke Herrell¹ and Joseph A. Smith¹
¹Vanderbilt University Medical Center, Department of Urologic Surgery, Nashville, TN; ²Vanderbilt University School of Medicine, Nashville, TN
(Presented By: Samuel D. Kaffenberger)

Introduction: Salvage robotic−assisted laparoscopic prostatectomy (sRALP) is a feasible treatment option for certain patients with recurrent prostate cancer (CaP) after primary therapy; however, its use remains controversial. Data regarding patient selection, complication rates, and cancer outcomes are scarce. Here, we report our initial 5−year experience with sRALP.

Methods: We evaluated 33 consecutive patients who underwent sRALP from 2006 to 2011. Patients who underwent brachytherapy (n=14), external beam radiation therapy (XRT) (n=10), combined brachytherapy/XRT (n=5), and high−intensify focused ultrasound (n=4) for localized CaP were included. All patients had biopsy−proven recurrent CaP and no evidence of nodal or metastatic disease. The primary oncologic outcome was lack of PSA nadir <0.1 ng/ml post−sRALP. Univariate logistic regression was used to test the correlation between margin status and PSA nadir.

Results: The median age of the cohort was 66.5 years (interquartile range (IQR) 57.9−67.4 years). The median time from primary therapy to sRALP was 50 months (IQR 26−61 months), and the median PSA prior to sRALP was 3.71 ng/ml (IQR 2.41−5.07 ng/ml). 13 patients had Gleason 6 (39.4%), 8 had Gleason 7 (24.2%), and 11 had >= Gleason 8 (33.4%) CaP at radiation failure biopsy. Median time of surgery was 2.93 hours (IQR 2.65−3.18 hours) and median blood loss was 150ml (IQR 100−213ml). There was 1 Clavien IIIb complication, a rectal laceration requiring repair and diversion. There was 1 Clavien II (Pulmonary Embolism) and 5 Clavien I complications: 4 anastomotic leaks and 1 bladder neck contracture. 31 of 33 patients (93.9%) were discharged on the first post−operative day. On pathologic analysis, 18 patients had stage T2 (54.5%), 14 patients had T3 (42.5%), and 1 patient had T4 (3%) disease. 3 patients had Gleason 6 (9.7%), 15 had Gleason 7 (48.4%), and 8 had >=Gleason 8 (25.8%) CaP. No patients had node positive disease. 9 of 33 patients had positive margins (27.3%), of which 3 did not achieve a PSA nadir <0.1 ng/ml (OR 5.5, 95%CI 0.74−40.8). In all, 28 of 33 patients (85%) had a post−sRALP PSA <0.1 ng/ml.

Conclusions: In our experience, sRALP is safe and is associated with low blood loss, and short length of stay. Pathologic and early oncologic outcomes are in line with open series. Although initial results are promising, further follow−up will be required to determine the oncologic efficacy of this procedure.
Poster #93

WAITING TILL THEY COME TO US; THE IMPACT OF VOIDING COMPLAINTS ON CANCER DETECTION RATES IN THE INNER CITY
Clifford Georges, Nicholas Karanikolas, Llewelyn Hyacinthe, Fernando Cabrera-Piquer and Semyon Gurgov
SUNY Downstate Department of Urology
(Presented By: Clifford Georges)

Introduction: We sought to determine whether African American or Caribbean American men undergoing prostate biopsy for elevated PSA in an inner city setting had higher rates and grade of prostate cancer if they had associated lower urinary tract complaints.

Methods: A retrospective review of 770 consecutive prostate biopsies performed at an inner city health care facility from 1/1/2005 to 8/31/2010 was performed. Patients were defined as having LUTS if they reported symptoms of frequency, intermittent stream, weak force of stream, nocturia on history or were taking alpha blocker therapy at the time of prostate biopsy.

Results: Of the 770 men, 598 met the inclusion criteria; 302 were biopsied for elevated PSA (Group1), 296 were biopsied for elevated PSA and associated LUTS (Group2). The average age for men in Group 1 was 64, average TRUS volume of 40.1cc and median PSA of 8.2ng/ml; Group 2 average age was 65, average TRUS of 54.1cc and median PSA 8.8ng/ml (p=.2, p=0.001, p=0.8, respectively). Of the 302 Group 1 men, 104 (34.4%) had negative prostate biopsies and 198(65.6%) had positive biopsies. Of the 296 Group 2 men, 148 (50.0%) had negative prostate biopsies and 148(47.3%) had positive biopsies (p=0.0002). The median Gleason score for both groups was 7. 31.2% of Group 1 patients had total Gleason score of 8 or more compared to 40.7% of Group 2, (p=0.1).

Conclusion: Prostate cancer was less readily identified in black men with LUTS and elevated PSA as compared to those with elevated PSA alone. The decreased rate of cancer detection, however, was associated with higher rates of intermediate and high–risk disease in the LUTS group. This study highlights the importance of prostate screening with PSA specifically in a high–risk, underserved inner city black population.

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<tr>
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<th>Gleason 6 (%)</th>
<th>Gleason 7 (%)</th>
<th>Gleason 8 (%)</th>
<th>Gleason 9 (%)</th>
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<tr>
<td>Group1</td>
<td>40(21.1)</td>
<td>91(48.1)</td>
<td>47(24.9)</td>
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Poster #94

COST-EFFECTIVENESS OF STANDARD VERSUS INTENSIVE ANTIBIOTIC REGIMENS FOR TRANS-RECTAL ULTRASOUND GUIDED PROSTATE BIOPSY PROPHYLAXIS
Mehrad Adibi, Margaret Pearle and Yair Lotan
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

Introduction: To compare cost–effectiveness of fluoroquinolones to intensive antibiotic regimens for transrectal ultrasound guided prostate biopsy (TRUSBx) prophylaxis.

Methods: A literature search was performed to determine the risk of hospital admissions after TRUSBx due to infectious complications. Average costs of hospital admission due to post–biopsy infections were determined from patients admitted to our University hospital within 1 week after biopsy. The standard antibiotic prophylactic regimen was chosen as two doses of ciprofloxacin or bactrim DS in the peri–procedural period and the intensive prophylactic regimen consisted of one dose of intramuscular amikacin along with 5 days of cipro or bactrim administered in the peri–procedural period. A decision tree analysis was created to compare cost–effectiveness of standard versus intensive antibiotic prophylactic regimens based on varying risk of infection, cost, and effectiveness of the intensive antibiotic regimen.
Results: The base case included the cost of TRUS biopsy as reimbursed by Medicare 2011 rates ($559). The rate of admission was set at 1%, and the average cost of admission was $5900. The total costs for the standard and intensive antibiotic regimens were $1 and $33, respectively. Assuming a 50% risk reduction in admission with the intensive regimen, the standard antibiotic regimen was slightly more cost-effective than the intensive protocol with average cost of $619 versus $622. One way sensitivity analysis showed that a very small increase in risk of admission from quinolone-resistant infections or risk reduction of the more intensive antibiotics will result in cost-superiority of the more intensive regimen. Three way sensitivity analyses showed that as the probability of admission using the standard antibiotics increased from 1% to 5%, or the risk reduction using the intensive regimen increased from 50% to 75%, using the intensive prophylaxis became substantially more cost-effective even at higher costs.

Conclusion: As the risk of admissions from infectious complications due to TRUSBx increases, use of an intensive prophylactic antibiotic regimen becomes significantly more cost-effective than current standard antibiotic prophylaxis.

Poster #95

DOES INTRAOPERATIVE SHEDDING OF PROSTATE CANCER CIRCULATING TUMOR CELLS OCCUR DURING ROBOTIC PROSTATECTOMY?
Eric Kauffman¹, Min Jung Lee², Sylvia Alarcon², Sunmin Lee², Jane Trepel² and Peter Pinto¹
¹Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Medical Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Eric Kauffman)

Objective: Research is being carried out to support the prognostic value of circulating tumor cells (CTC) in patients with clinically localized cancers, including prostate cancer. Few studies, however, have evaluated the effect of surgical resection and intraoperative tumor manipulation on CTC shedding. Here we explore whether CTC counts in patients with clinically localized prostate cancer are increased during robotic prostatectomy.

Methods: 8 mL blood specimens were obtained from 7 healthy donors and 12 patients with clinically localized prostate cancer undergoing robotic prostatectomy both immediately prior to and following surgery. CTC counts were determined using multiparameter flow cytometry-based detection of EPCAM(+)PSMA(+)CD45(−) cells which were viable as determined by Hoechst 33258 staining. CTC counts in preoperative vs postoperative blood specimens were correlated with primary tumor pathology.
Results Obtained: The average age of patients was 61 years old. No patients received an intraoperative blood transfusion. Final pathology revealed pT3 stage disease in 2 patients (1 pT3a, 1 pT3b), and the remainder were pT2. Most (83%) patients had moderate or high grade disease, including frequent perineural invasion (50%), and an average of 18% of the prostate gland was involved. The detectable CTC range for this assay performed on 7 healthy donors is from 0−8 cells. Among the prostatectomy patients, CTC numbers ranged from 0−8 cells preoperatively and 0−4 cells postoperatively (p=0.40). No correlation was observed between CTC counts and primary tumor pathology. There was no difference in mean levels prior to (1.6 +/- 2.3 cells) and after (1.5 +/- 1.3 cells) surgery.

Conclusions: We observed no significant changes in CTC counts during robotic prostatectomy for localized prostate cancer. Further all CTC counts in the pre and post prostatectomy blood draws were within the normal healthy donor range. Surgery did not result in significant CTC shedding. Continued accrual in this cohort and ongoing research is being carried out.

Poster #96

RISK OF PROSTATE CANCER ON THIRD PROSTATE BIOPSY FOLLOWING DIAGNOSIS OF ATYPICAL GLANDS SUSPICIOUS FOR CARCINOMA ON REPEAT BIOPSY
Brandon Isariyawongse, Ahmed El-Shafei and J. Stephen Jones
Glickman Urological and Kidney Institute, Cleveland Clinic Foundation, Cleveland, OH
(Presented By: Brandon Isariyawongse)

Introduction and objectives: Atypical glands suspicious for carcinoma (ASAP) are identified in approximately 3−5% of prostate biopsy specimens. Recommendations are to repeat biopsy based on an estimated 40% risk of cancer following this diagnosis. Most studies have involved this finding on initial biopsy, so we sought to identify the risk of cancer following a diagnosis of ASAP on repeat biopsy.

Methods: We identified 96 men with a diagnosis of ASAP on repeat prostate biopsy between January 2000 and June 2010. We analyzed the patient demographics and incidence of prostate cancer, high−grade prostatic intraepithelial neoplasia (HGPIN), and ASAP in third biopsy specimens. In patients diagnosed with cancer, we examined Gleason score, number of positive cores, and the presence of inflammation.

Results obtained: Fifty−two men (54.2%) were diagnosed with cancer on third prostate biopsy following ASAP diagnosis. Gleason grades 6, 3+4=7, 4+3=7, and 8 were observed in 26, 15, 6, and 4 (50%, 28.8%, 11.5%, and 7.7%) of these men, respectively. Of the 44 biopsy−negative men, 21 (47.7%) had HGPIN and 11 (25%) had ASAP on third biopsy. Of 33 men with inflammation, 15 (45%) were thereafter diagnosed with prostate cancer, as opposed to 37 (58.9%) of 63 men without inflammation on repeat biopsy.

Conclusions: After a second biopsy demonstrates ASAP, there remains a significant risk of prostate cancer, and only a small percentage of men will exhibit no abnormal pathologic features on subsequent biopsy.

Poster #97

HISTOPATHOLOGICAL FEATURES IN LOCAL RADIO-RECURRENT PROSTATE CANCER FOLLOWING HIGH INTENSITY FOCUS ULTRASOUND AS WHOLE-GLAND SALVAGE THERAPY
Ana Maria Autran-Gomez¹, Susanne Chan², Jose Gomez-Lemus², Linda Lee¹, Jonathan Izawa¹ and Joseph Chin¹
¹Division of Urology and Surgical Oncology University of Western Ontario, London ON, Canada; ²Department of Pathology University of Western Ontario London ON, Canada
(Presented By: Ana Maria Autran-Gomez)

Introduction and Objectives: The diagnosis of local radio−recurrent prostate cancer (PCa) following radiotherapy (RT) is controversial. Post−radiation prostatic biopsies, remaining as definitive means of assessing local response after RT with inter−observer variability in the interpretation and indications. Salvage High Intensity Focused Ultrasound (HIFU) has emerged as alternative in salvage setting. We provide a detailed histopathological description of the effects of whole−gland salvage HIFU, on post−treatment biopsy specimens in patients with local radio−recurrent PCa.
Material and Methods: The histopathological review of positive prostatic biopsy in pts with biopsy–proven recurrent localized PCa who underwent whole–gland salvage HIFU therapy following external beam radiation or brachytherapy, treated at our institution between 2006 and 2010 was conducted. Follow–up biopsies were performed at 180 days post–HIFU. H&E–stained slides were examined. Immunohistochemical stains for racemase, p63 and high molecular weight cytokeratin (34BE12) were using.

Results: Of 55 pts who underwent HIFU, 49 (89%) pts following a standardized follow–up biopsy. Positive biopsies reported in 14 pts (29%) and negative in 35(71%). Median follow–up was 25 months (range 5– 56). In 14 (100%)cases benign prostate ducts and acini showed variable degrees of atrophy. The glands presented marked reactive atypia and cystic changes (71%).Squamous metaplasia was observed in 8 cases (57%). Primary and secondary Gleason grades were assigned in 10 biopsies (71%). We observed concordance of Gleason grading between the pre and post therapy in 6 (60%) cases. The mean combined Gleason score pre (7.214±1.050) and post–salvage HIFU (7.333±0.707) was not statistically significant (p=0.320). Fibrosis, edema and reactive atypia were present in 93%. Coagulative necrosis was identified in 86%. Acute and chronic inflammation associated at treatment was detected.

Conclusion: Our results showed as main findings the presence of coagulative necrosis associated at acute and chronic inflammation, as well as stromal fibrosis and edema. In our cohort, the rate of local cancer control was 70 to 75% at 25 months. The histopathological analyses of prostatic biopsies following salvage HIFU in local radio–recurrent PCa require an accurate interpretation and presents an enormous challenge to pathologists and urologists.

Poster #98

INCREASED NUMBER OF NODES REMOVED AT RETROPERITONEAL LYMPH NODE DISSECTION IMPROVES OVER-ALL- AND CANCER-SPECIFIC SURVIVAL IN PATIENTS WITH TESTICULAR CANCER

Dan Lewinshtein, Sandra Koo and Christopher Porter
Virginia Mason Medical Center, Seattle, WA
(Presented By: Dan Lewinshtein)

Background: The benefit of a thorough retroperitoneal lymph node dissection (RPLND) for testicular cancer has been well established and essentially eliminates retroperitoneal recurrence of disease. RPLND is known to be a complex, advanced procedure and the number of nodes removed may vary amongst institutions. Thus, we explored whether number of nodes removed at RPLND may predict overall− and cancer−specific survival in patients who have undergone RPLND.

Methods: We retrospectively searched the Surveillance Epidemiology and End Results (SEER) database for all patients who had undergone RPLND for primary testicular cancer between 1973 and 2006. We performed logistic regression to assess the ability of number of nodes removed at RPLND to predict overall mortality. We adjusted for stage, age, and tumor histology. In addition, we used Kaplan–Meier life table analysis to evaluate actuarial survival probability as a function of removed nodes at the time of RPLND. Finally, we performed these analyses in a subgroup of patients with nonseminomatous germ cell tumor (NSGCT).

Results: The cohort consisted of 1494 patients. The median age and median number of nodes removed at RPLND were 30 years (0–87) and 14 (+/− 13.9 SD). Of all patients, 46.2%, 45.4%, and 8% were stage I, II and III, respectively. There were 1262 (84.5%) NSGCT and 178 (11.9%) seminoma diagnoses. On multivariate analysis, stage (<0.001), age (HR 0.057; p<0.001), and number of nodes removed (p<0.024)were all significant predictors of overall mortality. On Kaplan–Meier analysis, mean time to overall mortality (16.939 vs. 18.583 years, p<0.001) and cancer specific mortality (17.69 vs. 18.7 years, p<0.001) were significantly shorter for patients that had 5 or fewer nodes removed compared to those that had 6 or more removed.

Conclusions: The number of nodes removed at RPLND significantly predicted the overall− and cancer−specific survival in patients with NSGCT. Moreover, patients with fewer nodes removed at time of RPLND had significantly shorter mean actuarial overall survival and cancer specific survival. This analysis emphasizes the critical importance of a thorough RLPND on survival in patients with testicular cancer.
A DESCRIPTIVE ANALYSIS OF SEX CORD STROMAL TUMORS USING A NATIONAL DATABASE
Kunj Sheth, John Cashy and Shilajit Kundu
Northwestern University Feinberg School of Medicine, Department of Urology, Chicago, IL
(Presented By: Kunj Sheth)

Introduction and Objectives: Sex cord stromal tumors (SCSTs) account for 3–5% of all adult testicular tumors. However, biologic behavior of these rare tumors is not well elucidated. We report the treatment and outcomes in a large cohort of men with SCSTs.

Methods: The Surveillance Epidemiology and End Results (SEER) Program of the National Cancer Institute works to coordinate population-based cancer registries located across the United States starting from 1973. From the SEER database, continuous data on testicular cancer incidence, extent of disease at diagnosis, therapy, and patient survival were obtained for the years 1975 to 2008. Tumor histology was used to divide tumors into germ cell tumors (GCTs) and SCSTs. Further descriptive statistics and Kaplan−Meier survival analyses were employed for SCSTs.

Results Obtained: The overall incidence of malignant SCSTs was 0.45% (158) of all testicular tumors. In descending order, the histologic categorization of these tumors consisted of Leydig cell (56.3%), Sertoli cell (26.6%), sex cord–gonadal stromal tumor NOS (9.5%), Sertoli–Leydig cell tumor, poorly–differentiated (3.8%), Granulosa cell tumor (3.2%), and lastly Androblastoma (0.6%). The mean age of patients diagnosed with Leydig cell tumor (49.3 years) was significantly higher (p<0.001) than the mean age of patients diagnosed with Sertoli cell tumor (38.5 years). At the time of diagnosis 76.7% (115) of clinically staged tumors were localized and 23.3% (35) were considered to have regional or distant spread. 96.8% (153) of patients proceeded with radical orchiectomy at time of diagnosis. The majority of patients were observed. A small number of men received radiation treatment (3.3%, n=5) or RPLND (13.7%, n=21). Five−year cancer-specific survival was 68.8% in the entire cohort, with 82.8% 5−year survival for localized tumors and 30.4% 5−year survival for tumors with regional or distant spread. 5−year cancer specific survival was 68.0% for Leydig cell tumors and 72.0% for Sertoli cell tumors.

Conclusions: This is the largest population based analysis of SCSTs. Patient survival for SCST is significantly lower than patient survival in GCTs. Furthermore, once the tumor progresses past a localized state, the patient survival is significantly worse, underscoring the importance of early treatment.

Funding: none

THE IMPACT OF SURGICAL OR SYSTEMIC THERAPY FOR TESTICULAR GERM CELL MALIGNANCY ON RENAL FUNCTION
Nicholas Cost, Mehrad Adibi, Jessica Lubahn, Adam Romman, Ganesh Raj, Arthur Sagalowsky and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, Texas
(Presented By: Nicholas Cost)

Introduction & Objective: Despite the good prognosis of patients with testicular germ cell tumors (T−GCTs), the therapy needed to achieve cure may induce long−term morbidity. Data from other malignancies suggests that developing chronic kidney disease (CKD) affects long−term renal, cardiovascular and survival outcomes. Thus, we assessed patients treated for T−GCT to determine the effect of therapy on the natural history of renal function.

Methods: We reviewed an institutional database of T−GCT patients and included those >13yrs old with available pre and post−therapy serum Creatinine (Cr). Renal function was estimated with a calculated Glomerular Filtration Rate (eGFR). Patients were classified according to the CKD staging system. We also compared those managed with surgery−only vs. those also treated with chemotherapy (CT).

Results: 144 patients were reviewed. T−GCT stage distribution was: I−78(54.2%), II−28(19.4%) and III−38(26.4%). The median Cr and eGFR at diagnosis were 0.9(0.5−1.5) and 104.0(58.7−235) respectively. 102(70.8%) were CKD 0−I, 41(28.5%) CKD II and 1(0.7%) CKD III. The ed Cr and eGFR at last followup were 1.0(0.6−2.6) and 95.5(31.5−167.6) respectively. This difference between the pre and post−therapy eGFR was significant, p<0.01. The median change in eGFR was −2.1(−148−58).
81 (56.3%) patients received CT, median 4 cycles (1−12), and 63 (43.8%) were treated without CT, Table I. We observed that 8 (9.9%) of the CT treated patients developed new−onset CKD III, compared to none in the non−CT group, p=0.01. This increased risk with CT was related to an increasing number of CT cycles with 8.1% of those given 1−4 cycles developing CKD III vs. 15.8% of those given >4 cycles, p=0.02. Also, while there was an increase in new−onset CKD III with increasing T−GCT stage (2.6% Stage I, 3.6% Stage II and 13.2% Stage III), this was not statistically significant.

Conclusions: Patients with T−GCT treated with CT suffered a significant decrease in eGFR and were at a significantly increased risk of developing CKD III compared to those managed without CT. This is important as we assess for the long−term risks of T−GCT survivorship, and is useful in counseling patients on the risks of therapy.

<table>
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<th>Table I</th>
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<tr>
<td>Median eGFR at Diagnosis (Range)</td>
<td>100.1 (77.4−140.9)</td>
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<td>CKD Stage at Diagnosis (%)</td>
<td>6−1 (GFR &gt;90)</td>
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<tr>
<td></td>
<td>2 (GFR 60−89)</td>
</tr>
<tr>
<td></td>
<td>3 (GFR 30−60)</td>
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<tr>
<td>Median Cr at Last Follow Up (Range)</td>
<td>1.0 (0.66−2.59)</td>
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<tr>
<td>Median eGFR at Last Follow Up (Range)</td>
<td>91.4 (31.5−156.8)</td>
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<tr>
<td>Median Change in GFR (Range)</td>
<td>-16.3 (−147.7 to −40.5)</td>
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<tr>
<td>CKD Stage at Last Follow Up (%)</td>
<td>6−1 (GFR &gt;90)</td>
</tr>
<tr>
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<td>2 (GFR 60−89)</td>
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<td>Length of Follow Up in Mo (Range)</td>
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RECURRENCE AND TREATMENT PATTERNS IN PATIENTS WITH NON-MUSCLE-INVASIVE BLADDER CANCER

Karim Chamie¹, Mark S. Litwin¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Julie Lai², Jan M. Hanley², Badrinath R. Konety³, Christopher S. Saigal¹ and the Urologic Diseases in America Project²

¹UCLA, Los Angeles, CA; ²RAND, Santa Monica, CA; ³University of Minnesota, Minneapolis, MN

(Presented By: Karim Chamie)

Introduction and Objectives: Patients with bladder cancer are apt to develop multiple recurrences that necessitate aggressive treatment. We examined the recurrence and progression rate, and treatment patterns in a cohort of individuals with high−grade non−muscle−invasive bladder cancer.

Methods: Using linked SEER−Medicare data, we identified subjects with a diagnosis of high−grade non−muscle−invasive disease between 1992 and 2002 to determine recurrence and progression rates. We then used competing−risks regression analyses to examine the incidence of cystectomy, radiotherapy, and chemotherapy after each recurrence.

Results: Of 7,410 subjects, 4,826 (65.1%) experienced a recurrence and 1,909 (25.8%) experienced progression of disease. Of those that progressed, 588 (30.8%) underwent cystectomy, 551 (28.9%) underwent radiotherapy, 201 (10.5%) underwent systemic chemotherapy, and 569 (29.8%) died without undergoing any treatment. Increasing recurrences were associated with a higher rate of non−surgical aggressive treatment: increasing use of radiotherapy after the second (HR 1.53; 95% CI 1.21–1.93) and third recurrence (HR 1.59; 95% CI 1.24–2.03) and systemic chemotherapy after the third recurrence (HR 1.97; 95% CI 1.30–2.98). Among those subjects 66–69 years of age without any comorbid conditions treated at an NCI−designated cancer center with medical school affiliation for an undifferentiated T1 tumor that has recurred more than three times, approximately 58% do not undergo cystectomy or radiotherapy.

Conclusion: Approximately 30% of patients who progress to invasive disease do not undergo any form of treatment. Many healthy patients younger than 70 years of age do not undergo aggressive treatment, despite aggressive tumors that have recurred multiple times.

USING GEOGRAPHIC INFORMATION SYSTEMS TO IDENTIFY CHANGES IN BLADDER CANCER MORTALITY “HOT SPOTS” IN THE UNITED STATES

Sandip Prasad, Amit Patel, Aria Razmaria, Kyle Kiriluk, Alexandre Rosen, Todd Schuble, Chieko Maene, Brandon Pierce, Gary Steinberg and Norm Smith

University of Chicago, Chicago, IL

(Presented By: Sandip Prasad)

Introduction and objectives: Environmental factors have long been linked to carcinogenesis, progression and mortality from bladder cancer and regional variations in bladder cancer mortality have been observed for several decades. We sought to characterize geographic patterns in bladder cancer mortality in the United States by gender and race and assess for the impact of environmental exposure on the natural history of bladder cancer.

Methods: We analyzed age−adjusted county level data on bladder cancer mortality from the National Cancer Institute using a geographically−weighted regression model to identify clusters of increased bladder cancer mortality from 1950 to 2007. County−level socioeconomic, clinical and environmental data were obtained from the County Health Rankings. Hot spot analysis was calculated using the Getis−Ord Gi* statistic and spatial regression analysis was performed using Box−Cox transformation and OLS regression models with ArcGIS 10 adjusting for spatial autocorrelation.
Results obtained: The Northeast and upper Midwest had the highest number of bladder cancer mortality hot spots from 1950 to 1969, but the majority of areas in the Midwest were no longer hotspots in the latter part of the past century. (Figure) On multivariate spatial analyses of bladder cancer mortality from 1996 to 2007, mentally unhealthy days, adult smoking, motor vehicle mortality rate, college education, single parent households, premature deaths, diabetic screening and air pollution days were all associated with increased rates of bladder cancer mortality in all US or hot spot counties for white and black men (p<0.05). Model fit was significantly improved when looking at hot spots versus all US counties (R−squared= 0.66 vs. 0.09 for white men and 0.41 vs. 0.02 for black men).

Conclusions: Risk factors for bladder cancer mortality differ significantly by gender and race in different geographic locations within the United States. Models predicting bladder cancer death can be derived in hot spot counties, and these counties should be the focus of individual−level study of occupational and environmental factors.

Poster Session II

Poster #103

THE HISTOPATHOLOGIC CHARACTERISTICS OF BLADDER CANCER AFTER PROSTATE RADIOTHERAPY
Michael Abern¹, Ann Dude² and Christopher Coogan³
¹Duke University Medical Center, Urology, Durham, NC; ²Duke University Medical Center Durham, NC; ³Rush University Medical Center Chicago, IL
(Presented By: Michael Abern)

Introduction: Radiation therapy (RT) for prostate cancer (CaP) results in an increased risk of second malignancies including bladder cancer (CaB). While published series of radical cystectomy patients after RT have shown adverse pathology and increased complication rates, it is unknown how RT affects the characteristics of secondary CaB at the time of diagnosis.

Methods: We examined 278,234 cases of mean treated for clinically localized CaP reported to The Surveillance, Epidemiology and End Results (SEER) database between 1988-2007. Men diagnosed with CaB at least 1 year after the diagnosis of CaP (n = 3,085) were stratified by CaP treatment type, and histopathologic characteristics and survival were compared.

Results Obtained: 2,143 patients had RT for CaP and 942 had radical prostatectomy alone (RP). 1,300 men had external beam radiotherapy (XBRT), 306 had brachtherapy (BT), 226 had XBRT + BT, and 302 had XBRT after RP. CaB in men who had RT were more likely non−transitional cell carcinoma (TCC) (6.4% vs. 3.8%, p = 0.004), located at the trigone (6.9% vs. 5.4%, p = 0.012), and contain carcinoma in−situ (CIS) (9.2% vs. 7.0%, p < 0.001) compared to RP. Men who had RT had decreased prostate and bladder cancer specific survival (CSS) (median 37.2 vs. 43.4 months, p < 0.001) and RT independently predicted decreased survival (HR 1.33, p = 0.026) in a multivariate Cox analysis.

Conclusions: Men with CaB after RT for clinically localized CaP have adverse histopathologic characteristics and decreased CSS compared to CaB after RP.
NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER AT THE UNIVERSITY OF SOUTHERN CALIFORNIA
Adrian Fairey, Siamak Daneshmand, Tanya Dorff, Ryan Dorin, Gary Lieskovsky, David Quinn, Anne Schuckman, Jie Cai, Gus Miranda and Eila Skinner
University of Southern California, Los Angeles, CA
(Presented By: Adrian Fairey)

Introduction and Objectives: There is a paucity of data on neoadjuvant GC (Gemcitabine, Cisplatin) chemotherapy in patients with muscle-invasive bladder cancer (MIBC). Our aim was to compare pathologic and survival outcomes of neoadjuvant GC and M−VAC (methotrexate, vinblastine, doxorubicin, cisplatin) chemotherapy in patients with MIBC.

Methods: A retrospective analysis of prospectively collected data from the University of Southern California (USC) Bladder Cancer Database was performed. Between 1985 and 2011, 116 patients received neoadjuvant chemotherapy prior to radical cystectomy and extended pelvic lymph node dissection for clinical stage T2−T4N0M0 bladder cancer. The outcomes were pathologic complete response (pT0N0), pathologic tumor downstaging (pT0N0, pTaN0, pT1N0, or pTisN0), overall survival (OS), and recurrence−free survival (RFS). The Kaplan−Meier method and Cox proportional regression models were used to analyze survival data.

Results: The median follow−up duration was 4.5 years (range, 0 to 19.8 years). Fifty−eight patients each received GC and M−VAC chemotherapy. There were no statistically significant differences between the GC and M−VAC groups with regard to pathologic complete response (27.3% versus 17.1%, p=0.419) or pathologic tumor downstaging (45.5% versus 37.1%, p=0.498). The predicted 5−year OS (29% versus 38%, Log rank p=0.634) and RFS (36% versus 35%, Log−rank p=0.891) rates did not differ between the GC and M−VAC groups. However, in a subset of 37 patients with pathologic lymph node positive disease, the predicted 1−year RFS rate differed between the GC and M−VAC groups (0% versus 32%, Log rank p=0.019). Multivariable analysis showed a trend toward an independent association between type of neoadjuvant chemotherapy and RFS (GC versus M−VAC: HR 1.64, 95% CI 0.93 to 2.89, p=0.089).

Conclusions: Pathologic complete response, pathologic tumor downstaging, and survival did not differ in patients who received neoadjuvant GC and M−VAC chemotherapy. However, GC was associated with poorer RFS in a subset of patients with pathologic lymph node positive disease. Randomized controlled trials comparing neoadjuvant chemotherapy regimens are urgently needed.

COST ANALYSIS OF ROBOTIC-ASSISTED RADICAL CYSTECTOMY VERSUS OPEN RADICAL CYSTECTOMY UTILIZING A PROSPECTIVE, RANDOMIZED COHORT
Raj Kurpad, Jed Ferguson, Ian Udell, Angela Smith, Michael Woods, Matt Raynor, Eric Wallen, Matthew Nielsen and Raj Pruthi
University of North Carolina, Chapel Hill, NC
(Presented By: Raj Kurpad)

Introduction and Objectives: Robotic−assisted radical cystectomy (RARC) holds promise to improve patient perioperative outcomes while maintaining oncologic outcomes relative to open radical cystectomy (ORC). However, the cost−benefits of the robotic approach are under debate. We evaluated the detailed cost estimates of RARC and ORC utilizing a prospectively randomized patient cohort.

Methods: Over 10 months in 2008, 41 patients meeting inclusion criteria were randomized to either ORC (n=21) or RARC (n=20). Baseline demographic data, patient comorbidities, tumor characteristics, and perioperative outcomes were assessed. Real−world direct variable costs and allocated fixed costs including OR costs and hospital costs were obtained from hospital accounting and evaluated using parametric and non−parametric statistical analyses. Point estimates for RARC−specific OR capital expenses were calculated assuming 80% robot usage and subjected to sensitivity analysis.
Results: There were no statistically significant differences between groups for median age (ORC 70 yrs vs RARC 70; p=0.6), age−adjusted Charlson comorbidity index (6.2 vs 4.9; p=0.09), or pathologic tumor stage (p=0.14). The median for overall cost was higher for RARC (see table) (p=0.14). Significant differences between the two cohorts were found for OR time (293 mins vs 389; p<0.001), and length of stay (LOS) (6.0 days vs 4.0; p=0.02) which resulted in higher OR fees and lower post−op hospital costs for the RARC group, respectively. OR capital expenses and OR disposable costs were higher for the RARC group. Median transfusion costs were lower for RARC group ($98 vs $448; p=0.002).

Conclusions: Utilizing subjects enrolled in prospective randomized trial of ORC vs. RARC, the overall costs between RARC and ORC were not statistically different. RARC requires significant capital expenditure, longer OR times, and higher OR disposable costs in relation to ORC, while RARC patients have a significant decrease in LOS and post−op hospital costs. Future studies should aim to include differential costs due to time to convalescence to complete the cost analysis from the societal perspective.

<table>
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<td>$19837</td>
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<tr>
<td>IQR: ($16575 - $20206)</td>
<td>IQR: ($18297 - $22317)</td>
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<tr>
<td>OR fees†</td>
<td>$5441</td>
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<tr>
<td>OR disposables†</td>
<td>$2485</td>
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<td>$50</td>
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<td>Post-op hospital costs‡</td>
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(data reported as: †(means), ‡(medians)) (*p<0.05 for ORC v. RARC)

Poster #106

QUALITY OF DIAGNOSTIC CARE IN PATIENTS WITH BLADDER CANCER: A POPULATION-LEVEL ANALYSIS.
Karim Chamie¹, Jeffrey C. Bassett¹, Timothy J. Daskivich¹, Meryl Leventhal², Dennis Deapen² and Mark S. Litwin¹
¹UCLA, Los Angeles, CA; ²Cancer Surveillance Program, Norris Comprehensive Cancer Center, Keck School of Medicine, University of Southern California, Los Angeles, CA
(Presented By: Karim Chamie)

Introduction and Objectives: The initial transurethral resection of a bladder tumor (TURBT) should eradicate all macroscopic disease, establish tumor histology, and define grade and extent of disease. Detrusor muscle at diagnostic TURBT is often used as a surrogate of resection quality. We examined the incidence and mediators of muscle presence in the initial resection specimen among subjects diagnosed with non−muscle−invasive bladder cancer.

Methods: We retrospectively reviewed the medical records of all individuals with non−muscle−invasive bladder cancer between 2004 and 2005 within the confines of the Los Angeles SEER Registry. We recorded patient age, gender, race, marital status, socioeconomic and insurance status, tumor histology, grade, and stage, operating urologist and reporting pathologist volume, institution type, and the presence/mention of detrusor muscle in the initial resection specimen. We performed multivariate mixed−effects logistic regression analysis to determine variables associated with presence and mention of muscle in the diagnostic pathology report.

Results: We identified 1,865 individuals, 335 urologists, and 278 pathologists. Muscle was reported as present in 972 (52.1%), reported as absent in 564 (30.2%), and not mentioned in 329 (17.7%) of the initial pathology reports. Advancing age was associated with higher odds of having muscle reported as present (age 66–75: OR 1.62; 95% CI 1.04–2.53; and age 76–85: OR 1.60; 95% CI 1.03–2.48), while female gender (OR 0.71; 95% CI 0.53–0.95) and stage Tis (OR 0.46; 95% CI 0.23–0.90) had lower odds of having muscle reported as present during the resection specimen. Individuals with high grade or stage were no more likely to have muscle reported as present in the initial resection as those with low grade and stage. The mention of muscle by the reporting pathologist was positively correlated with stage T1 (OR 3.41; 95% CI 2.16–5.38), grade (moderately differentiated: OR 1.57; 95% CI 1.02–2.43; and poorly differentiated: OR 1.88; 95% CI 1.05–3.35), and pathology volume (medium volume OR 1.88; 95% CI 1.13–3.35).

Conclusion: In nearly half of individuals diagnosed with non−muscle−invasive bladder cancer, the initial report does not contain or mention detrusor muscle. Since urologists were unable to discern between grade (high vs low) or stage (Ta vs T1), we contend that endoscopic resection including muscle should be accomplished for all patients during the initial diagnostic resection.
UTILIZATION OF IMMEDIATE POSTOPERATIVE INSTILLATION OF INTRAVESICAL CHEMOTHERAPY (IPOIC): A QUALITY OF CARE CONCERN IN OLDER PATIENTS WITH NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)

Daniel A. Barocas¹, Jack Gallagher², Danielle Colayco³, Brent Schwartz³, Kylee Heap² and Denise Globe³
¹Vanderbilt University Medical School; ²Clarity Pharma Research, Spartanburg, SC; ³Allergan, LLC, Irvine, CA
(Presented By: Daniel A. Barocas)

Introduction and Objective: IPOIC reduces the odds of bladder tumor recurrence by 30−40% compared with trans–urethral resection (TURBT) alone in patients with NMIBC. For this reason, its use is recommended or presented as an option in US and European urology guidelines. However, population-based studies have reported utilization rates ranging from 0.33−17%. We undertook this study to determine if elderly patients are equally likely to receive IPOIC on a first resection for NMIBC as younger patients.

Methods: In a nation–wide survey of 259 urologists (425 invited, 61% response rate), each was asked to document the last four treated cases of NMIBC (n=1,010) with elaborate detail on patient and disease characteristics, as well as provider characteristics. We identified 171 patients who were treated for a first occurrence of NMIBC, 79 (45.9%) under 65 and 92 (54.1%) 65 or older. We compared utilization of IPOIC in patients undergoing a first TURBT for NMIBC between age groups and across strata of patient, provider and disease characteristics. Variables significant on univariate analysis (p<0.05) were included in the final multivariate logistic regression.

Results: Use of IPOIC was significantly lower among patients 65 and over (92/677, 13.6%) compared to younger patients (79/333, 23.7%, p<0.02). Its use was higher in the West (27.1%) and lower in the Mid–West (10.8%) compared to other regions, and was higher among patients who were treated for a shorter length of time (mean length of time under physician’s care 27.0 months for those receiving IPOIC and 42.2 months for those who didn’t (p<0.02). In addition, use of IPOIC was higher in patients treated by physicians with fellowship training in urologic oncology (31.2% vs. 13.8%, p<0.02). After controlling for each of these covariates in a multivariate model, age remained a significant independent predictor of use of IPOIC (OR 0.97, p<0.001). All tumor characteristics tested in the analyses were not significant predictors of receiving IPOIC.

Conclusions: While IPOIC reduces recurrence of NMIBC, its utilization remains below expected levels. Utilization is lowest among older Americans, and those in the Mid–West, while patients seeing a fellowship–trained urologic oncologist have a higher likelihood of receiving treatment. This variation in use of IPOIC raises concern for a quality of care gap across age strata, region and provider type, which should be further explored in future studies.

THE IMPACT OF POSTOPERATIVE TRANSFUSION ON SURVIVAL CHARACTERISTICS IN SURGICALLY TREATED MEN WITH TRANSITIONAL CELL CARCINOMA OF THE BLADDER

Andew Feifer¹, Jennifer M. Taylor², Annalisa Piccorelli³, Changhong Yu¹, Michael Kattan³ and Bernard Bochner²
¹Memorial Sloan Kettering Cancer Center, NY, NY; ²Department of Surgery, Urology Service, Memorial Sloan Kettering Cancer Center; ³Department of Quantitative Health Sciences, Cleveland Clinic, Cleveland, OH
(Presented By: Andew Feifer)

Objective: Antigen sensitization from exogenous packed red cell transfusions has been hypothesized to impact a patients’ immunological response to solid tumors. We evaluated the influence of perioperative PRBC transfusion on primarily the cumulative incidence of recurrence [CIR], and secondarily on the overall survival [OS] as well as cancer specific death [CSD] in patients with muscle invasive transitional cell carcinoma of the bladder [TCC].

Methods: We identified 2545 patients in the MSKCC prospectively maintained institutional database who underwent a radical cystectomy from 1995−2005. Perioperative transfusion was defined as within 30 days after radical cystectomy. After excluding patients with any history of preoperative radiotherapy, nonmuscle−invasive disease and those who received preoperative transfusions, 2209 patients were included in the cohort. We assessed the unadjusted impact of transfusion of outcomes via the Kaplan–Meir Method for OS, and cumulative incidence for CIR and CSD. We then adjusted for patient and tumor covariates, including perioperative chemotherapy and baseline Hemoglobin, using a multivariable Cox proportional hazard regression model for OS, and multivariable competing risk regression models for CIR and CSD, and assessed the impact of PRBC transfusion on CIR, CSD and OS.
**Results:** Median overall survival was 4.96 years. When stratified by receipt of PRBC transfusion, the unadjusted OS was 4.62 and 6.62 years respectively for transfusion and non-transfusion groups respectively [\(p<0.0001\)]. Both the unadjusted CIR and CSD were not statistically significant between groups [\(P=0.065\) for CIR, \(p=0.854\) for CSD]. After adjusting for tumor and patient characteristics, PRBC transfusion was an statistically significant independent predictor of CIR and OS [CIR; HR: 1.57 (1.1423, 1.9882), \(p=0.0037\), OS; HR: 0.9857 (0.8677, 1.10592) but not cancer specific death [CSD; HR: 1.027 (0.7373, 1.14131), \(p=0.902\)].

**Conclusions:** The receipt of PRBCs in the postoperative period is an independent predictor of CIR and OS in surgically treated men with bladder cancer, but not CSD. The immunologic mechanisms that may mediate this effect are in need of further investigation. While the receipt of perioperative PRBC may be unavoidable, it may also serve as an important surgical quality metric with direct impact on tumor biology.

**Poster #109**

**PROGNOSTIC SIGNIFICANCE OF HER2 ONCOGEN OVEREXPRESSION IN PRIMARY UROTHELIAL CARCINOMA OF THE BLADDER**

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¹Department of Urology, University Hospitals of Case Medical Center, Case Western Reserve University, Cleveland, Ohio, USA; ²Urology Research Center, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran; ³Department of Pathology, Sina Hospital, Tehran University of Medical Sciences, Tehran, Iran

(Presented By: Sepehr Salem)

**Introduction and objectives:** The level of expression and the prognostic significance of HER2 protein in urothelial carcinoma vary among different investigations. This study sought to further evaluate the prognostic relevance of HER2 expression in urothelial carcinoma of the bladder (UCB), and also to clarify the role of associated factors in a comparative study.

**Methods:** 120 patients with newly diagnosed and clinicopathologically confirmed primary UCB, and 132 controls without any malignant disease were evaluated prospectively. The formalin−fixed, paraffin−embedded specimens were stained immunohistochemically and monoclonal HER2 antibody was used to determine the HER2 expression (FDA−approved Hercep Test, Dako). Staining characteristics were compared with the clinicopathological results. Cox regression was used to estimate the adjusted hazard ratios (HR) with 95% confidence intervals (CI), and impact on disease−free survival was analyzed using Kaplan−Meier method.

**Results:** Overall HER2 expression was detected in 31% patients (55% cases vs. 9% controls, \(p<0.0001\)). HER2 overexpression (staining intensity score [SIS] ≥2+) was observed in 32.5% cases; however, none of the controls showed HER2 overexpression. Statistically significant correlation was revealed between HER2 expression and tumor stage and grade. Univariate analysis revealed a significant relationship between the HER2 immunoreactive score and history of hypertension. In multivariate regression analysis, HER2 was found to be an independent prognostic factor. Moreover, HER2 positive patients had higher rate of relapse in comparison with HER2 negative patients (\(p=0.002\)). Kaplan−Meier curves demonstrated a significantly worse disease−related survival (log−rank:0.01) in patients with HER2 expressing tumors compared to those without HER2 expression. HER2 expression in patients was significantly correlated with poor prognosis (HR:2.45, 95%CI:1.24–4.84, \(P=0.009\)).

**Conclusions:** Our findings suggest a prognostic significance of HER2 protein overexpression in patients with UCB. The relatively high percentage of HER2 expressing tumors (55%) indicates that there is a substantial collective of UCB patients who might potentially profit from anti−HER2 therapy. Moreover, hypertension might predispose the expression of HER2 oncogene in patients. Finally, HER2 evaluation test could be considered as a diagnostic procedure in differentiating the benign tissue from malignant one, particularly in patients with SIS≥2+.
ADHERENCE WITH SURVEILLANCE GUIDELINES AFTER RADICAL CYSTECTOMY: A POPULATION-BASED ANALYSIS
Behfar Ehdaie¹, Coral Atoria², William Lowrance³, Andrew Feifer³, Dean Bajorin², Bernard Bochner³, S. Machele Donat³, Guido Dalbagni³ and Elena Elkin²
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Health Outcomes Research Group, Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY; ³Urology Service, Department of Surgery, Memorial Sloan-Kettering Cancer Center, New York, NY; ⁴Genitourinary Oncology Service, Department of Medicine, Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Behfar Ehdaie)

Background: Surveillance after radical cystectomy is recommended to diagnose tumor recurrence and treatment complications. We evaluated the adherence of bladder cancer patients to the National Comprehensive Cancer Network guidelines for surveillance after radical cystectomy in a population-based cohort of Medicare beneficiaries with bladder cancer.

Methods: We used the Surveillance, Epidemiology, and End Results (SEER)–Medicare linked database to identify patients aged 65 years or older diagnosed with non-metastatic bladder cancer who underwent radical cystectomy between 2000 and 2007. We used information from Medicare claims to examine the frequency of surveillance tests in the two years following surgery. The guidelines recommend a urine cytology twice at the end of each year and imaging of the chest, abdomen and pelvis once at the end of each year. We evaluated the impact of patient and provider characteristics on adherence to surveillance guidelines, controlling for demographic, disease, and provider treatment characteristics.

Results: Of 3,757 patients who had radical cystectomy, 2,990 (80%) were alive after two years. Adherence with all recommended investigations was 17% in the first year following surgery and 17% in the second year among those alive after 2 years, only 9% of patients had complete surveillance in both years. Patients with advanced pathologic stage (III/IV) and those who were unmarried were less likely to be adherent with surveillance guidelines in either year. (adjusted odds ratio [AOR] for advanced stage 0.74, 95% CI 0.60–0.91; AOR for unmarried 0.82, 95% CI 0.68–0.99). Patients treated by high-volume surgeons and those who saw a medical oncologist were more likely to be adherent (AOR for high volume 2.00, 95% CI 1.70–2.36; AOR for medical oncology visit 1.52, 95% CI 1.27–1.82). We also observed significant geographic variability in adherence with surveillance guidelines.

Conclusions: There is substantial deviation of clinical practice from the standards recommended for surveillance after radical cystectomy. Variation in adherence with clinical guidelines suggests important opportunities for quality improvement in bladder cancer care.

NEoadjuvant and Adjuvant CHEMOTHERAPY FOR MUSCLE INVASIVE BLADDER CANCER: THE LIKELIHOOD OF INITIATION AND COMPLETION
Murugesan Manoharan, Ahmed Eldefrawy, Devendar Katkoori, Ahmed M. Mansour, Rakish Singal and Mark Soloway
University of Miami, Miller School of Medicine, Miami, Florida
(Presented By: Ahmed M. Mansour)

Introduction: Chemotherapy was shown to improve survival in patients undergoing radical cystectomy (RC) for muscle invasive bladder cancer (MIBC). The initiation and completion rates for perioperative chemotherapy are variable. Our aim is to compare the likelihood of initiating and completing neoadjuvant (NAC) and adjuvant chemotherapy (AC) in patients who underwent RC for MIBC.

Materials and methods: We performed a retrospective analysis of patients who underwent RC between 1992 and 2010. NAC was advised for patients with clinical stage ≥T2, hydronephrosis, or in the presence of extensive lymphovascular invasion (LVI) or prostatic stromal invasion. Patients with ≥ pT3 or lymph node metastases were considered for AC.

Results: 363 patients were considered for perioperative chemotherapy. Among the 141 who were offered NAC, 125(88.6%) initiated NAC. 222 were considered for AC, 151 (68.0%) initiated AC (p<0.001). In the NAC group, 118 (83.5%) completed planned number of cycles of chemotherapy. In the AC group 79 (35.5%) completed at least 4 cycles (p<0.001). the reasons for not completing chemotherapy were listed in Table 1.

Conclusions: Patients with MIBC are more likely to initiate and complete NAC, when compared to AC.

Table 1: Reasons for not initiating/completing the chemotherapy.

<table>
<thead>
<tr>
<th>Reason for not initiating</th>
<th>NAC N (%)</th>
<th>AC N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason for not initiating</td>
<td>16 (100)</td>
<td>15 (21.0)</td>
</tr>
<tr>
<td>Patient preference</td>
<td>16 (28.5)%</td>
<td>19 (21.0)%</td>
</tr>
<tr>
<td>Surgical/ Medical condition</td>
<td>N/A</td>
<td>56 (79.0)</td>
</tr>
<tr>
<td>Reason for non-completion</td>
<td>7</td>
<td>72</td>
</tr>
<tr>
<td>Renal impairment</td>
<td>2 (28.5)%</td>
<td>9 (12.5)%</td>
</tr>
<tr>
<td>Intolerability 3</td>
<td>(43.0)%</td>
<td>23 (32.0)%</td>
</tr>
<tr>
<td>Hematological complications</td>
<td>2 (28.5)%</td>
<td>33 (46.0)%</td>
</tr>
<tr>
<td>Sepsis</td>
<td>0</td>
<td>7 (9.5)%</td>
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</tbody>
</table>
PROSPECTIVE EVALUATION OF OUTCOME OF LYMPH NODE POSITIVE BLADDER CANCER TREATED WITH RADICAL CYSTECTOMY AND LYMPHADENECTOMY: EFFECT OF THE LEVEL OF NODE POSITIVITY

Tatum Tarin¹,², Nicholas Power¹,², Behfar Ehdai¹,², John Sfakianos¹,², Jonathon Silberstein¹,², Daniel Sjoberg³, Guido Dalbagni¹,² and Bernard Bochner¹,²

¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Urology Service, Sidney Kimmel Center for Prostate and Urologic Cancers, Memorial Sloan-Kettering Cancer Center, New York, NY, USA; ³Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY

(Presented By: Tatum Tarin)

Purpose: To prospectively evaluate recurrence−free survival (RFS) and cancer−specific survival (CSS) of patients with bladder cancer managed with radical cystectomy (RC) and a mapping pelvic lymph node dissection (PLND) with a proximal limit extending at least to the aortic bifurcation.

Patients and Methods: Between 2000 and 2010, 597 patients underwent RC with a prospectively established mapping PLND. Nodal information and patient outcomes were collected in our prospective database. We evaluated the impact of lymph node involvement on disease outcomes in accordance with the 2010 American Joint Committee on Cancer TNM staging system. Survival estimates were described using Kaplan−Meier methods. Gender, age, pathologic stage, histology, and grade were evaluated as predictors of RFS and CSS using multivariate Cox proportional hazard regression.

Results: Overall, 119 patients (20%) had lymph node involvement and 47 (8%) had common iliac lymph node involvement. On multivariate analysis, positive nodal status was significantly associated with increased risk of recurrence (P < .001) and cancer−specific death (P < .001) compared to N0 disease. Five−year RFS for N3 patients undergoing RC with PLND was 30% (95% CI, 15%–46%). This was not statistically different from our N1 and N2 patients (38% [95% CI, 22%–54%] and 35% [95% CI, 11%–60%], respectively).

Conclusion: Our prospective study demonstrates that 30% of patients with bladder cancer with common iliac node involvement (N3) undergoing RC with PLND can be rendered disease free at 5 years. This data strongly supports the use of a PLND that includes the common iliac lymph nodes in patients undergoing RC for bladder cancer.
Poster #113

VALUE OF URETHRAL FROZEN SECTION AT RADICAL CYSTECTOMY AND IMPACT ON INTRAOPERATIVE DECISION MAKING
Glen Yang¹, Jared Whitson¹, Anobel Odisho¹, Peter Carroll¹ and Badrinath Konety²
¹University of California, San Francisco; ²University of Minnesota
(Presented By: Glen Yang)

Objective: It remains unclear which patients should remain candidates for urethral preservation during radical cystectomy and what factors should influence this decision. The aim of this study was to assess the accuracy of intraoperative urethral frozen sections (FS) during radical cystectomy and to evaluate factors associated with a positive urethral frozen section and urethral recurrence.

Methods: Consecutive patients undergoing radical cystectomy at UCSF who had urethral FS were identified. Data on preoperative clinical and pathologic factors, intraoperative decision making, urethral margins, and urethral recurrence were recorded.

Results: 243 patients with mean age of 65 years and median follow-up of 20 months were included. A positive urethral FS was present in 23 patients (9.3%). Urethral recurrence occurred in 7 patients (2.9%). Tumor number, size, location, grade, histology, and the presence of CIS were not associated with positive urethral FS or with urethral recurrence. Positive urethral FS was associated with positive final urethral margin (p<0.001), prostatic urethral tumor involvement at cystectomy (p=0.05), and urethral recurrence (p=0.03). The positive and negative predictive values of urethral FS for predicting urethral recurrence were 30% and 97%, respectively. Urethral frozen section altered intraoperative decision making in 6 (2.4%) cases.

Conclusions: Urethral recurrence rates after radical cystectomy are low. Given its minimal morbidity for patients, intraoperative urethral FS during cystectomy is a useful tool. However, because of low positive predictive value, the decision to forego orthotopic bladder replacement or perform prophylactic urethrectomy must be combined with other risk factors for urethral recurrence as well as patient preferences.

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Poster #114

INVESTIGATION OF P53-INDEPENDENT FUNCTIONS OF ARF IN THE CONTEXT OF COMBINED FUNCTIONAL LOSS OF P53 AND PTEN IN A MOUSE MODEL OF INVASIVE BLADDER CANCER
Joan Delto, Takashi Kobayashi, James McKiernan, Mitchell Benson and Cory Abate-Shen
Columbia University, New York, NY
(Presented By: Joan Delto)

Introduction and Objective: Treatment of patients with muscle-invasive bladder cancer is still a major clinical challenge among urologists, since it is often associated with regional or distant metastasis, for which there is no curative treatment. Clearly, there is a need for identification of novel prevention and treatment paradigms for invasive bladder cancer; however, our limited understanding of the molecular mechanisms of bladder tumorigenesis has hampered the identification of new targets for therapeutic intervention. The purpose of this study is to interrogate molecular mechanisms of invasive bladder cancer, especially with regard to function of Arf, which is previously reported as a potent tumor suppressor.

Methods: Recently we established a genetically engineered mouse model for invasive bladder cancer with preceding carcinoma in situ lesion, based on the combinatorial deletion of p53 and Pten in bladder epithelium using an adenovirus expressing Cre recombinase (Adeno-Cre) delivered to the bladder lumen (Puzio-Kuter Gene Dev 2009). In this mouse bladder tumor, we found upregulation of Arf. To investigate functional significance of Arf, we made an additional deletion of Arf to p53− and Pten−deficient tumor.

Results: Although Arf/p53/Pten triple floxed (TKO) mice developed invasive bladder cancer, its manifestation was slower than those developed in p53/Pten double floxed (DKO) mice (median tumor−free survival; 86 vs 73 days, p = 0.002). Tumor size at 8 wks after virus infection was significantly larger in DKO than in TKO mice (0.69 vs 0.22 g, p = 0.02).

Conclusions: Our results indicate that Arf has a significant impact on shortening bladder cancer latency in the context of p53− and Pten−deletions although it is not required for bladder tumorigenesis in this context.
This project is funded in part by the Alexander and Margaret Stewart Trust.
Preliminary Results of Perioperative Outcomes and Oncologic Efficacy from a Single Institution Randomized Controlled Trial of Open Versus Robotic Assisted Radical Cystectomy

Jamie Messer, John Fitzgerald, Barbara Ercole, Robert Svatek, Marty Hilton and Dipen Parekh
University of Texas Health Sciences Center San Antonio, TX
(Presented By: Jamie Messer)

Introduction/Objective: In the past decade minimally invasive approaches including robotic assisted approach has emerged as a viable option for the treatment of many urologic malignancies. Robotic assisted Radical Cystectomy (RARC) for bladder cancer has been reported with the potential for lower blood loss, less transfusion requirement, and shorter hospital stay in previous retrospective and one prospective randomized study. We present preliminary data from a single institution prospective randomized clinical trial of open radical cystectomy (ORC) versus RARC.

Methods: Prospective randomized single institution series evaluating the feasibility of ORC versus RARC for consecutive patients was performed from July 2009 to June 2011. Oncologic efficacy was assessed based on the surrogates of total number of lymph nodes removed and positive surgical margins. Perioperative morbidity was assessed evaluating for estimated blood loss, transfusion requirements, length of stay and perioperative morbidity.

Results: To date 46 patients have been randomized with data available on 39 patients for analysis. Each group was similar with regards to age, sex, race, BMI, comorbidities, and previous abdominal procedures, operative time, and final pathologic stage. We observed no significant difference between oncologic outcomes of positive surgical margins (5% vs 5.263%, p 0.48) or number of LN removed (11 vs 23, p 0.40) for the RARC versus ORC groups respectively. The RARC group was noted to have decreased estimated blood loss (400 mL vs 800 mL, p 0.008) and a trend towards decreased rate of excessive length of stay (>5 days) (65% vs 84%, p 0.17) for the RARC versus ORC groups. The robotic group had a trend towards decreased rate of transfusion however this was not statistically significant (40% versus 53%, p 0.26).

Conclusions: Our preliminary findings from a single institution randomized trial of RARC versus ORC indicates that RARC has equivalent oncologic outcomes as measured by positive surgical margins and total number of lymph node removed. RARC demonstrates Perioperative benefits of decreased blood loss, fewer excessive hospital stays, and a trend toward fewer transfusions that was not significant.

<table>
<thead>
<tr>
<th>RARC(n=20)</th>
<th>ORC(n=19)</th>
<th>p/Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Operative Time (ORC)</td>
<td>309 (280-362)</td>
<td>289 (240-347.5)</td>
</tr>
<tr>
<td>Median BIL (ORC)</td>
<td>400 (380-762.5)</td>
<td>500 (550-1250)</td>
</tr>
<tr>
<td>Median Units Blood Transfused</td>
<td>0 (0-4)</td>
<td>0 (0-4)</td>
</tr>
<tr>
<td>Transfusion given (%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Median LOS</td>
<td>6 (5-8)</td>
<td>6 (6-5.5)</td>
</tr>
<tr>
<td>LOS p/Value</td>
<td>7/20 (35%)</td>
<td>3/15 (20%)</td>
</tr>
</tbody>
</table>

Tumor Stage

| pT0 | 2 (10%) | 2 (11%) |
| pT1 | 3 (15%) | 6 (31.6%) |
| pT2 | 3 (15%) | 3 (15%) |
| pT3 | 7 (35%) | 5 (26.3%) |

Positive Margins

| *Advanced* pT2a disease | 1/20 (5%) | 1/19 (5.2%) |

Median EI (ORC) | 11 (6.75-28.5) | 23 (16-28) | 0.40
RISK FACTORS FOR BLADDER CANCER RECURRENCE AFTER NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL TUMORS

Julian Mauermann¹, Yves Fradet¹, Wassim Kassouf², Ricardo Rendon¹, Niels Jacobsen⁴, Adrian Fairey⁴, Jonathan Izawa⁵, Anil Kapoor⁷, Peter Black⁷, Simon Tanguay³, Joe Chin⁵, Alan So⁷, Jean-Baptiste Lattouf⁸, David Bell³, Fred Saad⁶, Ed Matsumoto⁶, Darrel Drachenberg⁹, Ilias Cagiannos¹⁰ and Louis Lacombe¹

¹Department of Urology, Laval University, Quebec City, QC, Canada; ²Division of Urology, McGill University, Montreal, QC, Canada; ³Department of Urology, Dalhousie University, Halifax, NS, Canada; ⁴Division of Urology, University of Alberta, Edmonton, AB, Canada; ⁵Division of Urologic Surgery, University of Western Ontario, London, ON, Canada; ⁶Division of Urology, McMaster University, Hamilton, ON, Canada; ⁷Department of Urologic Sciences, University of British Columbia, Vancouver, BC, Canada; ⁸Department of Urology, University of Montreal, Montreal, QC, Canada; ⁹Section of Urology, University of Manitoba, Winnipeg, MB, Canada; ¹⁰Division of Urology, University of Ottawa, Ottawa, ON, Canada

(Presented By: Julian Mauermann)

Introduction and objectives: Upper urinary tract urothelial carcinomas (UTUC) are rare tumors, but cancer recurrence in the urinary bladder after nephroureterectomy is common and occurs in 22–69% of patients. Risk factors for bladder cancer recurrence after UTUC have been described, but series are small and results remain ambiguous.

Methods: We reviewed all upper tract urothelial cancers treated with nephroureterectomy at 10 Canadian University Centers between 1990 and 2010. 742 patients had the necessary information available. Covariables assessed at time of nephroureterectomy included age, gender, smoking status, presence of hydronephrosis, previous upper tract tumor, type of surgery, histopathological tumor entity, pT and pN stage, pathological grade, presence of CIS, tumor location, multifocality, tissue architecture, previous abdominal radiotherapy, distal ureter management, surgical margin status and the use of adjuvant chemotherapy. Univariate and multivariate Cox proportional hazards models were created to analyze the effect of various covariables on bladder cancer recurrence.

Results: 167 (22.5%) out of 742 patients developed a bladder cancer recurrence. Mean age was 69.7 years, 59% of the patients were male and median interval between nephroureterectomy and bladder cancer recurrence was 1.4 years. Univariate analysis of risk factors for bladder cancer recurrence identified the following factors: tumor location (HR 1.356, 95% CI 1.198−1.535, p<0.0001), multifocality (HR 1.579, 95% CI 1.121−2.222, p=0.0089), presence of CIS (HR 1.430, 95% CI 1.012−2.022, p=0.0428), architecture (HR 0.691, 95% CI 0.560−0.853, p=0.0006), use of adjuvant chemotherapy (HR 2.740, 95% CI 1.832−4.098, p<0.0001), and age (HR 1.017, 95% CI 1.001−1.033, p=0.0319). Multivariate analysis of risk factors for bladder cancer recurrence identified age (HR 1.034, 95% CI 1.014−1.055, p=0.0009), tumor location in both renal pelvis and ureter (HR 2.216, 95% CI 1.273−3.857, p=0.0049) and use of adjuvant chemotherapy (HR 2.674, 95% CI 1.468−4.873, p=0.0013).

Conclusions: Bladder cancer recurrence developed in 22.5% of patients. Only higher age, tumor location in both the renal pelvis and the ureter as well as the use of adjuvant chemotherapy were identified as risk factors for bladder cancer recurrence after nephroureterectomy for upper tract urothelial tumors.

Funding: None.
UTILITY OF PET/CT IN IDENTIFYING BONE METASTASIS IN PATIENTS WITH UROTHELIAL CARCINOMA
Phillip Abbosh, Robert Grubb, III, Kenneth Nepple, Aleksandra Klim, Barry Siegel, Farrokh Dehdashti, Seth Strope and Adam Kibel
Washington University, St. Louis, MO
(Presented By: Phillip Abbosh)

Purpose: Identification of bone metastasis in patients with urothelial carcinoma currently relies on alkaline phosphatase and bone scintigraphy. 18FDG−PET/CT (PET/CT) has proven useful in detecting soft tissue metastasis. Its role in identifying bone metastasis and its ability to replace bone scintigraphy is unknown. Herein, we compare the utility of PET/CT to bone scan in identifying osseous metastasis in patients with urothelial cell carcinoma.

Materials and Methods: We identified 321 patients with urothelial cell carcinoma at our institution that underwent either bone scan and/or PET/CT. Studies were considered concurrent if they were performed within 90 days of each other. We collected standard demographic, radiologic, and pathologic data on each patient.

Results: 98 of 321 patients (31%) had nonmuscle invasive tumors and 111 of 321 patients (66%) had muscle invasive tumors. 28 of 321 patients (9%) had metastatic disease prior to the time of evaluation. Overall, 58 of 321 (18%) of patients in this cohort had bone metastasis diagnosed as a result of one or both imaging tests. 45 of 244 patients (18%) had a bone scan showing bone metastasis and 20 of 125 patients (16%) of patients had a PET/CT showing bone metastasis. 48 patients had both studies, and 12 of these (25%) had osseous metastasis diagnosed as a result of one or both studies. However, only 30 patients had both studies performed within a 90 day interval. Five of these 30 patients (17%) had bone metastasis; all five had a PET/CT demonstrating skeletal disease, but bone scan was positive in 4 of the 5 patients (p=0.7, Chi−square). Bone scan underestimated the extent of disease compared to PET/CT, as all 4 patients with positive bone scans who had PET/CT within 90 days had additional lesions identified on PET/CT. Furthermore, CT scan, MRI, or plain film identified additional bony lesions which were missed on bone scan in 3 additional patients. However, no additional studies identified bony lesions which were missed by PET/CT.

Conclusions: In this retrospective analysis, bone scan and PET/CT identified a similar proportion of patients with skeletal metastasis, but bone scan often demonstrates less extensive disease than PET/CT. While sample size was small, the fact that PET/CT identified skeletal disease missed by bone scan raises the possibility that it could be superior to bone scan in this regard. Larger studies could confirm these findings.

USE OF NEOADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER: 10-YEAR EXPERIENCE AT A SINGLE INSTITUTION
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(Presented By: Stephen F Kappa)

Introduction and Objectives: Increasing data over the past 10 years supports the use of platinum−based (PB) neoadjuvant chemotherapy (NAC) for patients undergoing radical cystectomy (RC) for muscle−invasive bladder cancer. While level−1 evidence indicates that NAC provides a long−term survival benefit, its use is variable. Thus, we sought to determine utilization patterns and factors affecting use of NAC at a high−volume tertiary care center.

Methods: We studied 1040 consecutive patients who underwent RC for urothelial bladder cancer from January 2001 to December 2010. Use of NAC and PBNAC was determined for each year across strata of clinical stage and renal function. Baseline characteristics (age, race, sex, Charlson comorbidity index [CCI], body mass index [BMI], albumin level, glomerular filtration rate [GFR], clinical stage, surgeon and year of surgery) were compared between those who received NAC and those who did not. A multivariable model was fit for predictors of NAC, controlling for factors significant on univariate analysis.
Results: Mean age was 67.9 years and 20.1% were female. Among 656 patients with muscle–invasive disease, 66 (10.1%) received NAC, increasing from 1.6% in 2002 to 32.9% in 2010 (Figure). Twenty–seven of 390 patients (7.2%) with muscle–invasive disease and adequate renal function (GFR>60 mL/min) received PBNAC, reaching 18.2% of 44 eligible patients in 2010. On univariate analysis, age, CCI, BMI, clinical stage, year of surgery and surgeon were associated with use of NAC. Age (OR 0.96, 95%CI [0.92–0.99]), clinical stage T2 or higher (3.60, [1.68–7.73]), year of surgery (1.55, [1.33–1.81]), and surgeon predicted use of NAC on multivariate analysis.

Conclusions: Although NAC is supported by level–1 evidence, there are substantial toxicities and the ideal utilization rate remains unclear. Its adoption in a particular center can be viewed as an improvement in quality, yet individual decisions regarding use of NAC are influenced heavily by the clinical scenario and by patient and provider preferences. This study demonstrates that implementation lags behind discovery and supports the notion that research resources should be allocated to both aspects of improving the quality of care.

Poster #119

RISK FACTORS FOR UPPER URINARY TRACT AND URETHRAL RECURRENCES FOLLOWING RADICAL CYSTECTOMY
Nathan Perlis¹, Polat Turker¹, David Margel¹, Peter J. Bostrom¹, Marcelo Wroclawski¹, Tuomas Mirtti²,³, Martti Nurmi², Neil E. Fleshner¹, Antonio Finelli¹, Michael A. Jewett¹ and Alexandre R. Zlotta¹,⁴

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(Presented By: David Margel)

Introduction: Recurrences in the upper urinary tract (UUT) and the urethra following radical cystectomy (RC) for urothelial carcinoma (UC) of the bladder are often recognized after symptomatic presentation. Accurate predictive risk factors would aid in designing individually tailored follow–up protocols, perhaps improving morbidity and mortality.

Methods: 635 consecutive patients undergoing RC for bladder UC without neoadjuvant chemotherapy at The University Health Network, Toronto, Canada (1992–2008) and University of Turku, Turku, Finland (1996–2005) were studied. The rates of upper urinary tract and urethral recurrences were analyzed. Patients with urethrectomy were excluded from urethral recurrences analysis. Clinical and pathological variable associated with recurrence were evaluated using the pearson chi–square test. The Kaplan–Meier method was used to analyze survival.
**Results:** Mean follow up was 45 months (0–264). Among the 635 RC patients, 22 (3%) had an UUT recurrence and among the 559 patients without urethrectomy during cystectomy, 17 (3%) had a urethral recurrence. Median time to upper tract recurrence was 20 months (3–84 mo) and to urethral recurrence was 30 months (10–96 mo). Male gender (p=0.035), T2 or higher primary stage (p=0.014), concomitant CIS (p=0.001), pathological stage higher than T2 (p=0.03) and prostatic urethral involvement (p=0.05) were significant risk factors for urethral recurrence. Disease specific and overall survival of upper tract recurrences was poorer than urethral recurrences (43 vs 74% at 10 years, p=0.047).

**Conclusions:** Upper tract and urethral UC recurrences for patients following radical cystectomy are rare. Efforts should be made to closely monitor patients with CIS and prostatic urethral involvement for recurrences post-cystectomy. We found that urethral recurrence had a lower mortality rate than in other series. Both upper tract and urethral recurrences remain a challenge to timely diagnose and manage post-cystectomy, and an optimal monitoring schedule should be developed.

**Poster #120**

**TREATMENT PATTERNS AND COSTS OF TREATING NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)**

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(Submitted By: Danielle Colayco)

**Introduction and Objective:** Although intravesical perioperative instillation (IPOI) of chemotherapy reduces risk of recurrence in non–muscle invasive bladder cancer (NMIBC), it remains underutilized in the US. This study evaluates treatment patterns and costs associated with NMIBC.

**Methods:** Patients diagnosed with Ta bladder cancer (BC) from 1/1/2004 – 12/31/2007 were identified in the Surveillance, Epidemiology, and End Results–Medicare database. Patients were characterized by age at diagnosis, gender, tumor size and grade. Initial transurethral resection of bladder tumor (TURBT; CPT 52224, 52234, 52235, 52240, 52204, ICD−9 573.3, 574.9) was described with respect to setting and costs. IPOI was defined as intravesical instillation (CPT 51720, J9280, J9290, J9291, J9178, J9000, J9001, J9212 – J9215, J9340, ICD−9 99.25, V58.1) on day 0/1 post–TURBT. Predictors of IPOI utilization were evaluated using multivariate logistic regression. TURBT costs (physician services and facility) were based on 2011 Medicare rates.

**Results:** A total of 8,006 Ta BC patients were identified. Median age was 79.7 years and 76.1% of patients were male. A large majority (69.7%) of patients had low (23.4%) or moderate (46.3%) grade tumor, while 23.7% had high grade/undifferentiated disease; 6.5% was unknown. Most patients (69.5%) underwent initial TURBT in the outpatient setting (54.2% outpatient hospital, 9.7% ambulatory surgical center, and 5.5% physician’s office). The remainder (30.5%) were inpatient procedures. The overall mean TURBT cost was $3,214 based on the mean cost from an outpatient hospital ($1,814), ambulatory surgical center ($1,073), physician’s office ($1,131) or inpatient unit ($6,757). Among all patients, 6.7% received IPOI with/without subsequent induction therapy, 28.3% received instillations 2+ days post–TURBT, and 65% received no post–TURBT instillation. In multivariate analysis, patients receiving outpatient vs. inpatient TURBTs were more likely to receive IPOI (OR: 1.81; 95% CI= 1.43–2.28) as were patients with larger tumor size (OR: 2.44; 95% CI= 1.50–3.96) vs. smaller tumor size and those with higher grade vs. lower grade (OR: 1.47; 95% CI= 1.17–1.86).

**Conclusions:** A large proportion of potentially eligible BC patients do not receive IPOI. Patients receiving TURBTs in the outpatient setting were more likely to receive IPOI and clinicians targeted larger, higher grade tumors for IPOI, despite the fact that smaller, lower grade tumors derive greater benefit.
LENALIDOMIDE AUGMENTS THE RESPONSE OF BLADDER CANCER TO BCG IMMUNOTHERAPY IN AN IN VIVO MURINE MODEL
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(Presented By: Eugene Lee)

Purpose: Intravesical BCG is the gold standard for non-muscle invasive bladder cancer. However many patients do not respond to this therapy while others relapse and/or progress. As a result, there remains a need for therapies that can enhance the efficacy of BCG. Herein, we explore the efficacy of lenalidomide, a thalidomide derivative used as an immunomodulatory in multiple myeloma and myelodysplastic syndrome, in combination with BCG in vitro and in an in vivo bladder cancer model.

Materials and methods: We studied the effects of lenalidomide in combination with BCG induced cytokines in MBT-2 cells using PI-FACS. We then performed Western blotting for cell cycle and apoptosis regulatory proteins. Subsequently, we tested the efficacy of this combination in an immunocompetent murine model of bladder cancer with MBT-2 cells in C3H mice using the flank injection method. Tumor growth curves were created for the control, lenalidomide alone, BCG alone and combination treatment mice groups. Immunohistochemistry (IHC) was then performed using antibodies against cell cycle and apoptosis proteins.

Results: PI-FACS identified increased DNA fragmentation in the combinations of lenalidomide and TNF-α and FasL compared to control and each agent alone. Using Western blotting, we demonstrated that the combination resulted in apoptosis via caspase-3 activation. In the murine model, using the treatment groups described above, combination therapy resulted in a statistically significant decreased tumor size compared to the control group. While the BCG alone and lenalidomide alone groups did show a trend toward smaller tumor, they did not reach statistical significance. Furthermore, the TUNEL assay showed a substantial increase in apoptosis only in the combination group.

Conclusions: Our study demonstrates a potential role for the immunomodulatory agent, lenalidomide, in combination with BCG for non-muscle invasive bladder cancer. This in vivo model serves as a template for future clinical trials.

EVALUATION OF SELENIUM SUPPLEMENTATION ON THE PREVENTION OF BLADDER CANCER IN SWOG-COORDINATED SELECT
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(Presented By: Yair Lotan)

Introduction: Epidemiological and biological evidence suggest a preventative effect of selenium and vitamin E on bladder cancer. The objective of this study was to assess the effect of selenium, vitamin E, or the combination on bladder cancer development.

Methods: This was a secondary analysis of the randomized, placebo-controlled trial (Selenium and Vitamin E Cancer Prevention Trial [SELECT]) which included 34,887 men randomly assigned to four groups (selenium, vitamin E, selenium + vitamin E, and placebo) in a double-blind fashion between August 22, 2001, and June 24, 2004. Baseline eligibility included African American men age 50 years or older, others age 55 or older, a serum prostate-specific antigen level of 4 ng/mL or less, and a digital rectal examination not suspicious for prostate cancer. The primary end point was bladder cancer incidence as determined by routine clinical management.

Results: Within a median follow-up of 7.1 years (interquartile range, 6.4 – 8.0 years), 224 bladder cancer cases were recorded. Bladder cancer cases were older, more likely to be Caucasian and to have a smoking history compared to non bladder cancer subjects. Most cancers were urothelial and non-muscle invasive cancers. There were no significant differences in bladder cancer incidence among subjects in the placebo, selenium, vitamin E or selenium+vitamin E arms (placebo, n=53; vitamin E, n=56, HR=1.05 (0.64, 1.73), p=0.79; selenium, n=60, HR=1.13 (0.70, 1.84), p=0.52; vitamin E + selenium, n=55, HR=1.05 (0.63, 1.70, p=0.86).

Conclusions: This secondary analysis found no preventative effect of selenium or vitamin E, alone or in combination on bladder cancer in this population of men. Further studies are necessary to assess the effect in females and at different doses and formulations.
Poster #123

ROLE OF ESTROGEN, PROGESTERONE AND ANDROGEN RECEPTORS ON FORMATION AND PROGRESSION OF UROTHELIAL CARCINOMA OF THE BLADDER

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(Presented By: Sepehr Salem)

Introduction and Objectives: Males have a substantially higher risk of developing UCB than females, whereas its etiology still remains largely obscure. This study sought to further clarify the role of ER/PR/AR expression in urothelial carcinoma of the bladder (UCB), and also to evaluate the possible associations with progression and survival of cancer.

Methods: 120 patients with clinicopathologically confirmed primary UCB, and 132 controls without any malignant disease were evaluated prospectively. Their pathologic specimens were stained immunohistochemically using avidin–biotin–peroxidase technique and monoclonal ER/PR/AR antibodies were used to determine the ER/PR/AR expression (Dako). Staining characteristics were compared with the clinicopathological results. Cox regression was used to estimate the adjusted hazard ratios (HR) with 95% confidence intervals (CI), and impact on disease−free survival was analyzed using Kaplan−Meier method.

Results: ER/PR expressions were observed in 4.2%/2.5% of cases and 2.3%/1.5% of controls. AR expression was detected in 22% of the patients with UCB and all controls were AR−negative. No significant association was found between ER/PR immunoreactive scores and age, tumor size, stage and grade, while statistically significant correlation was revealed between AR expression and tumor stage and grade. AR/PR−positive patients had higher rate of metastasis in comparison with AR/PR−negative patients(p<0.05). In multivariate regression analysis, ER/PR was not found to be independent prognostic factors and survival was not affected by their expressions. However, AR−positive patients showed a significantly poorer prognosis than AR−negative cases (log−rank test, p=0.02) and it could also be used as a prognostic factor (HR: 2.12; 95%CI: 1.36−4.65).

Conclusions: AR expression was found in almost 22% of the tumors and it was significantly associated with high stage, poorly differentiated tumors and unfavorable outcome. Hence, AR could be considered as a potential target for additional hormonal therapy. AR evaluation test could also be regarded as a diagnostic procedure for determining the malignant bladder issues. Moreover, ER and PR expression were not found to have any direct roles in formation and progression of UCBs.

Poster #124

OUTCOMES OF RADICAL CYSTECTOMY FOR MICROPAPILLARY UROTHELIAL CARCINOMA AT THE UNIVERSITY OF SOUTHERN CALIFORNIA

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(Presented By: Adrian Fairey)

Introduction and Objectives: Outcomes of radical cystectomy for micropapillary urothelial carcinoma (MUC) are poorly defined. Our aim was to examine the impact of MUC on survival.

Methods: A retrospective analysis of prospectively collected data from the University of Southern California (USC) Bladder Cancer Database was performed. Between 1985 and 2008, 1681 patients underwent radical cystectomy and extended pelvic lymph node dissection for primary bladder cancer. All surgical specimens were reviewed by dedicated genitourinary pathologists. Histologic type was categorized according to the World Health Organization/International Society of Urological Pathology (WHO/ISUP) 2004 classification as urothelial carcinoma (n=1648) or micropapillary urothelial carcinoma (n=33). Patients were assigned a diagnosis of MUC if the review of pathologic material revealed any micropapillary component in the tumor. The outcomes were overall survival (OS) and recurrence−free survival (RFS). The Kaplan−Meier method and Cox proportional regression models were used to analyze survival data.
Results: The median follow-up duration was 10 years (range, 0 to 25 years). Baseline characteristics were similar between histologic types except MUC was associated with advanced clinical (cTanyN1−3: 2% versus 9%, p=0.03) and pathologic (pTanyN1−3: 23% versus 46%, p=0.01) TNM stage, multifocality (37% versus 58%, p=0.02), and high grade histology (84% versus 97%, p=0.04). The predicted 5-year OS (59% and 67%, Log rank p=0.79) and RFS (67% and 58%, Log rank p=0.50) rates did not differ between patients with UC and MUC. Multivariable analysis showed that histologic type was not independently associated with OS (HR 0.94, 95% CI 0.57 to 1.55, p=0.82) or RFS (HR 0.95, 95% CI 0.53 to 1.69, p=0.86).

Conclusions: Outcomes of radical cystectomy for patients with MUC are similar to those with UC when controlling for other clinical and pathologic factors.

Poster #125

INCIDENCE AND PROGNOSTIC IMPLICATIONS OF PERINEURAL INVASION AFTER RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA
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(Presented By: Manoj Rao)

Introduction and Objectives: We studied the clinical implications of perineural invasion (PNI) in the setting of urothelial carcinoma after radical cystectomy.

Methods: We reviewed our radical cystectomy database from 1/1996 to 4/2010, focusing on PNI in patients with primary urothelial carcinoma with pathologically localized(pT2NOMO), advanced(pT3−4NOMO), and node positive disease (pTxN1−3M0).

Results: Of the 459 patients who underwent radical cystectomy, PNI was found in 8%(6/77) pT2, in 46%(48/104) pT3−4, and 34%(26/71) N+ patients. Comparing PNI+ vs PNI – patients by group, recurrence rates were 33%(2/6) vs 17%(12/71) in pT2(p=0.6), 40%(19/48) vs 21%(12/56) in pT3−4(p=0.04), and 42%(10/24) vs 36%(17/47) in N+(p=0.8). 5 year recurrence–free survival was significantly worse in PNI positive patients with pT3=4NOMO(p=0.03) and pTxN+MO disease (p=0.04) over mean follow up of over two years(25 months; refer to figure).

Conclusions: We report our perineural invasion rates after radical cystectomy. Perineural invasion may be an indicator of a poor prognosis, especially in pathologically advanced and node positive disease.

Source of Funding: None
COMPARATIVE ANALYSIS OF EXISTING SURGICAL RISK ASSESSMENT TOOLS TO PREDICT POST-OPERATIVE MORTALITY RATES AFTER RADICAL CYSTECTOMY
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(Presented By: Tracy Downs)

Introduction: Radical cystectomy with urinary diversion is currently the gold standard treatment for muscle invasive transitional cell carcinoma. However, large series of radical cystectomies report complication rates between 22%−57% and 90-day mortality rates of 3−4%. Unfortunately, there are no widely accepted methods to identify which patients will suffer early mortality and not benefit from surgery. The objective of our study was to compare validated surgical risk tools to predict mortality rates in patients undergoing radical cystectomy and urinary diversion.

Materials and Methods: We retrospectively reviewed the physiologic parameters, operative parameters and 90-day mortality in 100 consecutive patients who underwent radical cystectomy and urinary diversion performed at the University of Wisconsin. Predicted mortality were calculated using the POSSUM, Portsmouth POSSUM (P−POSSUM), Simplified Acute Physiologic scoring system II (SAPS) and the Acute Physiological and Chronic Health Evaluation II (APACHE). Observed and predicted surgical outcomes were compared.

Results: Our observed mortality rate was 4%. The mean predicted mortality rates for the different surgical risk tools were the following: POSSUM (20.4%), P−POSSUM (7.0%), APACHE II (5.4%) and SAPS II (3.6%) for the entire cohort of patients. The mean predicted mortality rates for the 4 patients who died were POSSUM (18.6%), P−POSSUM (6.7%), APACHE II (4.3%) and SAPS II (5.1%). The SAPS II was the most accurate of the analyzed risk assessment tools with an area under the curve (AUC) of 0.719.

Conclusion: Most risk stratification methods were inaccurate in predicting mortality in patients undergoing radical cystectomy. SAPS II performed best but additional studies are required to develop “cystectomy” specific risk calculators.

NON-CLEAR CELL HISTOLOGY IS INDEPENDENTLY ASSOCIATED WITH POOR OUTCOMES IN THE TARGETED THERAPY ERA
Edward Rampersaud¹, Frederic Birkhaeuser¹, Joshua Logan¹, Geoffrey Sonn¹, Yvonne Chan², Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Fairooz Kabbinavar¹, Allan Pantuck¹ and Arie Belledegrun¹
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(Presented By: Edward Rampersaud)

Objective: The role of targeted therapy (TT) in metastatic renal cell carcinoma (mRCC) having non−clear cell histology is still being defined. We sought to examine the factors associated with survival outcomes in patients presenting with various histological subtypes in the TT era.

Methods: The UCLA Kidney Cancer Program database containing records of over 2000 patients, including 232 patients treated with TT since 2003, was queried. Of the 154 patients treated with FDA−approved TT, 131 had clear cell subtype (ccRCC) while 25 had non−clear cell histology (non−ccRCC). We compared the clinicopathologic factors and survival outcomes between these two groups using student’s t−test, chi−square, Kaplan−Meier (log rank), and multivariate Cox regression.

Results: The two groups were balanced for baseline demographic variables, including gender, race, BMI, pack−years of smoking, T−stage, and UCLA Integrated Staging System (UISS). Median survival of patients with ccRCC and non−ccRCC was 41.7 and 18.1 months, p<0.001. Among patients receiving TT−only, median survival of patients with ccRCC and non−ccRCC was 32.5 and 15.4 months, p=0.020. A subset of ccRCC patients treated sequentially with IMT followed by TT had a median survival of 47.9 months. Worsening UISS risk class, non−caucasian race, and non−ccRCC histology were all independently associated with risk of cancer death.

Conclusion: Non−clear cell histology is a significant risk factor for cancer specific death for mRCC patients treated by TT even after controlling for UISS risk category. Furthermore, subset analysis among those with clear cell histology suggests that carefully selected patients may achieve outstanding survival when treated by upfront immunotherapy followed by TT only at the time of progression.
A PROSPECTIVE TRIAL ASSESSING THE EFFECTS OF CLAMP ISCHEMIA DURING PARTIAL NEPHRECTOMY ON RENAL FUNCTION, BIOMARKERS, AND STRUCTURE
Barbara Ercole¹, Kathleen Torkko², William Hilton³, Prasad Devarajan⁴, Manjeri A Venkatachalam⁵, Joel M Weinberg⁶ and Dipen J Parekh⁷
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(Presented By: Barbara Ercole)

Introduction: Tolerance of the human kidney to clamp ischemia (CI) during partial nephrectomy (PN) has been considered to be limited to 20–30 min. We determined the utility of new biomarkers for following renal injury in this setting.

Material and Methods: 40 patients undergoing open PN without (N=27, avg clamp time 32.3 min, range 15–53 min., 74% > 30 min.) or with cooling (N=13 avg clamp 48 min. range 30–61 min.) had biopsies of uninvolved areas of the kidney preclamp, during clamping and 5 min. after clamp release, along with serial measurements of standard renal functional parameters plus measurement of serum cystatin C and NGAL, and of urine NGAL, cystatin C, NAG, LFABP, NGAL, KIM−1 and IL−18.

Results: Serum creatinine transiently increased at 24 hours by 21.9±6.4% after warm CI and 27.2±7.9% after cold CI (Ps < .001), but serum cystatin C did not change and plasma NGAL was minimally affected. Urine biomarkers increased irrespective of whether they were factored for creatinine, with particularly large changes in KIM−1 and LFABP, but did not correlate with duration of CI, the change in creatinine at 24 hours, or the use of cold or warm CI. Ultrastructure and staining for actin, phosphotyrosine, B1 integrin, and ICAM−1 showed changes consistent with CI, but much milder than predicted from animal models. Creatinine has remained stable in the patient cohort at up to 18 months of follow-up.

Conclusion: The data indicate that the insult to the clamped kidney from 30–60 minutes of CI under conditions of open partial nephrectomy is well tolerated despite increases of urinary biomarkers, which may in part reflect local effects of the surgery itself, expand indications for PN in the management of renal cancers, and support the use of CI as opposed to more complex procedures for PN.

SEQUENTIAL THERAPY OF CAREFULLY SELECTED PATIENTS WITH IMMUNOTHERAPY FOLLOWED, UPON PROGRESSION, BY TARGETED CANCER THERAPY FOR METASTATIC RCC CAN ACHIEVE OUTSTANDING SURVIVAL: THE UCLA EXPERIENCE
Frederic Birkhaeuser¹, Edward Rampersaud¹, Xiaoyan Wang², Nils Kroeger¹, Christine Anterasian¹, David Li¹, Frederic Pouliot¹, Nazy Zomorodian¹, Joseph Riss¹, Gang Li², Fairouz Kabbinavar¹, Allan Pantuck¹ and Arie Belldegrun¹
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(Presented By: Frederic Birkhaeuser)
Introduction and Objectives: The understanding of the molecular pathways involved in renal cell carcinoma (RCC) has yielded a new age of molecule–targeted therapies for the treatment of metastatic RCC (mRCC). We have previously published our extensive experience with immunotherapy (IMT). The aim was to examine and compare survival of patients treated with targeted therapy (TT) agents to our historical experience.

Methods: 232 consecutive patients treated with at least one TT regimen for mRCC since 2003 comprised the TT database, which was merged with the existing prospectively collected UCLA Kidney Cancer Program database. Of these, 147 had a cytoreductive nephrectomy followed by an FDA–approved TT agent: 111 (76%) had TT alone, 27 (18%) had first line IMT followed by TT at the time of progression, and 9 (6%) had other combinations with TT. Since 2003, only patients meeting the UCLA Clinical Pathologic Molecular (CPM) criteria for Interleukin−2 were offered upfront immunotherapy. TT patients were compared to similar cohorts treated with IMT alone.

Results: Median disease−specific survival (DSS) of patients evaluable for IMT alone (n=299), TT alone (n=109), or IMT followed upon progression by TT (n=26) was 21.4, 30.0, and 63.0 months, respectively (p=0.001). For patients with first−line sunitinib (n=66), median DSS was 27.0 months (p=0.125 compared to IMT alone). DSS from the time of institution of TT until last contact was comparable in both subgroups TT alone (n=104, 26.0 months) and IMT followed by TT (n=23, 23.0 months) (p=0.513).

Conclusions: Patients fitting the UCLA CPM criteria treated by IMT followed upon progression by TT can achieve outstanding DSS compared to patients receiving TT or IMT alone. Moreover, TT appears to be as effective in patients who progress after IMT as in patients with first−line TT and thus can be used with equal efficacy to rescue patients who progress after having previous IMT. Carefully selected low and intermediate risk mRCC patients should be strongly considered for upfront IL−2 based immunotherapy while reserving their option of TT upon progression.

Poster #130

DOES CYTOREDUCTIVE NEPHRECTOMY IMPROVE SURVIVAL IN NON-CLEAR CELL RENAL CELL CARCINOMA?

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(Presented By: Patrick Kenney)

Introduction: Non−clear cell histology is associated with poor prognosis among patients undergoing cytoreductive nephrectomy (CN) for metastatic Renal Cell Carcinoma (mRCC). We compare patients with non−clear cell mRCC undergoing CN to patients managed with their primary tumor in situ to determine if CN is associated with improved overall survival (OS).

Methods: We reviewed all patients with pathologically−confirmed non−clear cell mRCC at a single institution from 2002–2009 (n = 152). Exclusion criteria were similar to prospective CN studies and included unresectable primary (n = 4), ECOG performance status ≥2 (n=48), thrombus above the hepatic veins (n=1), and other malignancy within 5 years (n = 2). Patients with palliative nephrectomy (n=1), ongoing or unreported trials (n=4), and recurrent disease following local therapy (n=2) were excluded. Univariate Cox proportional hazards regression and Kaplan−Meier were used to estimate OS.
Results: 55 (61%) of the 90 included patients underwent CN. Median follow-up for the CN and non-CN groups was 12.3 and 9.8 months. There were no significant differences between the CN and non-CN groups with regards to median age, gender, ethnicity, or BMI. Serum Cr, albumin, LDH, and hemoglobin were comparable. Median corrected serum calcium was lower among patients undergoing CN (9.5 vs. 9.2 mg/dL, p < 0.01), as was the median number of non-nodal metastatic organ sites (1 vs. 2, p < 0.01). ECOG performance status of 0 was more common among CN patients (52.7 vs. 8.6%, p < 0.01). Comparing the CN and non-CN groups, histologies included papillary (43.6 vs. 25.7%), chromophobe (9.1 vs. 0%), collecting duct (1.8 vs. 0%), medullary (0 vs. 2.9%), translocation (3.6 vs. 8.6%) and unclassified RCC (41.8 vs. 62.8%). The frequency of sarcomatoid elements was similar (25.5 vs. 14.3%, p = 0.3). While there was no detectable difference in clinical node status, the CN patients were less likely to have clinical T3 or T4 disease (29 vs. 57%, p < 0.01). There was no difference in median OS between the CN and non-CN patients (12.8 vs. 13 months, HR 0.88 [0.53 – 1.46], p 0.62).

Conclusions: Despite several more favorable baseline characteristics among surgical patients, CN was not associated with improved median OS for patients with non-clear cell mRCC in this retrospective, single-institution review. Further efforts are needed to determine which patients with non-clear cell mRCC might benefit from CN. Supported in part by NCI P30 CA016672.

Poster #131

FUNCTIONAL RECOVERY AFTER PARTIAL NEPHRECTOMY: EFFECTS OF VOLUME LOSS AND ISCHEMIC INJURY
Matthew Simmons, Shahab Hillyer, Byron Lee, Amr Fergany, Jihad Kaouk and Steven Campbell
Cleveland Clinic, Cleveland, OH
(Presented By: Matthew Simmons)

Purpose: This study used a new method to estimate volume loss after partial nephrectomy (PN). The relative contributions of ischemic injury and volume loss on functional outcomes were evaluated.

Materials and Methods: We analyzed 301 consecutive patients with available data to meet inclusion criteria who underwent conventional PN between 2007 and 2010. Percent functional volume preservation (PFVP) was measured at a median of 1.4 years after surgery. MDRD-2 estimated GFR was measured pre- and perioperatively, and at a median of 1.8 years after PN. Statistical analyses were conducted to study associations.

Results: Hypothermia or warm ischemia ≤25 minutes were applied in 75% of cases. Median PFVP was 91% (range: 38–107%). Percent GFR preservation (PGP) at nadir and late time points was 77% and 90% of preoperative GFR, respectively. In multivariate analysis PFVP and warm ischemia time (WIT) associated with nadir GFR (p<0.001), while only PFVP associated with late GFR (p<0.001). Late PGP and PFVP were directly associated (p<0.001). Recovery of function to ≥90% of PFVP-adjusted levels was observed in 86% of patients. In patients with de novo postoperative stage ≥3 CKD, PFVP and Charlson score were associated with late PGP. WIT was not associated with late functional GFR decreases in patients considered high risk for ischemic injury.

Conclusions: In this cohort PFVP, and not ischemia time, was the primary determinant of ultimate renal function after PN. Technical modifications aimed at minimizing volume loss during PN while still achieving negative margins may result in improved functional outcomes.
COMPARING OUTCOMES AFTER LAPAROSCOPIC NEPHRECTOMY, PARTIAL NEPHRECTOMY AND CRYOABLATION FOR RENAL MASSES
Jack Lambert, Stephen Riggs, Thomas Fuller, Ryan Barnette and Bethany Barone
Eastern Virginia Medical School, Norfolk, VA
(Presented By: Jack Lambert)

Introduction and Objective: The primary goal of this project is to compare the survival and renal function outcomes for various types of treatment for renal cell carcinoma (RCC). This study compares open partial nephrectomy (OPN), laparoscopic radical nephrectomy (LN) and cryoablation (CA) in patients 30−90 year old. The secondary end point for this study is to compare complication rates between these cohorts.

Methods: We performed a retrospective review using our RCC database of over 500 patients from 2001−2011. Patients included in the analysis underwent OPN, LN, or CA. 293 patients were identified of which 116, 110 and 67 had OPN, LN, or CA, respectively.

Results: For the OPN, LN, and CA groups overall survival (OS) was 95.7%, 87.3%, and 89.6%, respectively. Cancer specific survival (CSS) was 99.1%, 96.4%, and 100%, respectively. Subset analysis of patients 70 years or older with Kaplan–Meier analysis did not show any statistical difference between the cohorts with regards to OS (p = 0.148) or CSS (p = 0.508). The average follow up was 23 months. Only two patients went on to require hemodialysis (HD). The mean absolute decrease from pre to post−operative glomerular filtration rate (GFR) for OPN, LN and CA were 3.9, 25.2, and 8.8, respectively (p < 0.001). The total number of complications was 24.1%, 16.4%, and 10.5% for the OPN, LN and CA cohorts respectively.

Conclusions: OS and CSS were similar amongst the various types of surgical treatments for RCC, regardless of age. While the OPN cohort experienced the most complications, their renal function outcomes were the most superior.
Poster #133

RENAL FUNCTION AFTER PARTIAL NEPHRECTOMY: IMPACT OF WARM ISCHEMIA RELATIVE TO THE QUANTITY AND QUALITY OF THE PRESERVED KIDNEY

R. Houston Thompson¹, Brian Lane², Christine Lohse¹, Bradley Leibovich¹, Amr Fergany³, Igor Frank¹, Inderbir Gill³, Michael Blute¹ and Steven Campbell³

¹Mayo Clinic, Rochester, MN; ²Michigan State; ³Cleveland Clinic, Cleveland, OH
(Presented By: R. Houston Thompson)

Purpose: The impact of ischemia time on renal function after partial nephrectomy (PN) relative to the quantity and quality of kidney preserved has recently been challenged. We evaluate the effects of warm ischemia time (WIT), preoperative glomerular filtration rate (GFR), and percent kidney preserved on renal functional recovery after PN for a solitary kidney.

Materials: Using the Cleveland Clinic and Mayo Clinic databases, we identified 362 consecutive patients with a solitary kidney who underwent PN utilizing warm ischemia with hilar clamping. Multivariable models with multiple imputations were used to evaluate associations with acute renal failure (ARF) and new onset stage IV chronic kidney disease (CKD).

Results: Median (range) WIT was 21 (4−55) minutes, median percent kidney preserved was 80 (25−98), and median preoperative GFR was 61 mL/min/1.73m² (11−133). Postoperative ARF occurred in 70 (19%) patients; among the 226 patients with a preoperative GFR >30 mL/min/1.73m², 38 (17%) developed new onset stage IV CKD during follow−up. In multivariable analysis, WIT (p=0.021), percent kidney preserved (p=0.009), and preoperative GFR (p<0.001) were significantly associated with ARF while percent kidney preserved (p<0.001) and preoperative GFR (p<0.001) were significantly associated with new onset stage IV CKD during follow−up. Using our previously published cutpoint of 25 minutes, >25 minutes WIT remained significantly associated with new onset stage IV CKD in a multivariable analysis adjusting for percent kidney preserved and preoperative GFR (hazard ratio 2.27, p=0.049).

Conclusions: Our results validate that quality and quantity of kidney are the most important features associated with renal function after PN. In the setting of warm ischemia, we also demonstrate that WIT remains an important modifiable feature associated with short and long−term renal function. Precision of surgery, maximizing the amount of preserved, vascularized parenchyma, should be a focus of study for optimizing the PN procedure.

Poster #134

SURVEILLANCE PROTOCOLS FOR LOCALIZED KIDNEY CANCER: A COST COMPARISON

Ian Udell, Raj Kurpad, Angela Smith, Michael Woods, Matt Raynor, Eric Wallen, Raj Pruthi and Matthew Nielsen
University of North Carolina, Chapel Hill, NC
(Presented By: Ian Udell)

Introduction and Objective: Approximately 58,240 new kidney cancer cases were diagnosed in 2010. Currently no prospectively validated regimen exists for postoperative follow−up in surgically treated patients (pts). The UCLA Integrated Staging System and Campbell’s Urology Guidelines represent two commonly accepted, risk−stratified, post−treatment kidney cancer surveillance protocols. We used Medicare charges to estimate per pt and total cohort direct medical costs to investigate the extent to which variation in intensity of recommended surveillance impacts these.

Methods: Medicare charges for each aspect of the surveillance protocols were obtained. Annual per−protocol costs were calculated according to the UCLA and Campbell’s guidelines and extrapolated to overall 5−year cost per pt. Total surveillance cost for a cohort of localized kidney cancer pts diagnosed in one year were obtained using proportions of cases in relevant stage strata reported in the SEER database from 2004−2008.
Results: The total cohort of localized kidney cancers diagnosed in 2010 is estimated at 54,198. Following the UCLA guidelines, the average yearly cost per pt is $3,151, $6,302, and $13,528 for low, intermediate, and high risk pts respectively. Five-year costs are $22,981, $32,434, and $56,801 respectively. Total cohort costs at five years would be $1,245,524,238, $1,757,857,932, and $3,078,500,598 respectively. Using Campbell’s guidelines, per-pt costs for localized T1, T2, and T3 tumors are $425, $533, and $4679 at one year and $2,125, $9,891, and $15,103 at five years respectively. Total cohort costs would be $115,170,750, $536,072,418, and $818,552,394 respectively.

Conclusions: With heightened economic pressure to provide cost-effective care, the substantial differences in recommended follow-up protocols for localized kidney cancer represent an area of uncertainty with substantial variation in hypothetical costs at the level of individual pts and for the population of kidney cancer survivors. These results motivate critical reevaluation of costs and benefits for different recommendations for surveillance of localized disease.

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Poster #135

DIAGNOSTIC UTILITY OF CONTRAST WASHOUT TO DIFFERENTIATE BENIGN AND MALIGNANT RENAL TUMOR HISTOLOGY ON COMPUTERIZED TOMOGRAPHY

Ryan Kopp¹, Lejla Aganovic², Kerrin Palazzi-Churas¹ and Ithaar Derweesh¹
¹UCSD Division of Urology, San Diego, CA; ²UCSD Department of Radiology, San Diego, CA
(Presented By: Ryan Kopp)

Introduction and Objectives: Renal tumor subtypes are distinct biological entities. Diagnostic methods that differentiate tumor types will have an increasing role for targeted therapy. We investigated the use of 4-phase computerized tomography (CT) with intravenous contrast to predict renal tumor histology.

Methods: Two center retrospective cohort study of 163 patients with 4-phase CT for renal masses obtained 10/2002 to 7/2011. Pathology confirmed clear cell (CC–RCC; n=92), papillary (Pa–RCC; n=43), chromophobe (Ch–RCC; n=6), oncocytooma (OC; n=11), or angiomylipoma (AML; n=11) histology. Demographics, history of smoking, hypertension, and diabetes, and preoperative creatinine were recorded. Imaging was interpreted by a radiologist (LA) who recorded tumor size, density measurements in Hounsfield Units (HU), composition, collecting system entry, necrosis, and cystic components. Data were analyzed within subgroups based on histology. Washout was calculated by the formula (Mass Nephrographic HU – Mass Delayed HU)/(Mass Nephrographic HU – Mass Noncontrast HU) and used to calculate sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV).

Results Obtained: Significant differences existed in age (p<0.001), sex (P<0.001), history of diabetes (p=0.005), preoperative creatinine (p=0.008). Tumor size was largest among CC–RCC and smallest among AML (p<0.001). Homogeneous composition was more common among Pa–RCC and Ch–RCC (p<0.001). Tumors with washout value <0 were Pa–RCC 96%, and Ch–RCC 4%. Washout value <0 had a specificity of 99.2% for Pa–RCC and 100% for non–CC–RCC. Washout value ≥0 had a sensitivity of 100% for CC–RCC, OC, and AML.

Conclusions: Washout value <0 is highly specific for Pa–RCC and non–CC–RCC. Washout value ≥0 is highly sensitive for CC–RCC, OC, and AML. These findings may provide a further tool in clinical decision making regarding initiation of targeted therapy. Additional prospective analysis is warranted.
Poster #136

NATIONWIDE PRACTICE PATTERNS FOR THE MANAGEMENT OF SMALL RENAL MASSES
Glen Yang, Maxwell Meng, Jacqueline Villalta and Jared Whitson
University of California, San Francisco, CA
(Presented By: Glen Yang)

Purpose: The diagnosis of small renal masses is increasingly common, and the use of surveillance, ablation, and partial nephrectomy have increased as familiarity with new technology and operative technique becomes more pervasive. We describe the changing national practice patterns in the management of small renal masses, including the use of surveillance and ablative techniques.

Methods: All patients in the SEER registry treated for renal masses up to 7 cm in diameter from 1998 through 2008 were included for analysis. Annual trends in the use of surveillance, ablation, partial nephrectomy, and radical nephrectomy were calculated. Multinomial logistic regression was used to determine the association of demographic and clinical characteristics with treatment modality.

Results: A total of 48,148 patients from 17 registry sites with a mean age of 63.4 years were included for analysis. Between 1998 and 2008, for masses < 2 cm and 2–4 cm, a dramatic increase was observed in the proportion of patients undergoing partial nephrectomy (31% vs. 50%, 16% vs. 33%, respectively) and ablation (1% vs. 11%, 2% vs. 9%, respectively). In multivariable analysis, year of diagnosis, younger age, male gender, and smaller tumor size were associated with increased use of partial versus radical nephrectomy. Older age, smaller tumor size, male gender, and the presence of bilateral masses were associated with increased use of ablation and surveillance versus radical nephrectomy.

Conclusions: While partial nephrectomy is now employed in 50% of patients with the smallest renal masses, it is still likely underutilized. Ablation and surveillance are less common overall, but increased usage is observed in men, older patients, and those with small or bilateral tumors.

Poster #137

NATURAL HISTORY OF RENAL FUNCTION IN UNTREATED KIDNEY CANCER
A. Almatar, Daved Margel, Tony Finelli, Hannah Chung, Neil Fleshner, Alexandre Zlotta, Laura Legere, Henry Ajzenberg and Michael Jewett
Division of Urology, Departments of Surgery and of Surgical Oncology, Princess Margaret Hospital and the University Health Network, University of Toronto
(Presented By: A. Almatar)

Introduction: Chronic kidney disease (CKD) is an increasing health problem and we now appreciate its relationships with kidney cancer. Many patients presenting with renal cell carcinoma (RCC) have pre-existing renal impairment and surgical or ablative treatment has been documented to cause further loss of function. However, the natural history of renal function in patients with untreated localized RCC has not been well documented. This would provide a new baseline for measuring the impact of kidney cancer therapy on renal function.

Objective: To establish the natural history of renal function in patients who are managed by active surveillance (AS) for T1a RCC.

Methods: 45 patients with localized sporadic biopsy–proven RCC < 4 cm managed by AS were retrospectively identified from May 2003 to September 2010. Patients all had baseline estimated glomerular filtration rate (eGFR)> 60 ml/min/1.73 m2 and normal contralateral kidney function.
eGFR was calculated using the Modification of Diet in Renal Disease (MDRD) equation. The rate of change in eGFR per year was calculated. Kaplan–Meier analysis was used to estimate the percentage of freedom from CKD stage 3 at follow–up.

Results: Median follow up was 26(IQR12–43) months. Median age was 69.5(62–77) years. The median baseline eGFR was 81(73–95) ml/min/1.73 m2. 12 (27%) patients had an eGFR ≥ 90 (CKD stage 1) and 33 (73%) patients had an eGFR between 60 and 89 (CKD stage 2). 8 patients (17.8%) developed CKD stage 3 by the end of follow–up. The median rate of change of eGFR was −1.75 (−2.2–10) ml/min/1.73m2 per year. The 3 year freedom from eGFR < 60 ml/min/1.73m2 in this cohort of patients is 80%. In the group of patients ≥ 65 years old (29 out of 45 or 64%), 6 out of 29 patients (20.6%) had CKD stage 3 at the end of follow–up with a 75% 3–year freedom from eGFR < 60 ml/min/1.73m2.

Conclusion: This is the first study, to our knowledge, to report the natural history of renal function in a cohort of biopsy–proven RCC patients undergoing AS. RCC patients may be at a higher risk for the development of renal dysfunction. The rate established in this study can be used in the future to compare with the rate of eGFR decline in patients who have undergone surgical or ablative treatment for RCC, and to assess the actual impact of these treatments on renal function.
Poster #138
SAFETY AND TOLERABILITY OF THE NOVEL POSITRON EMISSION TOMOGRAPHY (PET) MOLECULAR IMAGING TRACER 124I-GIRENTUXIMAB IN THE DIAGNOSIS OF CLEAR CELL RENAL CELL CARCINOMA (CCRCC)
Robert Uzzo¹, Jian Yu¹, Paul Russo¹, David Chen¹, Joseph O’Donoghue², Roman Bartz³, Paul Bevan³, Norman LaFrance⁴ and Chaitanya Divgi⁵
¹Fox Chase Cancer Center, Temple University School of Medicine, Philadelphia, Pennsylvania; ³Memorial Sloan-Kettering Cancer Center, New York, New York; ²Wilex AG, Munich, Germany; ⁴IBA Molecular, Dulles, Virginia; ⁵Kreitchman PET Center, Columbia University Medical Center, New York, New York
(Presented By: Robert Uzzo)

Introduction & Objectives: Histopathology is the definitive method for identifying ccRCC. Existing imaging modalities (e.g., computed tomography [CT], PET/CT) are not optimal for detection of ccRCC before surgical resection. Currently, 18F–FDG–PET/CT has few safety issues, but its low uptake in small tumors, poor imaging of slow-growing tumors, and false-negative results limit its use as a presurgical renal tumor diagnostic agent. 124I may be preferable to 18F in the development of antibody-linked PET isotopes because of a longer t1/2 (4.2 d), which allows for maximal vascular clearance of the labeled antibody. The chimeric antibody cG250 (124I–girentuximab), a carbonic anhydrase–avid marker upregulated in >95% of ccRCC, successfully utilizes 124I for presurgical characterization and diagnostic management aid in patients with renal masses. 124I–cG250’s medical benefit and its safety profile are presented.

Methods: Ph 1–2 (Divgi CR et al. Lancet Oncol. 2007) and ph 3 REDECT study (Uzzo et al., AUA 2010) data were used to assess the safety profile (n=26 & n=226). Patients with renal masses scheduled for surgical resection received a 15–20 min 124I–cG250 infusion (5 mCi/10mL); PET/CT occurred ≤7 d.

Results: 124I–cG250 was well tolerated for diagnostic identification of ccRCC, with no evidence of clinically–significant toxicity in either trial. Treatment–related adverse events (TRAEs) occurred in 13.3% (30/226) of patients in REDECT (most common: headache [4.4%]; nausea [1.3%]); no TRAEs occurred in ph 1–2. One serious TRAE (hepatic enzyme increase) was reported in REDECT in a patient recently started on ciprofloxacin while 3 patients discontinued REDECT because of AEs unrelated to 124I–cG250. Human antichimeric antibodies (HACAs) were observed in 28% (56/198) of evaluable REDECT patients, with no difference in the frequency/severity of AEs vs those without HACA. Product performance was robust with sensitivity/specificity of 94%/100% and 86%/86% for ph 1–2 and ph 3 trials, respectively.

Conclusions: Radiolabeled cG250 has demonstrated a favorable safety profile in diagnosis of ccRCC, with the imaging flexibility & convenience, resolution and tolerability of the 124I isotope. Completed clinical trials have shown that presurgical detection of ccRCC using 124I–girentuximab–PET/CT is a well tolerated and accurate diagnostic technique to distinguish and characterize ccRCC from indolent malignant or benign renal tumors.

Funding: Wilex AG/IBA Molecular

Poster #139
PROGNOSTIC ROLE OF LYMPHOVASCULAR INV ASION IN CLEAR CELL RENAL CELL CARCINOMA
Michael Belsante, Ramy Youssef, Oussama Darwish, Aditya Bagrodia, Payal Kapur, Feras Alhalabi, Vitaly Margulis and Yair Lotan
UT Southwestern, Dallas, TX
(Presented By: Michael Belsante)

Introduction and Objectives: Lymphovascular invasion (LVI) has been proven to be a predictor of clinical outcomes in multiple cancers, but its role in clear cell renal cell carcinoma (ccRCC) has yet to be elucidated. We sought to establish a relationship between LVI and aggressive pathological features of ccRCC as well as clinical outcomes.

Methods: Pathology slides were reviewed by a single pathologist and retrospective chart review was performed on partial and radical nephrectomy specimens performed in 1997–2010. Relationships between LVI and aggressive pathological features and clinical outcomes of ccRCC patients were evaluated.
**Results:** The study included 470 patients. All metastatic and node positive cases were excluded leaving 409 cases of ccRCC. Patients were 59% male, 81% stage pT1–2, and 69% Fuhrman grade 1 or 2. LVI was seen in 53 cases (13%) and was associated with aggressive pathological features including high grade (Fuhrman grade 3–4), stage (pT3–4), sarcomatoid differentiation, tumor necrosis, extraparenchymal extension, positive margins, adrenal involvement, and venous thrombus (p ≤ .002 for all). Presence of LVI was associated with shorter disease free survival (DFS) (p < .001) and cancer specific survival (CSS) (p = .003) on Kaplan–Meier analysis (see Figures 1–2). 5-year CSS and DFS were 97% and 89% for patients with no LVI and 82% and 72% for patients with LVI, respectively. Presence of more than one adverse pathological feature [advanced stage (pT3–4), grade (Fuhrman grade 3–4) or LVI] was an independent predictor of both CSS (HR 11.4 and p = .009) and DFS (HR 5.2 and p = .02) on multivariate analyses.

**Conclusions:** In our study the presence of LVI appears to be predictive of aggressive pathological behavior and may be used in conjunction with stage and grade as a predictor of poor oncologic outcomes in patients with node−negative, non−metastatic ccRCC. Further study should include LVI among prognostic indicators in this patient population.

**Poster #140**

**SYSTEMATIC CLASSIFICATION AND PREDICTION OF POSTOPERATIVE COMPLICATIONS FOLLOWING NEPHRECTOMY IN PATIENTS WITH METASTATIC RENAL**

Jonathan Silberstein¹, Ari Adamy¹, Alexandra Maschino¹, Behfar Ehdai⁴, Tullika Garg¹, Ricardo Favaretto¹, Tarek Ghoneim¹, Robert Motzer² and Paul Russo¹

¹Department of Surgery, Urology Service, Memorial Sloan-Kettering Cancer Center, New York, NY, ²Department of Medicine, Division of Urology, Memorial Sloan-Kettering Cancer Center, New York, NY

(Presented By: Jonathan Silberstein)

**Aim:** To evaluate and identify predictive factors for postoperative morbidity following nephrectomy in patients with metastatic renal cell carcinoma (mRCC).

**Methods:** We identified patients with mRCC who received nephrectomy between 1989–2009. Postoperative complications were characterized using a modified Clavien classification. Patient and disease characteristics, including a previously validated Memorial Sloan Kettering Cancer Center (MSKCC) risk stratification system utilizing calcium, hemoglobin, lactate dehydrogenase, and Karnofsky performance status (KPS), were evaluated as predictors of postoperative complications using univariate and multivariable logistic regression models.
**Results**: Over the study period, 195 patients with mRCC received nephrectomy, 53 (27%) developed grade ≥2 complications within 8 weeks of surgery. Pulmonary, thromboembolic events and anemia requiring transfusion were the most common types of complications following nephrectomy in the metastatic setting. In univariate analysis, age, low albumin, low KPS, high corrected serum calcium, low serum hemoglobin, and unfavorable MSKCC risk score were predictive of complications. Patients who sustained postoperative complications were less likely to receive systemic therapy within 56 days (OR 0.32; 95% CI 0.12, 0.86; p=0.024). A multivariable model containing KPS (OR 14.5; 95% CI 4.34, 48.6; p<0.0005) and age (OR 1.04; 95% CI 1.01, 1.08; p=0.014) demonstrated the greatest predictive accuracy (corrected AUC 0.72; 95% CI 0.63, 0.80) for postoperative complications.

**Conclusions**: Postoperative complications after radical nephrectomy in the setting of mRCC are common and occur frequently in older patients and those with worse KPS. These complications are important because they may delay or deny receipt of subsequent systemic therapy.

**Poster #141**

**REGIONALIZATION OF RENAL SURGERY: IMPACT OF HOSPITAL VOLUME ON UTILIZATION OF PARTIAL NEPHRECTOMY**

Marc Smaldone¹, Jay Simhan¹, Daniel Canter², Russell Starkey³, Fang Zhu¹, Karyn Stitzenberg⁴, Alexander Kutikov¹ and Robert Uzzo¹

¹Fox Chase Cancer Center, Philadelphia, PA; ²Emory University, Atlanta, GA; ³Thomas Jefferson University, Philadelphia, PA; ⁴University of North Carolina, Chapel Hill, NC

(Presented By: Marc Smaldone)

**Introduction and Objectives**: In an effort to reduce the risk of chronic kidney disease and its attendant cardiovascular and mortality risks, the AUA guidelines recommend nephron sparing surgery for all localized lesions amenable to partial nephrectomy. The purpose of this study was to investigate trends in regionalization of care for surgical management of renal cell carcinoma (RCC).

**Methods**: Using 1996 to 2009 hospital discharge data from NY, NJ, and PA, patients undergoing surgery for RCC were identified using ICD−9 coding. We assigned hospital volume status by quintiles based on relative proportions of renal procedures (radical nephrectomy, partial nephrectomy, ablation) performed on a per hospital basis in 1996; very low volume hospital: 0−6 (VLVH), low: 7−12 (LVH), moderate: 13−20 (MVH), high: 21−46 (HVH) and very high: ≥47 (VHVH). Procedure performance by hospital volume status was assessed over time using regression models and patient characteristics were compared between groups.

**Results**: Of 57,886 patients identified, there was a significant shift towards regionalization for total renal procedures to VHVH’s (18 to 48%, p<0.001) from 1996 to 2009. Patients treated at a VHVH were less likely to be older (ages 65−74 (OR 0.89 [CI 0.82−0.96]); 75−84 (OR 0.89 [CI 0.84−0.96]), have Medicaid (OR 0.68 [0.50−0.91]), Medicare (OR 0.88 [0.82−0.94]), or be uninsured (OR 0.39 [CI 0.30−0.51]). Over the duration of the study period, partial nephrectomy treatment increased from 8.3% (1996) to 35.4% (2009). Controlling for year treated and number of procedures performed, use of radical nephrectomy significantly decreased across volume strata compared to VLVH (all p values <0.001), while trends in use of ablation were less affected by volume status. A significant trend towards increased utilization of partial nephrectomy was observed with increasing volume status; LVH (OR 1.3 [CI 1.1−1.6]), MVH (OR 1.7 [CI 1.5−1.9]), HVH (OR 2.2 [CI 1.9−2.5]), VHVH (OR 4.3 [CI 4.0−4.6]).

**Conclusions**: While increasing overall, performance of partial nephrectomy has shifted to higher volume hospitals from 1996 to 2009. Inequities in access to optimal care exist and must be addressed in future studies.
Poster #142

AFFECT OF ACUTE KIDNEY INJURY ON LONG TERM RENAL FUNCTION ON PATIENTS UNDERGOING SURGEON CONTROLLED ROBOTIC PARTIAL NEPHRECTOMY
L. Spencer Krane, Patrick Mufarrij and Ashok K. Hemal
Wake Forest University School of Medicine, Winston Salem NC
(Presented By: L. Spencer Krane)

Introduction: The association between short term changes in renal function immediately following surgeon controlled robotic partial nephrectomy (RPN) have not been linked to long term functional outcomes. The purpose of this study is to evaluate what perioperative parameters, including acute kidney injury (AKI), following RPN predict changes in long term renal function.

Materials and Methods: Analyzing a prospectively maintained institutional review board approved database of 151 patients who underwent RPN by a single surgeon between March 2008 and June 2011 we identified 77 who had serum creatinine measurements greater than 3 months following discharge. AKI was defined as >25% decrease in MDRD calculated GFR at the time of discharge from the RIFLE definition. Median follow up was months (Range 3 – 36).

Results: 21 of 77 patients (27%) had AKI based on greater than 25% decrease in calculated GFR at the time of discharge (Median 31%, range 25−44%). Patient with AKI had a median 14% decrease (range 13% increase to 46% decrease) in estimated GFR as compared to those patients without AKI (median 4% decrease, range 50% increase to 64% decrease, p=0.01). On multivariate analysis including warm ischemia time, EBL, tumor size, and clamping technique, preoperative GFR and % change in GFR at discharge had the strongest association with change in long term GFR (p=0.0096 and 0.0207 respectively).

Conclusions: Change in GFR at the time of discharge predicts worse renal function at three months. Patients who have AKI may require more frequent monitoring of renal function postoperatively to ensure maintenance of GFR.

Poster #143

CONTEMPORARY EXPERIENCE OF INTERLEUKIN-2 TREATMENT IN ADVANCED RENAL CELL CARCINOMA
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(Presented By: Andrew Windsperger)

Introduction: Advanced renal cell carcinoma (aRCC) has historically been considered a chemotherapy— and radiotherapy—resistant malignancy. High dose Interleukin−2 (IL−2) has been the only therapy to produce durable complete responses in a small percentage of aRCC patients. We review our experience of high dose IL−2 treatment in patients with aRCC, and examine predictors of response to therapy.

Methods: A retrospective review of patients undergoing treatment with IL−2 from January 2003 to January 2010 for aRCC was performed. Age, number of treatment doses, metastatic organ sites, number of metastatic organ sites, histology, treatment responses, performance status, time to progression, and overall survival were evaluated. Responses were classified as complete response, partial response, stable disease, or progression.

Results: A total of 60 patients underwent treatment with IL−2 for aRCC between January 2003 and January 2010. Mean age was 52 years and performance status was 0 in 56 and 1 in 4 patients. Mean IL−2 courses administered were 1.5 with a mean of 14 doses per course. All patients but one had undergone prior nephrectomy. Over 48 months of median follow−up time, 9 out of the 60 (15%) patients had a complete response out of which 2 were partial responders that converted to complete responses after surgical resection of metastatic sites. Nine out of 60 (15%) had a partial response. Although metastatic disease in the lung was not significant amongst the groups, responders had a significantly smaller number of metastatic organ sites compared to non−responders (p=0.02). The number of doses administered was a predictor of response when comparing all responders to non−responders (p<0.05), although it was not significant when comparing complete and partial responders. Mixed, non−clear cell, or sarcomatoid histology were negative predictors of response. Median time to progression was 7 weeks and 32 weeks in the progression and partial responders respectively. Overall survival was 86%, 50%, and 27% in the complete response, partial response, and stable/ progression groups respectively.

Conclusion: Our series shows a 15% complete response and 15% partial response rate. Responders had smaller number of metastatic organ sites and higher number of doses administered. IL−2 continues to be a viable treatment option in aRCC for young patients who have good performance status and limited number of metastatic organ sites.
**COMPARISON OF PARTIAL AND RADICAL NEPHRECTOMY IN STAGE II OR GREATER RENAL TUMORS**

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(Presented By: Ryan Kopp)

**Objectives:** Partial nephrectomy (PN) has emerged as a preferred treatment option for stage cT1 renal masses, comparing favorably with radical nephrectomy (RN) from the standpoint of oncologic efficacy and conferring superior renal functional preservation. Further data is needed to show equivalence of PN to RN for higher stage tumors. We compared outcomes of patients who underwent PN and RN for stage II or higher tumors.

**Methods:** Retrospective review of 105 patients (61 RN/44 PN, mean age 55 years, median follow−up 21.5 months) who underwent RN or PN for stage ≥cT2 or ≥pT2 renal tumors at two institutions from 3/2003 to 5/2010. Patient and disease characteristics, RENAL nephrometry score, renal function, and oncologic outcomes were recorded and analyzed within subgroups based on treatment. Kaplan−Meier analysis compared development of metastases, disease specific (DSS) and overall survival (OS).

**Results Obtained:** Patient characteristics, including preoperative eGFR, were similar except for hypertension (RN 49% vs. PN 73%, p=0.017). Mean tumor size (cm) was larger (p<0.001) in RN (10.3) vs. PN (7.3). Mean nephrometry sum was higher (p<0.001) in RN (10.7) vs. PN (9.5). PN had 6 (13%) urine leaks. De novo GFR<60 was significantly greater in the RN cohort (32% vs. 10%, p=0.023). AJCC stage distribution between RN (II 30%, III 26%, IV 44%) and PN (II 43%, III 46%, IV 11%) groups was significant (p=0.002). Survival curves demonstrated OS was less for RN (p<0.001), but not within stage III (p=0.440). DSS was less for RN (p<0.001) except in stage III (p=0.259).

**Conclusions:** Patients undergoing PN for higher stage tumors may have equivalent oncologic benefits and superior renal functional outcomes compared to RN for >Stage I RCC. Larger populations with further follow−up are needed to investigate effects on renal function and overall survival. PN may be an effective treatment for select patients with advanced RCC.

**LAPAROENDOSCOPIC SINGLE-SITE PARTIAL NEPHRECTOMY: PATHOLOGIC, SHORT-TERM ONCOLOGIC, AND RENAL FUNCTIONAL OUTCOMES**

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(Presented By: Soroush Rais-Bahrami)

**Objectives:** We aim to present our experience of transumbilical LESS partial nephrectomy (LESSPN) with perioperative, short−term oncologic, and renal functional outcomes.

**Methods:** Perioperative data was collected on LESSPN cases performed between July 2008 and August 2011. A total of 15 LESSPNs were performed in 14 patients. One patient had LESSPN performed 3 months apart on contralateral kidneys for treatment of bilateral renal masses. All patients underwent transumbilical LESS using either one 12mm and two 5mm trocars or a single GelPoint device through which a 5mm flexible−tip laparoscope and a combination of flexible and conventional laparoscopic instruments were used. The 12mm trocar allowed for bulldog clamp placement for hilar−control, used in 9 cases. The remaining 6 cases were done without clamping hilar vessels. One case required insertion of an additional trocar remote from the single−site access.

**Results:** Of the 14 patients (57% male), undergoing 15 distinct LESSPN, the mean age was 57.9±8.7yrs with a mean ASA score of 2.1±0.7. The mean tumor size resected was 2.4±0.8cm (range 1.2−4.0): 8 clear cell renal cell carcinoma (RCC), 1 papillary type I RCC, 2 papillary type II RCC, 1 chromophobe RCC, 2 angiomyelolipomas, and 1 metanephric adenoma on final pathology, all with negative margins. The mean operative time was 169±47min with a warm ischemia time of 14.7±13.4minutes. The mean estimated blood loss in this series was 293±325mL (median 200mL), largely skewed by a single off−clamp case with a blood loss of 1300mL. No cases required intraoperative or postoperative blood transfusions. The mean length of hospitalization was 2.7±0.8days and mean analgesic requirement in morphine equivalents was 21.7±11.6mg. There was a notable downtrending of the patient reported visual analog pain scale (0−10) rating with each progressive postoperative day (line of best fit: y=−1.12x+6.05). Surveillance axial radiologic imaging, available for 14 cases, demonstrated no recurrence at a mean followup of 12.2±7.2mo (6−25). Change in serum creatinine at a mean followup of 10.9±7.4mo (1−27) was negligible (<0.1 mg/dL).
Conclusions: LESSPN is an efficacious operation, providing complete oncologic resection, excellent short-term oncologic outcomes, and renal functional outcomes comparable to reported series of conventional laparoscopy. Also, the LESS technique did not preclude employment of the off-clamp approach for optimal renal function preservation.

Poster #146

URINARY AND SERUM NEUTROPHIL GELATINASE ASSOCIATED LIPOCALIN (NGAL) LEVELS IN RESPONSE TO RENAL ISCHEMIA IN A NOVEL PILOT PORCINE MODEL

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(Apresented By: Jonathan Silberstein)

Aim: To develop a novel porcine model of study acute kidney injury (AKI) and determine the utility of urinary and plasma NGAL to measure AKI.

Methods: Laparoscopic bilateral cutaneous ureterostomies were created in female Yorkshire pigs followed by variable times of left renal hilar clamping (0, 15, 30 or 60 minutes); the right side served as internal control. Animals were survived for a minimum 48 hours. Urine was selectively collected and analyzed from each renal unit (RU) for volume and concentration of creatinine (uCr) and NGAL (uNGAL). uNGAL was measured using ELISA assay (Biporto Diagnostics, Salem, NH). Serum was collected daily, and analyzed for NGAL (sNGAL) and creatinine (sCr). At necropsy, renal procurement was performed for histopathologic evaluation.

Results: Surgical intervention was performed on 12 swine; 1 experienced a bowel injury and was euthanized, eleven completed the planned surgical intervention. Of these, one had severe signs of sepsis; another had evidence of complete right ureteral obstruction at necropsy, leaving 9 animals in the final analysis.

Urine production was reduced in ischemic RU compared to controls (ischemic RU =223cc vs control=838cc @ 24 hrs, p= 0.04) and accompanied by increases in urine output from the nonischemic contralateral RU (ischemic RU 1285cc vs control=578 cc @ 24hrs, p= .14). uNGAL production increased to greater levels in RU exposed to ischemia than either controls or nonischemic contralateral RU (uNGAL Ischemic RU= 1022ng/mL vs nonischemic unit = 38 ng/mL @ 24hrs, p=0.14). The peak increase in NGAL corresponded with longer ischemic times, while the time to peak was inversely related to the amount of ischemia. uNGAL measurements normalized to uCr (normalized uNGAL) demonstrated similar rises compared with controls but in an earlier time frame (<10 hours). uNGAL was more strongly associated with AKI than was sNGAL.

Conclusions: In this novel pilot porcine model utilizing selective urine sampling we have observed that induction of unilateral renal ischemia corresponds with acute physiologic changes in the contralateral RU. Additionally induced AKI is associated with increases in uNGAL concentration that are specific to the RU exposed to ischemia.
COMPLICATIONS IN SURGEON CONTROLLED ROBOTIC PARTIAL NEPHRECTOMY: INITIAL 175 CASES FROM A SINGLE SURGEON
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(Presented By: L. Spencer Krane)

Introduction: Surgeon controlled robotic partial nephrectomy (RPN) has become an increasingly popular management option for patients with small renal masses. As this technology has disseminated from the academic centers to other institutions, the expected complications and management of these should be described.

Materials and Methods: We queried a prospectively maintained institutional review board approved database 175 patients who underwent RPN by a single surgeon between March 2008 and June 2011 to identify all patients who deviated from routine postoperative course (Discharge post op day two from surgical floor) within 30 days of surgery. Complications were graded according to the Clavien classification and divided into either surgically related or medical complications.

Results: Overall, 39 (23%) of patients had any deviation from defined postoperative pathway and there were 36 with at least one Clavien complication. The majority of these were minor Clavien complications (26 Clavien I/II) and none had any significant sequelae. 6 (4%) major medical complications occurred, all of which required ICU monitoring and were mostly cardiac related (4). All of these patients had significant cardiac comorbidities. 7 (5%) were major surgical complications which required bladder clot evacuation (2), angioembolization of bleeding renal vessel (2), percutaneous drain placement (2), thoracostomy placement (1). A total of seven (7) patients required conversion to either open partial (5) or robotic radical (2) nephrectomy

Conclusions: RPN can be performed safely in patients with renal masses. Medical comorbidities place patients at risk for increased non-surgical complications. While some major complications do occur, most complications occurring from this procedure are minor and do not have long-term adverse patient consequences.

A PILOT STUDY ON THE ASSESSMENT OF CIRCULATING TUMOR CELLS AND CIRCULATING ENDOTHELIAL CELLS IN RENAL CELL CARCINOMA
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(Presented By: Andrew Windsperger)

Objective: Circulating tumor cells (CTC) and circulating endothelial cells (CEC) are found in the peripheral blood of most common malignancies and are promising surrogate biomarkers. Evolving data demonstrates a potential role of CTCs as an assessment for treatment response in several malignancies, but data is limited in regard to renal cell carcinoma (RCC). We sought to obtain preliminary data to correlate CTC and CEC levels in patients with RCC with response to treatment with antiangiogenic agents.

Methods: After IRB approval, 20 patients were enrolled between 7/2010 and 11/2010. Inclusion criteria included any patient with radiologic or histologic evidence of metastatic or locally advanced RCC who was scheduled to receive sunitinib, sorafenib, temsorlimus, or bevacisumab. Patients undergoing nephrectomy prior to treatment were sampled within one week of surgery, within one week of systemic treatment, and at the first planned radiologic assessment of response after two treatment cycles; all other patients had CTC/CEC's collected at baseline (at time of first radiologic assessment). Patient characteristics, prior treatment history, clinical response and survival data were obtained to correlate with CTC/CEC levels.

Results: There were 15 male patients and 5 female patients enrolled in the study with a median age of 61.5 years. Baseline performance status was 0 in six patients, 1 in 12 patients, and 2 in two patients. In the study, 18 of 20 patients had undergone prior nephrectomy. Review of histology found 12 patients with clear cell carcinoma, 2 with papillary RCC, 4 with mixed tumor (clear cell with sarcomatoid, rhabdoid, eosinophilic variant, and papillary features), 1 collecting duct carcinoma, and 1 undifferentiated histology. There were 12 patients with progression of disease (no response), 8 with a partial response, and 2 with mixed response (some progression and some response). Two patients died shortly following the second CEC level. Univariate analysis found a positive correlation between CEC level and progression in four patients, and negatively correlated with response in two patients, while CTC levels positively correlated with progression in one patient.
Conclusion: In this preliminary analysis, CTC and CEC levels appear to correlate with response to treatment for advanced RCC. Additional studies are ongoing to confirm these preliminary findings and predict which patients should receive a specific therapy.

Poster #149

A PROGNOSTIC MODEL FOR SURVIVAL FOLLOWING CYTOREDUCTIVE NEPHRECTOMY FOR METASTATIC RENAL CELL CARCINOMA

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Introduction: Cytoreductive nephrectomy (CN) for metastatic renal cell carcinoma (mRCC) has been shown to improve survival in select patients. While a number of pre−treatment prognostic criteria have been identified in patients with mRCC, little data exist on predictors of mortality following CN. We therefore sought to evaluate potential prognostic markers in these patients.

Methods: We evaluated 88 consecutive patients with complete laboratory data who underwent CN for mRCC. Clinical features selected for inclusion in the analysis were based upon the Memorial Sloan Kettering pre−treatment prognostic models with an emphasis on serum markers. These included post−operative lactate dehydrogenase (LDH), corrected serum calcium, white blood cell count (WBC), and hematocrit, as well as the Stage, Size, Grade, Necrosis (SSIGN) score, a validated post−nephrectomy predictive tool. Use of targeted therapy was also included in the model to account for variation in treatment after CN. Performance status was not included due to the overall favorable condition of patients selected for CN. Labs were drawn approximately 6−8 weeks following CN and before initiation of targeted therapy. The primary endpoint was overall survival, and multivariable analysis was performed using a Cox proportional hazards model. Harrell’s c−index was calculated as a measure of the predictive discrimination of the model.

Results: Median follow up of the entire cohort was 19.1 months (interquartile range (IQR) 1.9−82.8 months). 62 of the 88 patients were dead at time of last censor and median follow up of the survivors was 42 months (IQR 16.8−68.3 months). Results of the multivariable analysis are shown in the Table and demonstrate that anemia, elevated LDH, elevated WBC, and increasing SSIGN score are all independently associated with increased mortality in these individuals after CN. The C index for the model was 0.75.

Conclusions: We have identified several post−operative serologic markers that independently predict mortality after CN. Abnormalities in these serum markers may reflect a persistent paraneoplastic process, and our data suggest a potential role for these serologic tests in clinical decision−making and risk stratification post−CN.

| Table: Multivariable Cox proportional hazards regression for overall survival |
|--------------------------|----------------|----------|
| Post-operative elevated WBC | 3.77          | 1.43-9.97 | 0.007   |
| Post-operative anemia     | 2.16          | 1.13-4.17 | 0.021   |
| Post-operative elevated LDH | 2.28          | 1.17-4.45 | 0.015   |
| Post-operative hypercalcemia | 0.71        | 0.28-1.79 | 0.472   |
| SSIGN score               | 1.19          | 1.08-1.32 | 0.001   |
| Targeted Therapy          | 0.37          | 0.21-0.67 | 0.001   |
Poster #150

ADVERSE PATIENT SAFETY EVENTS: A COMPARISON OF LAPAROSCOPIC AND OPEN PARTIAL NEPHRECTOMY FROM 1998-2008
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(Presented By: Sean Stroup)

Objective: Associations of the diffusion of laparoscopic partial nephrectomy with patient safety remain uncharacterized. We compared the frequency of adverse patient safety events occurring in laparoscopic versus open partial nephrectomy over a 10–year period.

Methods: We utilized the Nationwide Inpatient Sample (NIS), a 20% sample of inpatient discharges in the U.S., from 1998 to 2008. All raw data was weighted to produce national estimates. We identified discharges with a principal diagnosis of kidney surgery by ICD−9CM codes. The primary outcome was occurrence of any Patient Safety Indicator (PSIs)—validated measures developed by the Agency for Healthcare Research and Quality to describe adverse outcomes related to patient safety. We used multivariate logistic regression to compare PSIs occurring in laparoscopic and open partial nephrectomy.

Results: The prevalence of both open and laparoscopic partial nephrectomy increased steadily during the study period (Figure 1). Compared to open, patients undergoing laparoscopic partial nephrectomy had lower Charlson Index morbidity scores (p < 0.001) and were more likely to undergo surgery at urban (p < .001) and teaching (p < 0.001) hospitals. Among the 60,149 open partial nephrectomies and 5,659 laparoscopic partial nephrectomies performed, PSIs occurred in 3,810 (6.3%) and 255 (4.5%) (p = 0.016) cases, respectively. On multivariate analysis, there were no significant differences in the probability of at least one PSI between open and laparoscopic partial nephrectomy [Odds Ratio (OR) 0.768, 95%CI 0.571−1.032, p<0.08)]. The probability of any PSI was 39% higher for Charlson ≥ 3 compared to < 3 (OR 1.39, 95% CI 1.2 to 1.6, p < 0.001).

Conclusions: Laparoscopic and open partial nephrectomy demonstrated similar risks of adverse patient safety events as defined by PSIs. These data suggest that, as it has diffused into clinical practice, laparoscopy has remained a relatively safe technique for performing partial nephrectomy.

Poster #151

R.E.N.A.L NEPHROMETRY AND NUMBER OF CRYOPROBES PREDICT COMPLICATIONS OF IMAGE-GUIDED PERCUTANEOUS RENAL CRYOABLATION.
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(Presented By: Michael L. Blute, Jr.)

Purpose: The R.E.N.A.L nephrometry score is a validated scoring system to classify the complexity of renal masses treated by partial nephrectomy. We aimed to evaluate the predictive value of the scoring system in patients undergoing image-guided percutaneous cryoablation (PCA) of renal masses.

Materials and Methods: The study included 139 patients with available preoperative CT or MRI images that underwent PCA were included in this study. All images were reviewed by a Urology resident. The primary endpoint variable was perioperative complications. R.E.N.A.L. scores were categorized into low (4−6), moderate (7−9), and high (10−12). Logistic regressions were conducted to determine which parameters were associated with complications. Additional variables collected included age at surgery, ASA score, lesion size, skin−to−tumor distance, skin−to−hilum distance, and number of treatment cryoprobes.

Results: Patient characteristics and operative data are listed in table 1. Overall, there were 16 (11.5%) patients with post−procedural complications. Complications included [list the most common complications here]. Median number of probes used was 2.1 (range 1–8). The model that best predicted complications included the number of probes used ($\chi^2$=9.38, p=0.002) and R.E.N.A.L. score ($\chi^2$=4.96, p=0.03). For each additional probe used, patients were twice as likely to have complications (OR=1.98, 95%CI 1.28−3.05). With each unit increase in R.E.N.A.L. scores, patients were 1.5 times more likely to experience a complication (OR=1.49, 95%CI 1.05−2.11).
Conclusions: Our results suggest that, an increase in both R.E.N.A.L Nephrometry score and number of probes used are associated with an increased risk of PCA post procedural complications. Nephrometry score assessment may be helpful in decision for treatment choice in the management of renal masses.

Poster #152

CYTOREDUCTIVE RADICAL NEPHRECTOMY (CRN) AND LEVEL II-IV INFERIOR VENA CAVA (IVC) THROMBECTOMY FOR METASTATIC RENAL CELL CARCINOMA (MRCC)
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(Presented By: Karin Westesson)

Introduction and Objectives: cRN for mRCC is associated with some improvement in survival when combined with cytokine therapy in patients with good performance status. Select patients with mRCC may have adverse local features such as level II−IV IVC thrombus that render cRN a technically challenging endeavor with increased risks of perioperative morbidity and mortality. Thus, the outcome of these patients relative to the overall cRN population is poorly defined.

Methods: Between 1990−2011, 56 patients with mRCC and level II (N =19), III (N =25) or IV (N =12) IVC thrombus underwent cRN and IVC thrombectomy at our institution.

Results: The age range of patients was 23 to 84 years old and 36 (64%) were male. Clinical information and follow−up data were obtained from an institutional retrospective data base. Site of metastasis were: lung, 22 (39%); liver 3 (5%); mediastinum 3 (5%); multiple sites 17 (30%). Clinical stage was T3a in 2 (3.6%), T3b in 38 (68%), T3c in 12 (21%), and T4 in 4 (7%). Twenty (36%) patients were clinical N1. Median tumor size was 10.2 cm (range, 1.4−21). Histologic classification was clear cell in 40 (71%), papillary in 4 (7%), and unclassified in 12 (21%). Five patients (9%) received neoadjuvant systemic therapy. Median ICU stay was 1 day and median hospital LOS was 7 days. Intraoperatively, 2 patients had splenectomies and 2 patients had embolization of thrombus. Clavien grade 3−5 complications occurred in 3 (5%) patients, of which two (3.6%) were fatal. Follow−up information was available for 49 patients and the median follow−up was 13 months (IQR: 6−33). Of these patients, 31 (63%) received postoperative systemic therapy with cytokines (14), targeted agents (16), or both (1). The overall median survival was 13 months (95% CI: 10−16), and was similar before (median 12 months) and after (median 13 months) the introduction of targeted therapy.

Conclusions: Among patients with mRCC with level II−IV IVC thrombus managed at a high−volume kidney center, cRN and IVC thrombectomy is associated with acceptable perioperative morbidity and mortality. The median survival of patients in our cohort is similar to the overall population of patients managed with cRN and cytokine therapy though less than those managed with cRN and targeted therapy based on data from published randomized trials. Patients with mRCC and level II−IV IVC thrombus may be considered for cRN provided that surgeons with experience with this procedure are available.
Poster #153

DOES TUMOR SIZE AT PRESENTATION PREDICT RATES OF DISTANT DISEASE IN PATIENTS WITH ADRENOCORTICAL CARCINOMA?
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(Presented By: Daniel Canter)

Introduction and Objectives: Current recommendations for adrenalectomy in metabolically inactive incidental adrenal lesions pivot on adrenal tumor size given that larger adrenal lesions are more likely to prove to be adrenocortical carcinoma (ACC) upon resection. In this study using a large administrative dataset, we assessed the impact of tumor size at presentation in patients with ACC on rates of metastatic disease.

Methods: We queried the National Cancer Database (NCDB) to assemble a cohort diagnosed with localized or regional/distant ACC based on SEER staging from 1985 to 2000 (n=2,251). Patients were stratified into three groups based on primary tumor size: < 4 cm, 4−6 cm, and > 6 cm, and rates of metastatic disease were then determined. A multivariable logistic regression model was then constructed to predict for local versus regional/distant disease.

Results: 1,721 patients with ACC had available staging information. Among patients with primary tumor sizes < 4 cm, 4−6 cm, and > 6 cm tumors, the rates of metastatic disease at presentation were similar: 50.6%, 45.2%, and 53.6% (p=0.09). Further stratification of the group with an initial primary tumor size > 6 cm reveals a statistically significant trend for increasing rates of metastatic disease at presentation once tumor size is > 12 cm (p<0.001). In a multivariable logistic regression model to predict the occurrence of local versus regional/distant ACC, only tumor size was found to be significant (p=0.01), with tumor size > 12 cm having increased odds of non−localized disease.

Conclusions: Approximately 50% of patients with adrenocortical carcinoma present with non−localized disease. Rates of localized versus regional/distant disease do not strongly relate to adrenal tumor size for tumors <12 cm. As such, these data should be considered when formulating recommendations for resection in patients with adrenal incidentalomas.

Funding: None

Poster #154

LEVEL 1 EVIDENCE IN UROLOGIC ONCOLOGY: A SYSTEMATIC REVIEW OF SURGICALLY RELEVANT POSITIVE RANDOMIZED CONTROLLED TRIALS (RCT)
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(Presented By: Anthony Corcoran)

Objective: RCTs provide the highest level of scientific evidence upon which to base objective treatment recommendations and further study. Here we perform a systematic review of surgically relevant positive RCTs for the treatment of localized genitourinary cancers over the last ten years and their applicability to contemporary practice.

Methods: An advanced search of English−language publications was performed using the Medline database from January 2000 to February 2011 using the terms prostate, kidney, bladder and testicular cancer with the ‘randomized controlled trials’ limiter. Articles with statistically significant positive results for surgical disease were included with the consensus of all the authors and reviewed. Phase III data evaluating systemic therapies for metastatic disease were excluded from this analysis. Studies were reviewed for number of patients, median follow up, primary and secondary endpoints outcomes and limitations. The search was repeated for breast, lung and colon cancers to provide a benchmark for comparison.

Results: We identified 24 RCTs encompassing a total of 265,418 pts for localized prostate (n=11; 3 screening, 1 chemoprevention, 4 surgical, 3 adjuvant encompassing 259,744 pts), kidney (n=7; 6 surgical, 1 adjuvant encompassing n=2,067 pts), bladder (n=3 with 1,334 pts) and testicular cancers (n=3 with 2,243 pts). Of the 24 studies identified, 11 (46%) were adequately powered, while 7 studies (28%) did not report power calculations. When evaluating American Urological Association and National Comprehensive Cancer Network guidelines and best practice statements, outcomes from 14 of the 24 studies were utilized. When compared to localized lung cancer (n=26), breast (n=20) and colon (n=20), level 1 RCT data in urologic oncology are underrepresented.
Conclusions: Urologic tumors account for 40% of all tumors in American males and nearly 20% of cancer deaths. A relative paucity of level 1 evidence exists in the surgical management of genitourinary tumors. When such data do exist they are often underpowered and infrequently objectified in contemporary guidelines. The reasons for this are multifactorial and require further study and improved

Poster #155

TUMOR MULTIFOCALITY IS ASSOCIATED WITH WORSE OUTCOMES IN PATIENTS WITH ORGAN-CONFINED UPPER TRACT UROTHELIAL CARCINOMA

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(Presented By: Eugene Cha)

Background: The prognostic impact of multifocal upper tract urothelial carcinoma (UTUC) disease is poorly understood. We sought to investigate the association of tumor multifocality (TM) with clinicopathologic features and outcomes of UTUC in patients managed by radical nephroureterectomy (RNU).

Methods: The study included 2492 patients treated with either open or laparoscopic RNU. Tumor characteristics included tumor stage, tumor grade, lymph node status, lymphovascular invasion, tumor architecture, tumor location, unifocal or multifocal disease, gender, age, history of bladder cancer, ECOG performance status and adjuvant chemotherapy. TM of UTUC was defined as synchronous presence of multiple tumors in the renal pelvis and/or ureter. Univariable and multivariable models tested the effect of TM on disease recurrence and cancer-specific mortality.

Results: Five-hundred and ninety patients (23.7%) had TM at the time of RNU. The median follow-up was 45 months (interquartile range:61). TM was significantly associated with a history of previous bladder cancer (p=0.032), lymph node involvement (p=0.036), tumor location in the ureter (p=0.003), higher tumor stage (p<0.001), higher tumor grade (p<0.001), infiltrative tumor architecture (p=0.003) and lymphovascular invasion (p=0.001). In organ-confined patients, TM was an independent predictor of both disease recurrence (hazard ratio [HR]: 1.43; p=0.019) and cancer-specific mortality (HR: 1.46, p=0.027). When assessed in all patients, TM was associated with both disease recurrence and cancer-specific mortality in univariable (p=0.005 and p=0.006, respectively), but not in multivariable analyses (p=0.468 and p=0.798, respectively). The main limitation is the retrospective design of the study.

Conclusions: TM is an independent prognosticator of disease recurrence and cancer-specific mortality in patients with organ-confined UTUC treated with RNU. Organ-confined patients with UTUC may need closer follow-up. Integration of TM with other factors may help identify those patients who would benefit from multimodal therapy.
ONCOLOGIC OUTCOMES AFTER RADICAL NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL CARCINOMA: COMPARISON OVER THE THREE DECADES
Mehrad Adibi, Ramy Youssef and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

Introduction & Objective: To compare clinico–pathologic features, therapeutic management and oncologic outcomes of upper tract urothelial carcinoma (UTUC) over the last three decades.

Methods: Utilizing a multi–institutional database of patients treated with radical nephroureterectomy (RNU) between 1983 and 2007, we compared clinico–pathologic features and survival outcomes over the last three decades. The following patient cohorts were utilized for analysis: group 1 comprised of patients treated prior to 1990s (n=106), group 2 included patients treated from 1990 to1999 (n=655), and group 3 consisted of patients managed from 2000 to 2007 (n= 701). Survival rates were compared using Kaplan–Meier survival analysis.

Results: The study included 1462 patients, 992 men and 470 women with 36 months median follow up after RNU. Tumors were organ confined (≤T2/N0) in 88% and high grade in 64%. Concomitant LND was performed in 600 (41%) patients and LN involvement was found in 143 patients. Neoadjuvant and adjuvant chemotherapy was administered to 47 (3.2%) and 171 (11.7%) patients, respectively. There were no significant differences in the distribution of organ−confined versus non−confined disease, performance of lymph node dissection during the RNU, and pathologic nodal status. There was a significant increase in high grade sessile tumors between groups 1 and 2, use of laparoscopic RNU and endoscopic management of UTUC between groups 2 and 3, and utilization of peri−operative chemotherapy from groups 1 to 3 (p<0.05). The overall 5 year disease−free survival rates were 66±5%, 68.5±2%, 71±2% and the 5 year cancer−specific survival rates were 75±5%, 72±2%, and 75±2% in group 1, 2 and 3 respectively, with no significant differences among the 3 groups (p>0.05).

Conclusion: Outcomes after RNU did not change significantly over the last 3 decades, despite staging and surgical refinements. Utilization of peri−operative systemic chemotherapy in UTUC management remains low. Further improvements in outcomes of UTUC patients necessitate rigorous investigation of multi−modal treatment approaches.

CIGARETTE SMOKING ADVERSELY IMPACTS PROGNOSIS IN UPPER TRACT UROTHELIAL CARCINOMA
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(Presented By: Behfar Ehdaie)

Background: Cigarette smoking is a primary causative factor for urothelial carcinoma but little data are available on the impact of smoking on prognosis in patients with upper tract urothelial carcinoma (UTUC). Our objective was to evaluate the impact of cigarette smoking on recurrence−free survival (RFS) and overall survival (OS) in UTUC patients treated with radical nephroureterectomy (RNU).

Methods: Data on demographic, smoking, and disease characteristics of 324 patients with UTUC treated with RNU between 1995 and 2008 were obtained from a prospectively maintained database. Disease recurrence was defined as local failure in the operative site, regional nodes, or distant metastases. We used Cox regression models to evaluate the association between several aspects of smoking, including lifetime duration of smoking, quantity and status, on RFS and OS.
**Results:** The study included 219 patients who were classified as ever smokers; 74% smoked ≥20 years and 37% smoked >20 cigarettes per day (CPD). Median follow-up was 72 months (95% CI: 65–91 months) for patients alive at last follow-up. Disease recurrence occurred in 27% (n=60) of patients and 41% (n=90) died during follow-up. Duration of smoking was not associated with RFS or OS. Compared to smoking 1–10 CPD, smoking 21–30 CPD (RFS: HR=3.34; 95%CI, 1.49–7.49; OS: HR=4.71; 95%CI, 1.99–11.20) or >30 CPD (RFS: HR=2.12; 95%CI, 1.09–4.13; OS: HR=2.65; 95%CI, 1.26–5.55) was significantly associated with lower RFS and OS probabilities. Among current smokers (n=41), associations remained significant and effect sizes comparing those who smoked >20 versus 1–10 CPD increased (RFS: HR=6.19; 95%CI, 1.28–29.9; OS: HR=6.40; 95%CI, 1.33–30.9). Among former smokers (n=163), associations were attenuated, and no longer significant.

**Conclusions:** Higher smoking quantity was associated with an increased risk of tumor recurrence or death, especially among patients who were actively smoking at the time of diagnosis. Treatment plans to promote smoking cessation are recommended for patients with UTUC.

**Poster #158**

**COMPLICATIONS AFTER OPEN AND LAPAROSCOPIC RADICAL NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL CANCER**

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(Presented By: Adrian Fairey)

**Introduction and Objectives:** No study has compared morbidity after open (ORN) and laparoscopic radical nephroureterectomy (LRNU) for upper urinary tract urothelial carcinoma (UTUC) using a standardized reporting methodology. Here we examined the association between surgical approach and complications.

**Methods:** A retrospective analysis of 142 consecutive patients treated with radical nephroureterectomy for UTUC between April 1994 and December 2008 was performed. Surgical approach was classified as ORNU or LRNU. All complications within 90 days of surgery were analyzed and graded according to the Clavien classification system. Univariable and multivariable logistic regression analyses were used to examine the association between surgical approach and complications.

**Results:** Baseline characteristics were similar between groups except that ORNU patients were less likely to have a preoperative serum Cr > 125 mmol/l (16% versus 32%, p=0.03), more likely to undergo complete lymph node dissection (9% versus 0%, p=0.01), and more likely to undergo extravesical only excision of the distal ureter (70% versus 60%, p=0.01). The 90–day overall complication rate (51% versus 21%), low-grade complication rate (27% versus 14%), and high-grade complication rate (25% versus 7%) differed between the ORNU and LRNU groups (p<0.01). Multivariable logistic regression analysis showed that LRNU was independently associated with a decreased risk of any complication (OR 0.25, 95% CI, 0.12 to 0.56, p<0.01) and high-grade complications (OR 0.22, 95% CI, 0.07 to 0.65, p<0.01).

**Conclusions:** LRNU was independently associated with a decreased risk of any complications and high-grade complications. Randomized controlled trials comparing surgical approach in the setting of UTUC are needed.

**Poster #159**

**LONG TERM OUTCOMES AFTER PARTIAL ADRENALECTOMY FOR PHEOCHROMOCYTOMA IN PEDIATRIC PATIENTS WITH VON-HIPPEL LINDAU**

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(Presented By: Dmitry Volkin)

**Purpose:** Children with hereditary cancer syndromes such as Von–Hippel Lindau Disease (VHL) are at an increased risk for developing bilateral pheochromocytomas. Traditional surgical management consisted of bilateral total adrenalectomy (TA) as the standard of care. Consequently, bilateral TA predisposes these children to a lifetime of hormone replacement with the associated morbid side–effects. To illustrate the advantage of partial adrenalectomy (PA), we report the largest single series on partial adrenalectomy for pediatric VHL patients.
Methods: From December 1994 to July 2011, a prospectively maintained database was retrospectively reviewed to identify pediatric patients (<16 yrs age) with hereditary pheochromoctyoma treated by PA. Demographic, perioperative, pathologic, and long term follow-up data were collected, including operative time, estimated blood loss, and steroid replacement status. PA (open, laparoscopic or robotic assisted) was performed if normal adrenocortical tissue was evident on preoperative imaging and/or intraoperative ultrasonography. Seven patients underwent a minimally invasive approach (6 laparoscopic, 1 robotic assisted) and four patients underwent open procedures.

Results: We identified 11 pediatric patients who underwent successful PA. All patients were diagnosed with VHL. Seven patients (64%) underwent PA by minimally invasive technique (6 laparoscopic and 1 robot assisted) and four patients underwent open PA. The average tumor size was 2.6 cm and the histology of all tumors was pheochromocytoma, with one being described as composite pheochromocytoma. 7 of the 11 patients remained tumor free radiographically and did not have evidence of elevated catecholamines at a median follow up of 8.8 years (range 4.12–14.8 yrs). Four patients (36%) were identified to have ipsilateral recurrence of pheochromocytoma. Three patients underwent repeat ipsilateral PA and 1 patient required total adrenalectomy due to lack of remnant normal adrenal gland. Only one patient required intermittent steroid replacement therapy.

Conclusion: Adrenal sparing surgery is safe and feasible in pediatric patients with hereditary cancer syndromes that predispose to the formation of pheochromocytoma. This approach allows for removal of tumor while preserving adrenocortical function and minimizing the side effects of long term steroid replacement on puberty and quality of life. Routine radiologic surveillance is critical to detecting recurrence or de novo lesions.

Poster #160

URINE NGAL LEVELS ALTERED BY COLLECTION AND PROCESSING PRACTICES
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(Presented By: Preston Sprenkle)

Introduction And Objectives: Urine neutrophil gelatinase associated lipocalin (uNGAL) has been used as a marker of acute kidney injury (AKI) in pediatric surgery, emergency room, transplant surgery, and intensive care unit settings. Limited information is available on the factors that may alter the assay results. Internal validation of the NGAL ELISA was performed in the clinical laboratory to elucidate these factors before implementation of the assay for clinical use.

Methods: NGAL ELISA kits were internally validated in the clinical laboratory to identify the variables that effect measured uNGAL levels. Evaluations included: the effect of the freeze/thaw cycle (uNGAL levels were measured at 4C prior to freeze and after being frozen at −80C then thawed for analysis); impact of blood contamination (urine samples were spiked with blood and with hemoglobin before analysis); gender differences (80 male and female volunteer voided specimens were compared); voided vs. catheterized (80 voided specimens were compared to 90 catheterized specimens).

Results: Freezing uncontaminated urine specimens at −80C does not alter the uNGAL levels compared to fresh (refrigerated) specimens, with a mean difference of 3.8% Blood contamination, especially leukocyte rich blood, significantly increases uNGAL levels up to twice the level of uncontaminated specimens. In voided urine samples from normal controls, women tend to have approximately twice the uNGAL of men (mean 15.7 vs. 9ug/L, respectively), however this difference is negligible when evaluating preoperative catheterized specimens (Men 15ug/L and women 18.8ug/L).

Conclusions: uNGAL is a reasonably stable biomarker that can be measured in fresh or previously frozen specimens without significant alteration of uNGAL level. Contamination of the urine specimen with blood, but especially leukocytes significantly alters the uNGAL level which likely explains the elevated uNGAL levels in voided urine specimens from women.
THE IMPACT OF MULTIPLE BIOPSIES ON ERECTILE FUNCTION IN MEN THAT PROGRESS FROM ACTIVE SURVEILLANCE TO RADICAL PROSTATECTOMY

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(Presented By: Adam Calaway)

Introduction and Objectives: The main reason for men choosing active surveillance is for the desire to preserve sexual potency. What is less clear is the impact of multiple biopsies on men in an active surveillance protocol who then undergo radical prostatectomy for progression of their disease. This study sought to investigate the effects of multiple prostate biopsies on functional outcomes after robotic assisted radical prostatectomy (RARP).

Methods: Between May 2009 and December 2009, 367 consecutive patients who underwent RARP by a single surgeon were retrospectively divided into two groups, one that had single prostate biopsy and another multiple biopsies before RARP. All patients were preoperatively potent and continent. After excluding the patients who did not have bilateral nerve sparing and who were intermediate and high risk, the two cohorts were matched for significant clinicopathologic preoperative variables. This left 50 and 23 patients for analysis in the single and multiple biopsy groups. The primary endpoint for our analysis was post−operative functional outcomes including potency and continence at 3 and 6 months after surgery.

Results: Age, prostate volume, pre−operative PSA, total cores during last biopsy, and number of positive cores on last biopsy, were comparable between patients in both groups. The median number of biopsies in the multiple biopsy group was two which was statistically significant when compared to the single biopsy group (p<0.001). The median interval between (last) biopsy date and date of surgery was 78 and 82 for the multiple and single biopsy groups (p=0.897). We found no effect on postoperative continence as a result of multiple biopsies, with rates of 84% (83%) and 94% (96%) for the single (multiple) biopsy groups at 3 and 6 months(p=0.88, p=0.77). However, multiple biopsy patients had worse postoperative erectile function with 43% of such patients being potent compared to 64% of single biopsy patients at 3 months (p=.25). Potency recovery at 6 months was significantly worse in the multiple biopsy group (57% v 80%, p=0.03).

Conclusions: Men subject to multiple preoperative biopsies are more likely to become impotent postoperatively than those who undergo surgery after a single biopsy. Patients and their doctors should be aware that active surveillance is not a non−morbid management option, as those that eventually progress to surgery have worse erectile function outcomes than those that opt for surgery initially.

TRANSPERINEAL BIOPSY – TEMPLATE BASED VERSUS CORES TARGETED TO A SUSPICIOUS AREA ON MRI: AN EFFICIENCY ANALYSIS

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(Presented By: Robert Dufour)

Introduction: There is much interest in improving the performance of prostate biopsy from the current standard of transrectal cores taken with ultrasound guidance alone. One approach is to do a transperineal template guided biopsy using a greater sampling density than the usual transrectal approach. An alternative approach is to use MR imaging to identify suspicious regions within the prostate for intensive sampling. We report a cohort of men who underwent both approaches, under general anaesthetic. We compare the two approaches for detection rates for clinically significant disease and the number of cores taken to give a diagnosis of clinically significant prostate cancer.
**Patients and Methods:** Men with a raised PSA underwent multi-parametric MRI. Suspicion of significant prostate cancer was scored using a 5 point scale. 69 men who scored 3 points or more were offered a combination of targeted and template guided transperineal biopsy. Significant cancer was defined as maximum cancer core length \( \geq 4 \text{mm} \) and/or the presence of any Gleason pattern 4. The sampling efficiency (cores per case detected) was calculated.

**Results:** 56/69 men (81%) had cancer detected, with significant cancer in 45/69 men (65%). Image guided biopsy detected 40 significant cancers (detection rate 58%) with a mean of 5 cores. Template guided biopsy detected 36 significant cancers (detection rate 52%) using a mean of 23 cores. Targeted biopsy detected only 5 insignificant cancers (7% of men), whilst template biopsy detected 14 (20% of men). The sampling efficiency (cores per diagnosis) for clinically significant cancer was 9 cores for targeted sampling versus 45 cores for template based sampling.

**Conclusions:** Cores targeted to a suspicious area on MRI are at least equivalent in the detection of clinically important prostate cancer and better at overlooking clinically insignificant prostate cancer than a transperineal template guided approach. Moreover, targeting in this manner achieves this with less than a quarter of the cores required for a template based approach.

**Poster #163**

**IMPACT OF DIFFERENT DEFINITIONS OF HIGH RISK PROSTATE CANCER ON SURVIVAL AFTER RADICAL PROSTATECTOMY**

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(Presented By: Gurdarshan Sandhu)

**Introduction and Objectives:** Multiple definitions of high risk prostate cancer exist. Studies have primarily correlated these definitions with biochemical recurrence and not with survival. We applied six previously described high risk definitions to men treated with radical prostatectomy and evaluated their ability to predict survival outcomes in a multi-institutional cohort.

**Methods:** The study population included 6477 men who were treated with radical prostatectomy between 1995 and 2005 and were followed for a median of 67 months. The six high risk definitions used in this study were preoperative PSA \( \geq 20 \text{ng/ml} \), biopsy Gleason score 8–10, clinical stage \( \geq T2c \), clinical stage T3, D’Amico definition, or National Comprehensive Cancer Network definition. Survival was evaluated using the Kaplan–Meier method to generate unadjusted prostate cancer survival estimates. To control for the competing risks of age and comorbidity, multivariable Cox proportional hazard regression models were used to estimate the hazard ratio for prostate cancer specific mortality (PCSM) and overall mortality (OM) in high risk patients compared to low/intermediate risk.

**Results:** High risk patients comprised between 0.7% (cT3) and 8.2% (D’Amico) of the study population. The 10-year Kaplan Meier prostate cancer survival estimates varied from 89.7% for PSA \( \geq 20 \text{ng/ml} \) to 69.7% for cT3 (Figure 1). On multivariable analysis controlling for age and comorbidity, high risk prostate cancer (of all definitions) had an increased risk of PCSM compared to low/intermediate risk with a hazard ratio (HR) ranging from 4.38 for PSA \( \geq 20 \) to 19.97 for cT3 (all \( p<0.0001 \)). For OM, again controlling for age and comorbidity, high risk patients of all definitions except preoperative PSA \( \geq 20 \text{ng/ml} \) (HR=0.98) were associated with increased risk of OM (HR range: 1.72 for D’Amico to 3.31 for cT3, all \( p<0.01 \)).

**Conclusions:** In a contemporary cohort of men with high risk prostate cancer treated with radical prostatectomy, the majority of men experienced long term prostate cancer survival. However, heterogeneity in survival outcomes existed based on the definition of high risk used. Clinical stage T3 and high Gleason grade were most strongly associated with PCSM and OM.
**Poster #164**

**PERINEURAL VERSUS LYMPHOVASCULAR INVASION: WHICH IS A BETTER MARKER FOR UNFAVORABLE BIOCHEMICAL OUTCOMES FOLLOWING PROSTATECTOMY? – RESULTS FROM THE DUKE PROSTATE CENTER DATABASE**

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(Presented By: Abhay Singh)

**Introduction:** There has been a substantial effort to study the clinical significance of perineural invasion in prostate biopsies (PNIb) however its prognostic significance remains controversial. Furthermore, the prognostic potential of perineural invasion in radical prostatectomy (RP) specimens (PNIp) has not been well studied. Available data suggests that biopsy specimens inadequately represent whole gland pathology with regards to perineural invasion thus rendering investigation of PNIp even more clinically relevant. While lymphovascular invasion in pathology specimens (LVIp) has been more rigorously investigated, studies examining its relationship with biochemical recurrence (BCR) risk have shown conflicting results. More importantly, there has been minimal comparison of PNIp and LVIp in the same cohort to determine which marker is the superior prognostic factor.

**Methods:** We retrospectively analyzed data from 1611 men who underwent RP from 1999 to 2010 from the Duke Prostate Center database. We evaluated PNIp and LVIp as predictors of time to BCR by comparing hazard ratios (HR) and 95% confidence intervals (CI) using crude and adjusted proportional hazards regression models that included both variables and controlled for age, race, year of RP, preoperative risk group (D’Amico criteria), pathological Gleason sum, seminal vesicle invasion, margin status, extracapsular extension, and lymph node involvement.

**Results:** A total of 1304 (81%) men had PNIp while only 82 (5%) men had LVIp. On crude regression, both PNIp (HR=3.39; 95% CI=1.94−5.84; p<0.001) and LVIp (HR=2.33; 95% CI=1.49−3.64; p<0.001) were significant predictors of adverse BCR risk. After adjusting for clinicopathological covariates, PNIp remained significantly associated with increased BCR risk (HR=1.85; 95% CI=1.04−3.31; p=0.04). Specifically, men with PNIp were 85% more likely to experience BCR relative to PNIp (−) men. In contrast, LVIp was not independently associated with BCR risk (p=0.23).

**Conclusions:** In a cohort of men who underwent RP in a tertiary−care hospital, PNIp is predictive of adverse BCR outcomes independent of clinicopathological parameters that include LVIp. Consequently, LVIp is a poor predictor of BCR risk. PNIp may thus provide additional prognostic information for men treated with RP and its inclusion in predictive nomograms requires study. Further analyses to determine if PNIp is likewise associated with metastasis and cancer−specific survival are warranted.

**Poster #165**

**PROSTATE CANCER SPECIFIC MORTALITY AND COMPETING CAUSES OF MORTALITY AMONG ELDERLY MEN AFTER LOCAL THERAPY FOR PROSTATE CANCER**

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(Presented By: Joseph Klink)

**Introduction and Objectives:** The benefit of definitive local therapy among elderly patients (> 65 years) with localized prostate cancer (PC) is uncertain, particularly for those with comorbid illness. Despite this uncertainty, the majority of these men currently receive local therapy. We analyzed the risk of prostate cancer−specific mortality (PCSM) relative to competing causes of mortality (CCM), stratified by disease severity and comorbidity, among contemporary men treated at two high−volume hospitals.

**Methods:** Between 1995−2005, 4237 consecutive men aged 65 years or older were managed by radical prostatectomy (N = 1634), external−beam radiotherapy (N = 1570), or brachytherapy (N = 1033) at Cleveland Clinic or Barnes–Jewish Hospital. Clinical information was obtained from prospective data bases. Comorbidity was assessed using ACE−27 and Charlson Comorbidity indices. PC risk was classified according to D’Amico criteria. Fine and Gray competing risk analysis was used to assess PCSM and CCM at 10 years.
**Results:** Over a median follow-up of 72 months (IQR: 46–97), 88 and 748 PCSM and CCM events were observed. Among healthy men with low risk PC, 10 year PCSM was 2% and CCM was 19%. Among healthy men with high risk PC, PCSM was 11% and CCM was 27%. In the group with moderate–to–severe comorbidities, CCM was 49, 59%, and 58% and PCSM was 1%, 3%, and 21% among those with low–, intermediate– and high–risk PC, respectively. Among these unhealthy men, 26% were treated by radical prostatectomy, of whom 45% had low–risk PC and 16% had high–risk PC. Among healthy men, 41% were treated by radical prostatectomy, of whom 54% and 9% had low– and high–risk PC, respectively.

**Conclusions:** The risk of PCSM vs. CCM for older men is low, particularly for those with moderate–to–severe comorbidity; 49–59% had died from CCM within 10 years. Current evidence suggests that local therapy for PC is associated with a 25% reduction in PCSM, at best. Thus, with active surveillance, it is unlikely that PCSM would exceed 5–7% in those with low– and intermediate–risk PC. These results should inform elderly men and physicians about the risk of PCSM and CCM when deciding upon treatment for localized PC.

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**Poster #166**

**TRENDS IN USAGE OF RADICAL PROSTATECTOMY IN THE UNITED STATES: 2000–2008**

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(Submitted By: Christopher Anderson)

**Objectives:** Radical prostatectomy (RP) remains one of the most common treatments for organ–confined prostate cancer and recent data suggests its use is rising. We examined the trends in use of RP in the United States from 2000–2008 and how the rise in volume is being distributed among different types of hospitals.

**Methods:** Using the Healthcare Utilization Project National Inpatient Sample (NIS) we identified all men ≥18 years old that underwent RP for prostate cancer from 2000–2008. Surgical robot ownership data from the 2007 American Hospital Association Statistics database was merged with NIS. The relationship between annual RP volume and several hospital variables was investigated. All statistics are presented as means and standard deviations. Multivariate analysis was performed using linear regression.

**Results Obtained:** Approximately 586,431 patients underwent RP at 3074 different hospitals from 2000–2008. There was a significant increase in use of RP after 2005, particularly in the highest volume–quartile hospitals (Figure 1). From 2000 to 2008, annual RP volume increased by 72% (50,729 to 87,108) and the number of hospitals performing RP decreased by 19% (2,630 to 2,135) resulting in an increase in average yearly hospital volume from 22.6 to 41.7. Several hospital variables were associated with a rise in mean hospital volume including teaching status (2000, 2008: 41.1, 77.7 vs. non–teaching 15.7, 21.6), urban location (2000, 2008: 26.2, 48.2 vs. rural 10.2, 11), and large bed size (2000, 2008: 29.7, 55.7 vs. small bed size 11.7, 20.5). Hospitals that owned a surgical robot in 2007 had a higher RP volume in 2000 (53.9) and 2008 (128) than hospitals without a robot (2000, 2008: 16.1, 16.5) and also accounted for a significant increase in volume after 2005. On multivariate analysis, teaching status, larger bed size, Western region, urban location and presence of a surgical robot all predicted a higher rate of annual hospital RP volume.
Conclusions: From 2000–2008 use of RP increased substantially, most notably after 2005. The dramatic increase in RP has resulted in higher case volume at certain hospitals, particularly those in the top tier of RP volume and those that invested in robotic technology by 2007.

Poster #167

RECOVERY OF URINARY FUNCTION FOLLOWING RADICAL PROSTATECTOMY: IDENTIFICATION OF TRAJECTORY CLUSTER GROUPS
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(Presented By: Christopher Anderson)

Objective: Post–prostatectomy urinary incontinence (PPI) can impact health related quality of life (HRQOL) among men treated with radical prostatectomy (RP) for prostate cancer. Currently, no consensus exists regarding which patients are at risk for impaired HRQOL secondary to PPI. Using a trajectory clustering analysis, we identified predictors of PPI recovery in unique patient groups.

Methods: Over a 5–year period, HRQOL was evaluated in patients undergoing RP using the Prostate Cancer Index (PCI) preoperatively and at 3, 6, and 12 months postoperatively. A novel cluster modeling technique was used to identify unique group trajectories of urinary function recovery over time.

Results Obtained: Group–based modeling of PCI urinary function scores identified three distinct PPI recovery patterns. Group 1 (n=73) had a significant postoperative decline with only 33.4% of optimum function at 12 months. Group 2 (n=258) had moderately diminished urinary function at 3 months with improvement to 76.8% of optimum function at 12 months. Group 3 (n=89) had high scores throughout. Members of group 1 tended to be older (p=0.001), suffer from major depression (p=0.008), have lower extremity circulatory disease (p=0.004), be past or current smokers (p=0.004) and have a higher number of comorbidities (p<0.001) relative to groups 2 and 3. On multivariate analysis, age and number of comorbidities significantly predicted inclusion in the poor functioning group.
Conclusions: A novel modeling approach identified three distinct PPI recovery patterns. Patient age and number of comorbidities predicted worse outcomes. These findings have implications for preoperative patient counseling and early intervention for treating PPI.

Poster #168

PROSTATE-SPECIFIC ANTIGEN TESTING AMONG PRIMARY CARE PHYSICIANS AND UROLOGISTS: PATTERNS OF CARE AND IMPACT OF PROFESSIONAL SOCIETY GUIDELINES

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(Presented By: Sandip Prasad)

Introduction and Objectives: During the past decade, the incidence of prostate cancer in the United States has declined. We hypothesized this was related to lower rates of prostate-specific antigen (PSA) testing and sought to evaluate PSA testing rates nationally.

Materials and Methods: Using the National Ambulatory Medical Care Survey, a nationally representative sample of outpatient visits in the United States, we analyzed rates of PSA testing in men age 40 years or older who visited PCPs or urologists from 1997 to 2008.

Results Obtained: An estimated 26.6 million (95% CI: 24.8–28.4 million) PSA tests were ordered during 94.5 million (95% CI: 90.9–98.1 million) office visits to urologists and 95 million (95% CI: 87.5–102.8 million) tests were ordered during 1.17 billion (95% CI: 1.15–1.18 billion) visits to PCPs, with an annual increase of 3.4% and 6.0%, respectively (p=0.055 and p<0.001 for trend). After adjusting for year, race, ethnicity, region, insurance and provider type, testing by PCPs was more likely among older men and highest among men aged 60 to 69 years (reference: 40–49 years; OR 2.32, 95% CI: 1.88–2.85). Compared to men without a chronic medical condition, those with one chronic condition had greater odds of receiving a PSA test (OR 1.28, 95% CI: 1.08–1.52).

Conclusions: Prostate cancer incidence has declined over the past decade despite increasing rates of office-based PSA testing by PCPs and urologists during the period. Increasing rates of PSA testing merit scrutiny, especially in men with limited life expectancies who are unlikely to benefit from screening.
**Poster #169**

**PROSTATE CANCER IN THE ELDERLY: FREQUENCY OF ADVANCED DISEASE AT PRESENTATION AND DISEASE-SPECIFIC MORTALITY**

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(Presented By: Edward Messing)

**Objectives:** The purpose of this study was to determine the frequency of metastatic (M1) prostate cancer (PC) at presentation in different age groups, to examine the association of age with PC-specific mortality, and to calculate the relative contribution of different age groups to the pool of M1 cases and PC deaths.

**Methods:** Records of 464,918 patients diagnosed with PC during 1998−2007 were obtained from the Surveillance, Epidemiology, and End Results (SEER) database. Age at PC diagnosis was grouped as: <50, 50−54, 55−59, 60−64, 65−69, 70−74, 75−79, 80−84, 85−89, 90+. The cumulative incidence of death from PC was computed using Gray’s method. Funding for this work was provided by the Ashley Family Foundation.

**Results:** The frequency of M1 PC at presentation was 3% for age categories <75; 5% for 75−79; 8% for 80−84; 13% for 85−89; and 17% for 90+. The 5−year cumulative incidence of death from PC was 3%−4% for all PC patients in any age category <75; 7% for 75−79; 13% for 80−84; 20% for 85−89; and 30% for 90+. Despite representing only 15% of older (50+ year old) male adults in the general US population, men age 75 and older contributed almost half (48%) of all presenting M1 PC cases. In addition, more than half (53%) of all PC deaths occurred in men who were age 75 and older at PC diagnosis.

**Conclusion:** Compared to younger patients (<75 years old), older patients were more likely to present with very advanced disease, had a greater risk of death from PC despite higher death rates from competing causes, and contributed almost half of all presenting M1 PC cases and more than half of all PC deaths. Awareness of these issues may improve future outcomes for elderly patients with PC.

**Poster #170**

**CONTEMPORARY TRENDS IN IMAGING USE IN MEN DIAGNOSED WITH PROSTATE CANCER**

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(Presented By: Sima Porten)

**Background:** Previous studies have found persistent over−use of imaging for clinical staging of men with low−risk prostate cancer. We aimed to determine contemporary imaging trends in three cohorts of men.

**Methods:** We analyzed imaging trends of men with prostate cancer who were a part of Cancer of the Prostate Strategic Urologic Research Endeavor CaPSURE (1998−2006), were insured by Medicare (1998−2006), or privately insured (Ingenix database, 2002−2006). The rates of computerized tomography (CT), magnetic resonance imaging (MRI), and bone scan (BS) were determined and time trends were analyzed by linear regression. For men in CaPSURE, demographic and clinical predictors of test use were explored using a multivariable regression model.

**Results:** Since 1998, there was a significant downward trend in BS (16%) use in the CaPSURE cohort (N=5,156). There were slight downward trends (2.4% and 1.7% respectively) in use of CT and MRI. Among 54,322 Medicare patients, BS, CT, and MRI use increased by 2.1%, 10.8%, and 2.2% and among 16,161 privately insured patients, use increased by 7.9%, 8.9%, and 3.7%, respectively. In CaPSURE, the use of any imaging test was greater in men with higher risk disease. Additionally, type of insurance and treatment affected the use of imaging tests in this population.

**Conclusions:** There is widespread misuse of imaging tests in men with low−risk prostate cancer, particularly for computerized tomography. These findings highlight the need for re−examination of financial incentives and other factors that drive decision−making with respect to imaging in this setting.

**Funding:** This study was funded by the Urologic Diseases of America Project
Poster #171

GHRELIN RECEPTOR AS A NOVEL IMAGING TARGET FOR PROSTATIC NEOPLASMS
Chen Lu, Andrew Williams, Ali Al-zahrani, Ana Maria Autran, Jonathan Izawa, Joseph Chin and John Lewis
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(Presented By: Ali Al-zahrani)

Background: Ghrelin is a natural growth hormone secretagogue (GHS) that is co-expressed with its receptor GHSR in human prostate cancer cells. Imaging probes that target receptors for ghrelin may delineate prostate cancers from benign disease. The specificity of a novel ghrelin imaging probe for prostate cancer over normal tissue or benign disease was assessed.

Methods: A fluorescein-bearing ghrelin analogue was synthesized (fluorescein-ghrelin(1−18)), and its application for imaging was evaluated in a panel of prostate cancer cell lines and human prostate tissue. Prostate core biopsy samples were collected from fresh surgery specimens of 13 patients undergoing radical prostatectomy. Ghrelin probe signal was detected and quantified in each sample using a hapten amplification technique and associated with pathological features.

Results: The ghrelin probe was taken up by GHSR-expressing LNCaP and PC−3 cells, and not in BPH cells that express low levels of GHSR. Binding was blocked by competition with excess unlabeled probe. The ghrelin probe signal was 4.7 times higher in PCa compared to benign hyperplasia tissue (p=0.0027) and normal tissue (p=0.0093). Furthermore, while the ghrelin probe signal was 1.9 fold higher in PIN compared to benign hyperplasia (p=0.0022) and normal tissue (p=0.0047), there was no significant difference in the signal of benign hyperplasia compared to normal tissue.

Conclusion: The imaging probe fluorescein−ghrelin(1−18) is specific for prostate cancer, and did not associate significantly with benign hyperplasia or normal prostate tissue. This data suggests that ghrelin analogues may be useful as molecular imaging probes for prostatic neoplasms in both localized and metastatic disease.

Poster #172

THE IMPACT OF ROBOTICS ON RADICAL PROSTATECTOMY TRAINING IN UROLOGY RESIDENCY: A SURVEY OF AUA RESIDENT MEMBERS WORLDWIDE
Patrick McDonough and Doug Sutherland
Multicare Urology
(Presented By: Patrick McDonough)

Purpose: The impact of robotic surgery on urology resident education is unknown. We set out to determine the current status of radical prostatectomy and robotic surgical training in urology residency.

Materials and Methods: This IRB approved project consisted of a 21 question survey that was intended to assess the state of RP and robotic surgical training in urology residency programs. The survey was sent worldwide via electronic mail to all resident members of the AUA and it was kept open for responses for a three week period in April of 2011.

Results: A total of 2,437 surveys were sent and responses were received by 356 residents for an overall response rate of 15%. Of respondents, 80% were US residents and 20% were international residents. Responses were evenly distributed from each year of urology residency. RARP is the most common approach to prostatectomy reported within U.S. residency programs whereas RRP remains more common abroad. Of respondents, 74% reported no defined robotic training curriculum required prior to performing as console surgeon. A dual console was available to 23% of respondents, 46% reported access to a robot for training purposes, and 24% reported access to a virtual reality robotic simulator. Only 9% of respondents reported having protected time for robotic training built into their residency. Using the ACGME criteria for “Surgeon,” 54% of US residents are exposed to fewer than 25 RRP’s, whereas 61% of US residents report exposure to greater than 25 RARP’s during their training. When participating as “Surgeon,” 42% of US residents agreed that their level of participation was greater during RRP than RARP. Of respondents, 30% agreed that their program’s transition from RRP to RARP has had a negative impact on their education with regard to prostatectomy.
Conclusions: RARP is the most common approach to RP within U.S. training institutions, yet a minority of residents report having a defined robotic training curriculum, access to a robot for training, or protected time for robotic training. A significant proportion of residents believe that the emergence of robotic surgery has decreased their participation in RP as learners and has negatively impacted their surgical education. These results suggest a need to improve resident training and participation in RARP.

Poster #173

CIRCULATING INTERLEUKIN 6 AND NERVE GROWTH FACTOR ARE ASSOCIATED WITH PERIPROSTATIC FAT LENGTH AND CANCER DETECTION AMONG NON-OBESE MEN PRESENTING FOR PROSTATE BIOPSY

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(Presented By: David Margel)

Background: In a previous study we demonstrated an association between circulating adipokine levels and prostate cancer. Evidence suggests that visceral fat (i.e. periprostatic fat) has greater metabolic activity than peripheral fat. However the association of serum adipokine with periprostatic fat has not been characterized. To further assess this relationship we correlated serum adipokine levels with both BMI (a measure of peripheral fat) and periprostatic fat (visceral fat) in a population of men who present for prostate biopsy.

Methods: The cohort consisted of 200 subjects initially stratified by BMI, 100 were obese (BMI >27) and 100 non-obese (BMI ≤27). Of the obese subjects 50 were diagnosed with prostate cancer and were age matched with 50 controls. The same process was used for the non-obese subjects.

Serum samples collected prior prostate biopsy were used to measure adipokines (adiponectin, leptin, PAI, Resistin, HGF, IL-1β, IL-6, IL-8, MCP-1, NGF and TNF-α) using Milliplex Multi-Analyte Profiling kits (Adipokine panels A and B; Millipore; Billerica, MA, USA) Periprostatic fat was measured on a sagittal transrectal ultrasound image. Clinical data including age, PSA, digital rectal exam, height and weight were collected at time of biopsy. Sample analysis, clinical data recording as well as fat measurements were done blinded to pathology results.

Statistical analysis—We used a Pearson correlation analysis to associate serum adipokine levels with periprostatic fat and BMI.

Results: No correlation was found between BMI and periprostatic fat. Periprostatic fat pad length was significantly correlated with NGF (r=0.65, p=0.002) and IL-6 (r=0.54, p=0.004) among non-obese subjects with prostate cancer. Conversely periprostatic fat was not correlated with serum adipokine levels among the obese subjects (with or without prostate cancer). BMI was correlated with leptin among obese (r=0.55, p=0.001) and non-obese (r=0.52, p=0.004) only in subjects without prostate cancer. BMI did not correlate with serum adipokine levels among obese or non-obese subjects diagnosed with prostate cancer.

Conclusions: We have demonstrated a significant correlation between periprostatic fat and serum levels of NGF and IL-6 among non-obese prostate cancer patients. These findings suggest that adipokines may be differentially secreted from visceral fat. Direct measurement of these molecules in the periprostatic fat would further our knowledge of the role of adipokines in prostate cancer.

Poster #174

DUAL ANTIANGIOGENIC THERAPY USING BEVACIZUMAB AND LENALIDOMIDE WITH DOCE TAXEL AND PREDNISONE IN PATIENTS WITH METASTATIC CASTRATION-RESISTANT PROSTATE CANCER (MCRPC)

Bamidele Adesunloye¹, Xuan Huang¹, Yang Ning², Ravi Madan¹, James Gulley¹, Melony Beaton¹, Paul Kluetz², David Adelberg, Philip Arlen¹, Howard Parnes¹, Marcia Mulquin¹, Seth Steinberg¹, John Wright¹, Jane Trepel¹, Nancy Dawson³, Clara Chen³, Carol Bassim⁴, Andrea Apolo¹, William Figg⁵ and William Dahut¹
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(Presented By: Bamidele Adesunloye)
**Introduction:** Angiogenesis may play a critical role in mCRPC. Previously, we had shown the potent anti-tumor activity of dual antiangiogenic therapy by combining bevacizumab (B) and thalidomide (T) with docetaxel (D) and prednisone (P) in mCRPC (Ning JCO 2010). We hypothesized that combining lenalidomide (L), an analogue of T, with B, D, and P would have a more favorable efficacy/toxicity profile.

**Methods:** All patients (pts) had chemotherapy-naïve mCRPC. 3 pts received R 15 mg daily, 3 pts had 20 mg daily, and the remaining had 25 mg daily for 14 days of every 21-day cycle (C). All pts received D 75 mg/m2 and B 15 mg/kg on day 1 with P 10 mg and enoxaparin daily throughout each C. After grade 3 neutropenia was seen in >80% of pts, the protocol was amended to include prophylactic pegfilgrastim on day 2. PSA was assayed each C with imaging after C2 and then after every 3C. Dental exams with mandible CT scan at baseline, after C5, and then every 6C or earlier if indicated.

**Results:** 47 of the planned 51 pts have been enrolled. Median age was 66 (51−82), median Gleason score 8 (70.2% 8−10, 29.8% 5−7), median on-study PSA 91.6 ng/ml (0.15−3520), and median pre-study PSA doubling time 1.43 months (0.52−6.73). Median number of treatment Cs was 14 (1−31) and PFS was 19.3 months as of this analysis. Among 45 pts who have completed ≥2 cycles, 39 (86.7%) and 30 (66.7%) had PSA declines of ≥50% and ≥75%, respectively. Of 29 pts with measurable disease there were 2 CR, 21 PR, and 6 SD (79.3% overall RR). 10/47 pts were taken off study for radiographic disease progression and 5/47 for other reasons.

Grade ≥3 toxicities included neutropenia (24/47), anemia (9/47), thrombocytopenia (5/47), weight loss (1/47), hypertension (3/47), and febrile neutropenia (4/47). Other toxicities included perianal fistula (3/47), rectal fissure (1/47), myocardial infarction (1/47), and osteonecrosis of the jaw (ONJ) (16/47, 34.0%). At the time of diagnosis of ONJ, 9/16 pts were on bisphosphonates, 3/16 had used bisphosphonates previously, and 4/16 had no history of bisphosphonate use. Although the incidence of ONJ was higher than the 18.3% reported by Ning, a recent study of carboplatin plus weekly docetaxel reported an incidence of 29.3%.

**Conclusions:** Dual antiangiogenic therapy with, B and L, plus D and P was associated with high PSA (86.7%) and tumor (79.3%) responses in mCRPC, with manageable toxicities. Further studies are underway to explore the high incidence of ONJ.

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**Poster #175**

**SMALLER PROSTATE SIZE IS ASSOCIATED WITH GREATER VOLUME OF DISEASE AT PROSTATECTOMY**

Boris Gershman, Douglas Dahl, Francis McGovern, Niall Heney, W. Scott McDougal and Chin-Lee Wu
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(Presented By: Boris Gershman)

**Introduction and Objectives:** Smaller prostate size is associated with a number of negative prognostic indicators including higher Gleason score and positive surgical margins. We hypothesized that this may be related to longer time to diagnosis for patients with smaller glands and investigated whether gland size is related to volume of disease at prostatectomy.

**Methods:** A retrospective review was performed of patients with Gleason 6–10 prostate cancer who underwent radical prostatectomy from 2001 through 2010. Patients were identified from a prostatectomy tumor bank database. Univariate and multiple logistic regression were performed to determine association between prostate weight and volume of disease at prostatectomy. Number of quadrants with prostate cancer on surgical pathology was used as a surrogate for volume of disease.

**Results Obtained:** A total of 2054 patients underwent radical prostatectomy. Mean age, PSA, and prostate weight were 59.6 ± 6.6 years, 6.0 ± 4.7 ng/ml, and 45.5 ± 17.5 grams, respectively. Gleason score was 6 in 1055 patients (51.4%), 7 in 858 patients (41.8%), and 8–10 in 141 patients (6.9%). Number of quadrants with prostate cancer was distributed as follows: 1 quadrant in 274 patients (13.3%), 2 quadrants in 464 patients (22.6%), and 3 quadrants in 1054 (37.0%). On one-way analysis of variance, increasing number of quadrants with cancer was associated with decreasing prostate weight (p < 0.001). On univariate and multiple logistic regression (Table 1), smaller prostate weight, higher PSA, and higher Gleason score were associated with increasing volume of disease.
Conclusions: Smaller prostate gland size is independently associated with increased volume of disease at prostatectomy. This supports the idea of a delay in diagnosis of prostate cancer for patients with smaller glands.

Poster #176

PRIMARY TREATMENTS FOR CLINICALLY LOCALIZED PROSTATE CANCER: SYSTEMATIC REVIEW AND COST-UTILITY ANALYSIS

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(Presented By: Matthew Cooperberg)

Background: The ideal treatment strategy for localized prostate cancer has not been determined. Based on a comprehensive review of the published literature, we conducted a lifetime cost–utility analysis comparing men undergoing open, laparoscopic, or robot–assisted radical prostatectomy (ORP, LRP, RARP), 3D conformal or intensity–modulated radiation therapy (3DCRT, IMRT), brachytherapy (BT), or combined external–beam radiation and brachytherapy (EBRT+BT).

Methods: A risk–stratified Markov model was constructed to determine outcomes in lifetime quality–adjusted life years (QALYs). A systematic literature review was conducted to determine event and transition probabilities in the model. Health states included remission, recurrence, metastasis, prostate cancer death, and other–cause death. Utilities were assigned for each health state, and additional disutility penalties accrued for complications and side effects. Salvage local and/or androgen deprivation therapies were allowed. Costs were determined from Medicare fee schedules, and patient time costs were also considered in a sensitivity analysis. Probabilistic Monte Carlo simulation was employed to determine the final QALYs and costs. Extensive one– and multi–way sensitivity analyses also was performed to test the robustness of the findings.

Results: Likelihood of recurrence, progression, and mortality increased with increasing disease risk, as did associated lifetime costs. In most comparisons, surgical modalities were associated with more QALYs than radiation modalities, and there were no significant differences between ORP, LRP, and RARP. For all strata, lifetime costs were significantly lower for surgical patients than for radiation patients, and did not differ substantially across surgical modalities. 3DCRT tended to be less effective than BT, IMRT, or EBRT+BT; QALYs otherwise were similar within each risk stratum among radiation modalities. For low–risk patients BT was the least expensive radiation modality; for high–risk patients BT and 3DCRT were less expensive than BT+EBRT. The findings were robust to an extensive set of sensitivity analyses.

Conclusions: Our analysis found modest differences in QALYs and substantial differences in payer and patient costs across treatment alternatives. These findings may inform future policy discussions regarding strategies to improve efficiency of treatment selection for localized prostate cancer.
DENOSUMAB PROLONGS BONE METASTASIS-FREE SURVIVAL IN MEN WITH CASTRATE-RESISTANT PROSTATE CANCER: A GLOBAL, RANDOMIZED, DOUBLE-BLIND, PHASE 3 TRIAL
Lawrence Karsh¹, Matthew Smith², Fred Saad³, Robert Coleman⁴, Neal Shore⁵, Karim Fizazi⁶, Bertrand Tombal⁷, Kurt Miller⁸, Paul Sieber⁹, Ronaldo Damiao¹⁰, Teuvo Tammela¹¹, Blair Egerdie¹², Hendrik Van Poppel¹³, Joseph Chin¹⁴, Juan Morote¹⁵, Tomasz Borkowski¹⁶, Zhishen Ye¹⁷, Amy Kupic¹⁷, Roger Dansey¹⁷ and Carsten Goessl¹⁷
¹The Urology Center of Colorado, Denver, CO; ²Massachusetts General Hospital Cancer Center, Boston, MA; ³University of Montreal Hospital Center, Montreal, Quebec; ⁴Weston Park Hospital, Sheffield, UK; ⁵Carolina Urologic Research Center, Myrtle Beach, SC; ⁶Institut Gustave Roussy, University of Paris, Villejuif, France; ⁷Université Catholique de Louvain Cliniques Universitaires Saint Luc, Bruxelles, Belgium; ⁸Charité Berlin, Berlin, Germany; ⁹Urological Associates of Lancaster, Lancaster, PA; ¹⁰Hospital Universitario Pedro Ernesto, Rio de Janeiro, Brazil; ¹¹Tampere University Hospital, Tampere, Finland; ¹²Urology Associates Urologic Medical Research, Kitchener, ON; ¹³Universitair Ziekenhuis Gasthuisberg, Leuven, Belgium; ¹⁴London Health Sciences Centre, London, Canada; ¹⁵Hospital Vall d’Hebron, Barcelona, Spain; ¹⁶Medical University of Warsaw, Warsaw, Poland; ¹⁷Amgen Inc., Thousand Oaks, CA
(Presented By: Lawrence Karsh)

Introduction: Bone metastases are a major cause of morbidity in men with castrate−resistant prostate cancer (CRPC). Prevention of bone metastasis is a major unmet medical need. This global phase 3 study evaluated the effect of denosumab (XGEVA®), a fully human monoclonal antibody against RANKL, on bone metastasis−free survival in men with non−metastatic CRPC.

Methods: PMen with non−metastatic CRPC at high risk for developing bone metastasis (PSA value ≥8.0 ng/mL and/or PSA doubling time ≤10.0 mos) were randomized 1:1 in a blinded manner to receive monthly subcutaneous (SC) denosumab 120 mg (n=716) or monthly SC placebo (n=716). The first patient was enrolled in February 2006 and the primary analysis cut−off date was July 2010. Stratification was by PSA risk group and prior/current chemotherapy for PC. Daily calcium and vitamin D supplements were strongly recommended. The primary endpoint was bone metastasis−free survival as determined by the time to first bone metastasis or death from any cause. The time to first bone metastasis excluding deaths and overall survival time were also evaluated. Bone metastases were detected by bone scan and confirmed by radiography, CT, or MRI. Images were reviewed by an independent central reading facility in a blinded fashion.

Results: Denosumab significantly increased bone metastasis−free survival by a median of 4.2 mos compared with placebo (29.5 and 25.2 mos, respectively; hazard ratio [HR] 0.85; 95% CI: 0.73, 0.98; P=0.028; risk reduction of 15%), and significantly delayed the time to first bone metastasis compared with placebo (HR 0.84; 95% CI: 0.71, 0.98; P=0.032; risk reduction of 16%). Time to symptomatic bone metastasis was also delayed (HR 0.67; 95% CI: 0.49, 0.92; P=0.01). Overall survival was similar between groups (HR 1.01; 95% CI: 0.85, 1.20; P=0.91). Rates of adverse events (AEs) and serious AEs were similar between groups. Yearly cumulative incidence of osteonecrosis of jaw was similar to rates previously reported for monthly denosumab 120 mg in patients with cancer and bone metastasis (year 1: 1.1%, year 2: 2.9%, year 3: 4.2%), with an overall cumulative rate of 4.6% (n=33). Hypocalcemia occurred in 1.7% (n=12) denosumab and 0.3% (n=2) placebo patients.

Conclusion: In men with CRPC, denosumab significantly prolonged bone metastasis−free survival and delayed time to bone metastasis, including symptomatic bone metastasis. This is the first large randomized study to demonstrate bone metastasis prevention in men with CRPC. Funding was provided by Amgen Inc.

EFFECT OF THE SIMULTANEOUS BLOCKADE OF ANDROGEN AND ESTROGEN RECEPTORS ON PROSTATE CANCER: PRELIMINARY RESULTS
Rafael Nunez-Nateras and Erik Castle
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(Presented By: Rafael Nunez-Nateras)

Purpose: Androgens and estrogens, via receptors on the prostate, have been shown to play an important role in normal prostate development and function as well as carcinogenesis and development of the castration resistant phenotype of disease. The aim of this study was to evaluate the effect of a simultaneous administration of an androgen receptor antagonist (Bicalutamide) and a selective estrogen receptor modulator (Raloxifene) on both androgen sensitive and androgen insensitive prostate cancer cell lines.
Material and methods: Experiments were performed on LNCaP, PC3 and DU145 cell lines. Western blot was utilized for the identification and relative presence of androgen and estrogen receptors in the cell lines. Drug concentrations required to achieve 50% of cell death (IC 50) were obtained using the MTT assay; such concentrations were identified for the drugs individually and when used in combination. The effect of the drugs on apoptosis was assessed using flow cytometry and based on the IC 50 concentrations identified with the MTT assay.

Results: Androgen receptor was found only on LNCaP cells as expected. Estrogen receptor and were present in the 3 cell lines. Results of the IC 50 for the drugs alone and in combination by each cell line are shown on table 1. An enhanced effect was observed when the drugs were used in combination in all the cell lines (both androgen sensitive and androgen insensitive). It was evident that the combination of the drugs decreased the total drug required to achieve the IC50 decreases considerably. Apoptosis rates were also affected by the simultaneous administration of Bicalutamide and Raloxifene. The synergistic effect of the combination was reflected in the increase of the apoptosis rate in all cell lines.

Conclusions: The simultaneous administration of Bicalutamide and Raloxifene has a synergistic effect on cell death and apoptosis of DU145, PC3 and LNCaP cell lines. The pathway(s) responsible for this observation may be independent of the androgen receptor as both AR negative cell lines were still affected by the combination over the SERM alone. Research is warranted to identify other potential pathways.

Table 1: IC50 of Raloxifene and Bicalutamide when administered alone and in combination

<table>
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<tr>
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<th>PC3</th>
<th>DU145</th>
<th>LNCaP</th>
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<tr>
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<td>Raloxifene alone (uM)</td>
<td>Bicalutamide alone (uM)</td>
<td>Raloxifene alone (uM)</td>
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<td></td>
<td>18</td>
<td>77</td>
<td>35</td>
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<tr>
<td>Raloxifene + Bicalutamide at IC50 (uM)</td>
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<td>34.2</td>
<td>0.03</td>
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THE CONCORDANCE OF PROSTATE NEEDLE BIOPSY AND RADICAL PROSTATECTOMY AFTER THE 2005 GLEASON SCORE MODIFICATION

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Purpose: At an International Society of Urological Pathology (ISUP) consensus conference in 2005, the old Gleason grading system underwent its first major revision. We determine the difference in concordance of patterns of Gleason grading for prostate needle biopsy and radical prostatectomy (RP) specimens before and after the ISUP modification, as well as differences in correlation of biopsy grade with pathological variables.

Materials and Methods: We correlated needle biopsy and RP Gleason score in 330 consecutive patients (2002–2004) before ISUP 2005 and 690 (2008–2010) after the 2005 Gleason modification. All pathological specimens were reviewed by expert Uro–pathologists at the University of Toronto. Four Gleason grading groups were considered 6, 7 (3+4), 7 (4+3) and 8–10. Also, tumor extension, surgical margins and pathological stage were correlated with the prostate biopsy Gleason score in each cohort.
Results: In needle biopsy specimens, Gleason score 6 assignment decreased from 53.6% in the old cohort to 30.7% in the new one (p=0.03). Gleason score 7 (3+4) increased from 32.7% to 44.1% in the new and old cohort respectively (p=0.055). The agreement in Gleason between biopsy and RP specimens was 67% and 58% for the old and new cohort, respectively (p=0.08). Agreement for Gleason 6 was 71.8% in the old cohort and 50.5% in the new one (p=0.002). For Gleason 7 (4+3) and >7 agreement decreased in the new cohort compared to the old one (43% vs 50% (p=0.4) and 46.3 vs 70.6 (p=0.0001), respectively. On the other hand, agreement for Gleason score 7 (3+4) increased from 64% in the old cohort to 72% in the new one (p=0.06).

The most significant change in pathological stage distribution was seen for Gleason 7. Pathological T2 stage increased for Gleason score 7 (3+4) from 50% in the old cohort to 60.5% (p=0.03) in the new one associated with fewer diagnosis of pT3 stage. For Gleason 7 (4+3), pT2 stage decreased from 64.3% to 49.5% (p=0.02). This was associated with an increase of pT3 stage from 33% to 44% for Gleason 7 (4+3) (p=0.06).

Conclusions: In a contemporary cohort, a shift of the most frequent Gleason scores from 6 to 7 (3+4) in biopsy specimens is demonstrated. Although overall the degree of concordance between biopsy and RP seems to have decreased, a better concordance was seen in Gleason 7 (3+4) category. In addition, with the new modified Gleason score RP outcomes of p stage, tumor volume and positive surgical margins where better correlated.

Poster #180

DEVELOPMENT OF A GENOMIC-CLINICAL CLASSIFIER MODEL FOR PREDICTING CLINICAL RECURRENT IN PATIENTS WITH LOCALIZED PROSTATE CANCER

Nicholas Erho¹, Anamaria Crisan¹, Mercedeh Ghadessi¹, Thomas Sierocinski¹, Benedikt Zimmermann¹, Zaid Haddad¹, Christine Buerki¹, Timothy Triche¹, Peter Black², Karla Ballman³, Eric Bergstralh³, George Klee³, Stephanie Fink³, Thomas Kollmeyer³, Robert Jenkins⁴ and Elai Davicioni¹

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(Presented By: Elai Davicioni)

Introduction and Objectives: The efficient delivery of adjuvant and salvage therapy after radical prostatectomy in patients with prostate cancer is hampered by a lack of biomarkers to assess the risk of clinically significant recurrence and progression. Better prognostic and predictive tools are required to guide clinical management.

Methods: Patient specimens from the Mayo Clinic Radical Prostatectomy Registry were selected from a nested case−control cohort with 14 years median follow−up. RNA expression levels from FFPE tumor specimens were measured with 1.4 million feature oligonucleotide microarrays. Patients were divided into a training set (n=359) for feature selection using cross−validated elastic−net logistic regression and model building with a Random Forests classifier. A separate validation set (n=186) was used for model evaluation. The final genomic clinical classifier (GCC) consists of 43 expressed biomarkers (from coding and non−coding regions of the genome) in combination with pathologic Gleason score. We compared the performance of the GCC against the multivariate CAPRA−S score, which combines five clinical variables (preoperative PSA, ECE, SVI, LNI and Gleason) and Gleason score alone for predicting clinical recurrence (defined as positive bone CT scans within five years after biochemical recurrence) following prostatectomy. The receiver−operator characteristic area−under−the curve (AUC) metric was used to compare the discrimination of the models for predicting clinical recurrence.

Results: In the validation set, the GCC model had an AUC of 0.75, in comparison to 0.59 and 0.65 for CAPRA−S and Gleason−only models, respectively. However, in contrast to CAPRA−S and Gleason−only models the GCC maintained consistent performance in high−risk (node negative and pT3 and/or positive margin or pT2 with positive margins) patients (n=107). In this group, the GCC had an AUC of 0.78, whereas CAPRA−S improved to an AUC of 0.65 and Gleason−only dropped to an AUC of 0.59.

Conclusions: A combined genomic−clinical classifier shows improved performance over multivariate CAPRA−S model and Gleason score alone in the prediction of clinical recurrence, notably in high−risk prostatectomy patients that are the most likely candidates for adjuvant therapy. We are further testing the performance of this classifier and its usefulness in guiding decision−making for the adjuvant therapy setting in additional validation studies.
Poster #181

IS CLINICAL STAGE T2C PROSTATE CANCER INTERMEDIATE- OR HIGH-RISK DISEASE? RESULTS FROM THE SEARCH DATABASE

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(Presented By: Abhay Singh)

Introduction: Clinical stage T2c is a nebulous factor in the algorithm for prostate cancer risk stratification. According to D’Amico risk stratification cT2c is part of the high-risk category where NCCN guidelines place this stage in intermediate-risk. As cT2c represents a possible decision fork it may influence treatment decisions and it is therefore important to define what risks cT2c portends. Furthermore, as diagnostic work up with the use of MRI continues to escalate clinical staging may become more important. For those reasons we sought to investigate which risk group the clinical behavior of cT2c tumors more closely resembles.

Methods: We retrospectively analyzed data from 1089 men who underwent radical prostatectomy (RP) from 1988 to 2009 who did not have low-risk CaP from the SEARCH database. We compared time to biochemical recurrence (BCR) between men with cT2c disease, those with intermediate-risk (PSA 10–20 ng/ml or Gleason sum (GS) =7), and those with high-risk (PSA>20 ng/ml, GS 8–10, cT3) using Cox regression models adjusting for age, race, year of RP, center, and percent cores positive. We also compared predictive accuracy of two Cox models wherein cT2c was considered either intermediate- or high-risk by calculating concordance index c.

Results: A total of 68 men (3.4%) had cT2c tumors. After a median follow-up of 47.5 months, there was no difference in BCR risk between men with intermediate-risk CaP and those with cT2c tumors (HR=0.90; p=0.60). In contrast, there was a trend for men with high-risk CaP to have nearly 50% increased BCR risk compared to men with cT2c tumors (HR=1.50; 95% CI=0.97–2.30; p=0.07) which did not reach statistical significance. Concordance index c was higher in the Cox model wherein cT2c tumors were considered intermediate– or high–risk by calculating concordance index c.

Conclusions: BCR risk for patients with clinical stage T2c was more comparable to men who had intermediate–risk disease than men with high–risk CaP. In addition, a model which incorporates cT2c disease as intermediate–risk has better predictive accuracy than one which considers cT2c as high–risk. These findings suggest men with cT2c disease should be offered treatment options for men with intermediate–risk CaP. Additionally, improvement of clinical staging through the rapidly–increasing use of MRI may have the potential to better identify bilateral organ–confined CaP and further establish risk classification.

Poster #182

MULTIPARAMETRIC MRI & SUBSEQUENT MR/ULTRASOUND FUSION BIOPSY IMPROVES DETECTION OF ANTERIOR PROSTATE CANCER LESIONS

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(Presented By: Dmitry Volkin)
**Introduction:** Studies estimate that 21% of prostate cancers (CaP) arise from the anterior portion of the prostate. However, anterior lesions have been notoriously under sampled by standard 12−core trans−rectal ultrasound (TRUS) prostate biopsy due to geometric constraints when aiming for the peripheral zone. This undersampling can lead to multiple clinical dilemmas: 1) patients with anterior lesions that have had multiple negative biopsies in the face of a rising PSA, 2) patients on active surveillance that might harbor more aggressive disease in an anterior lesion. Multiparametric MRI (mpMRI) of the prostate followed by MR/Ultrasound (MR/US) fusion biopsy is useful in the detection of these lesions.

**Methods:** In this retrospective review, all patients undergoing MR/US fusion biopsy between March 2007 and July 2011 were included. Patients received a 3 Tesla mpMRI of the prostate with endorectal coil; scans included T2, dynamic contrast enhanced, diffusion weighted, and spectroscopy images. Lesions were identified and graded for suspicion by 2 GU radiologists. Patients with anterior lesions were selected. All patients then underwent an MR/US fusion biopsy of one or more targeted lesions as well as a 12−core random TRUS sextant biopsy.

**Results:** Of the 373 patients that had a biopsy on fusion platform, 115 (31%) had one or more suspicious anterior lesions identified on mpMRI. 39 of these 115 patients (34%) had a total of 61 anterior lesions that on MR/US fusion biopsy were positive for cancer. Of the 39 patients, 20 of which had previous negative biopsies at an outside institution, 15 (39%) were found to be solely positive on MR targeted biopsy, while 24 (62%) were positive on TRUS random biopsy as well as MR targeted biopsies. Of the 20 patients with previous negative biopsies 19 had at least 2 negative biopsies (95%), 12 (60%) had at least 3 negative biopsies previously, and at least 5 (25%) of these patients had saturation biopsies also negative prior to their MRI/US fusion biopsy at our institution.

On further analysis, 9 of the 24 patients, with CaP on both MR targeted and TRUS random biopsy, were upstaged by the MR targeted biopsy. Four patients were upstaged from low risk (primary Gleason 3) to high risk (Primary Gleason 4), which alters therapeutic decision making.

**Conclusion:** MpMRI and subsequent MR targeted biopsy is capable of detecting anterior lesions that would have been missed by TRUS biopsy alone, which dramatically impacts patient management.

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**PROSTATE CANCER IMMUNOTHERAPY USING BI-SPECIFIC TUMOR-REACTIVE T CELLS**

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(Presented By: Robert Chan)

**Introduction:** Novel therapeutic options for castrate−resistant prostate cancer (CRPC) are desperately needed. CRPC expresses tumor−associated antigens (TAAs), which are potential targets for immune destruction. Notably, tumors use multiple mechanisms of immune evasion including downregulation of TAAs. To overcome this hurdle, we generated bi−specific T cells to recognize two different TAAs simultaneously.

**Methods:** We constructed a humanized and codon optimized first generation chimeric antigen receptor (CAR) targeting the tumor antigen Muc1, expressed in 90% of lymph node metastasis, which co−expressed truncated CD19 (selection marker to allow transgene detection) and prostate stem cell antigen (PSCA). We transduced primary human T cells and measured transgene expression. The cytolytic function of the transduced T cells was tested in an in vitro an 8 hr Cr51 release assay and a 96 hr co−culture experiment using the Muc1(+) and PSCA(+) prostate cancer cell line DU−145, as well as 293T cells modified to express either PSCA or Muc1, and 293T (negative control). In vivo studies using SCID mice subcutaneously injected with a mixture of 293T expressing PSCA and Muc1 were also performed.

**Results:** CAR/Muc1 and CAR/PSCA transgene expression was 73.1 +/- 16.8% and 78.8 +/- 14.4%, respectively. In the Cr51 release assay, CAR/Muc1 T cells killed Du−145 (41.7 +/- 5.5% specific lysis at 20:1 effector:target ratio) unlike control T cells (8.2 +/- 2.2%). In addition, the killing was specific (i.e., 293T cells were not killed by transgenic T cells). These results were replicated in co−culture experiments and clearly showed that T cells with single target antigen specificity were unable to completely eliminate cancer burden− residual tumor cells did not express Muc1. Thus, additional CAR/PSCA T cells were generated which killed DU−145 (65.6 +/- 19.6% with no killing by control cells (8.2 +/- 2.2%). Finally to assess whether bi−specific T cells enhanced tumor recognition in vitro, we used a mixture of T cells expressing CAR/PSCA and CAR/Muc1 that showed enhanced killing in our in vitro models. In vivo, CAR/Muc−1 T cells reduced tumor size by 50% with further testing of CAR/PSCA and mixture in progress.

**Conclusions:** Our findings represent the first reported attempt to employ bi−specific CAR T cells to target prostate cancer. These promising data underscore the importance of multi−antigen targeting and provide strong rationale for similar approaches in men with CRPC.
A NOMOGRAM PREDICTING ADT FAILURE FOR MEN STARTING ANDROGEN DEPRIVATION THERAPY BEFORE METASTATIC DISEASE: RESULTS FROM THE SEARCH DATABASE

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(Presented By: Christopher Keto)

Introduction and Objective: Predictive nomograms exist for many prostate cancer (PC) clinical states. However, predictors of progression to castration resistant PC (CRPC) in men starting androgen deprivation therapy (ADT) before metastases are ill defined. We used the Shared Equal Access Regional Cancer Hospital (SEARCH) Database to identify predictors of CRPC in men treated with ADT for PSA-only recurrence after radical prostatectomy (RP) creating a nomogram to assess 5- and 10-year CRPC risk.

Methods: Retrospective review of 441 men treated with RP and continuous ADT for rising PSA between 1988 and 2010 in the SEARCH Database. We excluded men with radiographic evidence of distant metastases, pre-ADT PSA >100ng/mL, and men with incomplete data leaving 211 men. We assessed potential CRPC risk factors in univariate analyses including pre-ADT PSA, pre-ADT PSA doubling time (PSADT), seminal vesicle invasion (SVI), pathologic Gleason sum (<4+3 vs. ≥4+3), margin status, extra-capsular extension, prior external beam radiation, time from RP to ADT, and lymph node status. We combined clinically relevant and statistically significant predictors into a multi-variable proportional hazards model with the start of ADT as time zero and created a nomogram from the results.

Results: During a median follow-up of 73 months after RP and 62 months after starting ADT, 47 men (22%) progressed to CRPC. Median time from start of ADT to CRPC was 55 months (IQR: 27–91). The 5- and 10-year risk of CRPC was 81% and 67%. Risk factors for progression to CRPC were logarithmically-transformed pre-ADT PSA (HR=1.60, p=0.002), logarithmically-transformed pre-ADT PSADT (HR=0.61, p=0.008), SVI (HR=1.88, p=0.032), and pathologic Gleason sum ≥4+3 (HR=2.27, p=0.009). The predictive accuracy of this model (Harrell’s c-index) was 0.75. Based on these results we created a nomogram to predict 5- and 10-year risk of CRPC (Figure 1).

Conclusions: The clinical predictors of progression to CRPC for men starting ADT for non-metastatic PC were higher pre-ADT PSA, shorter pre-ADT PSADT, Gleason sum ≥4+3 and SVI. If validated in future series, this nomogram may help identify high-risk men who should be considered for entry into clinical trials.
THE ASSOCIATION BETWEEN RACE AND PROSTATE CANCER RISK ON INITIAL BIOPSY IN A CONTEMPORARY, MULTIETHNIC COHORT
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(Presented By: Alexis Gaines)

Introduction and Objective: Previous studies have established a link between race and increased prostate cancer (PC) risk on a population level. Data addressing whether race predicts PC after adjusting for clinical characteristics (i.e. all else being equal) is mixed. The Prostate Cancer Prevention Trial found black race was borderline significantly related to PC risk (HR=1.42, p=0.051), but significantly related to high-grade disease (OR=2.61, p<0.001). However, these results were based upon 175 men of which nearly 90% had PSA values <4.0 ng/ml. Thus, we investigated the association between race and risk of PC and high-grade PC in men undergoing initial prostate biopsy in a contemporary, racially diverse cohort.

Methods: Retrospective review of 997 men (49% black, 51% white) from the Durham VA Medical Center undergoing initial prostate biopsy between 2001–2009 with complete data. Baseline characteristics were compared between black vs. white men using chi-squared and rank-sum tests. Age, logarithmically-transformed PSA, prostate volume, and biopsy year were treated as continuous variables. Body mass index (BMI) was treated as a categorical variable (<25, 25–29.9, 30–34.9, and ≥35 kg/m2). Multivariate analysis of race and biopsy outcome was tested using logistic regression adjusting for age, BMI, DRE, year, and PSA. Multinomial logistic regression was used to test the association between race and PC grade (Gleason ≤3+4 vs. ≥4+3) compared to men with a negative biopsy.

Results: Black men were younger at biopsy (p<0.001), and had a higher pre-biopsy PSA (p=0.004). On univariate analysis, black men (n=276, 56%) were more likely to have cancer on biopsy than white men (n=236, 47%, p=0.002). On multivariate analysis, black race was a significant predictor of PC (OR=1.46, p=0.007). Relative to white men, black men had an increased risk of both low (RRR=1.45, p=0.010) and high-grade PC (RRR=1.51, p=0.094). However, this association was significant only in the instance of low-grade disease.

Conclusion: We found black race was associated with greater risk of low-grade, high-grade and overall PC detection on initial biopsy. These data further support the hypothesis that race is associated with increased PC risk and disease severity even when all else is equal. Additional investigation of the mechanisms linking PC risk and aggressiveness in black men is needed.

DO ALL PATIENTS WITH GLEASON 8 PROSTATE CANCER DIE OF THEIR DISEASE?
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(Presented By: Sandra Koo)

Background: Until very recently, patients with Gleason 8 prostate cancer were considered poor surgical candidates and were treated with external beam radiation therapy with or without androgen deprivation therapy. Some studies suggest that patients may cured by multimodal therapy including radical prostatectomy (RP). Thus, we explored the natural history of a cohort of patients with Gleason 8 prostate cancer and attempted to ascertain predictors of prostate cancer-specific survival.

Methods: We retrospectively analyzed charts of patients who had pathologic Gleason 8 at time of RP. We then used Cox regression to evaluate clinical and pathologic variables that may predict prostate cancer-specific survival. We determined pathologic outcomes and rates of recurrence, survival, and cancer-specific survival using Kaplan-Meier analysis. Biochemical recurrence (BCR) was analyzed in patients operated after 1988, since systematic PSA follow up was instituted at that time and was defined at 0.1ng/ml.
Results: The cohort consisted of 117 patients. The median age was 65 years (range 49–93). The median PSA and median tumor volume were 9.60 (2–48) and 5.33 cc (0–50), respectively. Of all patients, 27.6% had a family history of prostate cancer, 68.1% were stage pT3 or higher, and 55.9% had positive margins. Of all patients, 40.7% had biochemical recurrence (BCR), 12.7% had metastatic disease, and 13.6% of patients died of prostate cancer. On both univariate and multivariate analysis, only margin status was a significant predictor of prostate cancer–specific survival, and patients were 4 times more likely to die of prostate cancer (HR 4.006; p=0.038). PSA, pathologic stage, family history, and secondary Gleason score were not significant. Kaplan–Meier estimated mean times to BCR and metastases were 16.8 years (14.5–19.1) and 22.7 years (21.0–24.4), respectively. Overall mean actuarial prostate–cancer specific survival was 21.6 years (19.6 –23.7). Patients with positive margin status had significant shorter mean actuarial time to prostate cancer death (19.4 vs. 22.0 years, p=0.016).

Conclusions: In this study, patients with very aggressive prostate cancer had acceptable rates of biochemical recurrence and only 13.6% of patients died of their disease. Moreover, patients that had positive margins were 4 times more likely to die of prostate cancer. This emphasizes the importance of meticulous surgical technique.

Funding: None

Poster #187

BENCHMARKS FOR OPERATIVE OUTCOMES OF ROBOTIC LAPAROSCOPIC AND OPEN RADICAL PROSTATECTOMY BASED ON RESULTS FROM A NATIONWIDE AMERICAN COHORT: THE HEALTH PROFESSIONALS FOLLOW-UP STUDY
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(Presented By: Mehrdad Alemozaffar)

Introduction: Multi−center evaluations of robot−assisted laparoscopic prostatectomy (RALP) and radical retropubic prostatectomy (RRP) operative outcomes have previously been limited to tertiary academic centers whose generalizability to community practice is uncertain, or to claims−based analyses of Medicare cohorts lacking consistent medical record confirmation. We sought to evaluate outcomes of RALP and RRP in a nationwide, community−based cohort to establish generalizable benchmarks for expected outcomes.

Methods: The Health Professionals Follow−up Study (HPFS) cohort of 51,529 men residing in all 50 US states was interrogated to evaluate outcomes of all men who underwent prostatectomy for prostate cancer from 2000 to 2009.

Results: Among all 2899 men diagnosed with prostate cancer from 2000 to 2009, 888 men underwent prostatectomy: 68% RRP (n=604), 26% RALP (n=228), 3% laparoscopic, and 3% perineal. RALP use increased during the study, representing 1% in 2002, and 79% by 2009. RRP patients were more likely to have clinical stage>T2 than RALP (33.1% vs. 18.8%, p<0.0001) and a higher median PSA (5.7ng/dl vs. 5.2, p=0.04); however, biopsy gleason scores and D’Amico risk were similar (p=0.06 and p=0.14, respectively). Peri−operative outcome comparison between RRP and RALP groups demonstrated no difference in rates of nerve−sparing (p=0.44), but RRP patients were more likely to undergo lymphadenectomy (85.6% vs. 48.0%, respectively, p=0.0001), experienced greater mean estimated blood loss (857.3ml vs. 205.7ml, p<0.0001), were more likely to receive blood transfusion (30.4% vs. 5.6%, p<0.0001), and had longer mean hospital stays (2.9 days vs. 1.9, p<0.0001). Oncologic outcomes between RRP and RALP revealed no difference in pathologic stage, gleason score, or rates of positive surgical margins (p=0.89, p=0.20, p=0.46, respectively). 224 patients in the RALP group (98.2%) and 558 patients in the RRP group (92.3%) were followed (mean follow−up 35.5 months and 74.9, respectively) with PSA recurrence noted in 93 (16.7%) of the RRP group and 14 (6.8%) of the RALP group. After adjusting for follow−up time, year of surgery, gleason score and clinical stage, the type of surgery did not predict recurrence (p=0.11).

Conclusion: In this nationwide, community−based cohort that provides broadly generalizable benchmarks of prostatectomy outcomes, RALP was associated with shorter hospital stay and less blood loss than RRP, while yielding similar oncologic outcomes.
EFFECT OF OPEN VERSUS ROBOT-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY ON CANCER CONTROL IN PATIENTS WITH CLINICALLY LOCALIZED PROSTATE CANCER: PROSPECTIVE ANALYSIS OF 1014 CONSECUTIVE PATIENTS

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(Presented By: Adrian Fairey)

Introduction and Objectives: There are limited prospective data comparing outcomes of Open Radical Prostatectomy (ORP) and Robot-Assisted Laparoscopic Radical Prostatectomy (RALRP) for clinically localized prostate cancer. Our aim was to compare ORP and RALRP with respect to cancer control outcomes.

Methods: A prospective analysis of data from the University of Alberta Radical Prostatectomy Database was performed. Between September 2007 and August 2010, 1019 consecutive men underwent radical prostatectomy for clinically localized prostate cancer. The surgical approach was selected by the surgeon. The outcomes were biochemical recurrence (BCR) and positive surgical margins (PSM). BCR was defined as a PSA ≥ 0.1 ng/ml followed by a subsequent confirmatory value or initiation of salvage therapy. PSM was defined as the presence of cancer at the inked margin in the radical prostatectomy specimen. The Kaplan–Meier method was used to estimate biochemical recurrence free survival (BCRFS). Univariable and multivariable analyses were used to determine the association between surgical approach and outcomes.

Results: Data were evaluable for 1014 out of 1019 patients. 204 patients underwent ORP and 810 patients underwent RALRP. The median follow-up duration was 21 months (IQR 12 to 29). Baseline characteristics were similar between the groups. In univariable analysis, 3-year BCRFS (90.6% versus 88.9%), overall PSM (26.5% versus 28.8%), and stage-stratified PSM (pT2: 19.9% versus 21.8%; pT3: 40.6% versus 49.1%) did not differ between the groups (all comparisons p>0.05). In multivariable analysis, surgical approach was not independently associated with BCR (HR 0.77, 95% CI 0.43 to 1.37, p=0.37) or PSM (OR 1.2, 95% CI 0.80 to 1.67, p=0.44).

Conclusions: ORP and RALRP provided comparable short-term oncologic efficacy. Extended follow-up of the prospective cohort is needed to confirm these preliminary findings.

PHYSICAL ACTIVITY AND PROSTATE CANCER RISK REDUCTION: DOES RACE MATTER?

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(Presented By: Abhay Singh)

Introduction: We previously reported that physical activity may reduce prostate cancer (CaP) risk among men undergoing prostate biopsy. However, whether the potential benefit of exercise against cancer differs by race is unclear. We therefore sought to further characterize the link between physical activity and CaP risk by examining these associations as a function of race.

Methods: Men undergoing prostate biopsy at the Durham VA Hospital were asked to complete a personal history survey which included an assessment of current exercise behavior. Participants were asked their frequency of different exercises intensities (mild, moderate and strenuous) as well as the average duration. Total current exercise was calculated by multiplying the frequency of exercise sessions per week within each intensity category by the average reported duration, weighted by an estimate of the metabolic equivalent (MET) and then summed across all intensities with the expressed as average total MET hrs/wk. Specifically, exercise intensities were as follows: mild (3 METs, e.g. easy walking, yoga), moderate (5 METs, e.g. brisk walking, tennis), and strenuous (9 METs, e.g. running, swimming). Quantified exercise was compared between race groups using rank sum test. Associations between exercise and CaP risk was determined using crude and adjusted logistic regression stratified by self-reported race.
Results: A total of 308 men had complete data for analysis. Of these men, 53% were white and 47% were black. There was no significant difference in the amount of physical activity between race groups (p=0.11). Increased amount of exercise was associated with decreased CaP risk for white men in both crude (OR= 0.89; 95% CI=0.81−0.98; p=0.02) and adjusted (OR=0.90; 95% CI=0.82−0.99; p=0.04) regression models that controlled for age, BMI, DRE, previous biopsy, and family history of CaP. We found no association between exercise and CaP risk among black men in both crude (p=0.79) and adjusted regression models (p=0.87).

Conclusions: Increased physical activity was associated with CaP risk reduction among white men but not among black men. Further investigations to validate this potential source of CaP race disparity and to identify exercise–specific parameters that influence CaP risk reduction (ex. age–specific or cumulative exercise) are required. Investigating race–specific mechanisms by which exercise modifies CaP risk and why these mechanisms disfavor black men in particular are warranted.

Poster #190

PATIENT PERSPECTIVES ON PSA SCREENING
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(Presented By: Nikhil Waingankar)

Introduction: Despite mixed results from large prospective, randomized trials as to whether PSA screening saves lives, the current AUA Best Practice guidelines recommend continued PSA screening in ‘well−informed’ men with greater than a ten−year life expectancy who wish to pursue early diagnosis. The purpose of our study was to assess how well−informed patients are about the risks, benefits, and alternatives of PSA screening.

Methods: Anonymous surveys were created that sought to assess patient knowledge and opinions on prostate cancer screening, and were distributed at a free community prostate cancer screening day. Survey responses were entered into an Excel spreadsheet, relative frequencies were calculated, and Chi−Square and Fischer exact tests were performed where appropriate.

Results: 207 screened patients completed and returned surveys. 96% felt that all men between ages 50 and 75 should have an annual PSA test, and 95% felt it was proven that PSA screening saves lives. 41.9% of screening participants incorrectly responded that a “normal” PSA proves an absence of cancer, while only 56% correctly responded that PSA can be elevated in benign disease. 26% of patients were unaware that their urologist may recommend prostate biopsy based on PSA results, and less than 33% correctly cited that the risks of prostate biopsy include sepsis. 71% and 83% reported that the risks and overall cost, respectively, of screening are not factors that affect their decision−making when considering the potential for finding and treating cancer.

Conclusions: It is evident that many patients lack a complete understanding of the risks, benefits, and alternatives of prostate cancer screening, yet the vast majority would opt for continued PSA checks despite its perceived costs and associated risks. It is thus vital that Urologists spend adequate time educating their patients thoroughly on the sequelae of prostate cancer screening before the first PSA is drawn. Particular attention must be paid to community held PSA screening events, to ensure that patient education precedes screening to ensure patient education.

Poster #191

CLOSE SURGICAL MARGINS AFTER RADICAL PROSTATECTOMY ARE AN INDEPENDENT PREDICTOR OF RECURRENCE
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(Presented By: Gregory Wirth)

Background: The term close surgical margin (CSM) refers to a tumor extending to the inked margin of the specimen without reaching it. Current guidelines state that CSM should simply be reported as negative, however, this recommendation remains controversial and relies on limited evidence.
**Objective:** To evaluate the impact of CSM on the long-term risk of biochemical recurrence following radical prostatectomy.

**Design, setting and participants:** We identified 1195 consecutive patients who underwent radical prostatectomy for localized prostate cancer in our institution from 1993 to 1999. In 894 of these patients, associations between margin status and location, Gleason score, pathological stage, pre-operative PSA, prostate weight, and age with the risk of biochemical recurrence were examined.

**Results and limitations:** Six-hundred forty-four of 894 patients (72%) had negative margins. Of these patients, 100 (15.5%) had CSM. In the group with PSA failure, median time to recurrence was 3.5 years. In the group without recurrence, median follow-up was 9.9 years. Cumulative recurrence-free survival differed significantly among the three types of margins (positive, negative and close) (p<0.001). On multivariate analysis, CSM constituted a significant, independent predictor of recurrence (HR 2.23 95%CI 1.08−4.99). Gleason score and positive margins were the strongest prognostic factors.

**Conclusions:** In this cohort, CSM were independently associated with a twofold risk of postoperative biochemical recurrence. Further evaluation of the clinical significance of CSM is indicated, as they might be an indicator of local recurrence and of relevance when considering salvage therapy.

**Poster #192**

**WHAT IS THE PREVALENCE AND IMPACT OF DEPRESSION, ANXIETY, AND DISTRESS IN PATIENTS WITH NEWLY DIAGNOSED LOCALIZED PROSTATE CANCER?**

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(Presented By: Sanoj Punnen)

**Introduction:** Despite increased attention towards sexual and urinary outcomes in men with prostate cancer, mental health concerns and their impact on recovery and functional outcomes often go unnoticed. The objective of this study was to determine the prevalence and severity of depression, anxiety, and distress in patients with newly diagnosed prostate cancer, to examine what factors are associated with worse mental health outcomes, and to ascertain if there is an association between mental health and functional outcomes.

**Materials and Methods:** The study population consisted of patients referred to the department of Urology at the University of California, San Francisco who were managed with active surveillance (AS) or radical prostatectomy (RP). Baseline levels of depression, anxiety and distress were ascertained using well-validated questionnaires: Patient Health Questionnaire 9 (PHQ−9), Generalized Anxiety Disorder 7 (GAD−7) and the Distress Thermometer (DT), respectively. Multivariate logistic regression was used to examine the associations between baseline factors and mental health measures. Mixed model repeated measures analysis was used to examine the association between mental health measures and sexual and urinary outcomes.

**Results:** The study cohort consisted of 907 patients. The prevalence at diagnosis of no, mild, or moderate to severe depression and anxiety were 85% and 82%, 11% and 14%, and 4% and 4%, respectively Low distress was present in 83% while 17% reported having high distress at baseline. There were no significant differences between AS and RP patients in their distribution of PHQ−9, GAD−7 and DT scores at baseline. Increasing International Prostate Symptom Scores (IPSS) and younger age appeared to be associated with increased depression, anxiety and distress levels, while decreased Sexual Health Inventory for Men (SHIM) scores appeared to be associated with increased depression and being single versus in a relationship appeared to be associated with increased distress. Increased levels of depression, anxiety and distress appeared to be associated with worse IPSS. Increased depression and distress were associated with worse urinary bother scores while increased anxiety was associated with worse SHIM scores.

**Conclusion:** Levels of depression, anxiety and distress appeared to be low at baseline. However, these mental health measures do appear to be associated with urinary and sexual outcomes.
Poster #193

EMPIRIC ANTIBIOTICS FOR AN ELEVATED PSA: A RANDOMIZED, PROSPECTIVE MULTI-INSTITUTIONAL TRIAL
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(Presented By: Michael Large)

Introduction and Objective: We sought to study the impact of an empiric course of antibiotics for a newly elevated PSA in an asymptomatic male.

Methods: Men of any age with a PSA > 2.5 ng/ml and normal digital rectal examination undergoing their first prostate biopsy were recruited from six medical centers. Patients with previous biopsy, prostate cancer, urinary tract infection (UTI) or prostatitis within the prior year, antibiotic use within one month, 5−alpha reductase inhibitor use, allergy to fluoroquinolones or clinical suspicion of UTI were excluded. Men were randomized to two weeks of ciprofloxacin 500 mg twice daily or no antibiotic. A PSA was obtained 21−45 days following randomization and immediately prior to prostate biopsy. All patients received institution−specific prophylactic peri−procedural antibiotics. Primary endpoint was change in PSA between baseline and on the day of biopsy. The trial was closed early following an interim analysis and decision rule for futility and early stopping.

Results Obtained: Complete data was available on 77 men with a mean age of 60.6 (IQR: 53.8 – 66.7). In the control group (no antibiotic; n=39), mean baseline and pre−biopsy PSA were 6.5 and 6.9 ng/ml, respectively (p=0.8). In men receiving antibiotic (n=38), mean baseline and pre−biopsy (post−antibiotic) PSA were 7.6 and 8.5 ng/ml, respectively (p=0.7). Prostate cancer was detected in 36 (47%) men. Detection rates did not significantly differ between individuals with an increasing PSA or decreasing PSA between the two measurements.

Conclusions: Empiric use of antibiotics for an elevated PSA in an asymptomatic patient is not of clinical benefit.

Poster #194

ROBOTIC ASSISTED LAPAROSCOPIC PROSTATECTOMY IN HIGH-RISK PROSTATE CANCER
Sean Stroup¹, Kerrin Palazzi-Churas², J. Kellogg Parsons² and Christopher Kane²
¹Naval Medical Center San Diego; ²University of California San Diego
(Presented By: Sean Stroup)

Objective: Robotic assisted laparoscopic prostatectomy (RALP) is increasingly considered a key component of a multimodal strategy to treat men with high−risk prostate cancer. We evaluated our experience treating men with D’Amico high−risk prostate cancer.

Methods: Under an IRB−approved protocol, we analyzed men with D’Amico high−risk prostate cancer who underwent RALP at our institution from February 2006 to July 2011. Clinicopathologic variables and cancer−related outcomes were assessed. Biochemical recurrence (BCR) was defined as PSA >0.2 ng/ml, 2 values at 0.2 ng/ml, or secondary treatment for an elevated PSA. Predictors of PSA recurrence were analyzed using multivariable logistic regression models.

Results: Of 503 patients undergoing RALP, 108 had D’Amico high−risk prostate cancer. These men had a mean age of 64 ± 6.7 years, mean BMI of 27.3 ± 4.2 kg/m2, and mean preoperative PSA of 8.5 (IQR 5.9−15.3) ng/ml. Most were high−risk by biopsy Gleason grade alone (≤ 6 – 1.9%, 7 – 6.5%, and ≥ 8 – 88%); and clinical stage suggested localized disease in most cases (cT1a−c – 37%, cT2a−c – 53%, and cT3−4 – 8%). Final pathology was consistent with high risk disease: Gleason grade ≤ 6 – 1.9%, 7 – 37%, and ≥ 8 – 57.4%; T−stage T2a–c – 52%, T3–4 – 48.2%; seminal vesicle invasion – 17.6%; positive margins – 29.6%; lymph node involvement – 2%. On multivariate analysis positive margins were related to larger tumor size (OR = 1.11, 1.06 − 1.163), but not preoperative PSA. At a median of 13.7 months, 26 (24%) men experienced BCR. Lymphovascular invasion on final pathology was the strongest predictor of BCR (OR = 7.771, 2.95 − 20.65).

Conclusions: In this cohort, RALP for high−risk prostate cancer was a feasible treatment option that provided robust short−term cure in 76% of patients. Tumor size and lymphovascular invasion were adverse pathologic features associated with increased risk of positive surgical margins and BCR, respectively.
THE EPIGENETIC ANALYSIS OF THE KALLIKREIN GENE FAMILY IN SEARCH FOR NOVEL DIAGNOSTIC AND PROGNOSTIC BIOMARKERS FOR PROSTATE CANCER
Ekaterina Olkhov¹,², Theodorus van der Kwast³, Vaiju Pethe¹, Hilmi Ozcelik¹,², Laurent Briollais¹, Neil E. Fleshner⁴, Eleftherios P. Diamandis¹,², Bharati Bapat¹,² and Alexandre R. Zlotta⁴,⁵
¹Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, ON; ²Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, ON; ³University Health Network, Toronto General Hospital, Toronto, ON; ⁴University Health Network, Princess Margaret Hospital, Toronto, ON; ⁵Mount Sinai Hospital, Toronto, ON
(Presented By: Ekaterina Olkhov)

Introduction: Prostate cancer (PCa) is the most common malignancy affecting men in Canada. Currently, a blood test for serum Prostate Specific Antigen (PSA) is used for PCa diagnosis. Although PSA is a useful biomarker, it has a poor sensitivity (70%−80%) and specificity (60%−70%). Therefore, there is a need to identify more effective PCa biomarkers. Evidence suggests that members of the 15−member KLK gene family are likely candidates since many KLKs are aberrantly expressed in primary PCa and PCa derived cell lines. DNA methylation may regulate this aberrant KLK expression. Aberrant DNA methylation is a well recognized hallmark of carcinogenesis and can serve as a diagnostic and prognostic biomarker for many cancers, including PCa.

Methods: In this study, KLK 10 was selected for analysis of DNA methylation based on its significant methylation levels on Agilent Human CpG Island microarrays and EpiTYPER. To investigate whether methylation mediated gene silencing and regulates KLK10 expression, we treated the PCa cell lines PC3 and 22RV1 with the demethylating drug 5−aza−2′deoxycytidine.

Results: Following treatment, 9.5−fold and 6−fold increase in KLK10 transcript expression were observed in PC3 and 22RV1 cells, respectively, establishing that methylation plays a role in regulating gene expression. Subsequently, using quantitative, high−throughput methylation−specific real−time PCR (MethyLight) technology, we evaluated the relationship between KLK10 promoter methylation and clinicopathological parameters in a series of 112 radical prostatectomies and adjacent normal prostate tissue. The prevalence of KLK10 methylation was greater in cancerous tissue (57%) vs. normal (4%). Further, KLK10 methylation was higher in locally advanced pT3a−pT3b (28/39−72%) vs. localized pT2 (36/73−49%).

Conclusion: Therefore, our results suggest that increase in KLK10 methylation may be associated with PCa progression.

EFFICACY OF LOW TEMPERATURE-SENSITIVE LIPOSOME ENCAPSULATED DOCETAXEL COMPARED TO FREE DOCETAXEL IN A XENOGRAFT MURINE MODEL OF PROSTATE CANCER
Dmitry Volkin¹, Nitin Yerram¹, Saurin Chokski¹, Ashish Ranjan², Compton Benjamin¹, Ayele Negussie², Paul Chung¹, Matthew Dreher², W. Marston Linehan¹, Bradford Wood² and Peter Pinto¹
¹National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Department of Radiology and Imaging Sciences
(Presented By: Nitin Yerram)

Introduction/Objective: Docetaxel is currently the standard of care, first line treatment in castrate resistant prostate cancer (CRPC) despite its clinically significant toxicity for the patient. The objective of this study was to investigate the efficacy of low temperature sensitive liposome (LTSL) encapsulated docetaxel in combination with mild hyperthermia in a murine prostate model.

Methods: Female athymic nude mice with human prostate PC−3M−luciferase cells grown subcutaneously into the right hind leg were randomized into six groups: saline +/− heat, free docetaxel +/− heat, and LTSL docetaxel (provided by Celsion Corp, Columbia, MD) +/− heat. Treatment (15 mg docetaxel/kg) was administered via tail vein once tumors reached a size of 200−300mm³. Mice that underwent hyperthermia were anesthetized and secured in a device that allowed only the leg with tumor to be submerged in 41−42°C water for one hour, which is sufficient to release a drug payload from LTSLs. Mice tumor volumes and body weights were recorded for up to 60 days. Survival was defined as the time when tumor volume was > 5x the treatment volume. Growth delay was also assessed at 5x the treatment volume. Treatment groups were compared for differences in mean survival using log rank test and growth delay using ANOVA followed by Neuman–Keul’s multiple comparison test (p<0.05).
**Results:** The tumor growth delay was (mean±SEM) 8 ± 1 day for LTSL alone, 15 ± 5 days for free docetaxel alone, 34 ± 8 days for free docetaxel with heat, and 36 ± 8 days for LTSL in combination with heat. Adding heat to LTSL or free docetaxel treatment resulted in significantly greater survival and growth delay compared to other treatments (p<0.05). However, these two effective treatments were not significantly different (p>0.05). Adding heat to LTSL docetaxel increased the growth delay 28 days, which was more than adding heat to free docetaxel (19 days), suggesting a benefit of encapsulation.

**Conclusions:** Adding mild hyperthermia to LTSL docetaxel or free docetaxel significantly increased survival over treatments without heat. Future biodistribution and histopathological studies of docetaxel in treatment mice would help elucidate the toxicity profile of free vs. encapsulated drug.

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**Poster #197**

**ROBOTIC RADICAL PROSTATECTOMY: 5 YEAR ONCOLOGIC BIOCHEMICAL RECURRENCE AND ONCOLOGIC OUTCOMES**

Michael Liss, Nima Beheshti, Douglas Skarecky, Blanca Morales, Kathryn Osann and Thomas Ahlering

UC Irvine Orange, CA

(Presented By: Michael Liss)

**Purpose:** Robot assisted radical prostatectomy (RARP) was introduced in California in 2002 and has demonstrated acceptable postoperative and early clinical outcomes. We present oncological outcomes in our initial four hundred cases operated on a minimum of 5 years ago.

**Materials and Methods:** The study cohort consisted of cases #1–400 undergoing RARP between June of 2002 and 2006. Pathological and PSA data was prospectively entered into an encrypted database and retrospectively reviewed for oncological outcomes. BCR was denoted for (1) any postoperative cancer treatment or (2) two persistent PSA values above 0.2 ng/ml. BCR free survival was estimated using Kaplan–Meier survival curves. The log rank test compares the event–time distributions for the comparisons of time to failure. Chi Square statistical analysis with a p value <0.05 were considered significant.

**Results:** Of the 400 patients, 21 died (Prostate 4 (1%), other 17). Of the remaining patients 10% (40 pts) have < 2 years follow up and 4 had none. The mean time since surgery is 6.8 years. The mean and median PSA follow up is 5.3 and 5.5 yrs, respectively. The overall 3 and 5yr−BCRFS is 88.5% and 86.0%. 295 (73.8%) were pT2; 5yr−BCRFS was 94.2% 5yr−PCSM 0.3%, 103 (25.8%) were pT3+: 5yr−BCRSF 52.4%, 5 yr−PCSM 2.9%. The pT2 +SM rate 6.9%; pT3 +SM rate 29/103(28.2%). To date 12 of the 17 pT2 BCRs (71%) have received secondary treatment versus 36/49 (73%) of pT3/4 patients with BCR. Only 1 of the 17 pT2 +SM has suffered a BCR (6.7%).

**Conclusions:** RARP does not compromise oncologic outcomes of patients with localized prostate cancer with evaluation of 5 year biochemical recurrence free survival outcomes. In our experience only one of the 17 pT2 positive surgical margins has developed BCR with 5 years of follow up.
Poster #198

A NOVEL RISK STRATIFICATION SYSTEM FOR CHEMOTHERAPY FAILURE IN TESTICULAR GERM CELL TUMOR (T-GCT)
Jessica Lubahn, Nicholas Cost, Mehrad Adibi, Adam Romman and Vitaly Margulis
Dallas, TX
(Presented By: Jessica Lubahn)

Introduction & Objectives: Patients with advanced T−GCT are successfully managed by a standardized regimen of platinum based systemic chemotherapy (p−CT). However, a few fail to respond adequately to first−line treatment, and could be well−suited for alternative systemic therapies or the clinical trials. We present a novel classification system, which can be easily used to predict failure of first−line p−CT.

Methods: We reviewed an institutional T−GCT database and selected patients who had undergone any CT. CT failures (CT−F) were defined as an inappropriate tumor marker response, tumor marker elevation following normalization, need for salvage CT, or presence of active GCT in post−CT RPLND. CT−F patients were compared to those successfully treated with CT (CT−S). Factors predictive of CT−F in a univariate analysis were used to develop a risk scoring system (RSS). The prognostic ability of the RSS was compared to the International Germ Cell Collaborative Group (IGCCG) classification by constructing Receiver Operating Curves (ROC).

Results Obtained: 205 patients were reviewed: 153 were CT−S and 52 were CT−F. Factors predictive of CT−F included AFP, HCG, number of metastatic locations, N and M status. Non−significant factors included histology (seminoma v non−seminoma), initial treatment modality, and T stage. The RSS, derived from the mean values of the CT−F group, had the following criteria: AFP>3000, HCG>50,000, LDH>800, ≥3 metastatic locations, N3, M1b.

The distribution of scores was obtained for CT−S and CT−F (all p<0.00) respectively: 0:101(69.2%) vs. 12(10.6%), 1: 39(26.7%) vs. 16(32.7%), 2: 4(2.7%) vs. 9(18.4%), ≥3: 2(1.4%) vs. 12(24.5%). The hazard ratios for scores 1,2, and ≥3 were 2.53,6.62, and 22.2 respectively (p<0.00).

The figure depicts time to CT−F, stratified by RSS. The calculated ROC for our RSS had an Area Under the Curve (AUC) of 0.78+/−0.04 (p=0.001) compared with the AUC of 0.72+/−0.48 (p<0.001) for the IGCCG classification.

Conclusions: Pending future validation, this RSS may be used to easily identify patients who would benefit from more aggressive CT regimens and could aid in risk−stratification for the development of future studies.

Poster #199

NOVEL PREDICTORS OF BENIGN PATHOLOGY IN STAGE IA OR IB PATIENTS WITH NON-SEMINOMATOUS TESTICULAR GERM CELL MALIGNANCY UNDERGOING PRIMARY RETROPERITONEAL LYMPH NODE DISSECTION
Mehrad Adibi, Nicholas Cost, Jessica Lubahn, Adam Romman and Vitaly Margulis
University of Texas Southwestern Medical Center, Dallas, TX
(Presented By: Mehrad Adibi)

Introduction: There is no consensus on the optimal treatment for Stage I testicular non−seminomatous germ cell tumors (T−NSGCT), partly due to the inaccuracy of clinical staging methods. Prior reports have demonstrated that the presence of embryonal carcinoma (EC), lymphovascular invasion (LVI), and absence of yolk sac tumor (YST) in the orchiectomy specimen are important risk factors predicting occult metastatic disease. We assessed whether a novel combination of the above factors could predict the presence of benign retroperitoneal pathology.
**Methods:** We reviewed an institutional database of patients with T−NSGCT and included all patients with Stage IA or IB NSGCT who underwent primary RPLND. Logistic regression analysis was used to compare patients with benign pathology versus germ cell tumor (GCT). A combination of significant pathologic factors was used as internal validation to predict the presence of benign or GCT pathology. Significance was determined at p<0.05. No financial funding was obtained.

**Results:** Among 55 patients with Stage IA or IB NSGCT managed with primary RPLND, 44(80%) had benign pathology and 11 (20%) had occult GCT in the retroperitoneum. No specimens revealed retroperitoneal teratoma in this cohort. Predictors of benign pathology were higher preorchiectomy alpha−fetoprotein levels (p=0.03), larger percentage of YST (p=0.02), lower embryonal carcinoma to YST (E/Y) ratio (p=0.001), presence of teratoma and absence of LVI in the primary orchiectomy specimen (both p=0.01). Multivariate analysis demonstrated an E/Y ratio ≤ 4 to be a strong predictor of benign pathology in the retroperitoneum, with an area under the receiver operating curve of 0.71 (+0.08 (p=0.04), and a sensitivity and specificity of 37% (16/43) and 100% (12/12), respectively. In combination with absence of LVI, an E/Y ratio ≤ 4 had a 100% (10/10) positive predictive value for benign pathology on internal validation. Conversely, presence of LVI and an E/Y ratio of ≥ 4 revealed a 64% (7/11) predictive value for GCT.

**Conclusions:** In our cohort, patients with Stage IA or IB NSGCT who had benign pathology on the primary RPLND had a significantly higher proportion of YST to EC in the preorchiectomy specimen. An E/Y cutoff value of ≤ 4 appears to be discriminatory for predicting benign pathology. Emphasis on the proportion of YST in the primary orchiectomy specimen in addition to other previously established risk factors may allow for improved risk stratification.

**POSTER SESSION II**

**Poster #200**

**MINIMALLY INVASIVE VERSUS OPEN RETROPERITONEAL LYMPH NODE DISSECTION FOR RESIDUAL MASSES AFTER CHEMOTHERAPY IN NONSEMINOMATOUS GERM CELL TESTIS CANCER**

Sandhya R. Rao, Mayer N. Fishman, Wade J. Sexton, Philippe E. Spiess and Julio M. Pow-Sang

Genitourinary Oncology Program, Moffitt Cancer Center, Tampa, FL

(Presented By: Sandhya R. Rao)

**Introduction and Objective:** The role of minimally invasive retroperitoneal lymph node dissection (MI−RPLND) for postchemotherapy (PC) residual masses by laparoscopy or robotic−assisted laparoscopy remains controversial. We compared clinical and oncological outcomes between patients undergoing open RPLND (O−RPLND) and MI−RPLND at our center.

**Methods:** A review of our IRB approved testis cancer database identified 18 men who underwent full template MI−RPLND (14−laparoscopic, 4−robotic) for non seminomatous germ cell testis cancer (NSGCT) between 2005 and 2011. These cases were matched with 18 men who underwent O−RPLND for age, stage and maximum residual mass dimension on imaging studies in the same time period. Surgical and oncologic outcomes were compared.

**Results:** When comparing O−RPLND versus MI−RPLND surgery, median operative time was 360 (range 200−720) minutes versus 359 (238−481) (p=0.3); average EBL was 764(100−2700) ml versus 378 (range 50−1500) ml (p=0.03); median hospital stay was 6 (range 5−13) days versus 3 (range 1−5) days, (p=0.004); average lymph node yield was 21 (range 4−42) versus 17 (range 5−36) nodes (p=0.3) and number of prior chemotherapy cycles 4 versus 3 respectively. Complications in the O−RPLND were one ureteric injury, one bowel injury and one postoperative wound infection. There was one IVC injury in the MI−RPLND group managed by repair at the time of surgery. In the O−RPLND group there was one recurrence within and two outside the retroperitoneum; and four deaths at a median follow up of 75 months; 2 were cause−specific. There has been no recurrence or mortality in the MI−RPLND group at a median follow up of 18 months.

**Conclusions:** MI−RPLND has significantly decreased EBL and shorter hospital stay. Comparison of lymph node yield, morbidity and OR times showed no significant difference. Though short−term oncological outcomes are comparable, longer comparative follow−up is required.
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<td>Volkin, Dmitry</td>
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<td>Yutkin, Vladimir</td>
<td>12/1/11</td>
<td>4:00 p.m.</td>
<td>Poster #69</td>
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</tbody>
</table>
The following urologic oncology fellowship programs have earned the credentials of the Society of Urologic Oncology:

Division of Urologic Oncology, Fox Chase Cancer Center
Program Director: David Y.T. Chen, MD
Department of Surgical Oncology
333 Cottman Avenue
Philadelphia, PA 19111
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Email: david.chen@fccc.edu
http://www.fccc.edu/healthProfessionals/fellowships/urologic.html

Duke University Medical Center
Program Director: Thomas J. Polascik, MD
Associate Professor, Division of Urologic Surgery
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Yellow Zone Duke South
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Email: polas001@mc.duke.edu
http://urology.surgery.duke.edu/education-and-training/fellowship-programs/urologic-oncology

Glickman Urological and Kidney Institute, Cleveland Clinic
Program Director: Andrew J. Stephenson, MD
9500 Euclid Avenue – Desk Q10-1
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Fax: (216) 636-4492
Email: stephe2@ccf.org
http://my.clevelandclinic.org/urology/fellowships/urologic_oncology_fellowship.aspx

Keck School of Medicine – University of Southern California
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Mayo Clinic Cancer Center, Mayo School of Graduate Medical Education
Program Director: Bradley C. Leibovich, MD
Associate Professor of Urology
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http://www.massgeneral.org/urology/Applicant Information

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Fax: (813) 745-4064
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University of Toronto - Uro-Oncology Fellowship Program,
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SUO Fellowship Programs

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SUO FELLOWSHIP PROGRAMS

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http://www.urology.wustl.edu/Teaching/SUOOverview.asp

The Society of Urologic Oncology (SUO) was created in 1984 to include members interested in the care of patients with malignant genitourinary disease. The SUO develops educational and research initiatives, studies in urologic oncology, and provides physician statements representing state-of-the-art assessments of these issues to other organizations.

For more information, visit www.suonet.org.

The National Cancer Institute (NCI) is the government’s primary agency for conducting and supporting research in cancer causes, diagnosis, prevention, and treatment. In support of the entire community of cancer researchers, NCI employs its funding mechanisms, organizations, and networks to support basic, translational, and clinical research, and to invest in extraordinary opportunities to further progress made possible by previous discoveries.

For more information, visit www.cancer.gov.

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SUO-SBUR Joint Meeting at the 2012 AUA Annual Meeting
May 2012
Atlanta, GA

SUO at the 2012 AUA Annual Meeting
May 2012
Atlanta, GA

SUO 2012 Annual Meeting
December 2012
Hyatt Regency Bethesda
Bethesda, MD