14th Annual Meeting of the Society of Urologic Oncology

Extraordinary Opportunities for Discovery

December 4 – 6, 2013

Bethesda North Marriott Hotel & Conference Center
Bethesda, Maryland

PROGRAM BOOK & ABSTRACTS
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board of Directors 2013 – 2014</td>
<td>2</td>
</tr>
<tr>
<td>Committees</td>
<td>3</td>
</tr>
<tr>
<td>2013 Faculty Listing</td>
<td>4</td>
</tr>
<tr>
<td>Promotional Partners and Contributors</td>
<td>7</td>
</tr>
<tr>
<td>Exhibitors and SPOREs Program Contributors</td>
<td>8</td>
</tr>
<tr>
<td>Industry Sponsored Symposia</td>
<td>9</td>
</tr>
<tr>
<td>General Meeting Information</td>
<td>10</td>
</tr>
<tr>
<td>Educational Needs and Objectives</td>
<td>11</td>
</tr>
<tr>
<td>Accreditation Information</td>
<td>13</td>
</tr>
<tr>
<td>NCI Prostate SPOREs-SUO Program</td>
<td>14</td>
</tr>
<tr>
<td>SUO General Scientific Program</td>
<td>18</td>
</tr>
<tr>
<td>Young Urologic Oncologists Dinner Podium Session – Full Abstracts</td>
<td>28</td>
</tr>
<tr>
<td>Young Urologic Oncologists Program Podium Session – Full Abstracts</td>
<td>30</td>
</tr>
<tr>
<td>Oral Abstract Session – Full Abstracts</td>
<td>33</td>
</tr>
<tr>
<td>Best Abstract Presentation – Full Abstracts</td>
<td>39</td>
</tr>
<tr>
<td>Poster Session I – Summary</td>
<td>42</td>
</tr>
<tr>
<td>Poster Session I – Full Abstracts</td>
<td>57</td>
</tr>
<tr>
<td>Poster Session II – Summary</td>
<td>133</td>
</tr>
<tr>
<td>Poster Session II – Full Abstracts</td>
<td>148</td>
</tr>
<tr>
<td>Alphabetical Index of Presenting Authors</td>
<td>224</td>
</tr>
<tr>
<td>SUO Fellowship Programs</td>
<td>229</td>
</tr>
<tr>
<td>Mark Your Calendars</td>
<td>234</td>
</tr>
</tbody>
</table>
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Penile Cancer
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Philippe E. Spiess, MSc, MD
Jonathan L. Wright, MD
A list of 2013 SUO speaker bios can be found on the SUO website at: suonet.org/meetings/2013/bios/SUO-2013-Speaker-Bios.pdf

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National Cancer Institute
Bethesda, MD

Andrea Apolo, MD
National Cancer Institute
Bethesda, MD

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Cambridge, MA

Gennady Bratslavsky, MD
SUNY Upstate Medical University
Syracuse, NY

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Myriad Genetic Laboratories
Salt Lake City, UT

Herbert B. Carter, MD
Johns Hopkins University School of Medicine
Baltimore, MD

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NMFF Urology
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Sheffield, UK

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British Columbia Cancer Agency
Kelowna, BC

Bogdan Czerniak, MD
University of Texas MD Anderson Cancer Center
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Scott M. Dehm, PhD
Masonic Cancer Center
Minneapolis, MN

Ralph W. deVere White, MD
UC Davis Cancer Center
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Colin P.N. Dinney, MD
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James A. Eastham, MD
Memorial Sloan-Kettering Cancer Center
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Johns Hopkins University School of Medicine
Baltimore, MD

Phillip Febbo, MD, PhD
Genomic Health, Inc.
Redwood City, CA

Inderbir S. Gill, MD
University of Southern California
Los Angeles, CA

Anna R. Giuliano, PhD
H Lee Moffitt Cancer Center and Research Institute
Tampa, FL

Martin E. Gleave, MD
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Vancouver, BC

Brent K. Hollenbeck, MD
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S. Percy Ivy, MD
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Toronto, ON

Ashish M. Kamat, MD
University of Texas MD Anderson Cancer Center
Houston, TX

Anil Kapoor, MD
St. Joseph’s Hospital
Hamilton, ON

Christopher P. Evans, MD
UC Davis Medical Center
Sacramento, CA
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>City, State</th>
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<tbody>
<tr>
<td>Wassim Kassouf, MD</td>
<td>McGill University</td>
<td>Saint Laurent, QC</td>
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<td>Michael W. Kattan, PhD</td>
<td>Cleveland Clinic Foundation</td>
<td>Cleveland, OH</td>
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<td>William Kim, MD</td>
<td>University of North Carolina</td>
<td>Chapel Hill, NC</td>
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<td>Eric A. Klein, MD</td>
<td>Cleveland Clinic Foundation</td>
<td>Cleveland, OH</td>
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<td>Alexander Kutikov, MD</td>
<td>Fox Chase Cancer Center</td>
<td>Philadelphia, PA</td>
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<td>Brian R. Lane, MD, PhD</td>
<td>Spectrum Health/Michigan State University</td>
<td>Grand Rapids, MI</td>
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<td>Vincent P. Laudone, MD</td>
<td>Memorial Sloan-Kettering Cancer Center</td>
<td>New York, NY</td>
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<td>Seth P. Lerner, MD</td>
<td>Baylor College of Medicine</td>
<td>Houston, TX</td>
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<td>Daniel W. Lin, MD</td>
<td>University of Washion Medical Center</td>
<td>Seattle, WA</td>
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<td>W. Marston Linehan, MD</td>
<td>National Cancer Institute</td>
<td>Bethesda, MD</td>
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<td>Stacy Loeb, MD</td>
<td>NYU Langone Medical Center</td>
<td>New York, NY</td>
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<td>William T. Lowrance, MD, MPH</td>
<td>Huntsman Cancer Hospital</td>
<td>Salt Lake City, UT</td>
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<td>M. Scott Lucia, MD</td>
<td>University of Colorado AMC</td>
<td>Aurora, CO</td>
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<td>Danil V. Makarov, MD</td>
<td>New York University School of Medicine</td>
<td>New York, NY</td>
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<td>Jodi K. Maranchie, MD</td>
<td>University of Pittsburgh</td>
<td>Pittsburgh, PA</td>
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<td>Viraj A. Master, MD, PhD, FACS</td>
<td>Emory University</td>
<td>Atlanta, GA</td>
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<td>Surena F. Matin, MD</td>
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<td>Houston, TX</td>
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<td>David F. McDermott, MD</td>
<td>Beth Israel Deaconess Medical Center</td>
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<td>Maxwell V. Meng, MD</td>
<td>University of California, San Francisco</td>
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<td>Edward M. Messing, MD</td>
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<td>David C. Miller, MD, MPH</td>
<td>University of Michigan Health System</td>
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<td>Joel B. Nelson, MD</td>
<td>University of Pittsburgh</td>
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<td>William G. Nelson, MD</td>
<td>Johns Hopkins University School of Medicine</td>
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<td>Lance C. Pagliaro, MD</td>
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<td>Ganesh Palapattu, MD</td>
<td>University of Michigan Health System</td>
<td>Ann Arbor, MI</td>
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<td>Vanderbilt University Medical Center</td>
<td>Nashville, TN</td>
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<td>John A. Petros, MD</td>
<td>Emory University School of Medicine</td>
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<td>Curtis A. Pettaway, MD</td>
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<td>Raj S. Pruthi, MD</td>
<td>University of North Carolina</td>
<td>Chapel Hill, NC</td>
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<td>Mark Purdue, PhD</td>
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<td>W. Kimryn Rathmell, MD, PhD</td>
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<td>Chapel Hill, NC</td>
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<td>Ashley E. Ross, MD, PhD</td>
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<td>Baltimore, MD</td>
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<td>Fred Saad, MD</td>
<td>Universite de Montreal</td>
<td>Brossard, QC</td>
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<td>Martin G. Sanda, MD</td>
<td>Emory University School of Medicine</td>
<td>Atlanta, GA</td>
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<td>Peter T. Scardino, MD</td>
<td>Memorial Sloan-Kettering Cancer Center</td>
<td>New York, NY</td>
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<td>Edward M. Schaeffer, MD, PhD</td>
<td>Johns Hopkins University School of Medicine</td>
<td>Baltimore, MD</td>
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<td>Howard I. Scher, MD</td>
<td>Memorial Sloan-Kettering Cancer Center</td>
<td>New York, NY</td>
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<td>Neal D. Shore, MD</td>
<td>Carolina Urologic Research Center</td>
<td>Myrtle Beach, SC</td>
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<td>Joseph A. Smith, Jr., MD</td>
<td>Vanderbilt University Medical Center</td>
<td>Nashville, TN</td>
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</tbody>
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Steven S. Smith, PhD
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Baltimore, MD

John T. Wei, MD, MS
Taubman Health Care Center
Ann Arbor, MI

Xifeng Wu, MD, PhD
University of Texas MD Anderson Cancer Center
Houston, TX
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Thank You to Our 2013 SPOREs Program Contributors

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### Thursday, December 5, 2013

**6:45 a.m. – 7:45 a.m.**  
*Industry Sponsored Breakfast Symposium*  
Sponsored by PCEC  
Location: Grand Ballroom C  
*“Understanding How New Biomarkers Assist in the Diagnosis and Prognosis of Prostate Cancer”*  
E. David Crawford, MD  
University of Colorado Health Science Center  
Denver, CO  
Neal D. Shore, MD  
Carolina Urologic Research Center  
Myrtle Beach, SC  
*Not CME Accredited*

**12:25 p.m. – 1:25 p.m.**  
*Industry Sponsored Lunch Symposium*  
Sponsored by Janssen Biotech, Inc.  
Location: Grand Ballroom C  
*“Introducing a New Option before Chemotherapy for the Treatment of mCRPC”*  
Vitaly Margulis, MD, FACS  
UT Southwestern Medical Center  
Dallas, TX  
Raoul Concepcion, MD, FACS  
Urology Associates  
Nashville, TN  
*Not CME Accredited*

**12:25 p.m. – 1:25 p.m.**  
*Industry Sponsored Lunch Symposium*  
Sponsored by Myriad Genetic Laboratories  
Location: Grand Ballroom B  
*“Prolaris: A Novel Molecular Biomarker for Prostate Cancer”*  
Matthew R. Cooperberg, MD, MPH  
University of California at San Francisco  
San Francisco, CA  
*Not CME Accredited*

### Friday, December 6, 2013

**12:20 p.m. – 1:20 p.m.**  
*Industry Sponsored Lunch Symposium*  
Sponsored by Medivation/Astellas  
Location: Grand Ballroom C  
*“XTANDI (enzalutamide) Capsules: An Option for Continuing the Care of Patients with mCRPC in the Urology Practice”*  
Lawrence I. Karsh, MD, FACS  
The Urology Center of Colorado  
Denver, CO  
*Not CME Accredited*
The 14th Annual Scientific Meeting in Urologic Oncology will be held December 4 – 6, 2013 at the Bethesda North Marriott Hotel & Conference Center. The Society of Urologic Oncology will sponsor this highly interactive meeting where all attendees participate in the discussions led by internationally renowned Urologic Oncologists, Medical Oncologists and Scientists. State-of-the-art translational topics on Prostate, Kidney, and Bladder Cancer, as well as strategies in Urologic Oncology will be discussed. This year’s meeting will also feature a Biomarkers of Prostate Cancer symposium on Wednesday prior to the start of the meeting. More information on the course and registration can be found below.

Attendee Participation
This meeting is designed to be a discussion of issues among members of the Urologic Oncology community. All attendees participate in the discussions and are encouraged to interact with program faculty.

Registration/Information Desk
Location: Grand Ballroom Foyer
Wednesday, December 4, 2013  7:00 a.m. – 6:00 p.m.
Thursday, December 5, 2013  6:30 a.m. – 6:00 p.m.
Friday, December 6, 2013  7:00 a.m. – 6:30 p.m.

Exhibit Hall
Location: Grand Ballroom A & D
Thursday, December 5, 2013  7:00 a.m. – 7:30 p.m.
SUO Welcome Reception  6:30 p.m. – 7:30 p.m.
Friday, December 6, 2013  7:00 a.m. – 11:00 a.m.

Evening Functions
Young Urologic Oncologists (Y.U.O.) Dinner
Moderator: Sam S. Chang, MD
Date: Wednesday, December 4, 2013
Time: 6:00 p.m. – 9:30 p.m.
Location: Grand Ballroom F - H
Cost: One ticket is included in the registration fee. Please let us know if you will be attending.
Attire: Business casual
Membership in the Y.U.O. 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.

SUO Dinner
Date: Thursday, December 5, 2013
Time: 7:30 p.m. – 10:00 p.m.
Location: Grand Ballroom B & C
Cost: $70.00 per person/$40.00 for fellows, nurses and residents
Attire: Business casual
Enjoy dinner with friends and colleagues.

Other Events
NCI Prostate SPOREs-SUO Workshop
Date: Wednesday, December 4, 2013
Time: 8:00 a.m. – 5:00 p.m.
Location: Grand Ballroom E
Description: On Wednesday, December 4, 2013, the day before the official start of the Society of Urologic Oncology (SUO) Winter Meeting, the NCI Prostate SPOREs (Specialized Programs of Research Excellence) along with the SUO will present a workshop on “Biomarkers of Prostate Cancer Aggressiveness.”

SUO-CTC Board of Directors Meeting
Date: Wednesday, December 4, 2013
Time: 5:00 p.m. – 6:00 p.m.
Location: Brookside

SUO Board of Directors Meeting
Date: Wednesday, December 4, 2013
Time: 6:00 p.m. – 9:00 p.m.
Location: Forest Glen

2013 SUO Fellowship Committee Meeting
Date: Thursday, December 5, 2013
Time: 6:30 a.m. – 7:30 a.m.
Location: Brookside A

2013 SUO Fellowship Annual Program Directors Meeting
Date: Thursday, December 5, 2013
Time: 12:25 p.m. – 1:25 p.m.
Location: Brookside A

2013 Young Urologic Oncologists (Y.U.O.) Program
Moderator: Stephen A. Boorjian, MD
Date: Friday, December 6, 2013
Time: 8:00 a.m. – 8:30 a.m.
Location: Grand Ballroom E – H
**Educational Needs**

Penile cancer is a rare disease in the United States with most urologists evaluating only a handful of patients throughout their careers. This leads to dilemmas regarding management of both the primary tumor as well as evaluation and management of the regional lymph nodes. Survival is dependent upon the presence and extent of Inguinal Lymph Node Metastasis. This impacts patient care in a variety of ways, which include: a need for knowledge related to the molecular events associated with Penile Cancer growth and metastasis; the development of prognostic markers that can reliably predict Inguinal Lymph Node Metastasis; effective minimally invasive strategies to stage the inguinal region that limit morbidity; and new therapeutic strategies for surgically incurable advanced cancer. Treatment of the primary tumor utilizing penile amputation is morbid and affects both urinary and sexual quality of life. A better appreciation for patients who are candidates for organ preservation and techniques to achieve this goal is needed.

With recent large-scale policy reforms, the US healthcare system is evolving to improve value and expand coverage. Health services research is the science behind understanding the implications of these policies, identifying new opportunities for change and transforming clinical practice to improve quality. This session affords insights into three hot-button areas that lie at the intersection of health services research and urologic oncology, including new treatment technologies, payment and delivery system reform and urologist led quality improvement efforts.

Prostate cancer is the most commonly diagnosed cancer in men and the second leading cause of male cancer death. Controversy remains regarding if population-based screening for prostate cancer is beneficial, how screening might best be performed (which markers and how should they be utilized), how to best manage low-risk prostate cancer and how new technologies might be adopted to improve our management of these men. This year’s prostate cancer session will provide important information to physicians in order that they may provide patients with the best treatment options and outcomes.

This year’s bladder cancer sessions will provide the following new information, which physicians need to be knowledgeable about to provide patients with the best treatment options and outcomes:

- Molecular and genomic classification of bladder cancer and enumeration of the most commonly seen genetic alterations.
- Evolving information on molecular and genetic classification of unique predictive and prognostic tumor genetic signatures.
- Use of agents for intravesical chemotherapy in patients with high risk non-muscle invasive disease.
- Major advances in molecular epidemiology and its use in clinical arena.
- Advances in immunotherapy for NMIBC and MIBC as well as its role in more advanced disease states, with a clear understanding of the mechanistic aspects of the immune system.
- Data driven analysis of best use of robotic surgery in the treatment of bladder cancer with a view to the aging population and specific risks in this group of patients.
- Discussion of enhanced recovery pathways to improve the speed of recovery following Radical Cystectomy.

Urologists and medical oncologists treating kidney cancer will need to have a clear understanding of emerging data regarding the biology of renal cell Carcinoma in the context of its multiple forms of presentation and diverse biological behaviors. Novel therapies, such as checkpoint blockade and combinations thereof that are being developed require a broader perspective of the role of the immune system and targetable pathways. Determining a plan of treatment for patients with vulnerable kidney function and those with metastatic disease with a primary in place may require effective multidisciplinary clinical care, often based on a foundation of team science. Having a better understanding of the new biological and genetic insights of kidney cancer will inform you of therapies and approaches, and possibly pave the way personalized therapy.
Educational Objectives

At the conclusion of the meeting, attendees should be able to:

1. Describe important molecular pathways implicated in penile cancer.
2. Identify primary penile tumor factors and techniques associated with success at organ preservation.
3. Describe the technique for different inguinal surgical staging procedures, their potential benefits and complications.
4. Describe current strategies for integrating chemotherapy, surgery and radiation into the care of patients with locally advanced penile cancer.
5. Describe the breadth of science that falls under the umbrella of health services research and explain its relevance to urologic oncology.
6. Identify the economic challenges facing the US healthcare system and their potential implications for urologic oncology.
7. Explain the challenges associated with rationalizing the adoption of new healthcare technologies, current policy levers and the potential impact of ongoing delivery system reforms.
8. Describe ongoing delivery system/payment reforms (e.g., accountable care organizations) in the US and their potential impact on urologic oncology.
9. Explain the underpinnings of physician led collaborative quality improvement and the real world challenges associated with implementing such initiatives.
10. Describe how active surveillance (AS) for prostate cancer might best be implemented, including patient selection and monitoring.
11. Evaluate if routine prostate MRI is justified in the AS population and how prostate MRI might be used in patient selection and monitoring.
12. Describe the role of biomarkers in risk assessment.
13. Identify triggers for a recommendation for treatment rather than continued AS.
14. Explain how new therapies approved in the metastatic setting might be evaluated for use in early stage disease.
15. Describe the mechanism of castration resistance and therapies useful in this clinical setting.
16. Describe the role of technology and how it may rationally be incorporated into clinical practice.
17. Explain the molecular and genomic classification of bladder cancer.
18. Identify the major advances in molecular epidemiology of bladder cancer and its use in clinical arena.
19. Identify the best use of robotic surgery in the treatment of bladder cancer with a view to the aging population and specific risks in this group of patients.
20. Identify the use of agents for intravesical chemotherapy in patients with high risk non-muscle invasive disease.
21. Describe the limitations of the cancer genome Atlas project.
22. Explain the mechanisms underlying development of resistance to VEGF inhibition.
23. Recognize the new agents available for checkpoint blockade.
24. Explain the mechanisms by how checkpoint blockade results in treatment response as well as toxicity.
26. Review the current understanding of the influence of race and its association with kidney cancer histology.
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 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 12.50 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.

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It is the policy of the University of Oklahoma College of Medicine that the faculty and sponsor disclose real or apparent conflicts of interest relating to the topics of this educational activity, and also disclose discussions of unlabeled/unapproved uses of drugs or devices during their presentation(s). Detailed disclosures will be made in the course handout materials.

DISCLOSURE REPORT

The disclosure report for this meeting may be found in your registration packet.
Wednesday, December 4, 2013

8:00 a.m. – 5:00 p.m.  *NCI Prostate SPOREs-SUO Workshop: Bio Markers of Prostate Cancer Aggressiveness

Program Chairs:

SPOREs: William J. Catalona, MD
NMFF Urology
Robert E. Reiter, MD
University of California, Los Angeles
Peter T. Scardino, MD
Memorial Sloan-Kettering Cancer Center

SUO: Daniel W. Lin, MD
University of Washington Medical Center
W. Marston Linehan, MD
National Cancer Institute
Surena F. Matin, MD
MD Anderson Cancer Center

8:00 a.m. – 8:10 a.m.  Welcome and Introductory Remarks
William J. Catalona, MD
NMFF Urology
Peter T. Scardino, MD
Memorial Sloan-Kettering Cancer Center

8:10 a.m. – 8:40 a.m.  What is Aggressive Prostate Cancer?
Moderator: Daniel W. Lin, MD
University of Washington Medical Center
Panelists: William J. Catalona, MD
NMFF Urology
H. Ballentine Carter, MD
Johns Hopkins Hospital
Peter T. Scardino, MD
Memorial Sloan-Kettering Cancer Center
Edward M. Messing, MD
University of Rochester Medical Center
Jonathan I. Epstein, MD
Johns Hopkins Medical Institutions
Lawrence D. True, MD, FASCP
University of Washington
Ashley E. Ross, MD, PhD
Brady Urological Institute
Patrick C. Walsh, MD
Johns Hopkins Hospital

8:40 a.m. – 8:55 a.m.  Discussion and Questions

8:55 a.m. – 10:30 a.m.  Biomarkers – Definitions, Statistical and Regulatory Framework, and Lessons Learned
Moderator: Daniel W. Lin, MD
University of Washington Medical Center
8:55 a.m. – 9:10 a.m. **Investigator’s Perspective**
  Howard I. Scher, MD  
  *Memorial Sloan-Kettering Cancer Center*

9:10 a.m. – 9:15 a.m. **Q&A**

9:15 a.m. – 9:30 a.m. **Statistical Issues**
  Michael W. Kattan, MD  
  *Cleveland Clinic*

9:30 a.m. – 9:35 a.m. **Q&A**

9:35 a.m. – 9:55 a.m. **Government Perspective**
  S. Percy Ivy, MD  
  *National Cancer Institute*  
  Jonathan P. Jarow, MD  
  *Johns Hopkins University School of Medicine*

9:55 a.m. – 10:00 a.m. **Q&A**

10:00 a.m. – 10:15 a.m. **Industry Perspective**
  Phillip Febbo, PhD, MD  
  *Institute for Genome Sciences/Policy*

10:15 a.m. – 10:20 a.m. **Q&A**

10:20 a.m. – 10:30 a.m. **Break**

**10:30 a.m. – 3:50 p.m. Candidate Biomarkers**

10:30 a.m. – 12:05 p.m. **Aids to Detection of Clinically Significant Cancer**
  *Moderator: W. Marston Linehan, MD*  
  *National Cancer Institute*

10:35 a.m. – 10:45 a.m. **Prostate Health Index**
  Stacy Loeb, MD  
  *NYU Langone Medical Center*

10:45 a.m. – 10:55 a.m. **Discussion**
  Michael W. Kattan, MD  
  *Cleveland Clinic*

10:55 a.m. – 11:05 a.m. **Q&A**

11:05 a.m. – 11:15 a.m. **4K Score**
  Andrew Vickers, PhD  
  *Memorial Sloan Kettering Cancer Center*

11:15 a.m. – 11:25 a.m. **Discussion**
  Daniel W. Chan, PhD  
  *Johns Hopkins University School of Medicine*

11:25 a.m. – 11:35 a.m. **Q&A**

11:35 a.m. – 11:45 a.m. **Genetic Variants Associated with Prostate Cancer Aggressiveness**
  Kathleen A. Cooney, MD  
  *University of Michigan Medical School*
11:45 a.m. – 11:55 a.m. Discussion
William B. Isaacs, PhD
Johns Hopkins University

11:55 a.m. – 12:05 p.m. Q&A
Lunch

12:05 p.m. – 1:05 p.m. Lunch

1:05 p.m. – 2:25 p.m. Tests After a Negative Biopsy
Moderator: Christopher P. Evans, MD
UC Davis School of Medicine

1:05 p.m. – 1:10 p.m. Introduction
Christopher P. Evans, MD
UC Davis School of Medicine

1:10 p.m. – 1:20 p.m. Progensa and PCA3 + T2-ERG
Christopher Barbieri, PhD, MD
New York Presbyterian Hospital

1:20 p.m. – 1:30 p.m. Discussion
John T. Wei, MD, MS
Taubman Health Care Center

1:30 p.m. – 1:40 p.m. Prostate Core Mitomic Test (PCMT)
Raoul S. Concepcion, MD
Urology Associates

1:40 p.m. – 1:50 p.m. Discussion
John A. Petros, MD
Emory University School of Medicine

1:50 p.m. – 2:00 p.m. ConfirmMDx
William G. Nelson, MD
Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins Hospital

2:00 p.m. – 2:10 p.m. Discussion
Steven S. Smith, PhD
City of Hope

2:10 p.m. – 2:25 p.m. Q&A

2:25 p.m. – 2:35 p.m. Break

2:35 p.m. – 3:50 p.m. Tests After a Positive Biopsy
Moderator: Christopher P. Evans, MD
UC Davis School of Medicine

2:35 p.m. – 2:45 p.m. Prolaris
Michael K. Brawer, MD
Myriad Genetic Laboratories

2:45 p.m. – 2:55 p.m. Discussion
Peter T. Scardino, MD
Memorial Sloan-Kettering Cancer Center

2:55 p.m. – 3:05 p.m. Oncotype DX® Prostate Cancer Assay
Matthew R. Cooperberg, MD, MPH
UCSF
3:05 p.m. – 3:15 p.m. Discussion
Eric A. Klein, MD  
*Cleveland Clinic Foundation*

3:15 p.m. – 3:25 p.m. Metamark
Peter Blume-Jensen, MD, PhD  
*Metamark Genetics*

3:25 p.m. – 3:35 p.m. Discussion
Fred Saad, MD  
*Universite de Montreal*

3:35 p.m. – 3:50 p.m. Q&A

3:50 p.m. – 4:40 p.m. Wrap-Up
Moderator: Peter T. Scardino, MD  
*Memorial Sloan-Kettering Cancer Center*
Panelists: William J. Catalona, MD  
*NMFF Urology*
Daniel W. Lin, MD  
*University of Washington Medical Center*
Ganesh Palapattu, MD  
*University of Michigan Hospital*
John A. Petros, MD  
*Emory University School of Medicine*
Eric A. Klein, MD  
*Cleveland Clinic Foundation*
Jonathan I. Epstein, MD  
*Johns Hopkins Medical Institutions*
Joel B. Nelson, MD  
*University of Pittsburgh*
Patrick C. Walsh, MD  
*Johns Hopkins Hospital*
Matthew R. Cooperberg, MD, MPH  
*UCSF*
Martin G. Sanda, MD  
*Universite de Montreal*
Jonathan P. Jarow, MD  
*Johns Hopkins University School of Medicine*
Christopher Barbieri, PhD, MD  
*New York Presbyterian Hospital*

4:40 p.m. – 4:50 p.m. Michigan Urologic Surgery Improvement Collaborative (MUSIC): Opportunities for Biomarker Collaboration
Michael L. Cher, MD  
*Wayne State University*

4:50 p.m. – 5:00 p.m. Concluding Remarks
W. Marston Linehan, MD  
*National Cancer Institute*
J. Brantley Thrasher, MD  
*University of Kansas Medical Center*
14th Annual Meeting of the Society of Urologic Oncology  
*Extraordinary Opportunities for Discovery*  
December 4 – 6, 2013  
Bethesda North Marriott Hotel & Conference Center  
Bethesda, Maryland

**GENERAL SCIENTIFIC PROGRAM**

*All sessions will be located in the Grand Ballroom E – H unless otherwise noted*

**WEDNESDAY, DECEMBER 4, 2013**

7:00 a.m. – 6:00 p.m.  
Registration/Information Desk Open  
*Location: Grand Ballroom Foyer*

6:00 a.m. – 6:00 p.m.  
Speaker Ready Room  
*Location: Timberlawn*

8:00 a.m. – 5:00 p.m.  
*NCI Prostate SPOREs-SUO Workshop: Bio Markers of Prostate Cancer Aggressiveness*  
See page 14 for full program  
*Not CME Accredited*

5:00 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’s (Y.U.O.) Dinner*  
*Location: Grand Ballroom F – H*

6:00 p.m. – 6:45 p.m.  
Cocktail Hour

6:45 p.m. – 7:15 p.m.  
Y.U.O. Business Meeting

7:00 p.m. – 7:15 p.m.  
Y.U.O. Abstracts Presentations*  
See page 27 for full abstracts

7:00 p.m.  
Podium #1  
**FOXP3 MEDIATES BLADDER CANCER STEM CELL HOMEOSTASIS AND DIFFERENTIATION**  
(Presented By: Arnold Chin)

7:05 p.m.  
Podium #2  
**SALVAGE RADIATION THERAPY IS ASSOCIATED WITH DECREASED RISKS OF METASTASES AND DEATH FROM PROSTATE CANCER AMONG PATIENTS WITH BIOCHEMICAL RECURRENCE AFTER RADICAL PROSTATECTOMY**  
(Presented By: Manuel Eisenberg)

7:10 p.m.  
Podium #3  
**PATTERNS OF SURVEILLANCE IMAGING AFTER NEPHRECTOMY IN THE MEDICARE POPULATION**  
(Presented By: Michael A. Feuerstein)
7:15 p.m. – 7:25 p.m. Collaborative Research Proposal Presentations

7:30 p.m. – 9:30 p.m. Bladder Cancer Program

*Only podiums 1 – 3 from 7:00 p.m. – 7:15 p.m. are CME accredited. All other sessions in the Young Urologic Oncologist (Y.U.O.) Dinner are NOT CME accredited.

THURSDAY, DECEMBER 5, 2013

6:30 a.m. – 6:00 p.m. Registration/Information Desk Open
Location: Grand Ballroom Foyer

6:00 a.m. – 6:00 p.m. Speaker Ready Room
Location: Timberlawn

6:45 a.m. – 7:45 a.m. Industry Sponsored Breakfast Symposia
Location: Grand Ballroom C
See page 9 for more details

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
Location: Grand Ballroom A & D

8:00 a.m. – 8:05 a.m. Welcome and Introduction
Daniel W. Lin, MD
University of Washington Medical Center
Surena F. Matin, MD
MD Anderson Cancer Center

8:05 a.m. – 9:20 a.m. Kidney Cancer Session I
Session Chair: Michael Jewett, MD
Princess Margaret Hospital
Moderator: W. Marston Linehan, MD
National Cancer Institute

8:05 a.m. – 8:15 a.m. The New Genetics of Renal Cell Carcinoma: TCGA, Chromatin and Metabolic Changes
W. Kimryn Rathmell, MD, PhD
University of North Carolina

8:15 a.m. – 8:25 a.m. Kidney SPORE Hot Topic: If VEGF Inhibition is so Great, Why Do RCC Patients Still Die?
Rupal Bhatt, MD
Florida State University

8:25 a.m. – 9:20 a.m. Renaissance of Immunotherapy for Kidney Cancer – Paradigm Change?
Moderator: Jeffrey A. Sosman, MD
Vanderbilt-Ingram Cancer

8:25 a.m. – 8:40 a.m. Translational Research: New Insights, Future Directions
Charles Drake, MD, PhD
Johns Hopkins University School of Medicine
<table>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
<th>Institution</th>
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<tbody>
<tr>
<td>8:40 a.m. – 8:55 a.m.</td>
<td>PD-1 PathwayBlockade in Renal Cell Carcinoma: Hype or a New Standard Therapy?</td>
<td>David F. McDermott, MD</td>
<td>Beth Israel Deaconess Medical Center</td>
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<td>8:55 a.m. – 9:20 a.m.</td>
<td>Discussion</td>
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<td>9:20 a.m. – 9:40 a.m.</td>
<td>State-of-the-Art Lecture I Evolution of the Bladder Cancer Genome from Occult Field Effects</td>
<td>Bogdan Czerniak, MD</td>
<td>MD Anderson Cancer Center</td>
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<tr>
<td>9:40 a.m. – 10:00 a.m.</td>
<td>Break</td>
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<td>Grand Ballroom A &amp; D</td>
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<tr>
<td>10:00 a.m. – 11:05 a.m.</td>
<td>Health Services Session</td>
<td>Session Chair: Brent K. Hollenbeck, MD&lt;br&gt;University of Michigan Health System&lt;br&gt;Moderator: Martin G. Sanda, MD&lt;br&gt;Emory University</td>
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<tr>
<td>10:00 a.m. – 10:12 a.m.</td>
<td>The Prospects for Health Services Research to Enhance Urologic Oncology</td>
<td>Christopher S. Saigal, MD</td>
<td>David Geffen School of Medicine, UCLA</td>
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<tr>
<td>10:12 a.m. – 10:24 a.m.</td>
<td>New Technology in Urologic Oncology: Lessons Learned and Future Challenges</td>
<td>Danil V. Makarov, MD</td>
<td>New York University School of Medicine</td>
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<tr>
<td>10:24 a.m. – 10:36 a.m.</td>
<td>ACO's to Improve the Quality of Cancer Care</td>
<td>David F. Penson, MD</td>
<td>Vanderbilt University Medical Center</td>
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<tr>
<td>10:36 a.m. – 10:48 a.m.</td>
<td>Implementing Evidence-Based Changes in Urologic Oncology Practice</td>
<td>David C. Miller, MD</td>
<td>The Urology Group</td>
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<td>10:48 a.m. – 11:05 a.m.</td>
<td>Discussion</td>
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<tr>
<td>11:05 a.m. – 12:25 p.m.</td>
<td>Bladder Cancer Session I</td>
<td>Session Chair: Ashish Kamat, MD&lt;br&gt;MD Anderson Cancer Center&lt;br&gt;Moderator: Andrea Apolo, MD&lt;br&gt;National Cancer Institute</td>
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<tr>
<td>11:05 a.m. – 11:25 a.m.</td>
<td>TCGA Update</td>
<td>Seth P. Lerner, MD</td>
<td>Baylor College of Medicine&lt;br&gt;William Kim, MD&lt;br&gt;University of North Carolina</td>
</tr>
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</table>
11:25 a.m. – 11:40 a.m.  Advances in Immunotherapy for Urothelial Carcinomas
Matthew Galsky, MD
The Mount Sinai Hospital

11:40 a.m. – 11:55 a.m.  Genomic Markers in Bladder Cancer (GWAS etc.)
Xifeng Wu, MD, PhD
MD Anderson Cancer Center

11:55 p.m. – 12:25 p.m.  Discussion

12:25 p.m. – 1:25 p.m.  Industry Sponsored Lunch Symposium
Location: Grand Ballroom C
See page 9 for more details

12:25 p.m. – 1:25 p.m.  Industry Sponsored Lunch Symposium
Location: Grand Ballroom B
See page 9 for more details

1:30 p.m. – 1:40 p.m.  *SUO Huggins Medal Presentation
*Not CME Accredited

1:40 p.m. – 2:00 p.m.  Huggins Medal Lecture

2:00 p.m. – 2:45 p.m.  *SUO-CTC Scientific Session
*Not CME Accredited

• Brief Review of SUO-CTC Active Trials
  Robert G. Uzzo, MD
  Fox Chase Cancer Center

• Clinical Research: The Process and Promise in GU Oncology
  Robert G. Uzzo, MD
  Fox Chase Cancer Center

• Level I Evidence in Genitourinary Oncology
  Anthony T. Corcoran, MD
  SUNY Stony Brook Medical Center

• Basics of Clinical Trial Governance
  Seth Lerner, MD
  Baylor College of Medicine

• SUO-CTC Panel on Partnering with Industry: ADAPT Trial: Process and Progress in Renal Cell Carcinoma
  Moderator: Brian R. Lane, MD, PhD
  Spectrum Health/Michigan State University
  Panelists: Gennady Bratslavsky, MD
  SUNY Upstate Medical Center
  Alex Kutikov, MD
  Fox Chase Cancer Center
  William T. Lowrance, MD, MPH
  Huntsman Cancer Hospital
  Viraj A. Master, MD, PhD, FACS
  Emory University
  Neal D. Shore, MD
  Carolina Urologic Research Center
2:45 p.m. – 3:00 p.m.  Break – Visit Exhibits  
Location: Grand Ballroom A & D

3:00 p.m. – 4:00 p.m.  Prostate Cancer Session I

 Session Chair: James A. Eastham, MD  
Memorial Sloan-Kettering Cancer Center  
Moderator: Eric A. Klein, MD  
Cleveland Clinic Foundation  
Panelists: Eric A. Klein, MD  
Cleveland Clinic Foundation  
M. Scott Lucia, MD  
University of Colorado AMC  
Maxwell V. Meng, MD  
University of California, San Francisco  
Edward M. Schaeffer, MD, PhD  
Johns Hopkins University School of Medicine

3:00 p.m. – 3:10 p.m.  Active Surveillance: Who and How  
Patient Selection and Monitoring  
Edward M. Schaeffer, MD, PhD  
Johns Hopkins University School of Medicine

3:10 p.m. – 3:20 p.m.  Role of MRI: Can MRI Replace Biopsy or Not?  
Maxwell V. Meng, MD  
University of California, San Francisco

3:20 p.m. – 3:30 p.m.  Biomarkers: What is the Evidence They are Useful in Selecting/Monitoring the AS Patient?  
Eric A. Klein, MD  
Cleveland Clinic Foundation

3:30 p.m. – 3:40 p.m.  Vagaries in the Interpretation of Prostate Biopsies  
M. Scott Lucia, MD  
University of Colorado AMC

3:40 p.m. – 4:00 p.m.  Panel Discussion

4:00 p.m. – 6:00 p.m.  *Poster Session I  
Location: Grand Ballroom A & D  
*Not CME Accredited  
See page 56 for full abstracts

6:30 p.m. – 7:30 p.m.  Welcome Reception  
Location: Grand Ballroom D

7:30 p.m. – 10:00 p.m.  SUO Dinner  
Location: Grand Ballroom B & C
FRIDAY, DECEMBER 6, 2013

7:00 a.m. – 6:30 p.m.  Registration/Information Desk Open
  Location: Grand Ballroom Foyer

7:00 a.m. – 4:00 p.m.  Speaker Ready Room
  Location: Timberlawn

7:00 a.m. – 8:00 a.m.  Breakfast in Exhibit Hall
  Location: Grand Ballroom A & D

7:00 a.m. – 11:00 a.m.  Exhibit Hall
  Location: Grand Ballroom A & D

8:00 a.m. – 8:30 a.m.  Young Urologic Oncologists (Y.U.O.) Program
  Abstracts selected by the Y.U.O.
  Moderator: Stephen A. Boorjian, MD
             MAYO Clinic
  See page 29 for full abstracts

8:00 a.m. – 8:05 a.m.  Introduction and Announcements

8:05 a.m.  Podium #4  THE IMPACT OF TECHNOLOGY DIFFUSION ON TREATMENT FOR PROSTATE CANCER
  (Presented By: Florian Schroeck)

8:13 a.m.  Podium #5  UTILIZATION OF A PROSTATE MRI NOMOGRAM FOR PREDICTION OF BIOPSY GLEASON SCORE
  (Presented By: M. Minhaj Siddiqui)

8:21 a.m.  Podium #6  A SINGLE CENTER VALIDATION ANALYSIS OF PROSTATE CANCER RISK LOCI FROM PUBLISHED GWAS: ASSOCIATION WITH PSA LEVELS, PROSTATE CANCER PROGRESSION AND MORTALITY
  (Presented By: John Sullivan)

8:30 a.m. – 9:15 a.m.  Penile Cancer
  Session Chair: Curtis A. Pettaway, MD
                  MD Anderson Cancer Center

8:30 a.m. – 8:40 a.m.  Transitional Science in Penile Cancer
  Insights into Molecular Pathways Associated with Penile Cancer Progression
  Chris Protzel, MD
  University of Rostock

8:40 a.m. – 8:50 a.m.  Human Papillomavirus in Penile Cancer: Rationale and Feasibility for Prevention
  Anna R. Giuliano, PhD
  H Lee Moffitt Cancer Center and Research Institute
<table>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tr>
<td>8:50 a.m. – 9:15 a.m.</td>
<td><strong>Management of Penile Cancer: A Case Based Approach</strong>&lt;br&gt;<strong>Moderator:</strong> Curtis A. Pettaway, MD&lt;br&gt;<strong>Urology:</strong> Curtis A. Pettaway, MD&lt;br&gt;<strong>MD Anderson Cancer Center</strong>&lt;br&gt;<strong>Chris Protzel, MD</strong>&lt;br&gt;<strong>University of Rostock</strong>&lt;br&gt;<strong>Radiation Oncology:</strong> Juanita Crook, MD&lt;br&gt;<strong>British Columbia Cancer Agency</strong>&lt;br&gt;<strong>Medical Oncology:</strong> Lance C. Pagliaro, MD&lt;br&gt;<strong>MD Anderson Cancer Center</strong></td>
<td>Grand Ballroom A &amp; D</td>
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<td>9:15 a.m. – 10:35 a.m.</td>
<td><strong>Prostate Cancer II</strong>&lt;br&gt;<strong>Session Chair:</strong> James A. Eastham, MD&lt;br&gt;<strong>Memorial Sloan-Kettering Cancer Center</strong>&lt;br&gt;<strong>Moderator:</strong> David Jarrard, MD&lt;br&gt;<strong>University of Wisconsin</strong>&lt;br&gt;<strong>Translational Forum</strong>&lt;br&gt;<strong>Introduction and Case Presentation</strong>&lt;br&gt;<strong>David Jarrard, MD</strong>&lt;br&gt;<strong>University of Wisconsin</strong>&lt;br&gt;<strong>Mechanism of Castration Resistance</strong>&lt;br&gt;<strong>Martin E. Gleave, MD</strong>&lt;br&gt;<strong>Vancouver Prostate Center</strong>&lt;br&gt;<strong>Aberrations in the Androgen Receptor</strong>&lt;br&gt;<strong>Scott M. Dehm, PhD</strong>&lt;br&gt;<strong>Masonic Cancer Center</strong>&lt;br&gt;<strong>Neoadjuvant Therapy</strong>&lt;br&gt;<strong>Mary-Ellen Taplin, MD</strong>&lt;br&gt;<strong>Dana-Farber Cancer Institute</strong></td>
<td>Grand Ballroom A &amp; D</td>
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<tr>
<td>10:05 a.m. – 10:35 a.m.</td>
<td><strong>Panel Discussion and Q&amp;A</strong></td>
<td>Grand Ballroom A &amp; D</td>
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<td>10:35 a.m. – 11:00 a.m.</td>
<td><strong>Break – Visit Exhibits</strong>&lt;br&gt;<strong>Location:</strong> Grand Ballroom A &amp; D</td>
<td>Grand Ballroom A &amp; D</td>
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<tr>
<td>11:00 a.m. – 12:00 p.m.</td>
<td><strong>Bladder Cancer Session II</strong>&lt;br&gt;<strong>Session Chair:</strong> Ashish M. Kamat, MD&lt;br&gt;<strong>MD Anderson Cancer Center</strong>&lt;br&gt;<strong>Moderator:</strong> Piyush K. Agarwal, MD&lt;br&gt;<strong>National Cancer Institute</strong>&lt;br&gt;<strong>Panelists:</strong> James Catto, MB, ChB, PhD, FRCS&lt;br&gt;<strong>University of Sheffield</strong>&lt;br&gt;<strong>Wassim Kassouf, MD</strong>&lt;br&gt;<strong>McGill University</strong>&lt;br&gt;<strong>Raj S. Pruthi, MD</strong>&lt;br&gt;<strong>University of North Carolina School of Medicine</strong>&lt;br&gt;<strong>Sandy Srinivas, MD</strong>&lt;br&gt;<strong>Stanford University</strong></td>
<td>Grand Ballroom A &amp; D</td>
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General Scientific Program

11:00 a.m. – 11:05 a.m.  
**Practical Issues in Management of Bladder Cancer**

Introduction: Case Presentations
Piyush K. Agarwal, MD
National Cancer Institute

11:05 a.m. – 11:45 a.m.  
Panel Discussion

11:45 a.m. – 12:00 p.m.  
Q&A

12:00 p.m. – 12:20 p.m.  
**State-of-the-Art Lecture II:**
Measuring and Improving Surgeons’ Technical Skill
John D. Birkmeyer, MD
University of Michigan

12:20 p.m. – 1:20 p.m.  
**Industry Sponsored Lunch Symposium**
Location: Grand Ballroom C
See page 9 for more details

1:20 p.m. – 2:20 p.m.  
**Oral Abstract Session**
Moderator: Jeffrey M. Holzbeierlein, MD
University of Kansas Medical Center
See page 32 for full abstracts

1:20 p.m. Podium #7  
*COMBINATION OF GENOMIC MARKERS AND CLINICAL VARIABLES PROVIDES SUPERIOR PROGNOSTIC PERFORMANCE IN HIGH-RISK BLADDER CANCER FOLLOWING RADICAL CYSTECTOMY*  
(Presented By: Anirban Mitra)
*Not CME Accredited*

1:30 p.m. Podium #8  
MICRO-RNA AND GENE EXPRESSION SUBTYPES OF HIGH-GRADE, MUSCLE-INVASIVE UROTHELIAL CARCINOMA  
(Presented By: William Kim)

1:40 p.m. Podium #9  
DYSREGULATION OF THE BETA-CATENIN COMPLEX IS AN INDEPENDENT PREDICTOR OF ONCOLOGICAL OUTCOMES IN PATIENTS WITH CCRCC  
(Presented By: Laura-Maria Krabbe)

1:50 p.m. Podium #10  
TRANSLOCATOR PROTEIN (TSPO): POTENTIAL AS A NOVEL BIOMARKER IN RENAL CELL CARCINOMA  
(Presented By: Chad Ritch)

2:00 p.m. Podium #11  
PROSTATE CANCER MICROPARTICLES AS A NEXT GENERATION SCREENING TOOL FOR PROSTATE CANCER  
(Presented By: Khurram Siddiqui)

2:10 p.m. Podium #12  
PATHOLOGIC EXAMINATION OF RADICAL PROSTATECTOMIES IN MEN WITH VERY-LOW-RISK DISEASE AT BIOPSY REVEALS DISTINCT ZONAL DISTRIBUTION OF CANCER IN AFRICAN AMERICAN MEN  
(Presented By: Debasish Sundi)
# General Scientific Program

## Prostate Cancer Session III

**Session Chair:** James A. Eastham, MD  
*Memorial Sloan-Kettering Cancer Center*

**Moderators:**  
- Peter T. Scardino, MD  
  *Memorial Sloan-Kettering Cancer Center*  
- Inderbir S. Gill, MD  
  *University of Southern California*

**Panel:**  
- Eric Klein, MD  
  *Cleveland Clinic Foundation*  
- Joel Nelson, MD  
  *University of Pittsburgh Medical Center*  
- Joseph A. Smith, MD  
  *Vanderbilt University Medical Center*  
- Raj Pruthi, MD  
  *University of North Carolina School of Medicine*

### What Can We Learn From Robotics About How to Introduce New Technology into Urologic Surgery?

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
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| 2:20 p.m. – 2:22 p.m. | Welcome and Introduction  
  Peter T. Scardino, MD  
  *Memorial Sloan-Kettering Cancer Center* |
| 2:22 p.m. – 2:28 p.m. | How Does FDA Approval of a Device Differ From the Approval of a Drug?  
  Jonathan Jarow, MD, FDA  
  *Johns Hopkins University School of Medicine* |
| 2:28 p.m. – 2:34 p.m. | Comparative Effectiveness Studies of Robotic vs. Open Prostatectomy: What Do We Know and When Did We Know it?  
  William Lowrance, MD, MPH  
  *University of Utah, Huntsman Cancer Hospital* |
| 2:34 p.m. – 2:40 p.m. | Marketing Robotic Surgery: Could We Have Done Better?  
  Vincent P. Laudone, MD  
  *Memorial Sloan-Kettering Cancer Center* |
| 2:40 p.m. – 2:46 p.m. | Improving Quality: Credentialing for Robotic Surgery  
  Steven J. Shichman, MD  
  *Tallwood Urological and Kidney Institute, Hartford Hospital* |
| 2:46 p.m. – 3:20 p.m. | Panel Discussion: Audience Q & A |

## Kidney Cancer Session II

**Session Chair:** Michael Jewett, MD  
*Princess Margaret Hospital*

**Moderator:** Gennady Bratslavsky, MD  
*SUNY Upstate Medical University*

### mRCC: Controversies and Issues

**Sub-Session Chair:** Jodi K. Maranchie, MD  
*University of Pittsburgh Medical Center*

### Dose Response Optimization of Targeted Therapy in mRCC

Georg Bjarnason, MD, FRCPS(C)  
*Sunnybrook Health Sciences Centre*
3:30 p.m. – 3:40 p.m. Influence of Race on RCC Incidence and Survival
Mark P. Purdue, PhD
National Cancer Institute

3:40 p.m. – 4:00 p.m. Q&A

4:00 p.m. – 4:30 p.m. Best Abstract Presentation
Moderator: Anil Kapoor, MD
St. Joseph’s Hospital
See page 38 for full abstracts

4:00 p.m. Podium #13 DIAGNOSTIC RENAL BIOPSY AND THE TREATMENT OF SMALL KIDNEY CANCERS
(Presented By: Marc A. Bjurlin)

4:10 p.m. Podium #14 GROWTH KINETICS AND OUTCOMES OF CLINICAL T1B RENAL MASSES UNDER ACTIVE SURVEILLANCE (AS)
(Presented By: Reza Mehrazin)

4:20 p.m. Podium #15 PREDICTING DRUG RESISTANCE IN METASTATIC RENAL CELL CARCINOMA: PERSONALIZED MEDICINE BY XENOGRAFTING PATIENT TUMORS INTO CHICKEN EMBRYOS
(Presented By: Clarisse Mazzola)

4:30 p.m. – 6:30 p.m. *Poster Session II/Reception
Location: Grand Ballroom A & D
*Not CME Accredited
See page 147 for full abstracts

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Podium #1
FOX3 MEDIATES BLADDER CANCER STEM CELL HOMEOSTASIS AND DIFFERENTIATION
Liz Peek; Hanwei Zhang MD; Jane Lee; and Arnold Chin MD, PhD
UCLA, Los Angeles, CA; UCLA, Los Angeles
(Presented By: Arnold Chin)

Introduction: Foxp3 is a member of the forkhead/winged helix family of transcription factors expressed in regulatory T cells as well as in epithelial cancers, including those of the breast, prostate, and bladder. However, the role of Foxp3 in epithelial cancers is unclear.

Methods: We investigate the clinical relevance of Foxp3 in bladder cancer by examining expression in a tissue microarray. Foxp3 isoforms were cloned and sequenced from bladder cancer cell lines and primary tumors. Overexpression and knockdown of Foxp3 was performed in bladder cancer cell lines in vitro and in vivo analysis of cell growth, proliferation, and expression of stem cell and differentiation markers. Circulating tumor cells from patients were examined for expression of Foxp3 by flow cytometry.

Results: Expression of Foxp3 inversely correlated with tumor stage, grade, and survival following radical cystectomy. We found a predominant expression of a FoxP3Δ3 isoform versus wild type Foxp3 in bladder cancer. In bladder cancer cell lines, overexpression of FoxP3Δ3 increases cell cycle progression, proliferation, and expression of CD44 and CD49f, as well as stem Oct4, Sox2, Nanog, and ALDH1, while global Foxp3 knockout leads to opposing effects. In an in vivo reconstitution model, Foxp3Δ3 overexpression leads to larger, less differentiated tumors, with loss of E−cadherin and gain of N−cadherin consistent with epithelial−to−mesenchymal transition. We further explore the role of Foxp3 as a real−time marker for tumor burden by examining its expression in circulating tumor cells (CTCs). Patients with higher−stage disease and nodal involvement were found to have elevated CTCs expressing high levels of Foxp3. Knockdown of Foxp3 by siRNA was found to increase cellular cytotoxicity to cisplatin.

Conclusions: We implicate Foxp3 in activating bladder cancer stem cells and as a novel therapeutic target.

Podium #2
SALVAGE RADIATION THERAPY IS ASSOCIATED WITH DECREASED RISKS OF METASTASES AND DEATH FROM PROSTATE CANCER AMONG PATIENTS WITH BIOCHEMICAL RECURRENCE AFTER RADICAL PROSTATECTOMY
Manuel Eisenberg, MD; R. Jeffrey Karnes, MD; R. Houston Thompson, MD; Dharam Kaushik, MD; Laureano Rangel; Eric Bergstralh; Stephen Boorjian, MD
Mayo Clinic, Rochester, Minnesota
(Presented By: Manuel Eisenberg)

Introduction and Objectives: Biochemical recurrence (BCR) has been reported in up to 30% of patients following radical prostatectomy (RP). While salvage radiation therapy (SRT) has been found to result in a durable PSA response in a substantial proportion of these men, its impact on metastasis and survival has been less well established. We evaluated the long−term outcome of patients with BCR after RP, specifically to evaluate the association of SRT with subsequent disease progression and mortality.

Methods: We identified 2657 patients diagnosed with BCR (defined as PSA ≥0.4 ng/mL) following RP between 1987−2003. Of these patients, 954 (36%) received SRT. Cox proportional hazard models were used to evaluate the association of receipt of SRT with disease recurrence and mortality among men with BCR, controlling for clinicopathologic variables.

Results: Median PSA at SRT was 0.6 ng/ml. Median follow−up after BCR was 14.4 years (IQR 10.5,17.9). A total of 1284 (48%) of these patients subsequently received salvage androgen deprivation therapy (ADT), while 530 (20%) developed systemic progression and 1214 (46%) died, including 301 (11%) who died from prostate cancer. Of men with BCR, those who received SRT were significantly more likely to have pathologic ≥ Gleason 7 tumors (54% vs 45%;p<0.0001), positive surgical margins (44% vs. 39%;p=0.01), and a shorter PSA doubling time (DT) at BCR (1.3 vs 2.5 years;p<0.0001). Despite these demographic differences, on multivariate analysis, receipt of SRT was associated with significantly decreased risks of receiving salvage ADT (HR 0.78; 95% CI 0.68, 0.90; p=0.0008) as well as of experiencing local recurrence (HR 0.11; 95% CI 0.05, 0.24; p<0.0001), systemic progression (HR 0.20; 95% CI 0.11, 0.36; p<0.0001), and death from prostate cancer (HR 0.22; 95% CI 0.10, 0.46; p<0.0001). Treatment with SRT for BCR was not, however, found to be significantly associated with patients’ risk of all−cause mortality (HR 0.89; p=0.29).

Conclusion: We found that SRT was associated with decreased receipt of salvage ADT, as well as lower risks of local recurrence, systemic progression, and death from prostate cancer among men with BCR. As such, SRT should continue to be considered in the management of select patients with BCR following RP, while further study, ideally in the setting of prospective clinical trials, will be required to determine the optimal individualized approach to these men.
Introduction: In the absence of guidelines, post-operative cancer surveillance imaging may be overused or underused relative to the risk of disease recurrence. Our objective was to characterize patterns of surveillance imaging after partial or radical nephrectomy in a population-based cohort of older adults with renal cancer.

Methods: From the Surveillance, Epidemiology, and End Results–Medicare database, we identified 10,506 patients, 66 years of age or older, who received partial or radical nephrectomy between 2000 and 2007 for renal cell carcinoma. Patients with another cancer diagnosis, lymph node-positive or metastatic disease were excluded. Primary endpoints were chest imaging (chest X-ray or CT) and abdominal imaging (CT or MRI) 6 to 36 months after surgery, stratified by tumor stage (T1–T3). We used repeated-measures logistic regression analysis to estimate the impact of demographic, disease and treatment characteristics on the odds of receiving chest or abdominal imaging in each of the first 3 years following surgery.

Results: The rates of cross-sectional abdominal imaging for T1 patients in each of the first 3 years were 53%, 52% and 45%, respectively. The corresponding rates of chest imaging for T3 patients were 49%, 52% and 46%. Rates of abdominal imaging surpassed chest imaging for each stage in each year of surveillance. Higher tumor stage and grade were associated with greater use of chest and abdominal imaging (p<0.0001 for both), controlling for other characteristics. Partial nephrectomy was associated with greater use of abdominal imaging compared with radical nephrectomy (p<0.0001). Use of imaging also varied with gender, race, income, marital status and geographic region.

Conclusions: In the absence of consensus guidelines, patterns of surveillance imaging after nephrectomy were not consistent with known patterns of disease recurrence or with previously published recommendations. New guidelines recently published should promote risk-based surveillance practices and decrease variability across patients and providers.
THE IMPACT OF TECHNOLOGY DIFFUSION ON TREATMENT FOR PROSTATE CANCER
Florian Schroeck, MD, MS; Samuel Kaufman, MA; Bruce Jacobs, MD, MPH; Yun Zhang, PhD; Alon Weizer, MD, MS; Jeffrey Montgomery, MD, MHSA; Scott Gilbert, MD, MS; Seth Strope, MD, MPH; and Brent Hollenbeck, MD, MS
1University of Michigan, Dept. of Urology; 2University of Florida, Dept. of Urology; 3Washington University, Division of Urology
(Presented By: Florian Schroeck)

Introduction and Objectives: Use of local therapy for prostate cancer may increase after the dissemination of new technologies such as robotic prostatectomy and intensity-modulated radiotherapy (IMRT), because patients and physicians may perceive these treatments as having less morbidity while achieving better or similar cancer control. Therefore, we examined the association of market-level technological capacity with receipt of local therapy.

Methods: We used Surveillance Epidemiology and End Results (SEER) – Medicare data for the years 2003 through 2008 to identify patients with newly diagnosed prostate cancer (n=59,043). We measured the capacity for delivering treatment with new technology as the number of providers offering robotic prostatectomy or IMRT per population in a market (hospital referral region). The association of this measure with receipt of prostatectomy, radiotherapy, or observation was examined with multinomial logistic regression, adjusting for patient- and market-level confounders.

Results: After adjusting for confounders, markets with high robotic prostatectomy capacity had higher use of prostatectomy (146 vs. 118 per 1,000 men, p=0.008) but a trend towards decreased use of radiotherapy (574 vs. 601 per 1,000 men, p=0.068), resulting in a stable rate of local therapy (Figure). In these markets, the increased use of radical prostatectomy was primarily driven by an increase in use of robotic prostatectomy (85 vs. 42 per 1,000 men diagnosed, p<0.001). High versus low IMRT capacity did not significantly impact use of prostatectomy (129 vs. 129 per 1,000 men, p=0.947) and radiotherapy (594 vs. 585 per 1,000 men, p=0.579, Figure).

Conclusions: Although there was a small shift from radiotherapy to prostatectomy in markets with high robotic prostatectomy capacity, increased capacity for both robotic prostatectomy and IMRT did not change the overall rate of local therapy. Our findings temper concerns that new technology spurs additional therapy of prostate cancer.
Introduction and Objectives: Gleason score grading is a cornerstone of risk stratification and management of patients with prostate cancer (PCa). The only reliable method to determine Gleason score remains direct pathologic determination from a tissue specimen. In this work, we examine the feasibility of MRI and clinical patient characteristics to predict biopsy Gleason scores (bGS).

Methods: We reviewed 143 men who underwent multiparametric prostate−MRI (MP−MRI) prior to any prostate biopsy from 8/2007 to 12/2012. Patient demographics, PSA, PSA density (PSAD), and imaging findings were assessed for association with PCa Gleason score on biopsy. Screen positive lesions (SPLs) were defined as lesions positive on T2W and DWI B−MRI images. Logistic regression modeling was used to assess association of the different parameters with bGS (no cancer, Gleason 6, 7, and ≥8). An optimized model for the prediction of bGS was determined and a nomogram was generated.

Results: The mean age of the cohort was 60.7 ± 7.7 years and mean PSA of 6.8 ± 6.5 ng/ml. Factors associated with Gleason score include age, PSA, PSAD, prostate volume, MRI suspicion score, total lesions seen on MRI, number of SPLs. Various models were examined utilizing factors positively associated with Gleason score and the combination of PSA density with SPLs outperformed most other combinations. A nomogram was generated to derive the probability of No cancer, Gleason 6, 7, and ≥8 PCa using the inputs of PSAD and number of SPLs (Figure 1). The correlating c−indexes to Gleason 6, 7, and ≥8 PCa detection were 0.87, 0.87, and 0.92 respectively. When tested on the original cohort, the most probable nomogram generated Gleason score correlated with actual pathologic bGS findings in 53% of the men. The top two most probable nomogram Gleason scores correlated the actual bGS findings in 81% of the men.

Conclusions: PSAD combined with prostate MRI imaging characteristics shows potential for pre−biopsy determination of prostate cancer Gleason score and presence. Further improvement in predictive performance of this test may ultimately yield a clinical tool that is of benefit for pre−biopsy risk stratification of patients for PCa of clinical significance.
Introduction: Genome-wide association studies (GWAS) have identified multiple single nucleotide polymorphisms (SNPs) associated with prostate cancer (PCa). Most recently the Collaborative Oncological Gene-environment Study (COGS) reported 23 novel PrCa risk loci. While these COGS SNPs and numerous other SNPs have been clearly associated with disease risk, their relationship with clinical outcomes has not been reported. We assessed the frequency of a selection of known susceptibility alleles from the COGS panel and previously reported GWAS within a single institution ascertainment of PCa patients with respect to clinical disease progression and disease-specific mortality.

Methods: We genotyped 1261 individuals of European ancestry treated for localized prostate cancer between June 1988 and December 2007 at our institution. Blood samples were prospectively collected and de-identified before being genotyped and matched to a clinical data set with follow up current as of June 2013. We investigated associations between 63 SNPs and biochemical recurrence (BR), castration-resistant metastasis (CM), and PCa-specific survival (DSS) using Cox proportional hazards models. Multivariate survival analysis was adjusted for Gleason score, pathological stage and age at diagnosis. We evaluated for association between SNPs and log PSA at diagnosis using linear regression, adjusted for age.

Results: On univariate analysis, two SNPs were associated (P < 0.05) with BR, three SNPs were associated with CM, and one SNP was associated with DSS. Applying a Bonferroni correction for number of SNPs (P < 0.0008), the only significant association was between SNP rs17632542 and PSA levels (P = 1.4x10-5). Five SNPs showed associations on multivariable analysis (P < 0.05), rs13385191 (BM), rs103294, rs11067228 and rs1529276 (CM), rs445114 (DSS), although not after correcting for multiple testing.

Conclusions: We identified an association between SNP rs17632542 in the KLK3 gene and PSA levels at diagnosis which replicates findings in the current literature. Further analysis is ongoing.
**Introduction:** Nearly half of patients with muscle−invasive/N+ bladder cancer succumb to their disease despite multimodal therapy. Adjuvant therapy decisions are based on limited clinical parameters with relatively weak predictive power. Here we aimed to develop and validate a genomic signature using whole transcriptome profiling that can identify patients at greatest risk of recurrence.

**Methods:** A set of neoadjuvant chemotherapy– naïve patients who underwent radical cystectomy for muscle invasive urothelial carcinoma from 1998−2004 at USC was used as the study population. Whole transcriptomes of archival tumors were profiled using 1.4 million−feature oligonucleotide microarrays. A discovery cohort (n=133) was used to develop a genomic classifier (GC) for predicting recurrence. A multivariable classifier (CC) based on typical clinical covariates was also developed for the same endpoint. Finally, CC and GC were combined into a genomic−clinical classifier (G−CC). Performances of GC, CC and G−CC were compared to a post−cystectomy nomogram from the International Bladder Cancer Nomogram Consortium (IBCNC). Classifier performance was assessed by area under receiver−operating characteristic curves (AUCs) in the discovery cohort and an independent validation cohort (n=66).

**Results:** A 15−gene GC was developed on the discovery cohort (median follow−up, 9.2 years) with AUC=0.88 for predicting recurrence, which was higher than any individual clinical variable, and the combined IBCNC (AUC=0.73) and CC (AUC=0.81). When genomic markers were combined with IBCNC (G−IBCNC) and CC (G−CC), AUCs of the models increased to 0.89 and 0.93. When the locked classifiers were blindly applied to the validation cohort (median follow−up, 10.8 years), GC still retained superior performance compared to individual clinical variables (AUC=0.77). Further, addition of GC to clinical nomograms improved their performance (IBCNC vs. G−IBCNC, 0.73 vs. 0.82; CC vs. G−CC, 0.78 vs. 0.86). G−CC high−risk patients had elevated recurrence probabilities (p<0.001), with multivariable analysis indicating that the genomic component was the most significant predictor of recurrence (p=0.005).

**Conclusions:** We report the discovery and validation of a combined G−CC that shows superior performance over clinical models for predicting recurrence after cystectomy. Such transcriptomic approaches can identify robust biological predictors of post−cystectomy outcomes.

*Not CME Accredited*
**Introduction and Objectives:** The spectrum of mutations associated with high-grade muscle-invasive urothelial carcinoma of the bladder is relatively well defined. Gene expression and miRNA patterns of urothelial carcinoma have also been investigated. However, whether there are relationships between miRNA and mRNA subtypes has yet to be determined. To determine whether intrinsic subtypes of high-grade muscle-invasive urothelial bladder cancer could be defined by miRNA and mRNA expression patterns, and to characterize relationships between miRNA and mRNA subtypes.

**Methods:** Level 3 data archives on the TCGA Data Portal website (tcga.cancer.gov/dataportal) were downloaded to obtain miRNA (miRNA-seq) and mRNA (RNA-seq) data from 131 high-grade, muscle-invasive urothelial carcinomas. Normalized miRNA-seq data, and median-centered and normalized RNA-seq data were assessed for intrinsic subtypes by most-variable genes using non-negative matrix factorization (miRNA-seq) and a bootstrapped ensemble clustering algorithm that merges the output of hierarchical and k-means clustering.

**Results:** miRNA-based NMF clustering resulted in the identification of 5 expression subtypes, whereas mRNA-based consensus clustering of the same samples identified 4 intrinsic expression subtypes. There were significant correlations between the miRNA and mRNA subgroups (p=9e−7, Chi square) although Bezier curves revealed that only miRNA group 1 was enriched in RNA Group 1, and that tumors from all other miRNA groups were dispersed more randomly across the RNA groups. There were biologically plausible relationships between specific miRNAs and the mRNAs they are known to regulate, eg RNA Group IV showed significantly lower expression of the miR-200 family of miRNAs, which are known to suppress EMT, and Group IV also had RNA expression patterns that were consistent with enhanced EMT (i.e. low CDH1 and high VIM and ZEB1). Conversely, RNA Group IV also had the highest expression of miR-100, which is known to suppress FGFR3 expression, and, as expected, Group IV had the highest FGFR3 mRNA expression levels.

**Conclusions:** Analysis of miRNA and mRNA expression patterns from TCGA's bladder cancer project reveals distinct intrinsic miRNA and mRNA subtypes for high-grade, muscle-invasive bladder cancer. There is a high level of correlation between miRNA Group 1 and mRNA Group 1 but no other miRNA and mRNA Groups. Previously reported miRNA-mRNA target relationships were confirmed by the analysis.
DYSREGULATION OF THE BETA–CATENIN COMPLEX IS AN INDEPENDENT PREDICTOR OF ONCOLOGICAL OUTCOMES IN PATIENTS WITH CCRCC

Laura-Maria Krabbe, MD1; Mary E. Westerman, BA2; Aditya Bagrodia, MD3; Bishoy A. Gayed, MD3; Oussama M. Darwish, MD3; Ahmed Q. Haddad, MD3; Dina Khalil, MD3; Payal Kapur, MD3; Arthur I. Sagalowsky, MD3; Yair Lotan, MD3; and Vitaly Margulis, MD3

1UTSW Medical Center Dallas and University of Muenster Medical Center, Muenster, Germany; 2UTSW Medical Center Dallas, TX

Introduction and Objective: After curative intended surgery around 30% of patients with clear cell renal cell carcinoma (ccRCC) experience disease recurrence. Epithelial to mesenchymal transition (EMT) is thought to play a crucial role in development of metastasis due to disruption of cell adhesions and acquisition of a motile phenotype and invasive properties. The beta–catenin complex is involved in cadherin–based cell–cell contacts and therefore is a key player in EMT. Thus, we evaluated dysregulation of beta–catenin and its clinical implications in patients with ccRCC.

Methods: Immunohistochemical staining was performed for the beta–catenin complex on tissue microarrays of patients with ccRCC. Membranous and cytoplasmatic beta–catenin expression patterns were assessed separately. Beta–catenin was considered normal (group 1) if none or only one component was abnormal and beta–catenin was considered dysregulated (group 2) if both (membranous and cytoplasmatic beta–catenin) were abnormal. Differences in pathological characteristics between both groups were assessed with the chi–square test and differences in recurrence–free survival (RFS) and cancer–specific survival (CSS) were assessed with the Kaplan–Meier method. Uni– and multivariate Cox proportional hazard models were used to assess independent predictors of oncological outcomes.

Results: The study cohort comprised 406 patients with a median follow–up of 58 months. 52 (12.8%) patients experienced disease recurrence and 25 (6.2%) patients died of disease. The Beta–catenin complex was dysregulated in 70 (17.2%) patients. Dysregulation of beta–catenin was significantly associated with adverse pathologic features, such as higher T–stage, nodal positivity, higher grade as well as presence of tumor thrombus, sarcomatoid features, necrosis and lymphovascular invasion (all p<0.001). Patients with dysregulated beta–catenin expression had inferior RFS and CSS (both p<0.001). In multivariate Cox proportional hazard regression analysis adjusting for tumor stage, nodal status and grade, dysregulation of the beta–catenin complex was an independent predictor of RFS (HR 2.2, 95%CI 1.2–3.9, p=0.008) as well as CSS (HR 2.4, 95%CI 1.1–5.6, p=0.044).

Conclusions: Our results indicate that dysregulation of beta–catenin may be an important biologic phenomenon in ccRCC carcinogenesis. These findings support further study of beta–catenin and overall systematic assessment of EMT in ccRCC.
Introduction: Translocator protein (TSPO) is a 18kDa protein that transports cholesterol into the mitochondria. Several studies in breast and colorectal cancer have demonstrated that increased TSPO expression and nuclear localization of TSPO are associated with aggressive tumors. Given that clear cell renal cell carcinoma (ccRCC) is a metabolically active tumor associated with deregulated cholesterol and lipid metabolism, we sought to determine whether an association exists between ccRCC and TSPO expression/localization.

Methods: Immunohistochemical (IHC) analysis for TSPO expression was performed on a tissue microarray (TMA) containing samples of matched benign and malignant tissue from 207 patients with ccRCC. TSPO expression was categorized by cellular localization (nuclear versus cytoplasmic) and quantified by combining visible level of expression and percentage of tissue involved to develop a TSPO score. Statistical analysis was performed to compare TSPO scores between tumor and normal tissue and across TNM stage and grade. Kaplan Meier (KM) survival analysis was performed to assess cancer-specific (CSS) and overall survival (OS) by TSPO scores separated into tertiles. Univariable and multivariable analysis were performed to assess the relationship between TSPO score and CSS and OS.

Results: A total of 207 patients underwent IHC for TSPO expression. Total (nuclear and cytoplasmic) TSPO expression was significantly higher in tumor versus normal tissue (p<0.001). In particular, nuclear localization for TSPO expression was higher in tumor versus normal samples (p<0.001). Stage T2 and higher tumors had increased nuclear expression of TSPO (p=0.02). Patients with M1 disease had markedly higher nuclear TSPO expression versus M0 disease (p<0.001). Patients with high levels of nuclear TSPO expression had significantly worse CSS and OS (p=0.01). However when controlling for stage and grade, nuclear TSPO expression did not independently predict CSS or OS.

Conclusions: To our knowledge, this is the first report demonstrating increased expression and nuclear localization of TSPO in ccRCC, particularly in patients with aggressive disease. Potential applications include PET imaging with TSPO based ligands similar to those currently under development in breast cancer. Further studies are needed to assess the association and utility of TSPO as a biomarker in ccRCC.
PROSTATE CANCER MICROPARTICLES AS A NEXT GENERATION SCREENING TOOL FOR PROSTATE CANCER
Khurram Siddiqui, MBBS, FRCS; Colleen Biggs, BSc; Michelle Billia, MD; Carlie Charlton, MSc; Clarisse Mazzola, MD; Nicholas Power, MD, FRCSC; Ann Chambers, PhD; Jun Yang, PhD; Leonard Luyt, PhD; Joseph Chin, MD, FRCSC; and Hon Leong, PhD
University of Western Ontario, London, Ontario, Canada
(Presented By: Khurram Siddiqui)

Introduction: Prostate cancer microparticles (PCMPs) are tumor cell fragments released by prostate cancer cells into the blood circulation and offer a non-invasive means of sampling the primary tumor, an ideal platform for a prostate cancer-specific fluid biopsy. Our blood test enumerates PCMP in minute volumes of patient blood in a high-throughput and multi-parametric manner. This pilot study aims to validate the clinical utility of this microparticle-based blood test to successfully distinguish patients with BPH from patients with PCa.

Methods: We used the A-50 Micro nanoscale flow cytometer (Apogee FlowSystems Inc.) to enumerate cancer microparticles present in patient plasmas collected from four cohorts of patients: healthy volunteers (N=24), benign prostatic hyperplasia (BPH) (N=19), localized and metastatic PCa (N=112 and 23 respectively). We used monoclonal antibodies specific to prostate specific membrane antigen (PSMA) and Ghrelin peptide, a ligand for the growth hormone secretagogue receptor (GHSR) which is over-expressed on prostate cancer cells. Dual positive PCMPs (PSMA+ve, Ghrelin+ve) were enumerated in all cohorts.

Results: We analysed 178 plasmas and found significantly higher counts (p<0.01, ANOVA, Bon Ferroni test) of PCMP (PSMA+ve, Ghrelin+ve) in patients with PCa as compared to BPH and healthy volunteers. However, there was no statistical difference between localized and metastatic patient cohorts. Figure 1 shows the distribution of PCMP counts. The scatterplots with means and respective 95% confidence intervals (red lines) reveal a cutoff (green dashed line) for distinguishing BPH patients from patients with PCa. With this cutoff, the blood test is 89% accurate in identifying patients with PCa (localized PCa cohort) with 20% of patients being mistakenly identified as having PCa. No significant differences (one-way ANOVA test) were observed between PCMP levels, Gleason score and stage of disease.

Conclusions: Our initial results show that PCMP levels have the potential to be the “Next Generation Screening Tool” for Prostate Cancer. Implementing this test in a large prospective clinical study will allow us to evaluate the performance characteristics of the test prior to prostate biopsy.
Introduction: Among men with very-low-risk prostate cancer (PCa) at biopsy, recent evidence has shown that African American men (AA) are at greater risk for adverse oncologic outcomes after radical prostatectomy (RP). We studied RP specimens from very-low-risk AA and Caucasian men to determine if there were systematic pathological differences.

Methods: RP specimens were evaluated for men with National Comprehensive Cancer Network (NCCN) very-low-risk PCa. All men underwent extended biopsy sampling at diagnosis (≥10 cores) and were treated in the modern Gleason grading era. Tumor volumes, grades, and locations in 87 AA and 89 Caucasians were analyzed. For each specimen, the dominant nodule was defined as the largest tumor with highest grade.

Results: Compared to Caucasians, AA men were more likely to have significant PCa (61% vs 29%, p<0.001); Gleason ≥7 (37% vs 11%, p<0.001) and volume >0.5cm³ (45% vs 21%, p=0.002) and more often anterior (51% vs 29%, p=0.003). Among men who underwent pathologic upgrading, the dominant nodule was also anterior more frequently in AA than in Caucasians (59% vs 0%, p=0.001).

Conclusions: AA men with very-low-risk PCa at diagnosis have a significantly higher prevalence of anteriorly-located cancer foci that are of higher grade and larger volume. Enhanced imaging or anterior zone sampling may detect these significant, anterior tumors, thereby improving outcomes of AA men considering active surveillance.
Introduction and Objectives: Renal biopsy may aid in the diagnosis of kidney cancer, but its impact on the clinical management of small kidney tumors is not well established. Our objective was to identify patient characteristics associated with receipt of diagnostic renal biopsy and the influence of biopsy on subsequent surgery.

Methods: In Surveillance, Epidemiology and End Results (SEER) cancer registry data linked with Medicare claims, we identified patients aged 66 years or older diagnosed with a renal parenchymal tumor less than 4 cm between 2000 and 2007. Diagnostic biopsy was defined by a Medicare claim within 1 month prior through 6 months following cancer diagnosis. Surgical management was defined by a claim for partial or radical nephrectomy or tumor ablation in the first 6 months following diagnosis. We also identified the specialty of the health care provider associated with the first claim for a renal mass or tumor.

Results: Of 5,179 patients with a tumor <4cm, 1,489 (29%) had a diagnostic renal biopsy, and 4,450 (86%) were managed surgically. Predictors of diagnostic renal biopsy included age, tumor size ≥2cm (adjusted odds ratio AOR 1.16 [95% CI 0.70–1.00], p=0.0524) and a low comorbidity burden (AOR 1.16 [95% CI 1.00–1.34], p=0.0507). Patients whose first renal mass diagnosis was made by a urologist had lower odds of renal biopsy (AOR 0.52 [95% CI 0.40–0.68], p<0.0001). In stratified analysis, patients who did not have a renal biopsy were less likely to have surgery if their tumor was <2cm (AOR 0.54 [95% CI 0.41–0.72], p<0.0001) but more likely with a low comorbidity burden (AOR 1.34 [95% CI 1.01–1.77] p=0.0407). Among patients who had a biopsy, greater comorbidity was associated with lower odds of surgery (AOR 0.56 [95%Cl 0.37–0.85] p=0.0058). Tumor size was not a predictor of surgery in patients who did have a renal biopsy. Controlling for patient, disease and provider characteristics, biopsy was associated with lower odds of having surgery (AOR 0.63 [95% CI 0.53–0.76], <0.0001), and the use of surgery decreased over time.

Conclusions: In this population–based cohort of older patients with small kidney tumors, diagnostic biopsy was more common among patients who were older, had greater comorbidity or larger tumors. Patients who had a biopsy were less likely to be managed surgically than those who did not. Diagnostic renal biopsy may aid in the selecting appropriate candidates for non–surgical management of small kidney cancers.
GROWTH KINETICS AND OUTCOMES OF CLINICAL T1B RENAL MASSES UNDER ACTIVE SURVEILLANCE (AS)
Reza Mehrazin; Marc Smaldone; Alexander Kutikov; Jeffrey Tomaszewski; Tianyu Li; Timothy Ito; Phillip Abbosh; Rosalia Viterbo; Richard Greenberg; David Chen; and Robert Uzzo
Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Reza Mehrazin)

Objectives: Compared to T1a lesions, the natural history of untreated T1b renal masses is poorly understood. We sought to assess the growth kinetics and outcomes of cT1b or larger cortical renal tumors which continue to remain on radiographic AS compared to those who underwent definitive surgery after a period of AS.

Methods: Our institutional, prospectively maintained, renal tumor database was reviewed to identify enhancing solid & cystic masses managed expectantly from 2000−2012. cT1a masses, transitional cell carcinoma or those suspected for metastatic or systemic disease were excluded from analysis. Based on standard radiographic staging, localized tumors > 4.0 cm (≥T1b) that were radiographically followed for > 6 months were included for analysis. Clinical & pathological records were reviewed to determine tumor growth rate and clinical outcomes in those remained on AS or those who underwent delayed surgical intervention. Mean for tumor size on presentation, annual linear tumor growth rate (LGR), Charlson comorbidity index (CCI), number of images obtained, and follow-up (FU) were calculated. Chi-square test & Logistic regression were used for uni- and multivariate analyses (MVA).

Results: Of 457 patients managed with AS, 67 cT1b tumors (in 63 patients) were identified. 43 pts (67%) were managed solely with AS, while 21 pts (33%) progressed to intervention. The median age at presentation patients managed with AS and intervention was 77 and 60 years respectively (p=0.0002), while no difference was observed in median CCI (3 vs. 2, p=0.6). No difference was observed in tumor size at presentation between patients managed with AS and those undergoing delayed intervention (5.9 vs. 5.4 cm, p=0.8). In contrast, the mean LGR significantly differed between patients managed expectantly and those progressing to intervention (0.37 vs. 0.73 cm/yr; p=0.02). On MVA, age (OR=0.9,CI:0.8−0.98) and LGR (OR=11,CI:1.8−60) were significant predictors of surgical intervention. With a mean FU period of 38.9 ± 24.0 months (range 6−105), 9 patients died (14%) from other cause and no patient progressed to metastatic disease.

Conclusions: Localized cT1b or larger renal masses show comparable growth rates to small tumors managed expectantly with low rates of progression to metastatic disease with short term follow up. An initial period of AS to determine tumor growth kinetics is a reasonable option in select patients with significant competing risks and limited life expectancy.
Introduction and Objective: The prognosis of patients diagnosed with metastatic renal cell carcinoma (mRCC) is generally poor, especially if cancer cells are already or eventually become resistant to targeted therapy. Determining the full range of drug sensitivities and resistance that pre-exist in the RCC tumor cells prior to implementation of targeted therapy in the same patient.

Methods: We developed a patient-derived xenograft model using chicken embryos. Different RCC cell lines (XP127, XP158, XP121, 786-0,...) were tested on our model using two different techniques: primary RCC patient-derived cells engraftment in the chorioallantoic membrane (CAM), and RCC cells vein injections. Each cell line was prepared for xenografting by washing with PBS prior to addition of 0.05% Trypsin+10mM EDTA. Cell pellets were washed with PBS twice. Matrigel (BD Biosciences Inc.) was added to the cell pellet in a 1:1 ratio for the tumor implantation assay and mixed extensively with a filtered tip micropipette. D9 chicken embryos were used for tumor implantation. Regarding the intravenous injection assay, a concentration of 1 million cells per milliliter was used and D12 chicken embryos were used. To evaluate drug sensitivities in vivo, cell lines were pre-treated overnight with 5µL sunitinib. Intravital imaging was performed to assess tumor size and quantify angiogenesis (tumor microvessel density). Tumor take rates were determined 6–8 days post implantation and 24 hours after vein injections.

Results: Tumor take rates varied amongst cell lines. A representative 786-0 tumor implanted in the CAM is presented in Figure 1 (picture obtained after injection of lectin-rhodamine). XP127’s which are sunitinib resistant maintained a similar level of tumor take (53%) but revealed smaller tumors, whereas XP158’s which are sensitive to sunitinib exhibited a low level of tumor take (13%) compared to its non-treatment control (35%). Further results will be available at the time of the SUO meeting.

Conclusion: Though in this first part of our experiment we only tested sunitinib, we believe our patient-xenograft model could be a useful tool to be able to tailor upfront the best targeted treatment for each patient with metastatic RCC.
Poster Session I
Thursday, December 5, 2013
4:00 p.m. - 6:00 p.m.
Poster Walks
See page 56 for full abstracts

Poster #1
INCIDENCE AND SIGNIFICANCE OF POSITIVE URETERAL MARGINS IN MICROPAPILLARY AND PLASMACYTOID VARIANT HISTOLOGY BLADDER CANCER
Hristos Kaimakliotis; Francesca Monn; Kevin Rice; Timothy Masterson; Thomas Gardner; Noah Hahn; Richard Foster; Richard Bihrlle; Clint Cary; Liang Cheng; and Michael Koch
Indiana University School of Medicine, Indianapolis, IN
(Presented By: Hristos Kaimakliotis)

Poster #2
PLASMACYTOID VARIANT HISTOLOGY UROTHELIAL BLADDER CANCER: THE INDIANA UNIVERSITY EXPERIENCE
Hristos Kaimakliotis; M. Francesca Monn; Jose Pedrosa; Kevin Rice; Timothy Masterson; Thomas Gardner; Noah Hahn; Richard Foster; Richard Bihrlle; Clint Cary; Liang Cheng; and Michael Koch
Indiana University School of Medicine, Indianapolis, IN
(Presented By: Hristos Kaimakliotis)

Poster #3
GENDER DISPARITIES IN DIAGNOSIS OF BLADDER CANCER AFTER INITIAL PRESENTATION WITH HEMATURIA: A NATIONWIDE CLAIMS-BASED INVESTIGATION
Cohn Josh¹; Kyle Richards¹; Benjamin Vekhter²; Christopher Lyttle²; Gary Steinberg¹; and Michael Large¹
¹Department of Surgery, Section of Urology, University of Chicago Hospitals, Chicago, IL; ²Center for Health and Social Sciences, University of Chicago, Chicago, IL
(Presented By: Kyle Richards)

Poster #4
PROSPECTIVE HEALTH-RELATED QUALITY OF LIFE ANALYSIS FOR PATIENTS UNDERGOING RADICAL CYSTECTOMY AND URINARY DIVERSION
Michael Large¹; Rena Malik¹; Joshua Cohn¹; Kyle Richards¹; Rangesh Kunnavakkum²; Norm Smith¹; and Gary Steinberg¹
¹Department of Surgery, Section of Urology, University of Chicago Hospitals, Chicago, IL; ²Department of Statistics, University of Chicago Medical Center, Chicago, IL
(Presented By: Kyle Richards)

Poster #5
SYNERGISM OF HISTONE DEACETYLASE INHIBITOR AR-42 AND CISPLATIN FOR BLADDER CANCER
David Li; Hanwei Zhang; and Arnold Chin
UCLA, Los Angeles, CA
(Presented By: Arnold Chin)

Poster #6
A CRITICAL ANALYSIS OF THE INFLUENCE OF GENDER ON BLADDER CANCER OUTCOMES FOLLOWING RADICAL CYSTECTOMY
Anirban Mitra¹; Eila Skinner²; Anne Schuckman¹; David Quinn¹; Tanya Dorff¹; and Siamak Daneshmand¹
¹University of Southern California, Los Angeles, CA; ²Stanford University, Stanford, CA
(Presented By: Anirban Mitra)

Poster #7
OUTCOMES FOLLOWING UROTHELIAL RECURRENCE IN BLADDER CANCER PATIENTS UNDERGOING RADICAL CYSTECTOMY
Anirban Mitra¹; Mehrdad Alemozaafar²; Brianna Harris¹; Anne Schuckman¹; Gus Miranda¹; Eila Skinner²; and Siamak Daneshmand¹
¹University of Southern California, Los Angeles, CA; ²Stanford University, Stanford, CA
(Presented By: Anirban Mitra)
Poster #8
CAN MUSCLE-INVASIVE BLADDER CANCER BE PREDICTED IN PATIENTS WITH CLINICAL T1 DISEASE?
Itay Sternberg¹; Lauren Baldinger²; Roy Mano³; Benjamin Katz³; Bing Ying Poon¹; Harry Herr¹; Bernard Bochner¹; and Guido Dalbagni¹
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Albert Einstein, Philadelphia, PA; ³Beth Israel Medical Center, New York, NY
(Presented By: Itay Sternberg)

Poster #9
PRETREATMENT NEUTROPHIL-TO-LYMPHOCYTE RATIO IS AN INDEPENDENT PREDICTOR OF CANCER-SPECIFIC AND OVERALL SURVIVAL IN PATIENTS WITH UROTHELIAL CARCINOMA UNDERGOING RADICAL CYSTECTOMY
Boyd Viers¹; Stephen Boorjian¹; Igor Frank¹; Robert Tarrell²; and Matthew Tollefson¹
¹Mayo Clinic Department of Urology, Rochester, MN; ²Mayo Clinic Department of Biostatistics, Rochester, MN
(Presented By: Boyd Viers)

Poster #10
UROTHELIAL CARCINOMA IN A BLADDER DIVERTICULUM: OUTCOMES AFTER RADICAL CYSTECTOMY
Brian Hu; Raj Satkunasivam; Jie Cai; Gus Miranda; and Siamak Daneshmand
University of Southern California Institute of Urology, Los Angeles CA
(Presented By: Brian Hu)

Poster #11
CHARACTERIZATION OF HYPOXIA SIGNALING IN BLADDER CANCER
Patrick Sweigert; Kimberly Foreman; and Gopal Gupta
Loyola University Chicago, Maywood, IL
(Presented By: Patrick Sweigert)

Poster #12
PERIOPERATIVE OUTCOMES AFTER RADICAL CYSTECTOMY AT NCI-DESIGNATED CENTERS: ARE THEY ANY BETTER?
Nawar Hanna¹; Giorgio Gandaglia¹; Maxine Sun¹; Toni K. Choueiri²; Jim C. Hu³; Pierre I. Karakiewicz¹; Simon P. Kim⁴; Ramdev Konijeti⁵; Francesco Montorsi⁶; Jesse D. Sammon⁷; Shyam Sukumar⁸; Paul L. Nguyen⁹; Steven L. Chang¹⁰; Mani Menon⁶; Adam S. Kibel¹¹; and Quoc-Dien Trinh²
¹Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, Canada; ²Department of Oncology, Dana-Farber Cancer Institute, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA; ³Department of Urology, University of California (UCLA), Los Angeles, CA, USA; ⁴Department of Urology, Yale School of Medicine, New Haven, CT, USA; ⁵Department of Urology, Vita Salute San Raffaele University, Milan, Italy; ⁶Vattikuti Urology Institute, Henry Ford Health System, Detroit, MI, USA; ⁷Department of Urology, University of Minnesota, Minneapolis, MN, USA; ⁸Department of Radiation Oncology, Dana-Farber Cancer Institute, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA
(Presented By: Nawar Hanna)

Poster #13
PHYSICAL ACTIVITY, OBESITY, AND BLADDER CANCER MORTALITY
Michael A. Liss; Martha White; Loki Natarajan; and J. Kellogg Parsons
UC San Diego, La Jolla, CA
(Presented By: Michael A. Liss)

Poster #14
CLINICAL T1 UROTHELIAL BLADDER CANCER: USC EXPERIENCE
Mehrdad Alemozaffar; Hooman Djaladat; Jie Cai; Gus Miranda; and Sia Daneshmand
USC, Los Angeles, CA
(Presented By: Mehrdad Alemozaffar)

Poster #15
IDENTIFYING INCIDENCE AND RISK FACTORS FOR VTE AMONG CYSTECTOMY PATIENTS FOR BLADDER CANCER
Josip Vukina; Abram McBride; Max McKbben; Jonathan Matthews; Raj Pruthi; Eric Wallen; Michael Woods; Matthew Nielsen; and Angela Smith
Chapel Hill, NC
(Presented By: Josip Vukina)
Poster #16
LONGER OPERATIVE TIMES PREDICT INCREASED LENGTH OF STAY FOLLOWING CYSTECTOMY FOR BLADDER CANCER
Abram McBride; Max McRibben; Josip Vukina; Jonathan Matthews; Raj Pruthi; Eric Wallen; Michael Woods; Matthew Nielsen; and Angela Smith
Chapel Hill, NC
(Presented By: Abram McBride)

Poster #17
PRESENCE OF VARIANT HYSTOLOGY AT TRANSURETHRAL RESECTION OF BLADDER TUMOR IS AN INDEPENDENT PREDICTOR OF POSITIVE LYMPH NODES AT CYSTECTOMY SPECIMEN IN PATIENTS UNDERGOING NEOADJUVANT CHEMOTHERAPY
Jose A. Pedrosa¹; Kevin R. Rice²; Timothy A. Masterson¹; Hristos Z. Kaimakliotis¹; M. Francesca Maonn¹; Noah M. Hahn¹; Thomas A. Gardner¹; Richard S. Foster¹; Richard Bihrle¹; K. Clint Cary¹; Liang Cheng¹; and Michael O. Koch¹
¹Indiana University, Indianapolis, IN; ²Walter Reed National Military Medical Center, Bethesda, MD
(Presented By: Jose A. Pedrosa)

Poster #18
MULTICENTER EVALUATION OF THE ROLE OF UROVYSION FISH ASSAY IN SURVEILLANCE OF PATIENTS WITH BLADDER CANCER: DOES FISH POSITIVITY ANTICIPATE RECURRENCE?
Casey Seideman¹; Daniel Canter²; Phillip Kim³; Billy Cordon³; Alon Weizer³; Irma Oliva³; Jianyu Rao³; Brant Inman²; Richmond Owusu³; Michael Posch¹; Harry Herr³; and Yair Lotan⁵
¹University of Texas Southwestern, Dallas, TX; ²Emory University, Atlanta GA; ³Memorial Sloan Kettering, New York, NY; ⁴University of Michigan, Ann Arbor MI; ⁵UCLA, Los Angeles, CA; ⁶Duke University, Durham NC
(Presented By: Yair Lotan)

Poster #19
INCORPORATION OF COMMON ILIAC NODES IN THE TNM DOES NOT ADD TO PROGNOSTIC STRATIFICATION OF POSITIVE LYMPH NODE PATIENTS AT TIME OF CYSTECTOMY
Jose A. Pedrosa¹; Kevin R. Rice²; Timothy A. Masterson¹; Hristos Z. Kaimakliotis¹; M. Francesca Monn¹; Thomas A. Gardner¹; Noah M. Hahn¹; Richard S. Foster¹; Richard Bihrle¹; K. Clint Cary¹; Michael O. Koch¹; and Liang Cheng¹
¹Indiana University, Indianapolis, IN; ²Walter Reed Military Medical Center, Bethesda, MD
(Presented By: Jose A. Pedrosa)

Poster #20
CLINICAL OUTCOME IN PATIENTS WITH T1 MICROPAPILLARY UROTHELIAL CARCINOMA OF THE BLADDER
Massimiliano Spaliviero; Guido Dalbagni; Bernard H. Bochner; Bing Ying Poon; Hongying Huang; Hilkmat A. Al-Ahmadie; Daniel D. Sjoberg; John P. Sfakianos; S. Machele Donat; Victor E. Reuter; and Harry W. Herr
Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Massimiliano Spaliviero)

Poster #21
SURGICAL QUALITY VARIABILITY, TIME TO RECURRENCE (TTR), AND OVERALL SURVIVAL (OS) FOLLOWING RADICAL CYSTECTOMY (RC) AND PELVIC LYMPH NODE DISSECTION (PLND) FOR BLADDER UROTHELIAL CARCINOMA (UCB)
Douglas A. Mata¹; Susan Groshen²; Donald G. Skinner³; Walter M. Stadler⁴; Richard J. Cote⁵; and Seth P. Lemmer⁶
¹Scott Department of Urology, Baylor College of Medicine, Houston, TX; ²USC/Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA; ³University of Southern California Keck School of Medicine, Los Angeles, CA; ⁴Section of Hematology/Oncology, University of Chicago Medicine, Chicago, IL; ⁵Department of Pathology, University of Miami Miller School of Medicine, Miami, FL; ⁶Department of Urology, Baylor College of Medicine, Houston, TX
(Presented By: Douglas A. Mata)
Poster #22
INTERIM RESULTS OF A PHASE 2 STUDY ADDING SORAFENIB TO NEOADJUVANT CISPLATIN AND GEMCITABINE (S-CG) FOR PATIENTS WITH MUSCLE-INVASIVE TRANSITIONAL CELL CARCINOMA OF THE BLADDER (NCT01222676)
Andrea Necchi; Patrizia Giannatempo; Luigi Mariani; Emanuela Fina; Marzia Pennati; Nadia Zaffaroni; Elena Farè; Nicola Nicolai; Luigi Piva; Davide Biasoni; Mario Catanzaro; Tullio Torelli; Silvia Stagni; Massimo Maffeazzini; Maurizio Colecchia; Biagio Paolini; Vera Cappelletti; Maria Grazia Daidone; Alessandro Gianni; and Roberto Salvioni
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy
(Presented By: Andrea Necchi)

Poster #23
THE CURATIVE POTENTIAL OF POST-CHEMOTHERAPY LYMPHADENECTOMY IN PATIENTS WITH UROTHELIAL CARCINOMA PRESENTING WITH NODAL METASTASES: ANALYSIS OF A SERIES FROM A TERTIARY CANCER CENTER
Andrea Necchi; Salvatore Lo Vullo; Patrizia Giannatempo; Elena Farè; Nicola Nicolai; Luigi Piva; Davide Biasoni; Tullio Torelli; Mario Catanzaro; Silvia Stagni; Alessandro Crestani; Maurizio Colecchia; Biagio Paolini; Alessandro Gianni; Luigi Mariani; Massimo Maffeazzini; and Roberto Salvioni
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy
(Presented By: Andrea Necchi)

Poster #24
IS AN EGFR 45-59 ML/MIN/1.73M2 A CONTRAINDICATION TO CONTINENT URINARY DIVERSION?
Manuel Eisenberg; R. Houston Thompson; Igor Frank; Dharam Kaushik; Robert Tarrell; Prabin Thapa; and Stephen Boorjian
Mayo Clinic, Rochester, MN
(Presented By: Manuel Eisenberg)

Poster #25
ENUMERATION AND MOLECULAR PROFILING OF CIRCULATING TUMOR CELLS (CTCS) IN UROTHELIAL CANCER (UC) BEFORE AND DURING SYSTEMIC TREATMENT
Emanuela Fina; Andrea Necchi; Chiara Iacona; Maurizio Colecchia; Patrizia Giannatempo; Daniele Raggi; Elena Farè; Nicola Nicolai; Roberto Salvioni; Alessandro Gianni; Filippo De Braud; Maria Grazia Daidone; and Vera Cappelletti
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy
(Presented By: Andrea Necchi)

Poster #27
THE IMPACT OF BODY MASS INDEX ON RENAL FUNCTIONAL OUTCOMES FOLLOWING MINIMALLY INVASIVE PARTIAL NEPHRECTOMY
Edris Negron; Kyle Richards; Joshua Cohn; Zoe Steinberg; Scott Eggener; and Arieh Shalhav
Department of Surgery, Section of Urology, University of Chicago Hospitals, Chicago, IL
(Presented By: Kyle Richards)

Poster #28
SURGEONS' PREFERENCES AND PRACTICE PATTERNS REGARDING INTRA-OPERATIVE FROZEN SECTION DURING PARTIAL NEPHRECTOMY
Abhinav Sidana; James Donovan; and Krishnanath Gaitonde
University of Cincinnati College of Medicine, Cincinnati, OH
(Presented By: Abhinav Sidana)

Poster #29
ASSESSMENT OF OUTCOMES IN PN INCORPORATING DETAILED FUNCTIONAL ANALYSIS
Tosio Takagi; Maria Mir; Rebecca Campbell; Nidhi Sharma; Erick Remer; Jianbo Li; Sevag Demirjian; Jihad Kaouk; and Steven Campbell
1Glickman Urological Kidney Institute, Cleveland Clinic, Cliveland, OH; 2Imaging Institute, Cleveland Clinic, Cliveland, OH; 3QuantitativeHealth Service, Cleveland Clinic, Cliveland, OH
(Presented By: Tosio Takagi)
Poster #30
ASSOCIATION OF PARTIAL NEPHRECTOMY AND PRESENCE OF ROBOTIC SURGERY FOR KIDNEY CANCER IN THE UNITED STATES
Steven V. Kardos¹; Brian Shuch¹; Peter G. Schulum¹; Quoc-Dien Trinh³; Maxine Sun³; Nathan D. Shippee⁴; Jesse Sammon³; and Simon P. Kim¹
¹Yale University, Department of Urology, New Haven, CT; ²Harvard Medical School, Brigham and Women’s Hospital, Division of Urology, Boston, MA; ³University of Montreal Health Center, Cancer Prognostics and Health Outcomes, Montreal, Canada; ⁴University of Minnesota, Division of Health Policy and Management, Minneapolis, MN; ⁵Henry Ford Hospital, Department of Urology, Detroit, MI
(Presented By: Steven V. Kardos)

Poster #31
SURGICAL OUTCOMES FOLLOWING NEOADJUVANT TARGETED MOLECULAR THERAPY FOR RENAL CELL CARCINOMA
Juan Jimenez; Amr Fergany; Michael Gong; Jihad Kaouk; Eric Klein; Venkatesh Krishnamurthi; John Rabets; Brian Rini; Robert Stein; Andrew Stephenson; and Steven Campbell
Cleveland Clinic, Cleveland OH
(Presented By: Juan Jimenez)

Poster #32
SURGICAL SALVAGE OF THERMAL ABLATION FAILURES FOR RCC
Juan Jimenez; Amr Fergany; Michael Gong; Jihad Kaouk; Robert Stein; Andrew Stephenson; and Steven Campbell
Cleveland Clinic, Cleveland OH
(Presented By: Juan Jimenez)

Poster #33
DIABETES MELLITUS IS ASSOCIATED WITH AN INCREASED RISK OF CANCER-SPECIFIC MORTALITY AMONG PATIENTS WITH CLEAR CELL RENAL CELL CARCINOMA UNDERGOING NEPHRECTOMY
Sarah Psutka¹; Suzanne Stewart¹; Christine Lohse³; Matthew Tollefson¹; Stephen Boorjian¹; John Cheville³; Bradley Leibovich¹; and R. Houston Thompson¹
¹Department of Urology, Mayo Clinic, Rochester, MN; ²Department of Statistics, Mayo Clinic, Rochester, MN; ³Department of Pathology, Mayo Clinic, Rochester, MN
(Presented By: Sarah Psutka)

Poster #34
UTILIZING PERCENTAGE OF SARCOMATOID DIFFERENTIATION AS A PROGNOSTIC FACTOR IN RENAL CELL CARCINOMA
Timothy Kim; Jasreman Dhillon; Hui-Yi Lin; Jinglin Yue; Mayer Fishman; Einar Sverrisson; Philippe E. Spiess; Shilpa Gupta; Julio M. Pow-Sang; Michael Poch; and Wade J. Sexton
Moffitt Cancer Center, Tampa, FL
(Presented By: Timothy Kim)

Poster #35
CELL CYCLE PROGRESSION SCORE PREDICTS METASTATIC PROGRESSION OF CLEAR CELL RENAL CELL CARCINOMA AFTER RESECTION
Eric Askeland¹; Vincent Chehval¹; Ryan Askeland²; Zaina Sangale³; Placede Gangnang Fosso³; Nafei Xu³; Saradha Rajamani³; Steve Stone³; and James Brown¹
¹Department of Urology, University of Iowa, Iowa City, IA; ²Department of Pathology, University of Iowa, Iowa City, IA; ³Myriad Genetics, Salt Lake City, UT
(Presented By: Vincent Chehval)

Poster #36
ASSOCIATION BETWEEN PATHOLOGIC FINDINGS SUSPICIOUS FOR HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER AND FUMARATE HYDRATASE MUTATIONS
Ryan Kopp; Kelly Stratton; Emily Glogowski; Kasmintan Schrader; Rohini Rau-Murthy; Paul Russo; Jonathan Coleman; and Kenneth Offit
Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Ryan Kopp)
Poster #37
A NOVEL IN SILICO HYPOTHESIS-GENERATING TECHNIQUE TO DISTINGUISH GENE EXPRESSION SIGNATURES OF CHROMOPHOBE RENAL CELL CARCINOMA AND ONCOCYTOMA
Michael Zilliox; and Gopal Gupta
Loyola University Chicago, Maywood, IL
(Presented By: Michael Zilliox)

Poster #38
UTILITY OF PERCUTANEOUS RENAL MASS BIOPSY (RMB) IN ASSESSING TUMOR GRADE IN PATIENTS UNDERGOING SUBSEQUENT TUMOR RESECTION
Serge Ginzburg¹; Robert Uzzo²; Brian Egleston²; Tahseen Al-Saleem²; Bart Milestone²; John Walton²; Daniel Canter¹; Jeffrey Tomaszewski²; Reza Mehrzad²; Marc Smaldone²; Rosalia Viterbo²; David Chen²; Richard Greenberg²; and Alexander Kutikov²
¹Albert Einstein Medical Center, Philadelphia, PA; ²Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Serge Ginzburg)

Poster #39
VOLUME PRESERVATION BETTER PREDICTS RENAL FUNCTIONAL OUTCOME THAN WARM ISCHEMIA TIME IN ROBOTIC PARTIAL NEPHRECTOMY
Timothy Durso¹; Adam Van Huis¹; David Surprenant¹; Patrick Sweigert¹; Helyn Alvarez¹; Jonathan Carnell²; Marcus Quek³; Robert Flanigan²; and Gopal Gupta²
¹Loyola University Chicago, Maywood, IL; ²Loyola University Medical Center, Maywood, IL
(Presented By: Timothy Durso)

Poster #40
TEMPORAL TRENDS AND FACTORS ASSOCIATED WITH RECEIPT OF SYSTEMIC THERAPY AMONG PATIENTS UNDERGOING CYTOREDUCTIVE NEPHRECTOMY
Marc Smaldone¹; Elizabeth Handorf¹; Simon Kim²; Robert Houston Thompson³; Brian Costello³; Anthony Corcoran³; Yu-Ning Wong¹; Robert Uzzo¹; Bradley Leibovich³; Alexander Kutikov¹; and Stephen Boorjian³
¹Fox Chase Cancer Center, Philadelphia, PA; ²Yale University, New Haven, CT; ³Mayo Clinic, Rochester, MN; ⁴State University of Stony Brook, Stony Brook, NY
(Presented By: Marc Smaldone)

Poster #41
PHYSICAL ACTIVITY DECREASES AND OBESITY INCREASES RISK OF KIDNEY CANCER MORTALITY
J. Kellogg Parsons¹; Martha White²; Michael A. Liss³; and Loki Natarajan⁴
¹UCSD, San Diego, CA.; ²UC San Digo, La Jolla, CA; ³UC San Diego, La Jolla, CA
(Presented By: J. Kellogg Parsons)

Poster #42
CLINICOPATHOLOGIC FEATURES OF RENOMEDULLARY INTERSTITIAL CELL TUMOR PRESENTING AS THE MAIN SOLID RENAL MASS
Wassim Bazzi¹; Hongying Huang²; Hikmat Al-Ahmadie³; and Paul Russo¹
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Albert Einstein College of Medicine, Bronx, NY
(Presented By: Wassim Bazzi)

Poster #43
IDENTIFYING INCIDENCE AND RISK FACTORS FOR VTE AMONG PARTIAL AND RADICAL NEPHRECTOMY PATIENTS FOR KIDNEY CANCER
Abram McBride; Max McKibben; Josip Vukina; Jonathan Matthews; Raj Pruthi; Mathew Raynor; Eric Wallen; Michael Woods; Matthew Nielsen; and Angela Smith
Chapel Hill, NC
(Presented By: Abram McBride)
**Poster Session I — Summary**

**Poster #44**  
**THE ASSOCIATION OF BASELINE HEALTH AND GENDER WITH SMALL RENAL MASS PATHOLOGY**  
Wassim Bazzi¹; Sheila Dejbakhsh²; and Paul Russo³  
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Columbia University Mailman School of Public Health, New York, NY  
(Presented By: Wassim Bazzi)

**Poster #45**  
**BAP1 SEQUENCING TO IDENTIFY CANCER SUSCEPTIBILITY IN FAMILIAL RENAL CELL CARCINOMA PATIENTS**  
Kelly Stratton; Shaheen Alane; Jason Littman; Kasimt Schrader; Ryan Kopp; Rohini Rau-Murthy; Kenneth Offit; and Vijai Joseph  
Memorial Sloan-Kettering Cancer Center, New York, NY  
(Presented By: Kelly Stratton)

**Poster #46**  
**RENAL CELL CARCINOMA AND NON-HODGKIN’S LYMPHOMA: GENOMIC APPROACHES TO IDENTIFICATION OF SHARED SUSCEPTIBILITY**  
Kelly Stratton¹; Kasimt Schrader¹; Christopher Manschreck¹; Rohini Rau-Murthy¹; Marina Corines¹; Janice Dutcher²; Peter Wiernik³; M. Lia Palomba¹; Carol Portlock¹; Rajmohan Murali¹; Robert Klein¹; Jonathan Coleman¹; Zsofia Stadler¹; Kenneth Offit¹; and Vijai Joseph¹  
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Cancer Research Foundation, Chappaqua, NY  
(Presented By: Kelly Stratton)

**Poster #47**  
**PLEURAL EFFUSION AS A PREDICTOR OF EARLY MORTALITY FOLLOWING CYTOREDUCTIVE NEPHRECTOMY (CN)**  
John Walton; Robert Uzzo; Anthony Corcoran; Elizabeth Handorf; Serge Ginzburg; Jeffrey Tomaszewski; Reza Mhrazin; David Chen; Rosalia Viterbo; Richard Greenberg; Marc Smaldone; and Alexander Kutikov  
Fox Chase Cancer Center, Philadelphia, PA  
(Presented By: John Walton)

**Poster #48**  
**GROWTH KINETICS OF BIOPSY PROVEN EARLY STAGE RENAL CELL CARCINOMA**  
Ashraf Almatar¹; Henry Ajzenberg¹; Tony Finelli¹; Andrew Evans²; and Michael Jewett¹  
¹Urology Oncology Division, Princess Margaret Cancer Centre, University Health Network, Toronto, Ontario, Canada; ²Laboratory Medicine Program, University Health Network, Toronto, Ontario, Canada  
(Presented By: Ashraf Almatar)

**Poster #49**  
**MULTICENTER RETROSPECTIVE EXPERIENCE IN THE SURGICAL MANAGEMENT OF ISOLATED NODAL RECURRENCES POST-NEPHRECTOMY IN PATIENTS WITH RENAL CELL CARCINOMA**  
Christopher M. Russell¹; David Buethe²; Michael Poch²; Thomas Schwaab³; Wassim Kassouf⁴; Simon Tanguay⁴; Armen G. Aprikian⁴; Wade J. Sexton⁵; and Philippe E. Spiess⁶  
¹USF Morsani College of Medicine, Tampa, FL; ²Moffitt Cancer Center, Tampa, FL; ³Roswell Park Cancer Institute, Buffalo, NY; ⁴McGill University, Montreal, Quebec, Canada  
(Presented By: Christopher M. Russell)

**Poster #50**  
**PERFORMANCE OF CT AND MRI FOR DISCRIMINATION OF THE PATHOLOGIC FEATURES OF SMALL RENAL MASSES**  
Michael Leapman¹; Karen Lee²; Manjil Chatterji³; Kristian Stensland³; Soo-Jeong Kim³; Ghalib Al-Jibara³; and Michael Palese⁴  
¹Mount Sinai Hospital, New York, NY; ²Department of Radiology, Mount Sinai Hospital, New York, NY; ³Department of Urology, Mount Sinai Medical Center, New York, NY; ⁴Department of Urology, Brookdale Medical Center, Brooklyn, NY  
(Presented By: Michael Leapman)

**Poster #51**  
**CLINICAL CHARACTERISTICS AND OUTCOMES OF ONCOCYTIC PAPILLARY RENAL CELL CARCINOMA**  
Michael Gorin; Mark Ball; Phillip Piorrozio; and Mohamad Aliaf  
The James Buchanan Brady Urological Institute and Department of Urology, The Johns Hopkins School of Medicine, Baltimore, MD  
(Presented By: Michael Gorin)
Poster #52
HYPERURICEMIA IS ASSOCIATED WITH DE NOVO CHRONIC KIDNEY DISEASE AFTER PARTIAL NEPHRECTOMY
Jason Woo; Hak Lee; Song Wang; Michael Liss; Nishant Patel; Ramzi Jabaji; Fuad Elkhoury; Michelle McDonald; Kerrin Palazzi; Reza Mehrzadeh; Anthony Patterson; and Ithaar Derweesh
1Department of Urology, University of California - San Diego, San Diego, CA; 2Department of Urology, University of Tennessee Health Science Center, Memphis, TN
(Presented By: Jason Woo)

Poster #53
CLINICOPATHOLOGIC OUTCOMES OF CYSTIC RENAL CELL CARCINOMA
Nicholas Donin; Sanjay Mohan; Hai Pham; Hersh Chandarana; Ankur Doshi; Michael Stifelman; Samir Taneja; and William Huang
1New York University School of Medicine, Department of Urology, New York, NY; 2New York University School of Medicine, Department of Radiology, New York, NY
(Presented By: Nicholas Donin)

Poster #54
CLINICOPATHOLOGIC CHARACTERISTICS, TREATMENT, AND OUTCOMES OF RENAL ONCOCYTOSIS
Nicholas Donin; Marc Bjurlin; Samir Taneja; Michael Stifelman; and Fang-Ming Deng
1New York University School of Medicine, Department of Urology, New York, NY; 2New York University School of Medicine, Department of Pathology, New York, NY
(Presented By: Nicholas Donin)

Poster #55
POSTOPERATIVE ELEVATION IN CREATININE KINASE DOES NOT IMPACT LONG-TERM RENAL FUNCTION IN PATIENTS UNDERGOING COMPLEX PARTIAL NEPHRECTOMY
Annerleim Walton-Diaz; Hong Truong; M. Minhaj Siddiqui; Gennady Bratslavsky; W. Marston Linehan; and Adam R. Metwalli
Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Annerleim Walton-Diaz)

Poster #56
THE NEWLY CHARACTERIZED ZONAL NEPHRO SCORING SYSTEM BEST PREDICTS MAJOR COMPLICATIONS AND TREATMENT FAILURES OF RENAL ABLATIVE THERAPIES
Sabine Nguyen; Patrick N. Espiritu; Wade J. Sexton; Jennifer Sweeney; Benjamin A. Biebel; Junsung Choi; and Philippe Spiess
H. Lee Moffitt Cancer Center Tampa, FL
(Presented By: Sabine Nguyen)

Poster #57
POORLY FUNCTIONING KIDNEYS RECOVER FROM ISCHEMIA DURING PARTIAL NEPHRECTOMY AS WELL AS STRONGLY FUNCTIONING KIDNEYS
Maria Carmen Mir; Toshio Takagi; Rebeca Campbell; Nidhi Sharma; Erick Remer; Jianbo Li; Sevag Demirjian; Jihad Kaouk; and Steven Campbell
Cleveland Clinic, Cleveland, OH
(Presented By: Maria Carmen Mir)

Poster #58
OBESITY AND INVASIVE PENILE CANCER
Kerri Barnes; Anna Button; Brian Smith; Charles Lynch; Bradley McDowell; and Amit Gupta
1University of Iowa Department of Urology, Iowa City, IA; 2University of Iowa Department of Biostatistics, Iowa City, IA; 3University of Iowa Department of Epidemiology, Iowa City, IA; 4University of Iowa Cancer Center, Iowa City, IA
(Presented By: Kerri Barnes)
Poster #59
TOO FRAIL FOR SURGERY? PREOPERATIVE PERCEPTIONS AND EXPECTATIONS OF SURGEONS AND PATIENTS
Daniel Canter¹; Louis Revenig²; Yuan Liu²; Sungjin Kim²; Kenneth Ogan²; and Viraj Master²
¹Einstein Health Network and the Urologic Institute of Southeastern Pennsylvania, Philadelphia, PA; ²Emory University, Atlanta, GA
(Presented By: Daniel Canter)

Poster #60
THE NATURAL HISTORY OF RENAL ANGIOMYOLIPOMAS
Nicole Kim¹; Jaimin Bhatt²; Antonio Finelli¹; Kartik Jhaveri¹; Andrew Evans¹; York Pei¹; Patrick Richard¹; Laura Legere¹; and Michael Jewett¹
¹UHN, Toronto, ON, Canada; ²University of Toronto, Toronto, ON, Canada
(Presented By: Jaimin Bhatt)

Poster #61
CAN PRE-OPERATIVE CT IDENTIFY POSITIVE LYMPH NODES IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA?
Alyssa Yee; John Sfakianos; Eugene Cha; Philip Kim; and Jonathan Coleman
Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: John Sfakianos)

Poster #62
EVALUATION OF THE PROGNOSTIC SIGNIFICANCE OF ALTERED MAMMALIAN TARGET OF RAPAMYCIN (MTOR) PATHWAY BIOMARKERS IN UPPER TRACT UROTHELIAL CARCINOMA (UTUC)
Aditya Bagrodia¹; Laura-Maria Krabbe¹; Bishoy Gayed¹; Payal Kapur¹; Ira Bernstein¹; Xian-Jin Xie¹; Christopher Wood²; Jose Karam³; Eiji Kikuchi³; Alon Weizer³; Jay Raman³; Mesut Remzi³; Charles Guo³; Nathalie Rioux-Leclercq⁴; Andrea Haite⁵; Marco Roscigno⁶; Francesco Montorsi⁷; Christian Bolenz⁸; Karim Bensalah⁹; Arthur Sagalowsky⁹; Shahrokh Shariat⁹; Yair Lotan⁹; and Vitaly Margulis¹
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(Presented By: Aditya Bagrodia)

Poster #63
ACTIVE SURVEILLANCE FOR LOW-RISK PROSTATE CANCER IN AFRICAN AMERICAN MEN: A MULTI-INSTITUTIONAL STUDY
Brian Odom¹; Maria Mir²; Scott Hughes³; Cedric Senechali³; Alexis Santy³; Remi Eyraud³; Andrew Stephenson³; Kelly Ylitalo⁴; and Ranko Micicinovic¹
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(Presented By: Brian Odom)

Poster #64
POTENTIAL OF IMPROVED DIAGNOSIS AND PROGNOSIS OF PROSTATE CANCER: MIRNA ANALYSIS OF TISSUE PRINTED TRUS BIOPSIES
Kai Hammerich¹; Christopher Lebeis²; John Humphrey²; Travis Sullivan²; Justin Zbrzezny²; Kelly Summerhayes-Greenfield²; Patrick Teebagya²; John Dugan²; John Libertino²; Antonio Holway²; and Kimberly Rieger-Christ²
¹Lahey Clinic Medical Center, Department of Urology, Burlington, MA; ²Lahey Clinic, Burlington, MA
(Presented By: Kai Hammerich)
**Poster #65**

**IMPACT OF PRIOR DOCETAXEL (D) ON SIPULEUCEL-T (SIP-T) PRODUCT PARAMETERS IN PROCEED PATIENTS (PTS)**
Celestia Higano¹; Andrew J. Armstrong²; Matthew R. Cooperberg³; Philip W. Kantoff⁴; James L. Bailen⁵; Raoul S. Concepcion⁶; Vahan Kassabian⁷; Shaker R. Dakhil⁸; Steven E. Finkelstein⁹; Jeffrey L. Vacirca¹⁰; Robert M. Rifkin¹¹; Andrew Sandler¹²; Candice McCoy¹³; James B. Whitmore¹⁴; Robert C. Tyler¹⁵; and Oliver Sartor¹³

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(Presented By: Celestia Higano)

**Poster #66**

**IMPROVEMENT IN CLINICAL TNM STAGING DOCUMENTATION WITHIN A PROSTATE CANCER QUALITY IMPROVEMENT COLLABORATIVE**
Christopher Filson¹; Brooke Boer²; Jon Curry²; Susan Linsell³; Zaojun Ye³; James Montie³; and David Miller³

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(Presented By: Christopher Filson)

**Poster #67**

**ONGOING GLEASON GRADE MIGRATION IN LOCALIZED PROSTATE CANCER AND IMPLICATIONS FOR USE OF ACTIVE SURVEILLANCE (2004-2010)**
Adam Weiner¹; Ruth Etzioni²; and Scott Eggener¹

¹Section of Urology University of Chicago Medical Center, Chicago, IL; ²Division of Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA

(Presented By: Adam Weiner)

**Poster #68**

**TRENDS IN THE INITIAL MANAGEMENT OF LOW-RISK PROSTATE CANCER IN THE UNITED STATES: A POPULATION-BASED ANALYSIS**
Adam Weiner¹; Ruth Etzioni²; and Scott Eggener¹

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(Presented By: Adam Weiner)

**Poster #69**

**THE FUTURE FACE OF PROSTATE CANCER IN THE US? DISPARITIES IN PRESENTING PROSTATE CANCER CHARACTERISTICS AMONG THE SOCIOECONOMICALLY DISADVANTAGED**
Joshua Gonzalez; Greg Gin; Kristian Stensland; Rajiv Jayadevan; Michael Leapman; Simon Hall; Alfred Winkler; and Hugh Lavery

Mount Sinai Hospital, New York, NY

(Presented By: Greg Gin)

**Poster #70**

**DEFINITION FOR BIOCHEMICAL SUCCESS FOLLOWING PRIMARY WHOLE GLAND PROSTATE CRYOABLATION**
David Levy¹; and Stephen Jones²

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(Presented By: David Levy)

**Poster #71**

**CHRONIC BASELINE PROSTATE INFLAMMATION IS ASSOCIATED WITH LOWER TUMOR VOLUME IN MEN WITH PROSTATE CANCER ON REPEAT BIOPSY: RESULTS FROM THE REDUCE STUDY**
Daniel Moreira¹; J. Curtis Nickel²; Leah Gerber³; Gerald Andriole⁴; Ramiro Castro-Santamaria⁵; and Stephen Freedland³

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(Presented By: Daniel Moreira)
Poster #72
LONG-TERM INCIDENCE OF HEMATURIA, URETHRAL STRICTURE, AND BLADDER CANCER FOLLOWING RADIATION THERAPY FOR PROSTATE CANCER
Alexander Kandabarow¹; Robert Blackwell¹; Matthew Harkenrider²; Gopal Gupta¹; Marcus Quek¹; and Robert Flanigan¹
¹Loyola University Medical Center, Department of Urology, Maywood, IL; ²Loyola University Medical Center, Department of Radiation Oncology, Maywood, IL
(Presented By: Alexander Kandabarow)

Poster #73
VARIATION IN USE OF ACTIVE SURVEILLANCE AMONG MEN UNDERGOING EXPECTANT MANAGEMENT FOR EARLY-STAGE PROSTATE CANCER
Christopher Filson¹; Florian Schroeck²; Zaojun Ye²; John Wei³; Brent Hollenbeck²; and David Miller²
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(Presented By: Christopher Filson)

Poster #74
ANALYTICAL VALIDATION OF THE ONCOTYPE DX PROSTATE CANCER ASSAY – A PROGNOSTIC MULTI-GENE RT-PCR TEST OPTIMIZED FOR NEEDLE BIOPSIES
Dejan Knezevic¹; Audrey Goddard¹; Nisha Natraj¹; Diana Cherbavaz¹; Kim Clark-Langone¹; Jay Snable¹; Drew Watson¹; Athanasios Tsiatis¹; Sara Falzarano²; Cristina Magi-Galluzzi²; Eric Klein²; and Christopher Quale¹
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(Presented By: Dejan Knezevic)

Poster #75
MAGNETIC RESONANCE IMAGING DETECTED PROSTATE EVASIVE ANTERIOR TUMORS: FURTHER INSIGHTS
Ghazi al Edwan¹; David Margel²; Massoom Haider³; Sangeet Ghai³; Antonio Finelli²; Robert Hamilton²; Girish Kulkarni²; Ants Toi³; and Neil Fleschner²
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(Presented By: Ghazi al Edwan)

Poster #76
ASSOCIATION OF MALE PATTERN BALDNESS AND RISK OF CANCER AND HIGH GRADE DISEASE AMONG MEN PRESENTING FOR PROSTATE BIOPSY
Ghazi al Edwan¹; Bimal Bhindi²; David Margel²; Karen Chadwick²; Antonio Finelli²; Alexander Zlotta²; John Trachtenberg J.²; and Neil Fleschner²
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(Presented By: Ghazi al Edwan)

Poster #77
ACTIVE SURVEILLANCE FOR LOW-RISK PROSTATE CANCER: UNIVERSITY OF MIAMI EXPERIENCE
Mark Soloway¹; and Viacheslav Iremashvili²
¹Department of Urology, University of Miami, Miami, FL; ²University of Miami, Miami, FL
(Presented By: Mark Soloway)

Poster #78
ANALYSIS OF INCIDENTAL PROSTATE CARCINOMA IN 1,106 PATIENTS UNDERGOING BPH SURGERY IN A DEVELOPING COUNTRY
Luiz Henrique Araujo; Gabriel Dos Anjos; Sabrina Thalita Dos Reis; Miguel Srougi; and Alberto Antunes
FMUSP-Sao Paulo-SP
(Presented By: Luiz Henrique Araujo)
Poster #79
THE PRESENCE OF HGPIN AND ASAP ON PROSTATE BIOPSY DOES NOT AFFECT PROSTATECTOMY OUTCOMES FOR PATIENTS OTHERWISE ELIGIBLE FOR ACTIVE SURVEILLANCE
Eugene Pietzak; Abdo Kabarriti; Phillip Mucksavage; Thomas Bavaria; Keith Van Arsdalen; Alan Wein; S. Bruce Malkowicz; and Thomas Guzzo
Hospital of University of Pennsylvania, Department of Surgery, Division of Urology, Philadelphia, PA
(Presented By: Eugene Pietzak)

Poster #80
SIGNIFICANCE OF PERCENTAGE GLEASON 4 IN PREDICTING ADVERSE PATHOLOGIC OUTCOMES: CAN WE EXPAND CURRENT CRITERIA FOR ACTIVE SURVEILLANCE?
M. Francesca Monn¹; K. Clint Cary¹; Hristos Z. Kaimakliotis¹; Liang Cheng²; and Michael O. Koch¹
¹Indiana University School of Medicine, Department of Urology, Indianapolis, IN; ²Indiana University School of Medicine, Department of Pathology, Indianapolis, IN
(Presented By: M. Francesca Monn)

Poster #81
ONE-STEP ULTRASOUND-BASED HIGH DOSE RATE (HDR) PROSTATE BRACHYTHERAPY WITH DOSE ESCALATION TO THE DOMINANT INTRA-PROSTATIC LESION
Juanita Crook; Ana Ots; Francois Bachand; Brent Parker; Matt Schmid; Deidre Batchelor; Michelle Hilts; and Cynthia Araujo
British Columbia Cancer Agency, Kelowna, British Columbia, Canada
(Presented By: Juanita Crook)

Poster #82
PROGNOSTIC UTILITY OF THE CELL CYCLE PROGRESSION (CCP) SCORE GENERATED FROM NEEDLE BIOPSY IN MEN TREATED WITH PROSTATECTOMY
Jay Bishoff; Stephen Freedland¹; Leah Gerber²; Pierre Tennstedt³; William Welbourn⁴; Julia Reid⁵; Markus Graefen⁶; Zaina Sangale⁷; Eliso Tikishvili⁷; Jimmy Park⁸; Adib Younus⁹; Alexander Guitin¹⁰; Jerry Lanchbury¹¹; Guido Sauter¹²; Michael Brawer¹³; Steven Stone¹⁴; and Thorsten Schlomm¹⁵
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(Presented By: Jay Bishoff)

Poster #83
SURGERY BY LOW-VOLUME SURGEONS MAY EXPLAIN RACIAL DISPARITY IN POSTOPERATIVE COMPLICATIONS FOR BLACK MEN UNDERGOING RADICAL PROSTATECTOMY
Ramdev Konijeti¹; Nedim Ruhotina¹; Stephen Reese¹; Benjamin Chung²; Adam Kibel¹; and Steven Chang¹
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(Presented By: Nedim Ruhotina)

Poster #84
THE BURDEN OF SKELETAL-RELATED EVENTS IN PROSTATE CANCER PATIENTS WITH BONE METASTASES
Nawar Hanna¹; Giorgio Gandaglia¹; Maxine Sun¹; Toni K. Choueiri²; Jim C. Hu³; Pierre I. Karakiewicz³; Simon P. Kim³; Ramdev Konijeti²; Francesco Montorsi²; Jesse D. Sammon²; Shyam Sukumar²; Paul L. Nguyen³; Steven L. Chang³; Mani Menon³; Adam S. Kibel¹; and Quoc-Dien Trinh³
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(Presented By: Nawar Hanna)
Poster #85
THE IMPACT OF ROBOTIC-ASSISTED RADICAL PROSTATECTOMY ON THE USE AND EXTENT OF PELVIC LYMPH NODE DISSECTION IN THE “POST-LEARNING CURVE” ERA
Giorgio Gandaglia; Nawar Hanna¹; Maxine Sun¹; Toni K. Choueiri²; Jim C. Hu³; Pierre I. Karakiewicz¹; Simon P. Kim⁴; Ramdev Konijeti⁵; Francesco Montorsi⁶; Meni Menon⁶; Jesse D. Sammon⁶; Shyam Sukumar⁶; Paul L. Nguyen⁷; Steven L. Chang²; Adam S. Kibel²; and Quoc-Dien Trinh²
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(Presented By: Giorgio Gandaglia)

Poster #86
SURVIVAL BENEFIT OF RADICAL PROSTATECTOMY IN PATIENTS WITH CLINICALLY ADVANCED PROSTATE CANCER: ESTIMATIONS OF THE NUMBER NEEDED TO TREAT BASED ON COMPETING-RISKS ANALYSIS
Giorgio Gandaglia; Nawar Hanna¹; Maxine Sun¹; Toni K. Choueiri²; Jim C. Hu³; Pierre I. Karakiewicz¹; Simon P. Kim⁴; Ramdev Konijeti⁵; Francesco Montorsi⁶; Meni Menon⁶; Jesse D. Sammon⁶; Shyam Sukumar⁶; Paul L. Nguyen⁷; Steven L. Chang²; Adam S. Kibel²; and Guoc-Dien Trinh²
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(Presented By: Giorgio Gandaglia)

Poster #87
INSTITUTIONAL MODIFICATION OF ANTIBIOTIC PROPHYLAXIS PROTOCOL REDUCES INFECTIOUS COMPLICATIONS FOLLOWING TRANSRECTAL ULTRASOUND GUIDED PROSTATE BIOPSY
Harras Zaid¹; Chad Ritch¹; Daniel Sun¹; Kirk Keegan¹; Jacob Ark¹; Roger Dmochowski¹; David Penson¹; Sam Chang¹; Daniel Barocas¹; and Michael Cookson³
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(Presented By: Harras Zaid)

Poster #88
IMAGING OF PROSTATIC ANATOMY IN PATIENTS WITH KNOWN PROSTATE CANCER USING MAGNETIC RESONANCE ELASTOGRAPHY: A FEASIBILITY STUDY
Daniel Yelfimov¹; Kevin Glaser²; Phillip Rossman²; Matthew Tollefson¹; and Lance Mynderse¹
¹Mayo Clinic, Department of Urology, Rochester, MN; ²Mayo Clinic, Department of Radiology, Rochester, MN
(Presented By: Daniel Yelfimov)

Poster #89
TRANSPERINEAL MAPPING TEMPLATE PROSTATE BIOPSY REDUCES THE LIKELIHOOD OF INTERVENTION IN ACTIVE SURVEILLANCE CANDIDATES
Brian M. Orr¹; John T. Wei²; Paul R. Womble³; Alon Z. Weizer³; Rohit Mehra³; Jeffrey S. Montgomery³; Scott A. Tomlins³; David C. Miller³; Lakshmi P. Kunju⁴; Brent K. Hollenbeck⁴; Ted A. Skolarus⁴; Cheryl T. Lee⁴; Ganesh S. Palapattu⁴; and Todd M. Morgan⁴
¹University of Michigan Medical School, Ann Arbor, MI; ²Department of Urology, University of Michigan, Ann Arbor, MI; ³Department of Pathology, University of Michigan, Ann Arbor, MI
(Presented By: Brian M. Orr)
Poster #90
ANDROGEN SIGNALING IN PROSTATE CANCER DISPARITIES BETWEEN AFRICAN AMERICAN AND CAUCASIAN AMERICAN POPULATION
Bi-Dar Wang; Qi Yang; Ceniccola Kristen; Alice Semerjian; Andrawis Ramez; Jarrett Thomas; Frazier Harold; Patierno Stephen; and Lee Norman
George Washington University, Washington, DC
(Presented By: Alice Semerjian)

Poster #91
IDENTIFICATION OF MEN WITH THE HIGHEST RISK OF EARLY DISEASE RECURRENCE AFTER RADICAL PROSTATECTOMY
Debasish Sundi; Vinson Wang; Phillip Pierorazio; Misop Han; Alan Partin; Phuoc Tran; Ashley Ross; and Trinity Bivalacqua
Johns Hopkins, Baltimore, MD
(Presented By: Debasish Sundi)

Poster #92
POPULATION-BASED COMPARISON OF ROBOTIC-ASSISTED VERSUS OPEN RADICAL PROSTATECTOMY SURGICAL MARGIN STATUS
Jim Hu¹; Giorgio Gandaglia²; Paul Nguyen³; Quoc-Dien Trinh⁴; Ya-Chen Tina Shih⁵; Firas Abdollah⁶; Karim Chamie⁷; Jonathan Wright⁸; Pierre Karakiewicz⁹; and Maxine Sun¹⁰
¹UCLA Dept of Urology, Los Angeles, CA; ²Cancer Prognostics Health Outcomes Unit, University of Montreal Health Centre, Montreal, Canada; ³Department of Radiation Oncology, Brigham and Women’s Hospital, Boston, USA; ⁴Center for Surgery and Public Health, Division of Urologic Surgery, Brigham and Women’s Hospital, Boston; ⁵Section of Hospital Medicine, Department of Medicine Program in the Economics of Cancer, University of Chicago, Chicago, IL; ⁶UCLA Department of Urology, Los Angeles, CA; ⁷Department of Urology, University of Washington School of Medicine, Seattle, WA; ⁸and Fred Hutchinson Cancer Research Center
(Presented By: Jim Hu)

Poster #93
LESS IS MORE: COMORBIDITY COUNT VS. CHARLSON SCORE TO PREDICT LONG-TERM, OTHER-CAUSE MORTALITY IN MEN WITH EARLY-STAGE PROSTATE CANCER
Timothy Daskivich¹; Lorna Kwan¹; Atreya Dash²; Sheldon Greenfield³; and Mark Litwin¹
¹Department of Urology, David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, CA; ²Department of Urology, University of California, Irvine, Irvine, California; ³Center for Health Policy Research and Department of Medicine, University of California, Irvine, Irvine, California
(Presented By: Timothy Daskivich)

Poster #94
TUMOR INFILTRATING B-CELLS ARE INCREASED IN PROSTATE CANCER TISSUE
Jason Woo; Michael Liss; Michelle Muldong; Amy Strasner; Ahmed Shabaik; Christopher Kane; and Christina Jamieson
Department of Urology, University of California - San Diego, San Diego, CA
(Presented By: Jason Woo)

Poster #95
APPLICATION OF THE 2013 AMERICAN UROLOGICAL ASSOCIATION EARLY DETECTION OF PROSTATE CANCER GUIDELINE: HOW MANY YOUNG MEN WILL WE MISS?
Gregory B. Auffenberg¹; and Joshua J. Meeks²
¹Northwestern University, Feinberg School of Medicine, Chicago, IL; ²Northwestern University, Chicago, IL
(Presented By: Gregory B. Auffenberg)

Poster #96
INITIAL EVALUATION OF THE ONCOTYPE DX PROSTATE GENOMIC PROSTATE SCORE FOR RISK STRATIFICATION IN PROSTATE CANCER PATIENTS CONSIDERED CANDIDATES FOR ACTIVE SURVEILANCE
Ganesh Kartha; Yaw Nyame; and Eric Klein
Cleveland Clinic, Cleveland OH
(Presented By: Ganesh Kartha)
Poster #97
IMPACT OF THE USPSTF 2012 PSA SCREENING STATEMENT ON TRUS BIOPSY FINDINGS ACROSS THE UNITED STATES
Tomy Perez¹; Rashed Ghandour¹; Jennifer Ahn¹; Edan Shapiro¹; Arindam RoyChoudhury¹; Michael Donovan²; and James McKiernan¹
¹Columbia University, New York, NY; ²Exosome Diagnostics, New York, NY
(Presented By: Tomy Perez)

Poster #98
PROSTATE CANCER AGGRESSIVENESS ON REPEAT BIOPSY: A COMPARISION BETWEEN MEN WITH NEGATIVE INITIAL BIOPSIES AND THOSE WITH HGPIN/ASAP
Ganesh Kartha; Ahmed El-Shafei; and J. Stephen Jones
Cleveland Clinic, Cleveland, OH
(Presented By: Ganesh Kartha)

Poster #99
PRESENTATION, EVALUATION AND TREATMENT OF LEYDIG CELL AND SERTOLI CELL TESTICULAR CANCER: AN ANALYSIS OF 192 PATIENTS FROM THE NATIONAL CANCER DATABASE
Harras Zaid¹; C.J. Stimson¹; Sam Kaffenberger¹; Sanjay Patel¹; Zachary Reardon¹; Daniel Barocas¹; Matthew Resnick¹; and Sam Chang¹
¹Vanderbilt University, Dept. of Urologic Surgery, Nashville, TN; ²University of Chicago, Dept. of Urologic Surgery, Chicago, IL
(Presented By: Harras Zaid)

Poster #100
IMPACT OF EARLY RE-OPERATIVE RETROPERINEAL LYMPH NODE DISSECTION (RPLND) IN GERM CELL TUMOR (GCT) PATIENTS CONSIDERED UNRESECTABLE AT INITIAL RESECTION
Jose A. Pedrosa¹; K. Clint Cary¹; Timothy A. Masterson¹; Kevin R. Rice²; Hristos Z. Kaimakliotis¹; Richard Bihrle¹; and Richard S. Foster¹
¹Indiana University, Indianapolis, IN; ²Walter Reed Military Medical Center, Bethesda, MD
(Presented By: Jose A. Pedrosa)

Poster #101
10-YEAR TRENDS IN POST-CHEMOTHERAPY RETROPERITONEAL LYMPH NODE DISSECTION COMPLICATIONS AND ADDITIONAL PROCEDURES
Clint Cary; Richard Bihrle; and Richard Foster
Indiana University Department of Urology, Indianapolis IN
(Presented By: Clint Cary)

Poster #178
SPOP MUTATIONS IN PROSTATE CANCER ACROSS ETHNICALLY AND GEOGRAPHICALLY DIVERSE PATIENT COHORTS
Mirjam Blattner¹; Daniel Lee¹; Catherine O’Reilly¹; Kyung Park¹; Theresa MacDonald¹; Francesca Khani¹; Kevin Turner¹; Peter Wild¹; Douglas Scherr¹; Ghil Suk Yoon³; Ove Andrén⁴; Juan Miguel Mosquera¹; Brian Robinson¹; Christopher Barbieri¹; and Mark Rubin¹
¹Weill Medical College of Cornell University and New York-Presbyterian Hospital, New York, NY; ²University Hospital Zurich, Zurich, Switzerland; ³Kyungpook National University School of Medicine, Daegu, Korea; ⁴Örebro University Hospital, Örebro, Sweden
(Presented By: Christopher Barbieri)

Poster #196
CONFIRMATION OF THE FREE HORMONE HYPOTHESIS: DECREASES IN PSA CORRELATE WITH FREE TESTOSTERONE RATHER THAN TOTAL TESTOSTERONE IN MEN WITH ADVANCED PROSTATE CANCER TREATED WITH GTX-758
Robert Getzenberg; Alvin Matsumoto¹; Christopher Coss²; Michael Hancock²; James Dalton²; and Mitchell Steiner²
¹Clinical Research Unit, V.A. Puget Sound Health Care System and University of Washington School of Medicine; ²GTx Inc, Memphis, TN
(Presented By: Robert Getzenberg)
Poster #1
INCIDENCE AND SIGNIFICANCE OF POSITIVE URETERAL MARGINS IN MICROPAPILLARY AND PLASMACYTOID VARIANT HISTOLOGY BLADDER CANCER
Hristos Kaimakliotis; Francesca Monn; Kevin Rice; Timothy Masterson; Thomas Gardner; Noah Hahn; Richard Foster; Richard Bihrle; Clint Cary; Liang Cheng; and Michael Koch
Indiana University School of Medicine, Indianapolis, IN
(Presented By: Hristos Kaimakliotis)

Introduction: Since the WHO introduced histologic variants for urothelial bladder cancer (UC) into its classification system in 2004, a body of literature has emerged evaluating the unique behaviors, treatment and outcomes of such variants. Examining differences in disease progression and nature of tumor invasion may lead to more accurate expectations of tumor behavior and improved management options for variant UC patients.

Methods: Using the Indiana University Bladder Cancer Database, we conducted a retrospective analysis of patients undergoing radical cystectomy for UC since 2008. Patients with positive ureteral margins (+UM) were identified. All patients were identified as micropapillary variant (MPV), plasmacytoid variant (PCV) or non-variant (NV) histology. Fisher’s exact and Student’s t-test were used for categorical and continuous variables respectively.

Results: 678 patients who underwent radical cystectomy for UC were identified, of which MPV and PCV were noted in 32 and 29 patients, respectively. 486 were NV histology. 32 patients from the full cohort had +UM on final pathology. Of patients with +UM, 5 were MPV, 9 PCV and 16 NV. Thus, the incidence +UM in NV histology patients was 3.3%, whereas among MPV patients it was 15.6% with an unadjusted relative risk (RR) of 4.6, and 31.0% in PCV patients with an unadjusted RR of 9.2 (p<0.001). Patients with MPV and PCV underwent an average of 2.4 intra-operative surgical margin resections for each ureter in an attempt to obtain frozen negative margins, versus 1.4 for NV cases (p=0.002). Carcinoma in-situ (CIS) on the endo-luminal ureteral margin was noted for all cases, except in 6 of the 9 PCV. These patients exhibited retrograde longitudinal invasion along the sub-serosal and adventitial ureteral tissues, which was difficult for pathology to identify on frozen section.

Conclusions: MPV and PCV comprise 4.7% and 4.3% of this cohort. The risk of developing +UM with either variant histology is significantly higher than among the NV cases. PCV exhibits a unique pattern of invasion along the ureter, which is contrary to the typical pattern of CIS or papillary transitional cell disease noted on the urothelial luminal aspect of the ureter. This finding proposes a new mode of invasion along the fascial sheath of the ureter in PCV and, in conjunction with the increased incidence of +UM, this may lead to a paradigm shift with surgeons and pathologists being more aware of the higher ureteral involvement.
Poster Session I – Full Abstracts

Poster #2
PLASMACYTOID VARIANT HISTOLOGY UROTHELIAL BLADDER CANCER: THE INDIANA UNIVERSITY EXPERIENCE
Hristos Kaimakliotis; M. Francesca Monn; Jose Pedrosa; Kevin Rice; Timothy Masterson; Thomas Gardner; Noah Hahn; Richard Foster; Richard Bihrle; Clint Cary; Liang Cheng; and Michael Koch
Indiana University School of Medicine, Indianapolis, IN
(Presented By: Hristos Kaimakliotis)

Introduction: Variant histology in urothelial bladder cancer is typically more aggressive, with worse outcomes compared to non-variant histology (NV). Bladder cancer variant literature is sparse, specifically regarding plasmacytoid variants (PCV). We sought to identify clinicopathologic findings in this subgroup of patients to delineate factors that may assist in determining prognosis and treatment plans.

Methods: Using the Indiana University Bladder Cancer Database, we conducted a retrospective analysis of all urothelial carcinoma patients since 2008. We specifically focused on comparing patients with any component of PCV urothelial carcinoma to patients with NV, as identified by cystectomy and TURBT specimens. Patients with other variant histology were excluded. Fisher’s exact test was used to assess significance between groups.

Results: Of 678 cystectomy specimens, 34 (5.0%) were identified with any degree of PCV, 29 with primary PCV, (>50% of total variant histology), and 5 with secondary or tertiary PCV. Pathologic outcomes were compared with NV (n=486) in Table below. Other variant histology patients were excluded (n=158). PCV had worse overall survival than NV (log rank p<0.001) with median survival of 19 months. Median survival was not reached for NV at 68 months. Among all cystectomy patients, T1 disease on TURBT was noted in 102 NV and 5 PCV patients. 80% of T1 PCV patients were upstaged to ≥pT3 on cystectomy, and 60% had lymph node involvement. This is in comparison to 20% of TURBT−T1 NV patients that were upstaged to ≥pT3 on cystectomy (p=0.009) and 17% of T1 NV with lymph node involvement at cystectomy (p=0.045).

Conclusions: PCV urothelial carcinoma is a particularly aggressive subset of bladder cancer compared to NV, as evidenced by the higher rate of lymph node involvement, positive surgical margins and pathologic staging at time of cystectomy. The significant upstaging of non-muscle invasive to invasive disease and higher lymph node involvement may in fact be evidence against differentiating between non-muscle and muscle invasive disease. Instead, any evidence of PCV histology during TURBT, regardless of stage, may warrant aggressive therapy.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Plasmacytoid UC (%)</th>
<th>Non-variant UC (%)</th>
<th>p &lt; 0.001</th>
</tr>
</thead>
<tbody>
<tr>
<td>pT0</td>
<td>0</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>pTis</td>
<td>0</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>pTa</td>
<td>0</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>pT1</td>
<td>2.9</td>
<td>16.1</td>
<td></td>
</tr>
<tr>
<td>pT2</td>
<td>20.6</td>
<td>27.2</td>
<td></td>
</tr>
<tr>
<td>pT3</td>
<td>35.3</td>
<td>21.6</td>
<td></td>
</tr>
<tr>
<td>pT4</td>
<td>41.2</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td>+ve LN</td>
<td>73.5</td>
<td>19.3</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>+ve Margins</td>
<td>41.2</td>
<td>9.9</td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>
Poster #3

GENDER DISPARITIES IN DIAGNOSIS OF BLADDER CANCER AFTER INITIAL PRESENTATION WITH HEMATURIA: A NATIONWIDE CLAIMS-BASED INVESTIGATION

Cohn Josh¹; Kyle Richards¹; Benjamin Vekhter²; Christopher Lyttle²; Gary Steinberg¹; and Michael Large¹

¹Department of Surgery, Section of Urology, University of Chicago Hospitals, Chicago, IL; ²Center for Health and Social Sciences, University of Chicago, Chicago, IL

(Presented By: Kyle Richards)

Introduction: Women have disproportionately higher mortality rates relative to incidence for bladder cancer. Multiple etiologies have been proposed, including delayed diagnosis and treatment. Guidelines recommend rule-out of malignancy in men and women presenting with hematuria. We aimed to determine the difference in timing from presentation with hematuria to diagnosis of bladder cancer in women versus men.

Methods: This is a retrospective population-based study examining the timing from presentation with hematuria to diagnosis of bladder cancer, based on data from the MarketScan databases, which include enrollees of more than 100 health insurance plans of approximately 40 large US employers from 2004 through 2010. All study patients presented with hematuria and were subsequently diagnosed with bladder cancer. The primary outcome measure was number of days between initial presentation with hematuria and diagnosis of bladder cancer by gender. Multivariable logistic regression analysis was performed to assess the impact of gender on odds of delay in bladder cancer diagnosis.

Results: 5416 men and 2233 women met inclusion criteria. Mean days from initial hematuria claim to bladder cancer claim was significantly longer in women (85.4 vs. 73.6 days, p<0.001), and the proportion of women with >6 month delays in bladder cancer diagnosis significantly higher (17.3% vs. 14.1%, p<0.001). Women were more likely to be diagnosed with urinary tract infection (33.1% vs. 17.6%, OR 2.32 [95% CI 2.07−2.59]) and less likely to undergo abdominal or pelvic imaging (73.1% vs. 77.3%, OR 0.80 [95% CI 0.71−0.89]). Female gender and urinary tract infection claim remained significant predictors of >3 month, >6 month, and >9 month delay between hematuria claim and bladder cancer diagnosis on multivariable regression analysis adjusted for age, UTI claim, number of hematuria visits, Charlson Co-morbidity Index, hematuria ICD-9 code, and year of diagnosis (see table).

Conclusions: Both men and women experience significant delays between presentation with hematuria and diagnosis of bladder cancer, with longer delays for women. This may be partly responsible for the gender-based discrepancy in outcomes associated with bladder cancer.

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR</th>
<th>95% CI</th>
<th>OR</th>
<th>95% CI</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.99</td>
<td>0.983−0.997</td>
<td>0.996</td>
<td>0.988−1.005</td>
<td>0.998</td>
<td>0.987−1.010</td>
</tr>
<tr>
<td>Female gender</td>
<td>1.26</td>
<td>1.12−1.42</td>
<td>1.16</td>
<td>1.00−1.33</td>
<td>1.23</td>
<td>1.02−1.48</td>
</tr>
<tr>
<td>UTI claim</td>
<td>1.97</td>
<td>1.74−2.22</td>
<td>1.92</td>
<td>1.66−2.11</td>
<td>1.79</td>
<td>1.49−2.16</td>
</tr>
<tr>
<td>No. hematuria visits</td>
<td>1.41</td>
<td>1.36−1.45</td>
<td>1.29</td>
<td>1.25−1.34</td>
<td>1.26</td>
<td>1.21−1.32</td>
</tr>
<tr>
<td>CCI</td>
<td>1.14</td>
<td>1.07−1.21</td>
<td>1.11</td>
<td>1.03−1.19</td>
<td>1.06</td>
<td>0.97−1.17</td>
</tr>
<tr>
<td>Hematuria ICD-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unspecified (ref)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gross</td>
<td>0.46</td>
<td>0.36−0.58</td>
<td>0.51</td>
<td>0.38−0.69</td>
<td>0.56</td>
<td>0.38−0.84</td>
</tr>
<tr>
<td>Microscopic</td>
<td>0.97</td>
<td>0.76−1.23</td>
<td>0.82</td>
<td>0.66−1.11</td>
<td>0.81</td>
<td>0.53−1.23</td>
</tr>
</tbody>
</table>
**Objective:** Health–related quality of life (HRQOL) for patients undergoing radical cystectomy (RC) and urinary diversion (UD) is poorly understood. Our aim was to prospectively assess the impact of RC and continent vs. incontinent urinary diversion on HRQOL.

**Methods:** Patients undergoing RC and UD for urothelial carcinoma by surgeon GDS or NDS had HRQOL assessment at baseline and follow–up using the validated FACT–Vanderbilt Cystectomy Index (FACT–VCI) questionnaire. The primary outcome was change in HRQOL between follow–up and baseline.

**Results:** From 9/15/2011 – 7/23/12, seventy–four patients enrolled. Median age was 68 (IQR 60–74), 78% (57/73) were Caucasian, 73% (53/73) were ≥cT2, 62% (45/73) underwent incontinent UD, and mean age–adjusted Charlson comorbidity index score was 2.4 ± 1.8 with no significant differences between participants (N=73) and non–participants (N=30). Median time from surgery to response was 175 days (IQR 101.5–232), and response rate was 68% with 9 deaths during follow–up. Baseline HRQOL scores did not significantly differ between respondents and non–respondents or between those living versus deceased. Overall, RC–specific, physical, social, and functional HRQOL scores did not differ from baseline to follow–up, while emotional HRQOL scores were significantly improved (15.7 ± 5.8 vs. 18.1 ± 3.9, p = 0.03). When stratified by type of UD, the results suggested no significant difference in overall or domain–specific HRQOL measures between patients undergoing incontinent (N=27) vs. continent (N=16) UD. On multivariate analysis including age, race, gender, marital status, age–adjusted Charlson comorbidity score, and UD type, only pathologic stage was significantly associated with adjusted overall HRQOL [β = −8.1, 95% CI (−14.2, −1.9), p=0.01].

**Conclusions:** Overall HRQOL scores did not statistically differ from baseline to median 6 month follow–up for patients undergoing RC and UD for urothelial carcinoma. Patients undergoing continent vs. incontinent UD had similar overall HRQOL scores at follow–up. Patient selection remains critical in choice of UD, and when patient selection and expectations are managed appropriately, HRQOL can be maintained.

**Table 1: Mean domain-specific HRQOL scores and adjusted (follow-up minus baseline) HRQOL scores by diversion type ± SD**

<table>
<thead>
<tr>
<th>Mean domain specific HRQOL scores by diversion type ± SD</th>
<th>Incontinent (N=27)</th>
<th>Continent (N=16)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystectomy-specific</td>
<td>41.5 ± 7.0</td>
<td>38.4 ± 10.1</td>
<td>0.24</td>
</tr>
<tr>
<td>Physical</td>
<td>22.2 ± 4.2</td>
<td>22.2 ± 4.2</td>
<td>1.00</td>
</tr>
<tr>
<td>Social</td>
<td>19.7 ± 5.1</td>
<td>20.9 ± 3.5</td>
<td>0.41</td>
</tr>
<tr>
<td>Emotional</td>
<td>17.8 ± 4.0</td>
<td>18.6 ± 3.7</td>
<td>0.90</td>
</tr>
<tr>
<td>Functional</td>
<td>18.2 ± 5.9</td>
<td>18.4 ± 4.5</td>
<td>0.88</td>
</tr>
<tr>
<td>Overall</td>
<td>119.4 ± 17.7</td>
<td>118.6 ± 19.6</td>
<td>0.88</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean overall baseline, follow-up, and adjusted HRQOL score by diversion type ± SD</th>
<th>Incontinent (N=27)</th>
<th>Continent (N=16)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Overall, Baseline</td>
<td>116.2 ± 19.6</td>
<td>124.5 ± 20.1</td>
<td>0.88</td>
</tr>
<tr>
<td>Mean Overall, Followup</td>
<td>119.4 ± 17.7</td>
<td>118.6 ± 19.6</td>
<td>0.19</td>
</tr>
<tr>
<td>Mean Overall Adjusted (Difference Followup-Baseline)</td>
<td>+3.2 ± 26.7</td>
<td>−5.9 ± 19.2</td>
<td>0.25</td>
</tr>
</tbody>
</table>
**Poster #5**

**SYNERGISM OF HISTONE DEACETYLASE INHIBITOR AR-42 AND CISPLATIN FOR BLADDER CANCER**

David Li; Hanwei Zhang; and Arnold Chin  
UCLA, Los Angeles, CA  
(Presented By: Arnold Chin)

**Introduction and Objectives:** Cisplatin−based chemotherapy remains the mainstay for high risk or metastatic urothelial carcinoma. Limitations include response rates of 40 to 60% and nephrotoxicity, with no standard of care second−line chemotherapy. Histone acetylation and deacetylation play a critical role in gene regulation modified by the enzymes histone acetyltransferase and histone deacetylase (HDAC). HDAC inhibitors, which induce epigenetic changes through modification of both histone and non−histone proteins, have emerged as a novel class of cancer therapeutics.

**Methods:** We investigate the efficacy of a novel broad specificity HDAC inhibitor AR−42 in bladder cancer cell lines in vitro and in vivo.

**Results:** We show that the combination of cisplatin and AR−42 synergistically kills multiple bladder cancer cell lines in vitro by apoptosis, with synergy even in the subset of CD44+CD49f+ cells expressing stem cell markers. This is supported by the in vivo combination of cisplatin and AR−42 in subcutaneous tumors derived from either total SW780 cells or SW780 cells fractionated to a CD44+CD49f+ subpopulation.

**Conclusions:** HDAC inhibition represents a novel class of therapeutics that may synergize with cisplatin−based chemotherapy for bladder cancer.

**Poster #6**

**A CRITICAL ANALYSIS OF THE INFLUENCE OF GENDER ON BLADDER CANCER OUTCOMES FOLLOWING RADICAL CYSTECTOMY**

Anirban Mitra¹; Eila Skinner²; Anne Schuckman¹; David Quinn¹; Tanya Dorff¹; and Siamak Daneshmand¹  
¹University of Southern California, Los Angeles, CA; ²Stanford University, Stanford, CA  
(Presented By: Anirban Mitra)

**Introduction:** Prior studies have reported that females experience worse outcomes following radical cystectomy for urothelial carcinoma of the bladder (UCB). However, the oncological basis behind this behavior is unclear. This study used a case−control approach to examine the impact of gender on prognosis following cystectomy for UCB.

**Methods:** A review of 2,567 patients who underwent radical cystectomy for UCB at USC was conducted. Female UCB patients were matched 1:1 for demographic, tumor and treatment characteristics with their male UCB counterparts. Tumor characteristics and outcomes of female patients were also compared to an unmatched independent male UCB cohort.

**Results:** A total of 414 female UCB cases were identified and matched 1:1 to 414 male UCB controls (median follow−up, 9.6 years). Cases were matched perfectly with controls for tumor and nodal stages, and lymphovascular invasion status (all, p=1.0). The subgroups were also nearly identical for surgical margin status (p=0.61), age (p=0.94), prior intravesical treatment (p=1.0), and neoadjuvant (p=0.64) and adjuvant chemotherapy (p=0.96) administration. Cases were also balanced with controls for tumor grade, p53 status, nodal yield, ASA score, presence of hydronephrosis, and time durations to diagnosis and cystectomy (p=0.14). When thus balanced for presentation, tumor and treatment characteristics, no differences in recurrence−free (RFS, p=0.45), cancer−specific (CSS, p=0.34) and overall survival (OS, p=0.71) were noted between the genders. Female UCB cases were then compared to an unmatched independent cohort of 1,166 male UCB patients (median follow−up, 13.5 years). In this comparison, female gender was associated with worse RFS (p=0.004), CSS (p=0.001) and OS (p=0.006). When characteristics were compared between these subgroups, greater proportion of females was observed to present with ≥pT3 tumors than males (41% versus 33.7%, p=0.001). A greater proportion of females also had node−positive disease (25.6% versus 20.9%, p=0.049), and did not receive intravesical therapy prior to cystectomy (74.6% versus 69%, p=0.032) than males. However, time to presentation and cystectomy did not differ significantly between genders.

**Conclusions:** Females have similar UCB outcomes to males when matched for demographic, clinicopathological and management characteristics. However, they present with more advanced tumors, thus probably explaining the general observation of poor outcomes.
OUTCOMES FOLLOWING UROTHELIAL RECURRENCE IN BLADDER CANCER PATIENTS UNDERGOING RADICAL CYSTECTOMY
Anirban Mitra¹; Mehrdad Alemozaffar¹; Brianna Harris¹; Anne Schuckman¹; Gus Miranda¹; Eila Skinner²; and Siamak Daneshmand¹
¹University of Southern California, Los Angeles, CA; ²Stanford University, Stanford, CA
(Presented By: Anirban Mitra)

Introduction: Radical cystectomy offers excellent local control for invasive urothelial carcinoma of the bladder (UCB), however, the prognosis following recurrence is poor. Urothelial disease recurrence may represent a true relapse of the original cancer, or a second malignancy arising from an altered urothelium. This study was designed to examine the course following urothelial recurrence of UCB in patients who previously underwent radical cystectomy.

Methods: A review of 2,029 patients who underwent radical cystectomy for UCB at USC from 1971−2005 was performed to identify those who recurred in the upper tract or urethra, with minimum 2−year post−recurrence follow−up if alive. Patients with urethral or upper tract primaries were excluded. Associations with post−recurrence disease−specific (PRDSS) and overall (PROS) survivals were analyzed.

Results: 80 patients (74 males) experienced urothelial recurrence after cystectomy (median follow−up, 12 years). 25 and 55 patients recurred in the upper tract and urethra, respectively, with time to recurrence comparable between the groups (medians, 28.2 vs. 25.3 months, p=0.87). 32 (40%) recurrences occurred within the first 2 years post−cystectomy, while 21 (26.3%) patients recurred after ≥4 years. Median post−recurrence follow−up was 37.7 months. 32 (40%) patients presented at follow−up with urethral discharge, meatal itching or gross hematuria. 24 (96%) patients with upper tract recurrence subsequently underwent nephroureterectomy, of which 11 (45.8%) died of UCB. 49 (89.1%) patients with urethral recurrence underwent urethrectomy, of which 28 (57.1%) succumbed to UCB. Median PRDSS and PROS were 58.4 and 48.7 months, respectively. Younger patients, and those with tumors that were not upstaged at cystectomy and negative surgical margins had higher PROS probabilities (p=0.018, 0.049 and 0.022, respectively). Patients who recurred >2 years after cystectomy also had higher PRDSS and PROS probabilities (p=0.002 and 0.003), which was confirmed by multivariable analysis. Site of urothelial recurrence did not impact PRDSS (p=0.72) and PROS (p=0.57).

Conclusions: UCB patients who recur in the urothelium >2 years after cystectomy and undergo urethrectomy or nephroureterectomy have improved post−recurrence outcomes. Prognosis of patients who recur in the urethra and upper tract are comparable, and surgical intervention for such recurrence can potentially prolong survival.
CAN MUSCLE-INVASIVE BLADDER CANCER BE PREDICTED IN PATIENTS WITH CLINICAL T1 DISEASE?
Itay Sternberg¹; Lauren Baldinger²; Roy Mano¹; Benjamin Katz³; Bing Ying Poon¹; Harry Herr¹; Bernard Bochner¹; and Guido Dalbagni¹
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²Albert Einstein, Philadelphia, PA; ³Beth Israel Medical Center, New York, NY
(Presented By: Itay Sternberg)

Introduction and Objectives: Up to 25% of patients with clinical T1 (cT1) bladder cancer harbor muscle-invasive disease (MIBC), and thus would be undertreated if a bladder preserving approach is elected. Our objective is to explore the ability to predict MIBC in patients with cT1 bladder cancer.

Methods: The charts of 1088 patients treated for cT1 after a restaging transurethral resection (re-TUR) performed within 3 months of the first TUR were reviewed. Of these, 223 underwent an immediate radical cystectomy (IRC), defined as cystectomy within 3 months of the re-TUR. Two patients were excluded for receiving BCG before IRC. None got neoadjuvant chemotherapy. We tested the ability of re-TUR parameters to predict MIBC at IRC. Univariate logistic regression analysis was used to evaluate the potential of each of our variables individually including the presence or absence of a palpable tumor on bimanual examination, location of tumors, number of tumors, complete resection during re-TUR, pathologic stage at re-TUR and the presence of muscle in the re-TUR specimen. Variables that were found to be promising were added to a multivariable logistic regression model.

Results: Of 221 patients, 75 (34%) had MIBC at IRC. On univariate logistic regression analysis the re-TUR variables that were promising predictors of MIBC, and included in the multivariable analysis, were pathologic stage, presence of muscularis propria, complete resection and tumor size. Ability to achieve a complete resection during re-TUR was the only variable that remained significant in the multivariable model. The odds ratios, 95% confidence intervals and p-values for the variables included in the multivariable model are presented in Table 1. The AUC for the multivariable model was 0.645 after correction with 10-fold cross validation.

Conclusions: Patients with residual T1 disease, patients with absent muscle, patients with large tumors and patients in which complete resection is not possible during a re-TUR are at an increased risk for harboring unrecognized MIBC and should be counseled to consider IRC. These data should be viewed with caution due to the retrospective nature of the study and inherent selection bias.

<table>
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<th>p-value</th>
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Poster #9
PRETREATMENT NEUTROPHIL-TO-LYMPHOCYTE RATIO IS AN INDEPENDENT PREDICTOR OF CANCER-SPECIFIC AND OVERALL SURVIVAL IN PATIENTS WITH UROTHELIAL CARCINOMA UNDERGOING RADICAL CYSTECTOMY
Boyd Viers¹; Stephen Boorjian¹; Igor Frank¹; Robert Tarrell²; and Matthew Tollefson¹
¹Mayo Clinic Department of Urology, Rochester, MN; ²Mayo Clinic Department of Biostatistics, Rochester, MN
(Presented By: Boyd Viers)

Introduction and Objectives: Pretreatment neutrophil lymphocyte ratio (NLR) is a marker of systemic inflammation that has been associated with adverse oncologic outcomes in a variety of malignancies. Herein, we evaluated the association of preoperative NLR with survival for patients with urothelial carcinoma of the bladder undergoing radical cystectomy (RC).

Methods: We identified 912 patients who underwent RC without neoadjuvant chemotherapy at our institution between 1994−2005. Preoperative NLR (within 90 days prior to RC) was recorded, and its association with outcome was analyzed using the established NLR cut point of 2.5. Cancer−specific (CSS) and overall survival (OS) were estimated using the Kaplan−Meier method and compared using the log rank test. Multivariate Cox proportional hazard regression models were used to analyze the association of NLR with outcome, controlling for clinicopathologic variables.

Results: At a median follow up 10.9 years, 323 patients experienced disease recurrence and 624 had died, with 348 dying from bladder cancer. Five and 10−year OS was 59% and 43%, respectively, for patients with NLR < 2.5 versus 47% and 30% for patients with NLR ≥ 2.5 (p<0.001). Similarly, CSS at 5 and 10 years was 69% and 63% for those with NLR < 2.5 versus 60% and 53% for patients with NLR ≥ 2.5 (p=0.001). On multivariate analysis controlling for age, pathologic tumor and nodal stage, ECOG performance status, and lymphovascular invasion, NLR ≥ 2.5 was associated with an increased risk of death from bladder cancer (HR 1.35; p=0.01) as well as all−cause mortality (HR 1.41; p<0.0001).

Conclusions: We found that NLR is independently associated with cancer−specific and all−cause mortality among patients undergoing RC for bladder cancer. Pending validation, these results suggest that serum NLR may be useful in preoperative patient risk stratification, including consideration for neoadjuvant chemotherapy and clinical trial enrollment.

Poster #10
UROTHELIAL CARCINOMA IN A BLADDER DIVERTICULUM: OUTCOMES AFTER RADICAL CYSTECTOMY
Brian Hu; Raj Satkunasivam; Jie Cai; Gus Miranda; and Siamak Daneshmand
University of Southern California Institute of Urology, Los Angeles CA
(Presented By: Brian Hu)

Introduction and Objectives: Management of urothelial carcinoma (UC) in a bladder diverticulum is challenging, particularly for the delivery of local treatments. The indications for radical cystectomy in these patients, given concern for earlier spread of disease, are often controversial.

Methods: We reviewed our Institutional Review Board−approved database including all patients who underwent radical cystectomy for curative intent for UC from 1971−2009. Clinical and pathologic data were obtained. The presence of bladder diverticula was determined by pathologic reporting. Patients with UC in a diverticulum were compared with patients without diverticula. Kaplan−Meier curves estimated recurrence−free survival (RFS) and overall survival (OS) stratified by clinically organ−confined (≤T2) or extravesical (>T2) disease. Multivariable Cox regression (including tumor grade, pathologic T stage, pathologic N stage, age, soft tissue margin status, and chemotherapy status) was performed to evaluate associations between UC in a diverticulum and survival.

Results: A total of 2045 patients underwent radical cystectomy and 1991 met inclusion criteria. UC in a diverticulum was seen in 77 (4%) patients, occurring exclusively in men with a mean age of 68 (±6.5). UC in a diverticulum represented the highest pathologic stage in 44 (57%) patients. Clinical to pathologic upstaging was seen in 48% of cases with UC in a diverticulum compared with 39% in cases without diverticula (p=0.031). On univariate analysis, there was no difference in RFS or OS comparing patients with UC in diverticula versus those without diverticula. This was true for both organ−confined and extravesical disease. On multivariable analysis, there was no difference in RFS (HR 0.92, 95% CI 0.59−1.42, p=0.69) or OS (HR 0.98, 95% CI 0.74−1.31, p=0.92) comparing patients with or without UC in diverticula. A subset univariate analysis of the 44 patients with the highest pathologic stage UC in the diverticulum demonstrated worse RFS (p=0.042) and OS (p=0.048) in those with extravesical disease compared with patients with extravesical disease and no diverticula. There was no difference in RFS or OS on multivariable analysis in this subset.

Conclusion: Upstaging was significantly more common in patients with UC in a bladder diverticulum, seen in almost half of patients. There was no difference in RFS or OS after radical cystectomy when comparing patients with or without UC in a diverticulum.
Poster #11
CHARACTERIZATION OF HYPOXIA SIGNALING IN BLADDER CANCER
Patrick Sweigert; Kimberly Foreman; and Gopal Gupta
Loyola University Chicago, Maywood, IL
(Presented By: Patrick Sweigert)

Introduction and Objectives: Hypoxia is a common feature of solid tumors and can induce a cascade of tumor glycolysis, angiogenesis and other cell survival responses by activating transcription through hypoxia inducible factors (HIFs). HIFs are transcription factors that are constitutively expressed and tightly regulated in an oxygen dependent manner. Under normoxic conditions, HIFα is rapidly ubiquitinated and targeted for destruction by the proteasome. Yet, under hypoxic conditions, HIFα is stabilized and translocates to the nucleus where it promotes transcription of various genes required for angiogenesis (VEGF), glucose transport (Glut1), glycolysis (lactate dehydrogenase) and erythropoiesis (erythropoietin). Previous reports suggest HIFα is aberrantly expressed in bladder cancers even under physiologic oxygen concentrations. Aberrant hypoxia signaling is considered a significant tumor-promoting event, and we examined HIFα expression and hypoxia signaling in a panel of bladder cancer cell lines ranging from superficial to invasive disease.

Methods: RT4, SW780, HT1376, J82, UMUC3 and T24 bladder cancer cell lines were cultured under standard, normoxic conditions. Western blot was performed using nuclear protein extracts and antibodies directed against HIF1α and HIF2α. HIF-1α transcriptional activity was assessed using an ELISA that measures binding of HIF to an oligonucleotide containing a hypoxia response element (HRE) oligonucleotide sequence. VEGF secretion was measured in cell culture media using an ELISA, with colorimetric absorbance values normalized to cell count.

Results: HIF1α and HIF2α protein expression was readily detectable in bladder cancer cell lines, but not normal cultured urothelial cells as determined by Western blot. HIF transcriptional activity was demonstrated through binding of HIF to a HRE that could be blocked by competitive binding of a specific oligonucleotide. The results were confirmed as VEGF, a downstream target of HIF signaling, was detected in the media of bladder cancer cell lines.

Conclusions: Identification of transcriptionally active HIFα in bladder cancer cell lines cultured in normoxia, but not normal urothelial cells, provides evidence for aberrant hypoxia signaling in bladder cancer. Development of novel therapeutics targeting hypoxia signaling may be of therapeutic benefit patients to patients with advanced bladder cancer.

Poster #12
PERIOPERATIVE OUTCOMES AFTER RADICAL CYSTECTOMY AT NCI-DESIGNATED CENTERS: ARE THEY ANY BETTER?
Nawar Hanna¹; Giorgio Gandaglia²; Maxine Sun¹; Toni K. Choueiri³; Jim C. Hu¹; Pierre I. Karakiewicz¹; Simon P. Kim⁴; Ramdev Konijeti⁵; Francesco Montorsi⁶; Jesse D. Sammon⁶; Shyam Sukumar⁷; Paul L. Nguyen⁸; Steven L. Chang²; Mani Menon⁶; Adam S. Kibel²; and Quoc-Dien Trinh²
¹Cancer Prognostics and Health Outcomes Unit, University of Montreal Health Center, Montreal, Canada; ²Department of Oncology, Dana-Farber Cancer Institute, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA; ³Department of Urology, University of California (UCLA), Los Angeles, CA, USA; ⁴Department of Urology, Yale School of Medicine, New Haven, CT, USA; ⁵Department of Urology, Vita Salute San Raffaele University, Milan, Italy; ⁶Vattikuti Urology Institute, Henry Ford Health System, Detroit, MI, USA; ⁷Department of Urology, University of Minnesota, Minneapolis, MN, USA; ⁸Department of Radiation Oncology, Dana-Farber Cancer Institute, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA
(Presented By: Nawar Hanna)

Objective: In 1971, the National Cancer Institute (NCI) introduced a network of NCI-designated Cancer Centers (CC), which underwent a comprehensive approval process relying on research, education and prevention activities. In this study, we examine the effect of CC status on perioperative outcomes after radical cystectomy (RC).

Methods: Within the Nationwide Inpatient Sample, we focused on RC performed from 2006 to 2010. As all recognized CC were residency teaching institutions, we stratified according to teaching and CC-teaching status. The rates of in-hospital mortality, intra- and postoperative complications, prolonged length of hospital stay as well as blood transfusion were examined. Multivariable logistic regression analyses further adjusted for confounding factors.

Results: Overall, 22840 RC patients (5451 at non-teaching, 10857 at residency teaching, 6532 at CC-teaching institutions) were identified. Patients treated at residency teaching and CC-teaching institutions were younger, healthier and more likely to hold private insurance. In multivariable analyses, patients treated at residency and CC-teaching institution were less likely to experience postoperative complications (OR 0.73 and OR 0.66, respectively) and blood transfusions (OR 0.77 and OR 0.53, respectively) relative to patients treated at non-teaching institutions. In addition, CC patients were also less likely to experience in-hospital mortality (OR 0.61, all p<0.001) as compared to non-teaching institutions.

Conclusions: On average, patients treated at residency and CC-teaching institutions are less likely to experience unfavorable outcomes after RC. Moreover, patients treated at CC fared better than patients treated at residency teaching institutions. Our findings acknowledge the quality of RC care at accredited CC.
**Poster #13**  
**PHYSICAL ACTIVITY, OBESITY, AND BLADDER CANCER MORTALITY**  
Michael A. Liss; Martha White; Loki Natarajan; and J. Kellogg Parsons  
UC San Diego, La Jolla, CA  
(Presented By: Michael A. Liss)

**Introduction:** Physical activity and obesity are modifiable lifestyle factors that are potential therapeutic targets for bladder cancer prevention and control. However, there are limited data on physical activity, obesity, and bladder cancer mortality. Further analyses of these associations may identify novel prevention and treatment strategies for bladder cancer.

**Methods:** The National Health Information Survey (NHIS) is an annual representative cross-sectional household interview survey. We used baseline data from 1998 through 2004 linked to mortality data reporting deaths through 2006. The primary outcome variable was bladder cancer-specific mortality. The primary exposure variables were self-reported physical activity (dichotomized as “did no exercise” versus “light, moderate or vigorous exercise in >=10 minute-bouts”) and obesity as measured by body mass index (BMI). We utilized multivariable adjusted Cox proportional hazards regression models, with delayed entry to account for age at survey interview. Analyses were adjusted for the complex NHIS multistage sampling methodology using survey weights.

**Results:** Complete data were available on 222,163 participants, of whom 96,715 (48%) were men and 146,014 (73%) non-Hispanic Whites, and among whom we identified 83 bladder cancer-specific deaths. There were no associations of ethnicity (p=0.43) or gender (p=0.14) with bladder cancer mortality. In multivariate analyses, individuals who reported “any physical activity” were 53% less likely (adjusted hazards ratio (HRadj) 0.53; 95% CI 0.29 to 0.96; p-value = 0.038) to die of bladder cancer than non-exercisers. There were no significant differences in bladder cancer mortality for overweight (BMI 25.0 to 29.9 kg/m2, HRadj 1.06, 95% CI 0.55 to 2.04, p-value = 0.87) or obese (BMI >= 30 kg/m2, HRadj 0.61, 95% CI 0.33 to 1.12, p-value = 0.11) individuals compared to those of normal weight (BMI < 25 kg/m2). Compared to never smokers, former smokers were nearly three times as likely (HRadj 2.95, 95% CI 1.50 to 5.79; p-value<0.001) and current smokers over 4 times as likely (HRadj 4.24, 95% CI 1.86 to 9.65, p-value<0.001) to die of bladder cancer.

**Conclusions:** Physical activity decreases the risk of bladder cancer mortality. These studies suggest that exercise interventions may potentially prevent bladder cancer death.

**Poster #14**  
**CLINICAL T1 UROTHELIAL BLADDER CANCER: USC EXPERIENCE**  
Mehrdad Alemozaffar; Hooman Djaladat; Jie Cai; Gus Miranda; and Sia Daneshmand  
USC, Los Angeles, CA  
(Presented By: Mehrdad Alemozaffar)

**Introduction:** Patients with clinical T1 (cT1) bladder cancer present a dilemma regarding the decision to proceed with radical cystectomy (RC) or conservative therapy. We review outcomes of patients with cT1 bladder cancer who underwent RC.

**Methods:** A retrospective review of 1964 patients undergoing RC for bladder cancer at our institution from 1971-2008 revealed 442 patients with cT1 disease on last TURBT (excluding patients with any TURBT with clinical stage >T1 and patients receiving any neoadjuvant therapy) of whom 97 had muscle present on last TURBT.

**Results:** Of the 442 patients with cT1 disease, 260 (58.8%) remained <pT1, 124 (28.1%) were upstaged to >pT2, and 58 (13.1%) had positive lymph node (LN+) at RC; therefore, 182 (41.2%) had more extensive disease pathologically than documented clinically. LN+ patients were more likely than <pT1 or >pT2 to have LVI on TURBT (24.1% vs 11.5% vs 11.3%, p=0.029) and RC (67.2% vs 5.8% vs 36.3%, p<0.001). No clinical variables were associated with risk of upstaging to pT2 or LN+ disease on multivariate analysis (MVA). 5-yr recurrence-free survival (RFS) was 75.4% with MVA associating worse survival with >pT2 (HR=1.819, p=0.02), LN+ (HR=8.202, p<0.001), pathologic LVI (HR=2.022, p=0.002), multifocal disease (HR=1.306, p=0.001), and increasing number of TURBTs (HR=1.116, p=0.005). Limiting this cohort to patients with muscle present on last TURBT (N=97), following RC there were 65 (67%) remaining <pT1, 23 (23.7%) were upstaged to >pT2, and 9 (9.3%) were LN+. When limiting this cohort to patients with muscle present on last TURBT (N=97), following RC there were 65 (67%) remaining <pT1, 23 (23.7%) were upstaged to >pT2, and 9 (9.3%) were LN+; therefore, 31 (33%) had more extensive pathologic disease than thought clinically. Their 5-yr RFS was 81.4% with MVA associating worse survival with LN+ (HR=9.111, p=0.007) and increasing number of TURBTs (HR=1.108, p=0.028). Their 5-yr OS was 73.5% with MVA associating worse survival with LN+ (HR=7.976, p=0.004).

**Conclusion:** Patients with cT1 have a significant rate of upstaging to muscle-invasive or LN+ disease at cystectomy, even when muscle is present at last TURBT. Although the presence of LVI may be associated with more extensive disease favoring cystectomy over conservative management, there are no reliable clinical predictors available to determine upstaging to >pT1.
Poster #15
IDENTIFYING INCIDENCE AND RISK FACTORS FOR VTE AMONG CYSTECTOMY PATIENTS FOR BLADDER CANCER
Josip Vukina; Abram McBride; Max McKibben; Jonathan Matthews; Raj Pruthi; Eric Wallen; Michael Woods; Matthew Nielsen; and Angela Smith
Chapel Hill, NC
(Presented By: Josip Vukina)

Introduction and Objectives: Deep venous thrombosis (DVT) and pulmonary embolism (PE) constitute the continuum of venous thromboembolism (VTE), a potentially preventable disease that carries significant morbidity and mortality. The incidence of VTE among radical cystectomy patients for bladder cancer is among the highest of genitourinary oncology procedures, conferring a 5 times increased odds of VTE. Our objective was therefore to determine the rate of VTE among patients undergoing radical cystectomy for bladder cancer using a large national database and identify risk factors for VTE in this population.

Methods: Using the American College of Surgeons− National Surgical Quality Improvement Program (NSQIP), we performed a review of patients undergoing radical cystectomy for bladder cancer from 2005−2011. ACS−NSQIP collects prospective data on 135 variables, including peri−operative data, 30−day post−operative complications and mortality on major surgical procedures at over 450 participating academic and private institutions. The overall VTE rates for all groups were calculated and predictors of VTE were identified using multivariable logistic regression models.

Results: Of 878 total patients who underwent radical cystectomy, 50 (5.69%) experienced a VTE. The most common VTE was DVT (n=25, 50%) followed by PE (n=13, 26%) and DVT + PE (n=12, 24%). On multivariable analysis (shown below), when controlling for numerous covariates, increased operative time and history of one or more neurologic comorbidities (i.e. history of TIA, stroke, paraplegia) were associated with an increased risk of VTE (see table).

Conclusions: VTE risk is high among radical cystectomy patients with bladder cancer with increased risk noted in those patients with neurologic comorbidities and longer operative time.

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LONGER OPERATIVE TIMES PREDICT INCREASED LENGTH OF STAY FOLLOWING CYSTECTOMY FOR BLADDER CANCER

Abram McBride; Max McKibben; Josip Vukina; Jonathan Matthews; Raj Pruthi; Eric Wallen; Michael Woods; Matthew Nielsen; and Angela Smith
Chapel Hill, NC
(Presented By: Abram McBride)

Introduction and Objectives: Operative time can be a significant predictor of multiple perioperative outcomes, including complications and readmissions. However, little data exist regarding how operative times impact length of stay following cystectomy among patients with bladder cancer. Therefore, our objective was to determine the impact of longer operative times on subsequent length of stay (LOS) among patients undergoing radical cystectomy for bladder cancer using a large national, prospective database.

Methods: Using the American College of Surgeons–National Surgical Quality Improvement Program (NSQIP) database, we performed a review of patients undergoing radical cystectomy for bladder cancer from 2005–2011. ACS–NSQIP prospectively collects data on 135 variables, including pre-operative and 30-day post-operative data on major surgical procedures at over 450 participating academic and private institutions. The median operative time and LOS were calculated and predictors of length of stay were identified using a multivariable logistic regression model, with particular attention to LOS.

Results: Of 877 patients who underwent radical cystectomy, 76% were male, 92% Caucasian, and 73% with ASA 3 or above. Median operative time was 320 minutes (IQR 252–411) and length of stay 8 days (IQR 7–11). On multivariable analysis (shown below), when controlling for numerous covariates, operative time was a significant predictor for longer LOS among patients undergoing cystectomy (p<0.0001) with a one hour increase in operative time predicting a 1/2 day longer LOS. Other predictors of LOS included advanced age, partially dependent functional status, and pulmonary comorbidities (p<0.0001).

Conclusions: Longer operative times predict longer LOS among cystectomy patients, with each additional hour increased LOS by nearly a half–day. Further research to identify whether longer operative times with the robotic approach also predict longer LOS is warranted.

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<td>≥ 1 Pulmonary Comorbidity</td>
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Objective: The utilization of neoadjuvant chemotherapy (NeoCT) in the scenario of muscle invasive bladder cancer is supported by level one evidence. However, the consequence of this strategy relates to the potential over-treatment of patients with minimal disease and inappropriate treatment of chemorefractory disease. Our objective is to evaluate the association of preoperative variant histology with positive lymph nodes in patients who underwent NeoCT.

Methods: A retrospective review of the Indiana University Bladder Cancer database was performed between the years 1991 and 2013. Patients who underwent NeoCT followed by radical cystectomy (RC) were identified. The primary outcome of interest was pathologic lymph node positivity. Clinical N positive patients and patients with locally advanced disease were included if therapy was delivered with curative intent. The association of TURBT variants (sarcomatoid, plasmacytoid, micropapillary and nested) with the primary outcome was evaluated using Pearson chi-square methods and multivariable logistic regression.

Results: The final study cohort consisted of 140 patients who received NeoCT followed by RC. Median age was 63 years (IQR: 57–70), 79.3% were male and 95.0% Caucasian, 19.3% of patients were clinically N+ while 11.4% were clinical stage T3/4. The presence of sarcomatoid variant was identified in 4 (2.9%) patients, plasmacytoid in 5 (3.6%), micropapillary in 6 (4.3%), nested in 2 (1.4%) and mixed variant was identified in 2 (1.4%); totaling 19 (13.6%) patients. The incidence of lymph node positivity was 52.6% in patients with variant histology at TURBT compared to 24.0% of patients without variant histology at TURBT (p=0.002). When controlling for age, gender, cN+ and type of NeoCT (cisplatin based), patient who presented with variants histology at TURBT had a 3 fold increased odds having positive lymph nodes (CI 95% 1.017–8.972, p=0.047).

Conclusions: The presence of variant histology at TURBT is associated with increased odds of positive lymph nodes in patients undergoing NeoCT and RC. This patient population seemingly warrants aggressive therapy which may include earlier cystectomy. The chemosensitivity of variant histology needs further study.
Introduction: In the setting of surveillance cystoscopy without a visible tumor the significance of a positive FISH assay is unclear. Previous studies have speculated that a positive FISH assay “anticipates” future cancer recurrence. This is a multicenter study to determine if patients with a positive FISH assay are more likely to recur or progress than pts with a negative assay.

Methods: An IRB approved, multi-institutional, retrospective review was performed identifying pts followed for urothelial bladder carcinoma from 2005–2010. Patients with cystoscopic evidence of tumor or positive cytology were excluded. Pathology, follow-up cystoscopy, cytology, and FISH data were analyzed. Our primary endpoint was cancer recurrence, defined by biopsy. Progression was defined as recurrence with a muscle invasive diagnosis, or >T2.

Results: 664 patients were included for analysis. Mean age was 69.4 (range 23–95 yrs). Mean follow-up was 61.1 months (1-104 mos). Demographic and clinicopathologic data are outlined in Table 1. 277 (41.7%) recurred, at mean time of 15 mos. If FISH was positive and cytology was atypical, mean time to recurrence was 11.8 months vs 21.0 months for pts who were FISH negative, with normal cytology. Univariate analysis identified atypical cytology, positive FISH, cystoscopic findings, and previous intravesical therapy to be associated with recurrence (p< 0.05). No association was found between stage or grade and recurrence. On multivariate analysis T stage, cystoscopic findings and cytology were independently associated with recurrence (p<0.05). Progression to >T2 occurred in 34 (5.1%) pts. Univariate analysis identified FISH positivity, T stage, previous intravesical therapy and ethnicity as significant risk factors. On multivariate analysis, only T stage and FISH result were found to be independent predictors of recurrence (p<0.05).

Conclusions: Patients with positive FISH and atypical cytology are more likely to recur even in the absence of visible tumor. FISH positivity may portend a higher risk for progression. Patients with a positive FISH should undergo closer surveillance. These findings should be validated prospectively.
Poster Session I – Full Abstracts

Poster #19
INCORPORATION OF COMMON ILIAC NODES IN THE TNM DOES NOT ADD TO PROGNOSTIC STRATIFICATION OF POSITIVE LYMPH NODE PATIENTS AT TIME OF CYSTECTOMY
Jose A. Pedrosa¹; Kevin R. Rice²; Timothy A. Masterson¹; Hristos Z. Kaimakliotis¹; M. Francesca Monn¹; Thomas A. Gardner¹; Noah M. Hahn¹; Richard S. Foster¹; Richard Bihrle¹; K. Clint Cary¹; Michael O. Koch¹; and Liang Cheng¹
¹Indiana University, Indianapolis, IN; ²Walter Reed Military Medical Center, Bethesda, MD
(Presented By: Jose A. Pedrosa)

Objective: In the 7th edition of the TNM classification the N component was changed to incorporate the presence of regional involvement of the common iliac nodes as a new N3 category. Despite the association between higher level station and disease burden, the prognostic value of pure anatomical location is yet to be proven. Our aim in this study is to evaluate if the presence of positive lymph nodes (+LN) at the common iliac position portends a worse prognosis.

Methods: Review of the Indiana University Bladder Cancer Cystectomy Database was performed, assessing patients with +LN from 1999 to 2011. A total of 274 patients met the criteria (urothelial carcinoma and curative intent). Follow up data was obtained from the Indiana University Health Cancer Registry, which captures data from facilities through the regional area and Social security death index. Survival analysis utilizing the Kaplan Meier method and log-rank test to compare N stages was performed to characterize recurrence-free (RFS) and overall survival (OS). The median follow up was 55.3 months.

Results: The median age was 66 years old, 78.5% were male and 157 patients (57.3%) underwent an extended pelvic lymph node dissection (PLND). The median number of LNs removed was 18 (IQR: 12 to 27), +LNs was 3 (IQR: 1 to 6) and LN density was 0.16 (IQR: 0.07 to 0.35). According to the 2010 TNM classification, we found: 91 (33.2%) N1, 139 (50.7%) N2 and 44 (16.1%) N3 patients. The 5 year RFS was 46.1%, 22.4% and 39.4% for N1, and N2 and N3 stages, while the 5 year OS was 41.8%, 16.4% and 23.3%, respectively. Patients comprising the N1 survival curves were statistically different from N2 and N3, however, the same significance was not reached when comparing N2 vs. N3 categories (p=0.881; RFS and p=0.869; OS). Similar results were observed when evaluating only those patients with extended PLND. Patients with pathologic stage N1 were statistically different from N2 and N3 patients; there was no difference between N2 vs. N3 patients (p=0.866; RFS and p=0.481; OS).

Conclusion: Utilization of common iliac lymph node involvement to define a prognostic category was not associated with worse oncologic outcome in our series.
Poster #20
CLINICAL OUTCOME IN PATIENTS WITH T1 MICROPAPILLARY UROTHELIAL CARCINOMA OF THE BLADDER
Massimiliano Spaliviero; Guido Dalbagni; Bernard H. Bochner; Bing Ying Poon; Hongying Huang; Hilkmat A. Al-Ahmadie; Daniel D. Sjoberg; John P. Sfakianos; S. Machele Donat; Victor E. Reuter; and Harry W. Herr
Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Massimiliano Spaliviero)

Objective: To report cancer−specific outcomes in patients with non−muscle−invasive micropapillary urothelial carcinoma (UC).

Methods: Following Institutional Review Board approval, the records of 36 patients restaged within 3 months of initial clinical stage T1 (cT1) disease diagnosis were reviewed. Early cystectomy (within a 3−month landmark after restaging TURBT), or conservative management (intravesical Bacillus Calmette−Guérin, surveillance, or deferred cystectomy) was offered according to disease features at restaging TURBT (residual tumor volume, multifocality, presence of carcinoma in situ, lymphovascular invasion), surgical risk assessment, or patient′s preference.

Results: Kaplan−Meier methods and log rank test starting at the landmark time. At restaging, all patients had ≤cT1 disease. Fifteen (42%) patients underwent early cystectomy (group I); 21 (58%) were managed conservatively (group II). The micropapillary pattern (n = 32) was focal in 3 patients; moderate (10−50%) in 21; and extensive (>50%) in 8. Median follow−up time from landmark for cancer−specific and metastasis−free survivors was 3.1 (IQR 1.1, 5.9) years and 3.1 (IQR 1.8, 5.9) years, respectively. The 5−year cumulative incidence of cancer−specific mortality was 17% in group I and 25% in group II, with an absolute difference of 7.1% (95% Confidence Interval (CI): −26.4%, 40.6%; p = 0.8). The 5−year cumulative incidence of metastasis was 21% in group I and 34% in group II, with an absolute difference of 13% (95% CI: −23%, 49%; p = 0.9).

Conclusions: Using proper selection criteria, including patient and pathologic factors, certain cT1 micropapillary UC managed conservatively may have outcomes similar to patients undergoing early cystectomy.
Poster #21
SURGICAL QUALITY VARIABILITY, TIME TO RECURRENCE (TTR), AND OVERALL SURVIVAL (OS) FOLLOWING RADICAL CYSTECTOMY (RC) AND PELVIC LYMPH NODE DISSECTION (PLND) FOR BLADDER UROTHELIAL CARCINOMA (UCB)

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(Presented By: Douglas A. Mata)

Introduction: This study, originally conducted to evaluate the use of p53 as a biomarker, also provides an opportunity to examine variability in surgical quality measures such as PLND extent, number of LNs identified on pathology, and presacral LN dissection and their associations with TTR and OS.

Methods: Patients with pathologic organ−confined, node−negative (pT1/T2N0M0) UCB following RC and bilateral PLND with ≥15 LNs on pathology or a normal post−op abdominal/pelvic CT were eligible. PLND extent was defined as standard (below common iliac [CI] bifurcation) or extended (CI and above, including up to the inferior mesenteric artery).

Results: 499 patients from 39 sites in the U.S., Canada, and Europe were registered between 8/1997 and 1/2006. 440 pathology and 216 operative reports were reviewed for this analysis. Median LN number was 19 (interquartile range [IQR]: 12 – 35). Extended PLND was performed in 47% of patients, 69% of whom were from two U.S. sites. These sites had a higher median LN number: 42 vs. 20 for other U.S. sites, 13 for Europe, and 7 for Canada. 35% had <15 LNs and this was associated with PLND extent: 84% standard vs. 16% extended. Presacral LN dissection performed in 33% of patients was associated almost exclusively with extended PLND. 5−year TTR and OS probabilities were 0.78 (95% CI: 0.74 – 0.82) and 0.83 (0.79 – 0.87), respectively. In unadjusted univariate analysis, neither PLND extent nor LN number were associated with TTR or OS; however, presacral LN dissection was protective (Table). There was no association between PLND extent, LN number, or presacral LN dissection and TTR or OS after adjustment for age, year, gender, ethnicity, institution, or treatment arm and correction for multiple testing.

Conclusion: Despite entry criteria requiring bilateral PLND, many patients had suboptimal dissections per protocol. Extended PLND was associated with a higher LN number and with presacral LN dissection. There was no independent association of PLND extent, LN number, or presacral LN dissection with TTR or OS in this pathologic organ−confined UCB cohort. Two ongoing RCTs will contribute additional data on outcomes for non−organ confined and/or pathologic node positive UCB.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time to recurrence</th>
<th>Overall survival</th>
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<tbody>
<tr>
<td></td>
<td>HR (95% CI)</td>
<td>p</td>
</tr>
<tr>
<td>PLND extent (EXT vs. STD)</td>
<td>0.83 (0.54–1.26)</td>
<td>0.27</td>
</tr>
<tr>
<td>Number of LNs on pathology</td>
<td>1.00 (0.99–1.01)</td>
<td>0.41</td>
</tr>
<tr>
<td>Presacral LN (yes vs. no)</td>
<td>0.57 (0.36–0.93)</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Note: CI = 95% confidence interval; EV = events; EXT = extended; HR = hazard ratio; LCI = lower CI; STD = standard; UCI = upper CI.
Introduction: The small, yet significant, survival advantage with neoadjuvant chemotherapy in muscle-invasive bladder cancer (MIBC) needs to be improved. A rationale exists for inhibiting the RAF/MEK/ERK pathway, the VEGFR1−3, and PDGFR. The S−CG combination is being investigated in an ongoing open-label, single-group, Phase 2 trial. We present the interim results at the end of 1st stage.

Methods: Chemonaive pts with T2−4N0 MIBC were given 4 cycles of cisplatin 70 mg/m2 on day 1 and gemcitabine 1000 mg/m2 on day 1 and 8, every 3 weeks. Sorafenib 400 mg q12h was administered daily from day 1 until surgery (radical cystectomy). Pts were staged with computed tomography (CT) and positron emission tomography (PET)/CT scan at baseline and after treatment, and with CT after 2 cycles. An optimal 2-stage Simon’s design is applied whereby 6 pathologic complete responses (pT0, primary endpoint) should be observed in the first stage before moving to full enrollment of 45 cases. Residual carcinoma in situ with no evidence of concurrent invasive tumor (T1−T4) was considered as pT0. Intention−to−treat analysis was applied. 50 mL of blood samples were collected at baseline and at day 8 of each cycle for exploratory biomarker and circulating tumor cell (CTC) analysis.

Results: 23 pts were enrolled from 04/11 to 07/13. Thus far, 21 completed the treatment and are evaluable. Median age was 61 yrs (IQR: 54−66). 11 had T2, 9 T3, and one a T4 disease. 6 pts had hydronephrosis at presentation. 19 pts underwent radical cystectomy. Eight pts (38.1%, 95% CI: 18.1−61.6%) had a pT0 and 2 pts a pT<2. G3−4 side effects consisted of hematologic toxicity in 8 pts (38%), hand−foot syndrome (HFS) in 3 pts, hypertension and asthenia in 2 pts each. 9 pts (42.8%) needed a temporary interruption of sorafenib, 6 a dose reduction, and 2 suspended the drug.

After a median follow up of 12.6 months, 3 pts (14.3%) had a recurrence or progression and died. An increase of median level from baseline to day 8 of 2nd cycle was observed for VEGF (85.8 to 119.5 pg/mL). CTC evaluations were carried out in 11 pts. Four pts with pT<2 response were evaluable for CTC (range 7−21 cells by ScreenCell®) and all of them had a stepwise reduction prior to cystectomy.

Conclusions: Sorafenib seems to enhance the efficacy of CG in the neoadjuvant setting. If confirmed, research should identify the biological mechanisms underlying clinical benefit compared to its lack of activity in the metastatic/refractory cases.
Poster #23
THE CURATIVE POTENTIAL OF POST-CHEMOTHERAPY LYMPHADENECTOMY IN PATIENTS WITH UROTHELIAL CARCINOMA PRESENTING WITH NODAL METASTASES: ANALYSIS OF A SERIES FROM A TERTIARY CANCER CENTER
Andrea Necchi; Salvatore Lo Vullo; Patrizia Giannatempo; Elena Farè; Nicola Nicolai; Luigi Piva; Davide Biasoni; Tullio Torelli; Mario Catanzaro; Silvia Stagni; Alessandro Crestani; Maurizio Colecchia; Biagio Paolini; Alessandro Gianni; Luigi Mariani; Massimo Maffezzini; and Roberto Salvioni
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy
(Presented By: Andrea Necchi)

Introduction: The available information would suggest a benefit from surgical removal of metastatic disease in selected patients with urothelial cancer, but the level of evidence is rather low. We aimed to analyze the contribution of post-chemotherapy (CT) lymphadenectomy only on survival outcomes in responding patients from our center.

Methods: Between 1986 and 2012, 157 patients with locally advanced or metastatic urothelial cancer received first-line combination of methotrexate, vinblastine, doxorubicin, and cisplatin (MVAC). Of them, patients experiencing at least a stable disease of subdiaphragmatic nodal disease/local recurrence only were selected. For the sake of parsimony, the prognostic effect of singly taken covariates (surgery, methotrexate, vinblastine, doxorubicin, and cisplatin (MVAC)). Of them, patients experiencing at least a stable disease of subdiaphragmatic nodal disease/local recurrence only were selected. For the sake of parsimony, the prognostic effect of singly taken covariates (surgery, methotrexate, vinblastine, doxorubicin, and cisplatin (MVAC).

Results: 59 patients were identified. 31 (52.5%) had regional nodes and 28 (47.5%) had metastatic disease. 42 (71.2%) had multiple nodal sites, 15 pts (25.4%) had an upper tract tumor primary, 24 (40.7%) had received major surgery. Twenty-eight patients underwent post-chemotherapy pelvic (N=14) or retroperitoneal lymphadenectomy (N=14) after achieving a complete response (CR, N=7) or a partial response–stable disease (PR+SD, N=21). 8/28 patients (28.6%) achieved a pathologic–CR. Median follow up was 88 months (IQR: 24–211). Median progression–free (PFS) survival by treatment group (surgery vs observation) was 18 (95% CI, 11–N.E.) and 11 (95% CI, 5–19) months, respectively (logrank test p=0.009). Median overall survival (OS) was 37 (95% CI, 20–N.E.) and 19 (95% CI, 9–38) months, respectively (p=0.004). Surgical consolidation was associated with better PFS (HR: 0.43, 95% CI, 0.22–0.84, p=0.013) and OS (HR: 0.36, 95% CI, 0.17–0.76, p=0.007) in univariable analysis (UVA). This was the only significance in UVA and it was retained in multivariable analysis when adjusting for each of the other covariates. No effect of pathologic status was found. Results are limited by small numbers.

Conclusions: In well selected patients with UC like those achieving a clinical benefit from chemotherapy and having exclusive nodal metastatic disease there was a clear survival advantage when removing disease residuals.

Poster #24
IS AN EGFR 45-59 ML/MIN/1.73M2 A CONTRAINDICATION TO CONTINENT URINARY DIVERSION?
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(Presented By: Manuel Eisenberg)

Introduction and Objectives: Given the potential increased urinary dwell time and solute reabsorption, continent diversion (CD) after radical cystectomy has traditionally been considered contraindicated for patients with compromised renal function (RF). Nevertheless, differential RF outcomes following incontinent diversion (ID) versus CD have not been well established. Herein, we evaluate the risk of RF decline among patients with ID versus CD, stratified by preoperative eGFR above/below 60 ml/min/1.73m2.

Methods: We identified 1383 patients treated with radical cystectomy and urinary diversion between 1980 and 2008 with a preoperative eGFR of 45–89 ml/min/1.73m2. eGFR was evaluated preoperatively, at 6 months postoperatively, then at yearly intervals thereafter. Time to RF decline, defined as a ≥10 ml/min/1.73m2 decline in eGFR, was compared between ID and CD in patients with a preoperative eGFR of 60–89 (CKD2) and 45–59 (CKD3a) ml/min/1.73m2 using the Kaplan–Meier method. Cox proportional hazards regression models were used to evaluate the association of type of diversion with RF decline.

Results: A total of 74% (1021/1383) of patients received an ID and 26% (362/1383) underwent CD. Preoperative CKD2 and CKD3a were noted in 59% and 41% of patients with an ID, versus in 74% and 26% of patients with CD. Median follow–up after cystectomy for patients alive at last follow up was 11.2 years (IQR 7.8, 16.4). At 10 years after surgery, the risk of RF decline in patients with an ID was noted to be higher in those with preoperative CKD2 than CKD3a (82% vs 70%; p<0.0001), while the risk of RF decline in patients with a CD was similarly noted to be higher in those with preoperative CKD2 than CKD3a (78% vs 65%; p<0.0001). However, at 10 years after surgery, the risk of RF decline in patients with ID and CD was similar among those with preoperative CKD2 (82% vs 78%, respectively; p=0.72) and with preoperative CKD3a (70% vs 65%, respectively; p=0.26). On multivariable analysis, CD was associated with RF decline for patients with CKD2 (HR 1.2; p=0.04), but not for CKD3a (HR 1.1; p=0.66).

Conclusions: The risk of RF decline over 10 years after urinary diversion was not significantly different between patients undergoing ID versus CD with a preoperative eGFR of 45–89 ml/min/1.73m2. Further, CD does not appear to confer an increased risk of RF decline in patients with a preoperative eGFR of 45–59 ml/min/1.73m2.
Poster #25
ENUMERATION AND MOLECULAR PROFILING OF CIRCULATING TUMOR CELLS (CTCs) IN UROTHELIAL CANCER (UC) BEFORE AND DURING SYSTEMIC TREATMENT
Emanuela Fina; Andrea Necchi; Chiara Iacona; Maurizio Colecchia; Patrizia Giannatempo; Daniele Raggi; Elena Farè; Nicola Nicolai; Roberto Salvioni; Alessandro Gianni; Filippo De Braud; Maria Grazia Daidone; and Vera Cappelletti
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy
(Presented By: Andrea Necchi)

Introduction: CTCs provide clinically relevant information in different tumor types and represent promising tools in UC, for which multimodal decision making and innovative tools for patient selection are needed. However, optimal approaches to detect and characterize CTCs remain open questions.

Methods: We prospectively evaluated CTCs in two populations of UC pts with either muscle-invasive (M0) or metastatic disease (M+) being enrolled in a phase 2 trial of neoadjuvant sorafenib, cisplatin, and gemcitabine, in a phase 2 trial of 2nd–line anti-TGFβ receptor ALK1 PF-03446962, or receiving standard 1st–line chemotherapy. 5 ml of whole blood were filtered by ScreenCell® Cyto device and CTC status was assessed with centralized scoring by referral pathologists on the basis of cytopathological criteria. Additional 5 ml of whole blood were processed by immunomagnetic beads that exploit epithelial—and tumor—associated surface markers as catcher antigens (AdnaTestSelect® kit) and the expression level of a panel of markers (EPCAM, MUC1, HER2, CEA and EGFR) was evaluated by multiplex PCR. Assays were done at baseline and during treatment for all pts (overall, 240 assays).

Results: In the time-frame 07/2012–03/2013, 16 M0 pts and 23 M+ pts were enrolled, respectively. At baseline, ScreenCell detected ≥1 CTC in 89% and 94% of M0 and M+ patients, respectively (median CTC: 6; range 1–95), while PCR signals ≥ specific cut-off values were observed in 5/16 M0 and 13/23 M+ cases, with distinct patterns for the different biomarkers (Figure). Discordant results between biomarkers profile and CTC number trend were observed in 6/10 M+ cases and consisted in substantially unchanged EPCAM expression levels despite an increase in CTC number during treatment, suggesting a different sensitivity in reflecting treatment-related changes. However, three M0 patients with favorable pathological response to neoadjuvant treatment (pT0/downstaging to pT<2) showed a stepwise reduction in CTC number before cystectomy.

Conclusions: The present combined technique for CTC detection seems to be promising compared to currently available results in UC, though additional follow-up data are necessary to analyze associations with clinical outcome.
Poster #27
THE IMPACT OF BODY MASS INDEX ON RENAL FUNCTIONAL OUTCOMES FOLLOWING MINIMALLY INVASIVE PARTIAL NEPHRECTOMY
Edris Negron; Kyle Richards; Joshua Cohn; Zoe Steinberg; Scott Eggener; and Arieh Shalhav
Department of Surgery, Section of Urology, University of Chicago Hospitals, Chicago, IL
(Presented By: Kyle Richards)

Introduction and Objectives: Partial nephrectomy is the standard of care for the management of small renal masses and is increasingly performed via minimally invasive partial nephrectomy (MIPN). Obesity is a known risk factor for kidney cancer and can potentially make surgery more challenging. Our aim is to assess the impact of body mass index (BMI) on perioperative and renal functional outcomes in patients undergoing MIPN.

Methods: In our IRB−approved, prospectively maintained clinical database, we identified 1,206 patients who underwent kidney surgery from August 2002 until March 2013. Follow up has been maintained every 6 months for 2 years, and yearly thereafter with axial imaging at the discretion of the physician. Estimated glomerular filtration rate (eGFR) was obtained at baseline and at each follow−up visit. From this group, patients that underwent MIPN with more than 12 months of follow up were selected. Exclusion criteria included missing preoperative eGFR or conversion to radical nephrectomy. Patients were separated into 4 cohorts based on BMI: 1. BMI <25 kg/m2, 2. BMI 25−30 kg/m2, 3. BMI 30−35 kg/m2, and 4. BMI >35 kg/m2. Change in eGFR was compared across demographic and clinical variables via univariate and multivariate regression models.

Results: 235 patients met inclusion criteria with overall median follow−up of 17 months [IQR 7, 37]. There was no difference in follow−up, baseline demographic, clinical, perioperative, or pathologic features across BMI groups. Increasing BMI was associated with a significant absolute reduction in eGFR at 1 year on univariate analysis (0.44 mL/min/BSA reduction in GFR per 1 kg/m2 increase in BMI, p=0.008). BMI (p=0.046), CCI (p=0.007), tumor size (p=0.012), and preoperative eGFR (p<0.01) were independently associated with significant absolute reduction in eGFR in a multivariate model adjusted for gender, race, BMI, age−adjusted Charlson Comorbidity Index (CCI), warm ischemia time, and preoperative eGFR. Controlling for the same variables, gender (p=0.05), BMI by category (p=0.035), CCI (p=0.041), and preoperative eGFR (p<0.01) were independently associated with increased odds of being chronic kidney disease stage ≥ III at 1 year.

Conclusions: MIPN is feasible in obese patients with similar perioperative outcomes to non−obese patients. BMI is an independent risk factor for worsening kidney function following MIPN, and these patients should be counseled accordingly.

Poster #28
SURGEONS’ PREFERENCES AND PRACTICE PATTERNS REGARDING INTRA-OPERATIVE FROZEN SECTION DURING PARTIAL NEPHRECTOMY
Abhinav Sidana; James Donovan; and Krishnanath Gaitonde
University of Cincinnati College of Medicine, Cincinnati, OH
(Presented By: Abhinav Sidana)

Objective: Intra−operative frozen section (FS) evaluation for tumor margin during partial nephrectomy (PN) is a matter of controversy in urologic oncology. We evaluate the preferences and practice patterns of urologists regarding intra−operative FS during PN.

Methods: A 17−item questionnaire was designed to collect information on surgeons’ preferences and practice patterns regarding FS during PN. The survey was sent to the members of the Society of Urologic Oncology and the Endourological Society. Univariate and multivariate Logistic logistic regression analysis was done to identify the predictors determining the surgeon’s preferences and practice patterns.

Results: 197 responses were received. 69% and 58% of respondents chose to obtain FS (always or sometimes) during Open Partial Nephrectomy (OPN) and Laparoscopic Partial Nephrectomy (LPN) respectively. There was a strong correlation between surgeons’ preferences during OPN and LPN. Younger surgeons are less likely to obtain FS during OPN (p<0.05). For surgeons who did not routinely obtain FS, “confidence about complete resection” was the most common reason (79%), followed by “no change in management with positive margins” (35%). Majority (75%) believed the margins to be negative if surgical margin was free of tumor microscopically by one cell layer. Older surgeons considered negative margins to be free of tumor microscopically by >= 5mm. Surgeons who performed more than 25 PNs annually were less likely to fulgurate the tumor bed after resection (p=0.025) while more likely to send an additional specimen from tumor bed for FS analysis (p=0.007). 54% and 42% of respondents would repeat FS for positive microscopic margins during OPN and LPN respectively. 95% of the respondents would not recommend additional treatment for positive margins on final pathology.

Conclusion: Despite recent literature pointing to low clinical utility of intraoperative FS analysis, more than half of the surgeons still opt for intraoperative FS. Surgeon’s age and volume influence preferences and practice pattern in regards to FS analysis to some extent. Fellowship training, surgical approach and region of practice do not appear to dictate a surgeon’s preferences in regards to intra−operative FS during PN.
Poster #29
ASSESSMENT OF OUTCOMES IN PN INCORPORATING DETAILED FUNCTIONAL ANALYSIS
Tosio Takagi¹; Maria Mir¹; Rebecca Campbell¹; Nidhi Sharma²; Erick Remer¹; Jianbo Li³; Sevag Demirjian¹; Jihad Kaouk¹; and Steven Campbell¹

¹Glickman Urological Kidney Institute, Cleveland Clinic, Cleveland, OH; ²Imaging Institute, Cleveland Clinic, Cleveland, OH; ³Quantitative Health Service, Cleveland Clinic, Cleveland, OH
(Presented By: Tosio Takagi)

Objective: We assessed perioperative morbidity and oncologic outcomes after conventional clamped partial nephrectomy (PN) while also utilizing volumetric analysis to differentiate the contributions of parenchymal mass loss and recovery from the ischemic insult.

Methods: A total of 122 patients undergoing PN for whom detailed analysis of the functional recovery specific to the operated kidney could be performed were analyzed. Volumetric CT was utilized to measure the volume of functional parenchyma pre and post PN specifically in the operated kidney. GFR was determined by the MDRD2 equation along with RFS for patients with a contralateral kidney. Recovery from ischemia (GFR preserved/volume saved) would be 100% if all nephrons recovered from the ischemic insult. Precision of surgery was defined as postoperative parenchymal volume/predicted parenchymal volume presuming loss of a 5 mm rim of normal parenchyma related to excision/reconstruction. Trifecta required negative margins, no Clavian grade ≥3 or urological complications, and both precision of surgery ≥80% and recovery from ischemia ≥80%.

Results: Median age was 61 years with 64 (52%) patients having open procedures. Warm ischemia was used in 72 patients (median 20 min), and 45 patients had a solitary kidney. RENAL score distribution was 43 (35%) low, 55 (45%) intermediate and 24 (20%) high complexity. Median precision of excision/reconstruction was 93%, and precision was ≥80% in 106 patients (87%). Median recovery from ischemia was 96%, and recovery from ischemia was ≥80% in108 (89%) patients. All tumors had negative surgical margins. Twelve patients (9%) had perioperative complications. Trifecta was achieved in 85 patients (70%). Although univariable analysis showed cold ischemia, open surgery and solitary kidney were significant predictors to accomplish trifecta, only cold ischemia and solitary kidney were significant predictors on multivariable analysis.

Conclusion: Given careful patient selection and commensurate surgical expertise, excellent oncological and functional outcomes can be obtained with conventional clamped PN. Morbidity remains modest and manageable. Analysis of volumetric outcomes is necessary to facilitate comprehensive evaluation of functional outcomes after PN, allowing for differentiation of parenchymal volume loss vs. failure of nephrons to recover from ischemia.

Poster #30
ASSOCIATION OF PARTIAL NEPHRECTOMY AND PRESENCE OF ROBOTIC SURGERY FOR KIDNEY CANCER IN THE UNITED STATES
Steven V. Kardos¹; Brian Shuch¹; Peter G. Schulam¹; Quoc-Dien Trinh²; Maxine Sun³; Nathan D. Shippee⁴; Jesse Sammon⁵; and Simon P. Kim⁷
¹Yale University, Department of Urology, New Haven, CT; ²Harvard Medical School, Brigham and Women’s Hospital, Division of Urology, Boston, MA; ³University of Montreal Health Center, Cancer Prognostics and Health Outcomes, Montreal, Canada; ⁴University of Minnesota, Division of Health Policy and Management, Minneapolis, MN; ⁵Henry Ford Hospital, Department of Urology, Detroit, MI
(Presented By: Steven V. Kardos)

Introduction: While hospital and surgeon characteristics are associated with the type of nephrectomy performed for renal cell carcinoma (RCC), it is unknown whether hospital presence of robotic surgery increases the likelihood of patients receiving partial nephrectomy (PN). Therefore, we evaluate the relationship of PN and hospital presence of robotic surgery from a population–based cohort in the U.S.

Methods: After merging the Nationwide Inpatient Sample (NIS) and the American Hospital Association (AHA) survey from 2006 to 2008, we identified 21,999 patients who underwent either PN or radical nephrectomy (RN) for RCC. The primary outcome of this study was the type of nephrectomy performed. Multivariable logistic regression was used to identify hospital characteristics associated with receipt of PN, after adjusting for patient case mix.

Results: Overall, we identified 4,832 (22.0%) and 16,347 (88.0%) patients who were surgically treated for RCC with PN and RN, respectively. On multivariable analysis, patients undergoing surgery were more likely to receive PN at academic (OR: 2.77; p<0.001), urban (OR: 3.66; p<0.001), and American College of Surgeon (ACOS) designated cancer centers (OR: 1.10; p<0.05) compared to non–academic, rural, and non–designated hospitals, respectively. After adjusting for patient and hospital characteristics, patients undergoing surgery at hospitals with presence of robotic surgery were also associated with higher adjusted odds ratios for receipt of PN compared to those treated at hospitals without the presence of this advanced treatment technology (OR: 1.28; p<0.001).

Conclusions: While academic status and urban locations are established characteristics influencing the type of nephrectomy performed for RCC, ACOS cancer center designation and hospital presence of robotic surgery were also associated with higher use of PN. Our results are informative in identifying key hospital characteristics which may facilitate greater adoption of PN.
Poster #31
SURGICAL OUTCOMES FOLLOWING NEOADJUVANT TARGETED MOLECULAR THERAPY FOR RENAL CELL CARCINOMA
Juan Jimenez; Amr Fergany; Michael Gong; Jihad Kaouk; Eric Klein; Venkatesh Krishnamurthi; John Rabets; Brian Rini; Robert Stein; Andrew Stephenson; and Steven Campbell
Cleveland Clinic, Cleveland OH
(Presented By: Juan Jimenez)

Introduction: Targeted molecular therapy for renal cell carcinoma (RCC) can facilitate the operative management of unresectable tumors due to tumor size, proximity to vital structures or bulky lymphadenopathy. Theoretical risks of their use in the perioperative period include poor wound healing and vascular complications, and a better understanding of the incidence of adverse events is required.

Methods: We identified all patients from January 2007 to March 2013 with RCC who received targeted therapy prior to resection, and their charts were retrospectively reviewed.

Results: Thirty-eight patients received neoadjuvant targeted therapy and underwent 42 procedures including partial nephrectomy (17), radical nephrectomy (11) or metastectomy (14) for locally advanced (15), locally recurrent (5) or metastatic (22) disease. Preoperative therapy included sunitinib (33), sorafenib (3), pazopanib (1), everolimus (1) or bevacizumab plus interleukin−2 (4) for a median treatment duration of 21 weeks (range 5 – 71 weeks). Treatment was held a median of 21 days (7 – 370 days) before and after surgery. Tumor downsizing occurred in 22/42 cases, with a median reduction of 34% (range 10 – 60%). Median EBL was 700 mL, but perioperative bleeding occurred in 10 patients requiring intraoperative transfusion (8), reoperation (1) or readmission (1). There was 1 postoperative death from multisystem organ failure associated with disseminated intravascular coagulopathy during a concomitant liver resection. No thromboembolic events occurred. Six minor wound healing complications were identified (cellulitis 2, incisional hernia 3, and wound seroma 1) along with 3 tissue healing complications (urine leak 2 and bowel anastomotic leak leading to abdominal abscess 1). There were no cases of fascial dehiscence.

Conclusion: Surgery after targeted treatments appears to be safe with modest and manageable morbidity in the majority of cases. Careful patient selection, meticulous surgical technique, and diligent postoperative care can enable good outcomes in this challenging patient population.

Poster #32
SURGICAL SALVAGE OF THERMAL ABLATION FAILURES FOR RCC
Juan Jimenez; Amr Fergany; Michael Gong; Jihad Kaouk; Robert Stein; Andrew Stephenson; and Steven Campbell
Cleveland Clinic, Cleveland OH
(Presented By: Juan Jimenez)

Introduction: Cryoablation (CA) and radio frequency ablation (RFA) are attractive therapies for small renal masses in patients with substantial comorbidities. Salvage extirpative therapy for local tumor recurrence following thermal ablation (TA) can be challenging due to resulting perinephric fibrosis.

Methods: All patients undergoing surgical salvage therapy for an ipsilateral renal mass recurrence following TA between September 1997 and July 2013 were identified, and their charts were reviewed.

Results: A total of 22 patients were managed surgically after failing CA (14) or RFA (8); all had failed (5) or were not amenable to repeat TA. Partial nephrectomy (PN) was preferred in all patients but was not possible in 9 who required radical nephrectomy (RN). The latter group included one patient who was rendered anephric because PN was not possible. Also, one attempted PN in a solitary kidney was aborted due to hilar tumor location complicated by extensive fibrosis that precluded PN, and the kidney was left in situ based on patient desire to avoid dialysis. In the PN group (n=12), open surgery was required in 11 (92%), and only 1 was able to be performed through a MIS approach. In the RN group, 6 patients were managed with MIS, although 2 laparoscopic cases required conversion due to bleeding/DIC or extensive fibrosis. For the entire experience the median EBL was 310 ml, but there were 3 outliers with ≥ 1L, which is distinctly unusual for similar surgery in the virgin setting. One patient in the PN group experienced local recurrence near the resection bed despite negative margins, suggesting that the adjacent area was contaminated with a microscopic satellite lesion. There were significant adverse intraoperative or postoperative events in 5 patients (bleeding 2, reoperation 2, severe ileus 1), 4 of whom were initially managed with CA. Since January 2008, we have been able to perform PN more frequently (9/12=75% vs. 3/10=30% for cases prior to that timeframe).

Conclusions: Surgical salvage for local tumor recurrence following TA is successful in most instances, but is complicated by fibrosis, which appears to be more substantial after CA than RFA. Our more recent experience suggests that PN is possible in many cases, but has typically required an open approach. Difficulty of surgical salvage should be recognized as a potential limitation of the TA treatment strategy.
**Poster #33**

**DIABETES MELLITUS IS ASSOCIATED WITH AN INCREASED RISK OF CANCER-SPECIFIC MORTALITY AMONG PATIENTS WITH CLEAR CELL RENAL CELL CARCINOMA UNDERGOING NEPHRECTOMY**

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(Presented By: Sarah Psutka)

**Introduction:** Conflicting data exist regarding the interaction of diabetes mellitus (DM) with outcomes for patients with renal cell carcinoma (RCC). Herein, we evaluate the association of DM with survival among RCC patients treated with nephrectomy.

**Methods:** We reviewed 2589 patients treated surgically for sporadic, unilateral, M0 RCC between 1990 and 2008 at the Mayo Clinic and compared demographic and tumor characteristics in patients with and without DM (nonDM). Patients with DM (n=313) were matched 1:2 to nonDM patients according to date of surgery, age, smoking status, obesity, ECOG performance status (PS), CKD stage, histological subtype, and nuclear grade. Cancer-specific (CSS) and overall survival (OS) were compared by Kaplan–Meier analysis with the log-rank test. Cox proportional hazards regression models were used to evaluate the association of DM with outcomes, controlling for clinicopathologic features. Further, a sub-analysis was performed in matched patients with clear cell RCC (ccRCC; n=257 DM, n=501 nonDM).

**Results:** A total of 313 (12%) patients had DM. DM patients were significantly older at RCC diagnosis, more likely to be obese, and had higher Charlson scores, CKD class, rates of smoking, and worse PS at surgery (p<0.001). Patients with DM were also more likely to be found to have ccRCC (83% vs. 76%, p=0.02) and to undergo nephron-sparing surgery (42% vs. 35%, p=0.01), while other pathologic features were similar in DM and nonDM. Among the 939 matched cases and controls, 463 patients died at a median of 5.5 years after nephrectomy including 159 who died from RCC. Median follow-up after nephrectomy for survivors was 8.6 years. Five-year CSS was not significantly different among DM patients 84% vs. nonDM patients 87% (p=0.11), although 5-year OS was significantly worse among DM patients (66% vs. 75%; p=0.01). After adjusting for Charlson score, DM patients remained at significantly increased risk of all-cause mortality (HR 1.33; p=0.004). Additionally, among patients with ccRCC, patients with DM were more likely to die from RCC compared with nonDM in a multivariable analysis controlling for the SSIGN (Stage, Size, Grade, Necrosis) score (HR 1.44; 95% CI 1.03–2.03; p=0.034).

**Conclusion:** We found that DM was independently associated with decreased CSS among patients with ccRCC treated surgically and with decreased OS in all RCC subtypes. Further studies to determine the potential biologic mechanism for this interaction are warranted.

**Poster #34**

**UTILIZING PERCENTAGE OF SARCOMATOID DIFFERENTIATION AS A PROGNOSTIC FACTOR IN RENAL CELL CARCINOMA**

Timothy Kim; Jasreman Dhillon; Hui-Yi Lin; Binglin Yue; Mayer Fishman; Einar Sverrisson; Philippe E. Spiess; Shilpa Gupta; Julio M. Pow-Sang; Michael Poch; and Wade J. Sexton

Moffitt Cancer Center, Tampa, FL

(Presented By: Timothy Kim)

**Introduction:** Sarcomatoid renal cell carcinoma (sRCC) is a histologic feature that denotes an aggressive variant of kidney cancer and worse overall outcomes. Our aim was to determine if the percentage of sarcomatoid differentiation (%Sarc) could be used for prognostic risk stratification.

**Methods:** We performed a retrospective analysis of patients who underwent surgery at our center and found to have sRCC. A single genitourinary pathologist reviewed each specimen for %Sarc and other pathologic variables of interest. %Sarc was analyzed as a continuous variable and as a binary variable using cut-points of 5%, 10%, and 25%. Potential prognostic factors associated with overall survival (OS) were determined using the Cox regression model. OS curves were generated with Kaplan–Meier methods and survival differences compared using the log-rank test.

**Results:** Between 1998 and 2012, 1,307 consecutive cases of RCC were identified, of which 59 patients were confirmed to have sRCC (4.5%). As a continuous variable %Sarc was associated with OS (p=0.023). Predictors of survival on multivariable analysis included pT stage, tumor size, cM stage, and %Sarc at the 25% binary level. OS was most dependent on the presence or absence of metastatic disease (4 months vs. 21.2 months). However, in a subgroup analysis of cM0 patients with locally advanced (≥ pT3) tumors, OS was significantly diminished in patients with > 25% Sarc compared to ≤ 25% Sarc (p=0.045). OS relative to %Sarc was no different in subgroup analyses of patients with early stage disease (pT1–T2, M0) or in patients with clinical metastatic disease.

**Conclusions:** Patients with sRCC have a poor overall outcome as evidenced by high rates of recurrence and death. Patients without clinical metastatic disease and > 25% Sarc have a higher risk of relapse and worse OS. More effective systemic therapies are desired for patients with sarcomatoid differentiation, and nomograms to predict recurrence or survival could incorporate this pathologic feature for added risk stratification.
Poster #35
CELL CYCLE PROGRESSION SCORE PREDICTS METASTATIC PROGRESSION OF CLEAR CELL RENAL CELL CARCINOMA AFTER RESECTION
Eric Askeland¹; Vincent Chehval¹; Ryan Askeland²; Zaina Sangale³; Placede Gangnang Fosso³; Nafei Xu³; Saradha Rajamani³; Steve Stone³; and James Brown¹
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(Presented By: Vincent Chehval)

Introduction and Objectives: Clear cell renal cell carcinoma (ccRCC) is primarily treated surgically when organ−confined. Following resection, close follow−up is required to evaluate for recurrence. Alterations in expression levels of cell cycle progression (CCP) genes have shown prognostic value in certain cancers. We sought to evaluate the prognostic value of the CCP expression profile of surgically resected ccRCC.

Methods: Medical records of patients with a history of ccRCC treated with resection were retrospectively reviewed. Patients with metastasis or lymph node involvement at the time of surgery were excluded. Those with T2a−T3b tumors were included. At least 4.5 years of follow−up without recurrence was required for the control group. Those who developed metastasis within 5 years of resection were included in the case group. Tumor from formalin−fixed paraffin−embedded slides was macrodissected and RNA extracted. Thirty−one cell cycle genes and 15 control genes were evaluated. Cell cycle genes were normalized and a CCP score was obtained. CCP score, patient sex, age at surgery, tumor stage, Fuhrman nuclear grade (FNG), tumor size, smoking status, lymphovascular invasion (LVI), follow−up and time to metastasis were available for analysis. Univariate and multivariate logistic regression models were employed to evaluate the association of CCP and clinical parameters with metastatic progression of ccRCC. Tissue processing and analysis were funded by Myriad Genetics.

Results: Twenty−six cases and 38 controls were evaluated. Median time to metastasis was 1.68 years (IQR 1.06−3.69) for the case group. Median follow−up was 6.69 years (IQR 5.88−9.28) for controls. Univariate analysis revealed that LVI (OR 4.64, p=0.005), FNG (OR 4.16, p=0.0099) and CCP score (OR 2.65, p=0.0091) were the only variables which significantly predicted progression to metastasis. Multivariate logistic regression modeling using CCP and all clinical variables revealed the covariates age (p=0.026), tumor size (p=0.022) and CCP score (p=0.026) were statistically significant. Multivariate logistic regression modeling using a step−wise variable selection of age, CCP, tumor size and LVI revealed an AUC of 0.84, which decreased to 0.78 if CCP score was excluded.

Conclusions: The cell cycle progression score predicts metastatic progression after resection of organ−confined ccRCC and appears to add significant prognostic information to standard clinical and pathological variables.
**Poster #36**  
ASSOCIATION BETWEEN PATHOLOGIC FINDINGS SUSPICIOUS FOR HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER AND FUMARATE HYDRATASE MUTATIONS  
Ryan Kopp; Kelly Stratton; Emily Głogowski; Kasmintan Schrader; Rohini Rau-Murthy; Paul Russo, Jonathan Coleman; and Kenneth Offit  
Memorial Sloan-Kettering Cancer Center, New York, NY  
(Presented By: Ryan Kopp)

**Introduction:** Hereditary leiomyomatosis and renal cell cancer (HLRCC) resulting from fumarate hydratase (FH) mutations may present with skin, uterine, and renal tumors each with unique pathologic features. Reported suspicion of HLRCC in pathological specimens may prompt genetic testing. We evaluated the association between suspicious pathology (SP) and positive FH testing in patients undergoing treatment in a hereditary cancer clinic.

**Methods:** In an IRB approved study we identified patients undergoing FH testing by the Clinical Genetics Service at MSKCC between 11/2008–1/2013. We defined SP as report of possible HLRCC diagnosis during pathologic assessment. Patients underwent FH testing by a CLIA approved laboratory. We compared clinicopathologic data in those with and without SP. Statistical analysis utilized Fisher’s exact test and Mann−Whitney test.

**Results:** We identified 27 patients undergoing primary testing for HLRCC. One patient lacking pathology was excluded. Of the remaining 26, median age was 37 years (IQR 31, 49) 14 (54%) were female, and 16 (62%) Caucasian. Clinical characteristics included 3 (12%) skin leiomyomas, 13 (93% women) fibroids, and 18 (67%) renal tumors. SP was present in 18 (69%) patients; 8 of 15 (53%) kidneys, 9 of 12 (75%) leiomyomas, 3 of 6 (50%) metastases. Patients with SP were younger (p=0.01) and more often had stage ≥pT3 RCC (p=0.015). FH mutation was present in 7 (26%) and was not significantly associated with SP (p=0.375). Analyzing SP by tumor site identified that SP from renal tumors was significantly associated with positive FH mutation status (p=0.026). Renal SP had a sensitivity of 100% and specificity of 70% for HLRCC.

**Conclusions:** Pathological assessment is important for identifying histological features that may trigger genetic testing for cancer susceptibility syndromes. In this study, SP across all tumors was not associated with FH mutations. However, SP from renal tumors had a high sensitivity and was significantly associated with FH mutation. Clinical suspicion along with pathological assessment remain important elements of identifying patients who may benefit from testing for cancer syndromes.

**Poster #37**  
A NOVEL IN SILICO HYPOTHESIS-GENERATING TECHNIQUE TO DISTINGUISH GENE EXPRESSION SIGNATURES OF CHROMOPHOBE RENAL CELL CARCINOMA AND ONOCYTOMA  
Michael Zilliox; and Gopal Gupta  
Loyola University Chicago, Maywood, IL  
(Presented By: Michael Zilliox)

**Introduction and Objectives:** There has been recent renewed interest in renal mass biopsy because up to 25% of small renal masses (SRMs) are benign. Difficulty exists in the pathologic differentiation of renal oncocytoma (RO) from chromophobe RCC (chRCC) in small tissue samples, as obtained by core biopsy or fine needle aspiration. Owing to the uncertainty of pathological diagnosis by biopsy, patients are over−treated, despite the benign nature of RO. There is a pressing need to identify immunohistochemical markers for pathological analysis of biopsy tissues from renal masses to distinguish chRCC from benign RO. We sought to identify discriminating gene expression profiles for both chRCC and RO using publically available microarray data.

**Methods:** We identified 3 publicly available studies that compared chRCC with RO using the same microarray platform, Affymetrix U133 plus 2.0. Strikingly, the 3 studies came to differing conclusions. To see if we could reconcile the disparate results, we re−analyzed the data from the 3 studies using a novel bioinformatic approach, the gene expression barcode. The combined study included 28 RO and 28 chRCC patients (Yusenko− 4 of each, Rohan− 9 of each, Tan− 15 of each). We looked for genes expressed (as opposed to up−regulated) in chRCC and unexpressed in RO (not down−regulated).

**Results:** Six biomarkers identified by previous analysis were found. We then ranked the genes to maximize sensitivity for detecting chRCC, while minimizing the number of false positive RO and maximizing sensitivity for RO while missing the fewest chRCCs (Table 1). Although the individual studies disagreed (shown by whether they identified each biomarker −Y/N), meta−analysis reconciled the results and better ranked the biomarkers. MAL2 and TM30B were identified for positive detection of chRCC while AQ6 and MAPRE3 seem appropriate for RO.
Conclusions: Using our technique of in silico hypothesis generation of publicly available data, we were able to reconcile divergent data from 3 studies to identify several promising biomarkers that may be able to differentiate chRCC from RO. Further wetlab validation of these markers is warranted.

Poster #38
UTILITY OF PERCUTANEOUS RENAL MASS BIOPSY (RMB) IN ASSESSING TUMOR GRADE IN PATIENTS UNDERGOING SUBSEQUENT TUMOR RESECTION
Serge Ginzburg¹; Robert Uzzo²; Brian Egleston²; Tahseen Al-Saleem²; Bart Milestone²; John Walton²; Daniel Canter¹; Jeffrey Tomaszewski²; Reza Mehrzad²; Marc Smaldone²; Rosalia Viterbo²; David Chen²; Richard Greenberg²; and Alexander Kutikov²
¹Albert Einstein Medical Center, Philadelphia, PA; ²Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Serge Ginzburg)

Introduction and Objectives: Percutaneous RMB is an increasingly important pre–operative risk stratification tool. Traditionally, ability of RMB to predict tumor grade has been limited; however, a recent European report documented RMB grade concordance of 93%. As such, we sought to assess the test characteristics of RMB in patients who underwent resection of a solid renal mass at a high volume cancer center.

Methods: Our prospectively maintained kidney cancer database was queried for patients undergoing RMB followed by surgical resection. All specimens were reviewed by an experienced uropathologist. Concordance between the RMB and surgical specimens was determined with respect to the benign vs. malignant pathology and pooled tumor grade (high vs. low).

Results: 147 renal biopsies were identified in our database from 2004 to 2012. Only patients who underwent a core RMB followed by subsequent surgical resection were included in the analysis (n = 42). Median age was 70 years, 74% were male and 98% Caucasian. Median tumor size was 4.3 cm [1.5–16.4]. 30% of patients underwent RMB at an outside institution, but were resected at our Center. Tumor complexity was high, intermediate and low in 41%, 44% and 15%, respectively. 36/42 lesions (86%) were malignant (30 clear cell, 2 papillary, 2 sarcomatoid, a chromophobe and a collecting duct RCC), of which 26/36 (72%) proved high grade at resection. 37 (88%) of the core biopsies were diagnostic in differentiating benign from malignant disease with 95% accuracy. Meanwhile, only 22 (63%) of the 35 biopsies categorized as malignant were informative for grade with accurate pooled tumor grade concordance of only 55%.

Conclusions: Core RMB in patients who underwent subsequent tumor resection at our institution performed poorly in assessing tumor grade. More than a third of RMBs were non–informative for grade, while accuracy of biopsies where grade assessment was possible was only 55%.
Poster Session I – Full Abstracts

Poster #39
VOLUME PRESERVATION BETTER PREDICTS RENAL FUNCTIONAL OUTCOME THAN WARM ISCHEMIA TIME IN ROBOTIC PARTIAL NEPHRECTOMY
Timothy Durso¹; Adam Van Huis¹; David Surprenant¹; Patrick Sweigert¹; Helyn Alvarez¹; Jonathan Carnell³; Marcus Quek³; Robert Flanigan³; and Gopal Gupta²
¹Loyola University Chicago, Maywood, IL; ²Loyola University Medical Center, Maywood, IL
(Presented By: Timothy Durso)

Introduction and Objectives: The most important determinants of renal functional outcomes during robotic assisted laparoscopic partial nephrectomy (RALPN) for kidney cancer are debated among urologists. We analyzed the relationship between warm ischemia time (WIT), percent functional volume preservation (PFVP), and percent glomerular filtration rate preservation (PGP) in patients who underwent partial nephrectomy.

Methods: We reviewed the records of 133 consecutive patients who underwent (RALPN) from June 2008 to March 2013, including classic partial nephrectomy (CPx), on−clamp enucleation (OnCE), and off−clamp enucleation (OffCE). Patients were included in our analysis on the basis of having pre− and post−surgical imaging available and a serum creatinine drawn at least 12 weeks post−procedure. 47 patients met the inclusion criteria. Kidney volumes were then assessed before and after surgery using 3D reconstruction software. Percent of total parenchymal volume was used to determine the functional contribution of each kidney. The functional outcome (PGP) of the operated−on kidney was then analyzed with respect to WIT and PFVP for the three procedures.

Results: Among all patients, PGP correlated significantly with PFVP (R²=.194, t=3.294, p=.002), but not with WIT (p=.138). Enucleations had a greater PFVP than CPxs (8.1 ± 2.4 %, p < .001). Among patients with WIT, PGP correlated significantly with both PFVP (R²=.252, t=3.532 p=.001) and WIT (R²=.143, t=−2.481 p=.018). Multivariate regression (R²=.311) showed significant correlation with PFVP (p = .005) and borderline correlation with WIT (p = .089). Compared with CPxs, OnCEs had a greater PFVP (7.8 ± 2.2 %, p=.001), borderline greater PGP (13.0 ± 7.4%, p=.085), and no difference in WIT (p=.421, mean = 27 ± 7 min.). OffCEs had a greater PFVP than CPxs (8.4 ± 2.1 %, p < .001). No statistically significant differences were found between OffCEs and OnCEs.

Conclusions: PFVP was a significant contributing factor in every comparison with respect to renal functional outcomes. WIT appeared to have a negative impact on functional outcomes, but the significance of this relationship was partially negated by including PFVP in the analysis. When considering RALPN, urologists should prioritize the preservation of parenchymal volume. Robotic tumor enucleation optimized renal functional outcomes by maximizing preserved parenchymal volume. Further follow−up is warranted.
**Introduction and Objective:** Utilization of systemic therapy among patients treated with cytoreductive nephrectomy (CN) for metastatic renal cell carcinoma (mRCC) remains poorly characterized, particularly in the targeted-therapy era. We evaluated temporal practice patterns in the utilization of systemic therapy among patients undergoing CN from a large national cancer registry, and assessed patient and disease features associated with receipt of systemic treatment.

**Methods:** We reviewed the National Cancer Database to identify patients with stage IV RCC who underwent CN between 1998–2010. Systemic therapy was defined as any treatment with immunotherapy and/or chemotherapy (including targeted agents). We evaluated the association between clinico-pathologic features and patients' receipt of systemic therapy using multivariable logistic regression with generalized estimating equations, and assessed the interaction of treatment with time, stratified as immunotherapy era (1998–2004) versus targeted-therapy era (2005–2010).

**Results:** Of 22,409 patients with mRCC undergoing CN, 8,830 (39%) received systemic therapy. Receipt of systemic therapy increased from 32% in 1998 to 49% in 2010 (p<0.001), largely due to increased utilization of chemotherapy (13.9% versus 46.7%; p<0.001). On multivariate analysis, increasing patient age (51–60 years: OR 0.82 [CI 0.73–0.92]; 61–70 years: OR 0.67 [CI 0.59–0.76]; ≥71 years: OR 0.36 [CI 0.31–0.43]), papillary (OR 0.81 [CI 0.71–0.93]) or sarcomatoid (OR 0.88 [CI 0.8–0.98]) histology, as well as coverage with Medicaid (OR 0.61 [CI 0.5–0.74]), Medicare (OR 0.70 [CI 0.62–0.79]), or no insurance (OR 0.75 [CI 0.63–0.91]) were associated with decreased utilization of systemic therapy. Interestingly, we found that although use of systemic therapy in the elderly (≥71 years) and in patients with Medicare/Medicaid remained lower throughout the time period of study, each of these cohorts was significantly more likely to receive systemic treatment in the targeted versus immunotherapy era (p<0.05 for both).

**Conclusion:** Utilization of systemic therapy among patients undergoing CN has increased over time, coinciding with the introduction of targeted therapies. Nevertheless, still less than half of such patients receive systemic treatment. While the etiology for lack of treatment is likely multifactorial, including clinician discretion, the potential health policy implications of continued disparities in care warrant further investigation.

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**Objective:** Modifiable lifestyle factors are potential targets for kidney cancer prevention and control. However, there are limited data on physical activity, obesity, smoking, and bladder cancer mortality. Further analyses of these associations may identify novel prevention and treatment strategies.

**Method:** The National Health Information Survey (NHIS) is an annual representative cross-sectional household interview survey. We used baseline data from 1998 through 2004 linked to mortality data reporting deaths through 2006. The primary outcome variable was kidney cancer-specific mortality. The primary exposure variables were self-reported physical activity (dichotomized as “did no exercise” versus “light, moderate or vigorous exercise in >=10 minute–bouts”) and obesity as measured by body mass index (BMI). We utilized multivariable adjusted Cox proportional hazards regression models, with delayed entry to account for age at survey interview. Analyses were adjusted for the complex NHIS multistage sampling methodology using National Center for Health Statistics public release survey weights.

**Results:** Among 222163 individuals with complete follow-up data, of whom 96715 (48%) were men and 146014 (73%) non-Hispanic Whites, we identified 71 kidney cancer-specific deaths. Those who died from kidney cancer were more likely to be men (p=0.01); ethnicity was not associated with kidney cancer death (p=0.86). In multivariate analyses, individuals who reported “any physical activity” were 50% less likely (adjusted hazard ratio (HRadj) 0.50, 95% CI 0.27 to 0.93, p-value = 0.028) to die of kidney cancer than non-exercisers, while obese individuals (BMI ≥ 30 kg/m2) were nearly 3 times more likely (HRadj 2.84, 95% CI 1.30 to 6.23, p-value = 0.009) compared to those of normal weight (BMI < 25 kg/m2). Compared to never smokers, former smokers were twice as likely (HRadj 2.00, 95% CI 1.05 to 3.80, p-value = 0.034) to die of kidney cancer.

**Conclusions:** Physical activity decreases and obesity increases the risk of kidney cancer mortality. These studies suggest that exercise and weight loss interventions may potentially prevent kidney cancer death.
Introduction and Objectives: There has been a rise in incidental small renal masses after cross-sectional imaging, approximately 20% of which are benign. We sought to describe the clinical, pathologic, and radiographic features of renomedullary interstitial cell tumor (RMICT), formerly known as medullary fibroma (MF), a rare, benign renal mass that is indistinguishable from other renal cortical tumors by imaging.

Methods: After institutional review board approval, we reviewed data on patients from the Memorial Sloan–Kettering Cancer Center kidney tumor database from 1989 to 2012 (4,898 patients) with a pathologic diagnosis of RMICT or MF as the main resected tumor. Data collected included procedure, age, gender, presentation, preoperative tumor radiographic characteristics (size, location, nearness to collecting system, R.E.N.A.L. nephrometry score), and final pathologic size.

Results: Ten patients (0.2%) with RMICT were identified. All patients had undergone partial nephrectomy for 10 tumors (9 right sided). Clinical presentation was incidental to abdominal imaging performed for another clinical reason in 6 patients, as part of a hematuria evaluation in 2 patients, and as part of nephrolithiasis follow-up imaging in 2 patients. The mean patient age was 52 years (range 39–73), and 8 patients were female. The mean preoperative and final pathologic tumor size was 1.65 cm (range 1.0–2.5) and 0.96 cm (range 0.3–1.7), respectively. The location of the tumors was medullary (0–9 mm from the collecting system) in 8 patients and cortical (2.5 cm mostly–exophytic and 1.5 cm mostly–endophytic tumor) in 2 patients.

Conclusions: Our data demonstrate a female predominance in RMICT with a mean tumor size of < 2 cm. Medullary location is consistent with its pathologic origin. To our knowledge, this is the largest single–institution series of RMICT.
Poster #43
IDENTIFYING INCIDENCE AND RISK FACTORS FOR VTE AMONG PARTIAL AND RADICAL NEPHRECTOMY PATIENTS FOR KIDNEY CANCER
Abram McBride; Max McKibben; Josip Vukina; Jonathan Matthews; Raj Pruthi; Mathew Raynor; Eric Wallen; Michael Woods; Matthew Nielsen; and Angela Smith
Chapel Hill, NC
(Presented By: Abram McBride)

Introduction and Objectives: Venous thromboembolism (VTE) is a potentially preventable disease that carries significant morbidity & mortality. The incidence of VTE among radical and partial nephrectomies has not been well-studied. A large single institution series revealed a low VTE rate (1.5%) in contrast to a large national database study showing that nephrectomy carried the highest risk of pulmonary embolism. However, the latter study did not discriminate between type of nephrectomy or diagnosis. Our objective was therefore to determine the rate of VTE among patients undergoing radical (RN) or partial nephrectomy (PN) for kidney cancer using a large national database, identify differences among open and laparoscopic procedures, and identify risk factors for VTE in this population.

Methods: Using the American College of Surgeons–National Surgical Quality Improvement Program (NSQIP) database, we performed a review of patients undergoing open or laparoscopic RN or PN for kidney cancer from 2005–2011. NSQIP collects data on 135 variables, including peri-operative data, 30-day post-operative complications and mortality on all major surgical procedures at over 450 participating academic and private institutions. Overall VTE rates for all groups were calculated & predictors of VTE were identified using multivariable logistic regression models.

Results: Of 1,582 patients who underwent RN, 1.6% and 0.47% of those undergoing open or laparoscopic approach experienced VTE (see Table). In contrast, of 911 patients who underwent PN, 1.1% and 1.3% of those undergoing an open or laparoscopic approach experienced VTE. On multivariable analysis, when controlling for numerous covariates, only increased operative time was found to be a significant predictor of VTE risk following RN (p<0.001) whereas advanced age was identified as a predictor following PN (p=0.03).

Conclusions: VTE risk among RN and PN is low, and does not appear to vary on open or laparoscopic approach. Operative time appears to be most predictive of VTE among those undergoing radical nephrectomy, whereas advanced age is most predictive for those undergoing partial nephrectomy.

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<td>2 (0.51%)</td>
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**Poster 44**

**THE ASSOCIATION OF BASELINE HEALTH AND GENDER WITH SMALL RENAL MASS PATHOLOGY**

Wassim Bazzi¹; Sheila Dejbakhsh²; and Paul Russo³

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(Presented By: Wassim Bazzi)

**Introduction and Objectives:** Previous reports have described that in small renal masses (SRM) 20% are benign and women are twice as likely to have benign pathology. In this study we explore further the association of baseline health and gender with SRM pathology.

**Methods:** After IRB approval, retrospective chart review of patients who have undergone nephrectomy at Memorial Sloan−Kettering Cancer Center from 05/1998 to 10/2012 with final path <4cm and staged as pT1a if malignant. Tumor size < 4cm was chosen to limit the tumor mass effect on renal function. Patients with solitary kidney, multiple and bilateral tumors, and history of prior renal surgeries were excluded. Estimated glomerular filtration rate (eGFR) was calculated using the CKD−Epi formula. Chronic kidney disease (CKD) was defined as eGFR < 60 mL/min per 1.73 m². Collected data included age, gender, race, American Society of Anesthesiologists (ASA) class which were divided into low (I−II) and high (III−IV), procedure, side, preoperative serum creatinine (Screa), eGFR, and final pathology. Malignant pathologies were clear cell renal cell carcinoma (RCC), papillary RCC and chromophobe RCC whereas benign were oncocytoma, angiomyolipoma and other benign. Logistic regression analysis was performed to determine clinical factors associated with malignant SRM.

**Results:** Our cohort consisted of 1726 patients with mean age 59.7 yrs. 61% (n=1045) were men, 90% (n=1553) were white, 43% (n=736) had high ASA, 89% (1540) underwent PN, 30% (n=525) had CKD, 83% (n=1426) with malignant pathology and mean tumor size 2.5cm. On bivariable analysis patients with malignant SRM, had a higher proportion of men (64.3 vs. 42.7%, p<0.001), high ASA class (43.8 vs. 37.3%, p=0.041) and larger tumors (2.6 vs. 2.3, p<0.001). There were no differences in age, race, mean eGFR or proportion with CKD. On logistic regression analysis by gender factors associated with malignant pathology were in women were higher ASA class (OR 1.57 95% CI 1.07−2.32, p=0.02) and tumor size (OR 1.48 95% CI 1.20−1.81, p<0.001), and in men were tumor size (OR 1.33, 95% CI 1.06−1.67, p<0.01) and age though the latter finding is clinically insignificant.

**Conclusions:** Our results are in line with previous reports on the association of male gender and larger tumor size with malignant SRM and in addition we do show that among women those with poor health have a higher likelihood for having a malignant SRM.

**Poster 45**

**BAP1 SEQUENCING TO IDENTIFY CANCER SUSCEPTIBILITY IN FAMILIAL RENAL CELL CARCINOMA PATIENTS**

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(Presented By: Kelly Stratton)

**Introduction:** BAP1 mutations in renal cell carcinomas (RCC) have been associated with advanced disease and worse survival. Germline alterations are associated with mesothelioma and uveal melanoma. Recent studies have identified families with suspected germline alterations leading to RCC susceptibility. Here we evaluated patients with Familial Renal Cell Carcinoma (FRC) for BAP1 mutations as a possible cause for cancer susceptibility.

**Methods:** We identified 120 kidney cancer patients referred to the Clinical Genetics Service at Memorial Sloan−Kettering Cancer Center between 1999 and 2012. Of these, 10 patients had suspected FRC as defined by one first or second degree relative with a history of kidney cancer or young age of onset (<50) and any relative with kidney cancer. All patients underwent genetic counseling with negative testing when indicated by clinical history and patient desire. In an IRB approved protocol we evaluated each patient for BAP1 mutations using Sanger sequencing.

**Results:** Six women and four men were identified, including eight patients of European heritage and two Hispanic. Mean age at diagnosis was 49.6 years. Nearly equal distribution of tumor grade was seen in patients with available pathology. Mean tumor size was 7.3 cm. Metastatic disease was identified in one patient. Additional primary tumors were seen in 7 patients including breast, prostate, uterine, lymphoma, non−melanoma skin, and lung cancer. Clinical testing was negative in four VHL, two SDHD, two SDHB, one TSC1/2, one FLCN, and one suspected PTEN carrier. Two patients had negative BRCA testing and one tested negative for Lynch Syndrome. All patients with clear cell RCC were confirmed to not carry VHL mutations. Sequencing for BAP1 did not identify any germline mutations.

**Conclusions:** Our data suggest that deleterious BAP1 mutations may account for a very small fraction of germline predisposition in familial RCC cases. A larger study may be required to discover BAP1 germline mutations in FRC. We plan to incorporate suspected FRC patients into an ongoing protocol to perform systematic BAP1 testing.
Poster #46
RENAL CELL CARCINOMA AND NON-HODGKIN’S LYMPHOMA: GENOMIC APPROACHES TO IDENTIFICATION OF SHARED SUSCEPTIBILITY
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(Presented By: Kelly Stratton)

Introduction: Statistical and epidemiologic studies have found that renal cell carcinoma (RCC) and non−Hodgkin’s lymphoma (NHL) occur metachronously or synchronously more frequently than expected, suggesting a shared genetic factor. Here we identify patients with coexistence of RCC and NHL (RCC/NHL) in a cancer genetics clinic.

Methods: We performed a retrospective review of patients with a history of RCC or NHL, referred to the Clinical Genetics Service at MSKCC between 1999 and 2012. Cancer diagnosis was self−reported or obtained from pathologic reports. Germline DNA and available matched tumors are being sequenced on Illumina HiSeq 2500 after targeted capture using Agilent SureSelect All Exome libraries.

Results: From the clinical genetics database we identified 119 patients with NHL and 68 with RCC. Women represented 65% and 56% respectively. Thirteen patients had RCC/NHL. Six had RCC followed by NHL, three had NHL followed by RCC, and four had synchronous tumors. Limited genetic testing was performed in three patients with clinical histories concerning for Lynch Syndrome, but no mutations were identified. Germline DNA from two patients have successfully undergone whole exome sequencing. In one case we also sequenced the renal and lymphoma tumors. Data shows discovery of over 40,000 single nucleotide variants(SNVs) and 2800 Insertion/deletions (Indels). There were 11 rare heterozygous variants predicted to be damaging, and where the wild type allele was found to be lost in both the RCC and NHL tumors. These included several high value candidate genes such as RBBP6 a retinoblastoma tumor suppressor, KIF1A, SLC6A15, INHBA and ADAMTSL1. Missense mutations were seen in several genes including HOXD1, POLG, SETD1B, and TLE1.

Conclusions: Utilizing a cohort of patients with coexistence of RCC and NHL, we demonstrate in a pilot experiment that exome sequencing of the germline and the renal and lymphoma tumors provides insight into the mutation spectrum in these discrete cancers. By limiting candidate mutations to a narrow spectrum of allele frequency, we were able to identify putative etiologic variants. Analysis of additional germline and multiple tumor exomes is underway and will detect other mutations shared in primary and secondary cancers. This approach will lead to an improved understanding of mechanisms of shared susceptibility to these tumor types.

Poster #47
PLEURAL EFFUSION AS A PREDICTOR OF EARLY MORTALITY FOLLOWING CYTOREDUCTIVE NEPHRECTOMY (CN)
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(Presented By: John Walton)

Introduction: A significant proportion of patients with metastatic renal cell carcinoma (mRCC) demonstrate rapid disease progression following cytoreductive nephrectomy (CN) and, thus, likely do not benefit from surgery. With clinical predictors of rapid disease progression lacking and pleural effusion (PEF) common at presentation in mRCC patients, we sought to identify the association between PEF and early mortality following CN.

Methods: Using a prospectively maintained database, we identified all patients undergoing CN for mRCC from 1993−2012. PEF was identified via routine preoperative plain or axial imaging. Primary outcomes were overall (OS) and disease–specific survival (DSS) following CN. Survival curves were estimated using the Kaplan−Meier product−limit method. Logistic regression models were used to test the association between PEF and survival outcomes, adjusting for patient and disease characteristics.

Results: Of the 138 patients with mRCC identified (median follow up 14.5 months), PEF was identified in 18 patients (13%). PEF patients had higher rates of nutritional deficiency (p=0.24) and clear cell histology (p=0.03). Both disease specific (p=0.02) and overall survival (OS) (p=0.003) were decreased in PEF patients. On multivariate analysis, patients with PEF had increased overall (HR=2.4, 95% CI 1.3−4.4; p=0.005) and disease specific (HR=2.8, 95% CI 1.4−5.7; p= 0.005) mortality.

Conclusion: In our institutional cohort, PEF appears to be a marker for early mortality in patients with mRCC undergoing CN. As such, pending validation in other cohorts, presence of PEF may help prognosticate rapid disease progression following CN and thus better select patients for a “litmus test” with upfront targeted therapy.
Poster #48
GROWTH KINETICS OF BIOPSY PROVEN EARLY STAGE RENAL CELL CARCINOMA
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(Presented By: Ashraf Almatar)

Introduction: Active surveillance (AS) of incidentally detected small renal masses (SRMs) is a treatment option for elderly patients or those in whom the risks of treatment are high. Several studies have examined the natural history of SRMs on AS. However, these reports lack consistent biopsy confirmation of tumor histopathology and include benign tumors. The growth and progression patterns of different renal cell carcinoma (RCC) histological subtypes are poorly understood.

Objective: To report the growth and progression patterns of the largest cohort of biopsy confirmed SRM RCC patients on AS.

Methods: Serially imaged biopsy proven RCC SRMs from the Renal Cell Consortium of Canada (RC4) study of AS and Princess Margaret Cancer Centre AS cohort were studied. Maximum dimensions and volume of lesions were measured to determine growth rates of the RCC subtypes. Progression rates and times to lesion progression were calculated using the Kaplan Meier methodology. Tumor progression was defined as the time when tumor diameter became ≥4cm, or doubling of tumor volume was ≤12 months. The rates of growth in both tumor volume and axial diameter of lesions estimated and compared among the different RCC subtypes.

Results: 104 SRMs that were biopsy proven RCC had a median follow up of 31.6 months (IQR 13.6–49.4). Median age at first image was 72.2 years (64.6–77.5). The median baseline maximum axial dimension of all lesions was 2.4 cm (1.9–2.9) and the volume was 6.1 cm³(2.9–10.9). There were 72 (69.2%) clear cell RCC, 14 (13.5%) papillary type 1 RCC, 6(5.8%) papillary type 2 RCC, 4(3.8%) papillary RCC unclassified, 4 (3.8%) chromophobe RCC and 4(3.8%) unclassified RCC. Thirty lesions (29%) progressed by last follow up, where 18 lesions doubled in volume within 1 year and 12 lesions increased in size to more than 4 cm. Of the lesions which progressed, 24 were ccRCC, 2 chromophobes, 2 unclassified RCC and 2 papillary RCC type 2 while none of the papillary type 1 progressed by last follow up image. The estimated median time to progression for all lesions was 7.4 years while it was 3.6 years for ccRCC. Interestingly, the volume growth rate of ccRCC is 4.7cm³/year while it is 0.048 for papillary type 1 (p value= 0.035).

Conclusion: There is wide variation in the growth and progression rates between the different histological subtypes of RCC. The use of biopsy to establish the histological diagnosis of a SRMs which may aid in patient counseling and decision making.

Poster #49
MULTICENTER RETROSPECTIVE EXPERIENCE IN THE SURGICAL MANAGEMENT OF ISOLATED NODAL RECURRENCES POST-NEPHRECTOMY IN PATIENTS WITH RENAL CELL CARCINOMA
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(Presented By: Christopher M. Russell)

Introduction and Objective:
10 – 24% of patients treated surgically for local renal cell carcinoma (RCC) will experience a post-surgical recurrence, which poses a therapeutic challenge as surgical resection represents the only potentially curative option. Resection of recurrent disease carries the risk of significant perioperative morbidity. Isolated nodal recurrence represents a subset of locoregional recurrence, yet to be described, which may demonstrate a unique disease course and response to surgical intervention. We assessed numerous characteristics of patients receiving surgical resection of isolated nodal recurrence of RCC.

Methods: Upon IRB approval a retrospective chart review at three independent institutions, identified 29 patients surgically treated for isolated nodal recurrence of RCC between 1993 and 2012. Of those, 15 met inclusion criteria of pN0 disease at initial nephrectomy and M0 disease at recurrence. Clinical, pathologic, and radiological characteristics of presenting and recurrent disease were then reviewed.

Results: Mean age at diagnosis was 51.9 (SD±16.9) yrs. Overall mean time to primary recurrence was 35.7 (SD±22) mos. and was significantly different between pT1/2 and pT3/4 tumors at 46.1 and 24.2 mos. (p=0.027) respectively. Mean time to primary recurrence in patients who developed post surgical metastasis was not statistically different from those without recurrence at 39.1 and 36.7 mos. (p=0.849) respectively. Mean size of recurrence was 4.4 (SD±3.0) cm and the most common sites of involvement were the para-aortic and para-caval nodes. Six patients (40%) experienced a secondary recurrence at a mean of 22.2 (SD±16.2) mos. Neither pathologic staging nor positive lymph node density correlated with increased risk of secondary recurrence.

Conclusion: The data presented here suggests nodal recurrence of RCC demonstrates a more favorable surgical response than other forms of local recurrence. Previous series report a metastatic progression rate of 60–65% for local non-nodal recurrence, while the secondary recurrence rate in our series was only 40%. In addition, time to primary recurrence was not correlated with risk of post surgical metastatic disease and hence all patients with isolated nodal recurrences should be considered for surgical resection regardless of the time to recurrence.
Introduction: The ability to apply non-invasive cross sectional imaging to distinguish between benign and malignant small renal masses (SRM) holds considerable value. While characteristic imaging features for both MRI and CT have been reported, the comparative predictive abilities among these modalities remains undefined.

Methods: We retrospectively reviewed the imaging characteristics and histopathologic records of 72 individuals who underwent partial (PN) or radical nephrectomy (RN) with CT or MRI at a single institution between 2007 and 2012. 18 individuals were excluded from analysis for cystic lesions or incomplete radiographic records. Two independent radiologists, blinded to patient pathology or outcome, retrospectively reviewed preoperative imaging. A score reflecting degree of malignancy was assigned based on the contribution of pattern of enhancement, degree of enhancement, contour of the mass, and the presence of calcifications or fat.

Results: The median tumor size was 2.8 cm (IQR 2−4.5 cm). 27 (50%) were clear cell renal cell carcinoma (RCC), 8 (14.8%) papillary RCC, 3 (5.6) chromophobe RCC, 7 (13%) oncocytoma, and 9 (16.7%) other benign lesions including lipid−poor angiomyolipomas. MRI demonstrated a higher diagnostic accuracy compared with CT, while combination of CT and MRI yielded higher specificity than either individual diagnostic modality alone. Low (<0.45) and high (>0.65) ratios of enhancement were significantly associated with accurate subtype determination (p=0.048), while moderate degrees of enhancement (0.45−0.65) were not predictive. SRMs with irregular contour were accurately identified in 92.9% compared with 55% of smooth−appearing tumors (p=0.011).

Conclusion: The use of dual modality imaging may enhance the diagnostic accuracy of small renal masses where qualitative and quantitative characteristics distinguish between lesions of varying malignant potential.
Poster #51
CLINICAL CHARACTERISTICS AND OUTCOMES OF ONCOCYTIC PAPILLARY RENAL CELL CARCINOMA
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(Presented By: Michael Gorin)

Introduction and Objectives: Papillary renal cell carcinoma (pRCC) has traditionally been classified as either type 1 or 2. Recently, however, a distinct oncocytic variant of pRCC has been described. In this study we report the clinical characteristics and outcomes of patients with this rare variant of pRCC.

Methods: We retrospectively queried the Johns Hopkins renal mass database for patients who underwent extirpative surgery between 2003 and 2012. A cohort of patients with oncocytic pRCC were identified and formed the basis of our analysis.

Results: During the study period, 2019 patients underwent a partial or radical nephrectomy at our institution. Of these patients, 16 (0.8%), including 9 (56.3%) men and 7 (43.8%) women, with a median age of 64.1 years (IQR 54.1–70.6) were diagnosed with oncocytic pRCC. No patient had a prior history of renal cell carcinoma and all presented with a solitary renal mass without evidence of nodal or metastatic disease. Notably, only 1 (6.3%) patient had a family history of renal cancer. The majority of patients (81.3%) were treated with a partial nephrectomy. At final pathology, tumors had a median diameter of 2.3 cm (IQR 1.8−3.2) and 12 (75.0%) were stage pT1a. Additionally, 2 (12.5%) tumors were classified as pT3a on the basis of perinephric fat invasion. Fuhrman grade was reported in 12 (75.0%) cases and 41.7% and 58.3% of these tumors were grade II and III, respectively. No tumor was found to be multifocal. In total, 14 (87.5%) patients had clinical follow−up of ≥3 months and none experienced a recurrence during a median follow−up of 52.3 months (IQR 15.3−72.8).

Conclusions: Oncocytic pRCC is a rare histologic variant. We observed a relatively large percentage of high grade and invasive lesions suggesting a propensity for an aggressive phenotype. Despite this, we found that small oncocytic pRCC tumors can be adequately treated with nephron sparing surgery.

Poster #52
HYPERURICEMIA IS ASSOCIATED WITH DE NOVO CHRONIC KIDNEY DISEASE AFTER PARTIAL NEPHRECTOMY
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(Presented By: Jason Woo)

Introduction and Objectives: Uric acid elevation has been associated with an increased risk of chronic kidney disease (CKD) in the medical setting. We investigated the relationship between uric acid levels and the renal function in patients with cortical renal masses undergoing partial nephrectomy (PN).

Methods: A multi–institutional retrospective study was performed of patients who underwent PN for renal cortical neoplasms, and who had preoperative and postoperative uric acid laboratory determination at 6 months follow−up. Data was analyzed between two groups: Patients who had hyperuricemia (>7mg/dL for males, >5.7 mg/dL for females) at 6 months follow up and patients with normal uric acid levels at 6 months follow up. Demographics, RENAL nephrometry score, peri−operative outcomes, and renal function were analyzed and compared. Rate of de novo estimated glomerular filtration rate<60 mL/min/1.73 m2 (eGFR at most recent follow−up, MDRD equation) was primary outcome. Sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) were calculated for association of hyperuricemia with de novo eGFR<60. Multivariable analysis (MVA) was performed to identify factors associated with de novo eGFR<60 at last follow−up.

Results: 298 patients were identified with appropriate uric acid data from patients undergoing PN at UC San Diego Health System and the University of Tennessee Health Science Center (8/2005–8/2013). 112 had postoperative hyperuricemia and 186 had normal uric acid levels. Demographics, median ischemia time (normal uric acid 23 minutes vs. hyperuricemia 24 minutes, p=0.1) and tumor size (normal uric acid 3.4 cm vs. hyperuricemia 3.5 cm, p=0.153) were similar. More patients in the hyperuricemia group were male, non-Caucasian, obese with BMI >30, hypertensive and smokers (p <0.05). Rate of de novo eGFR<60 was significantly higher with hyperuricemia vs. normal uric acid levels (20.5% vs. 4.3% p<0.001). Hyperuricemia had sensitivity 74.2%, specificity 66.7%, PPV 20.5%, and NPV 95.7% for de novo eGFR<60. MVA for de novo eGFR<60 demonstrated hyperuricemia (OR 14.9, p<0.001) and increasing RENAL nephrometry score (OR 3.5, p=0.017) as independent factors associated with development of de novo eGFR<60.

Conclusions: Uric acid elevation postoperatively is independently associated with renal functional degeneration after PN. Further studies are requisite to clarify the etiology of this association.
Poster #53
CLINICOPATHOLOGIC OUTCOMES OF CYSTIC RENAL CELL CARCINOMA
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(Presented By: Nicholas Donin)

Objective: Complex renal cysts are commonly identified on imaging studies for unrelated conditions. Up to 37% of these cysts are malignant and prompt surgical resection based on radiographic criteria (Bosniak classification system). The purpose of this study was to describe the clinicopathologic characteristics and oncologic outcomes of patients undergoing nephrectomy for cystic renal cell carcinoma (cRCC).

Methods: Using an IRB−approved Renal Tumor Database, we retrospectively reviewed the clinical, pathologic, radiologic, and oncologic outcome data of patients receiving nephrectomy for a complex cystic renal tumor. All cases were reviewed independently by GU radiologists to confirm a cRCC.

Results: 71 patients were identified who received nephrectomy for a complex cystic lesion. Nine of these patients were eliminated after review of their pre−operative radiographic studies demonstrated a solid masses with central necrosis or > 20% solid tumor component, leaving 62 patients for analysis. Average age was 64 years. 40 (64%) patients were male. At the time of resection, 1 (1.6%), 3 (4.8%), 54 (87.1%), and 4 (6.5%) had a Bosniak category II, IIF, III, and IV cystic lesion respectively. 19 (30.6%) patients were initially managed expectantly but underwent surgery due to progression of complexity on follow−up. The mean tumor size was 3.3 cm (range 0.7−12cm) on final pathology. 48 (76.7%) of the lesions were found to be malignant. 37 (77.1%), 5 (10.4%), 4 (8.3%), and 2 (4.1%) were stage T1a, T1b, T2a, and T3a respectively. Twenty (40.8%), 26 (53.1%), and 3 (6.1) of the masses were found to be Fuhrman grade 1,2, and 3 respectively. Clear cell was the most common histologic subtype (56%), followed by papillary (27.8%) and unclassified RCC (4.2%). With a mean and median follow−up of 48.4 and 43.0 months (respectively), no patients in the entire cohort developed a local or metastatic recurrence. All patients were alive at last follow−up.

Conclusions: cRCC can be accurately identified using well−defined radiographic criteria. In our series with moderate follow−up, cRCC do not appear to recur or progress regardless of size, histologic subtype or grade. These findings suggest that the malignant potential of cRCCs are significantly less than solid RCCs. Further investigation is required to determine if cRCC should be classified and managed independently from solid RCCs.

Poster #54
CLINICOPATHOLOGIC CHARACTERISTICS, TREATMENT, AND OUTCOMES OF RENAL ONCOCYTOSIS
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(Presented By: Nicholas Donin)

Introduction and Objectives: Renal oncocytosis is a recently established disease entity characterized by numerous oncocytic tumors and diffuse oncocytic changes in renal parenchymal epithelia. It is infrequently described with approximately 30 reported cases in the literature. We investigated a consecutive series of 10 patients with oncocytosis at a single center to determine their clinicopathologic characteristics, management, and outcomes.

Methods: We queried our IRB−approved Renal Tumor Database for patients who had undergone surgery for a renal mass with a pathologic diagnosis of oncocytosis. Clinical and pathologic data were analyzed retrospectively. A single GU pathologist reviewed all identified cases.

Results: Between July 2002 and July 2013, 10 patients were identified who underwent nephrectomy with a pathologic diagnosis of renal oncocytosis. The majority were male (80%), with a mean age at diagnosis of 60.4 years. 87.5% of patients were Caucasian. Surgical management was partial nephrectomy for 87.5% with the remaining 12.5% undergoing radical nephrectomy. Bilateral tumors were common (50%). A total of 28 tumors were diagnosed in this cohort, with a median of 2 tumors per patient (range 1−9). Average tumor size was 3.7cm (range 1.8−9). The most common dominant tumor histology was oncocytoma (54.6%). At last follow−up 18% of patients had ESRD. Median follow−up was 40 months. No patients developed metastatic disease.

Conclusions: Oncocytosis is a rare pathologic entity. Patients with oncocytosis frequently develop bilateral tumors, undergo multiple procedures, and a substantial proportion of these patients have severe renal dysfunction, in some cases requiring hemodialysis. Papillary, chromophobe, and clear cell features can accompany the oncocytic changes. The entity itself appears to have low metastatic potential.
Introduction: Postoperative rhabdomyolysis /elevated serum creatinine kinase (CK) can be seen following prolonged surgery and in patients with increased body mass index (BMI). Grossly elevated CK which is seen in rhabdomyolysis has been known to cause acute tubular necrosis (ATN). However, there is no defined cutoff value of CK above which the risk of kidney injury is significantly increased. We report risk factors associated to developing postoperative elevated CK and its effects on renal function in patients who underwent partial nephrectomy at the National Institutes of Health between 2007 and 2012.

Methods: We retrospectively evaluated patients who had undergone complex multifocal partial nephrectomies between January 2007 and December 2012. CK levels were routinely collected on all patients and followed until less than a threshold of concern (2000 IU/L). Serum creatinine was checked preoperative (preop), postoperative (postop) daily and on 3 month postop follow-up. Kidney function was assessed using eGFR (CKD–EPI–Creatinine 2009 formula). Student’s t-test and chi-square statistics were used to test for differences between parameters of interest.

Results: 209 cases were reviewed. Mean age and BMI for the group was 48.0 years and 30.1 respectively. Open surgery was used in 62.7% cases, 30.6% were robotic and 6.7% were laparoscopic. Mean surgery time was 374 minutes. Mean highest CK value during hospital stay was 2962 U/L. On univariate analysis, factors significantly associated with increased postoperative serum CK levels were young age (p = 0.004), male gender (p=0.003), high BMI (p=0.0005), surgery time (p<0.0001), number of kidney tumors resected (p<0.0001) and estimated blood loss (p=0.01). Elevated serum CK was significantly associated with decreased eGFR in the acute postoperative period (p<0.001 for eGFR postop day 1, p=0.01 for eGFR day of hospital discharge). However, there was no significant association between elevated serum CK and decreased eGFR at 3 month follow up (p=0.6).

Conclusions: Postoperative elevations of CK may transiently prolong ATN after partial nephrectomy, but does not appear to negatively impact long term overall renal function. Factors associated with the development of elevated serum CK postoperative are age, male gender, high BMI, prolonged surgery time, EBL and number of lesions resected.
**Objective:** To assess the prognostic abilities of the zonal Ne.Ph.R.O. scoring system, a novel, simplified, and user−friendly nephrometry scoring system based on 4 salient anatomical features of renal architecture, in treatment failure and peri−operative complications associated with small renal masses (SRM) treated with percutaneous ablation.

**Methods:** After obtaining IRB approval, charts and pre−operative CT or MRI imaging of 68 patients who had undergone either radiofrequency ablation (RFA) or cryoablation (CA) of their renal masses from 8/2004 to 11/2010 were retrospectively reviewed. A total of 69 SRMs were treated. Patient age, SRM side, SRM biopsy results if available, treatment modality, and treatment outcomes were recorded. The R.E.N.A.L. and Ne.Ph.R.O. nephrometry scoring systems were used to grade SRM complexity and surgical risk based on pre−operative imaging; subcomponent scores as well as total scores of each system were computed. Comparisons between continuous variables were made using either the t−test or the Mann−Whitney U test. Comparisons between categorical groups were made using the chi−square test or Fisher exact test. Statistical significance was set at p<0.05.

**Results:** The median patient age was 72 (IQR 61–76). Median SRM size was 2.0 cm (IQR 1.6–2.5). Of the 69 SRMs treated, 50 (72.5%) were treated with RFA and 19 (27.5%) with CA. Sixty−five (94.2%) SRMs were biopsied; 36 (52.2%) were proven to be renal cell carcinoma. A significant association was found between the Physical Zone component (Zone 3, upper pole division of renal unit) of the Ne.Ph.R.O. scoring system and major complications which included pneumothorax requiring chest tube and pacemaker malfunction (p=0.008). No significant association was shown between components of R.E.N.A.L. scoring system and major complications (p=0.20). A significant association between treatment failure requiring re−ablation and SRMs rated as high−risk Ne.Ph.R.O. score (score 10−12) was found (p=0.004). No significant association was shown between treatment failure and R.E.N.A.L. risk categories (p=0.76).

**Conclusion:** The zonal Ne.Ph.R.O. scoring system not only proves ease of use in evaluating the complexity of renal masses but also continues to demonstrate prognostic value—it has shown to be a predictor of treatment failure and complication in SRM ablative modalities when compared to the R.E.N.A.L. scoring system.
POORLY FUNCTIONING KIDNEYS RECOVER FROM ISCHEMIA DURING PARTIAL NEPHRECTOMY AS WELL AS STRONGLY FUNCTIONING KIDNEYS

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(Presented By: Maria Carmen Mir)

Objective: Some authors have proposed that poorly functioning kidneys may not recover from ischemia as well as strongly functioning kidneys, which would have impact on the surgical approaches to partial nephrectomy (PN).

Methods: A total of 122 consecutive patients undergoing PN at our institution with appropriate studies to facilitate analysis of function and parenchymal mass volume in the operated kidney (CT and SCr within 2 months prior and 4−12 months postoperative) were analyzed. Patients with a contralateral kidney also required renal scans in the same time frame to provide split renal function. Volumetric CT was utilized to measure the volume of functional parenchyma pre and post PN in the operated kidney and the contralateral kidney. GFR was determined by the MDRD2 equation. Recovery of nephron function (GP/VS = % GFR preserved/% volume saved) would be 100% if all nephrons recovered from the ischemic insult.

Results: Median age was 61 years with approximately 50% of patients having open procedures. Median RENAL score was 7. Cold ischemia was used in 50 patients (median 26 min), while 72 had limited warm ischemia (median 20 min). Median %GFR preserved in the operated kidney was 79.5%. Median parenchymal volume saved was 84 %. Function in the contralateral kidney remained stable without significant increase. Overall recovery of nephron function (GP/VS) was 95.5 %, and was 100.7% for the cold ischemia subgroup and 93% in the limited warm ischemia subgroup. Recovery of nephron function (GP/VS) was similar for all strata of preoperative eGFR in the operated kidney (<30, 21−45, 46−60, and > 60) as detailed in the table (p > 0.18 for all comparisons), even in the limited warm ischemia subgroup.

Conclusion: Preoperative GFR at PN does not correlate with how well the kidney will recover from the ischemia insult. Our results suggest that the amount vascularized parenchyma preserved by the PN is the main determinant of the postoperative GFR. Even poorly functioning kidneys recover well from the ischemic insult as long as limited warm ischemia or hypothermia are utilized.
Introduction: Obesity has been associated with increased risk of penile squamous cell carcinoma (PSCC) in a single institutional retrospective study. This may be due to impaired genital hygiene, buried penis and smegma accumulation, functional phimosis caused by obesity or through other mechanisms. In order to investigate this association at a population level, we conducted a matched case-control study linking the Iowa Department of Motor Vehicles Drivers' License Database (DLD) with the Iowa Cancer Registry of the State Health Registry of Iowa (SHRI).

Methods: We identified all men diagnosed with invasive PSCC from 1973 to 2010 through the Iowa Cancer Registry. Body mass index (BMI) was calculated using self-reported height and weight from the DLD. There were 425 cases of invasive penile squamous cell carcinoma identified, with DLD information available on 330 cases. Population-based, cancer-free male controls from the Iowa DLD were frequency matched to cases in a 3:1 ratio. Matching was performed within 5-year age and calendar year strata, according to time of diagnosis for cases and time of DL issuance for controls. In total, 990 controls were matched to the 330 cases. Conditional logistic regression was used to evaluate the association between BMI and risk of developing invasive penile cancer. The estimated effect of BMI is reported along with 95% confidence intervals and is assessed for significance at the 0.05 level with two-sided statistical testing.

Results: As compared to men with a normal weight (BMI < 25) the risk of invasive penile cancer increased with increasing obesity, with an odds ratio of 2.68 (95% CI 1.90–3.77; p =< .0001) for overweight men, 3.89 (95% CI 2.51–6.03; p = <.0001) for obese men, and 1.81 (95% CI 0.48–6.76; p = 0.3805) for morbidly obese men. Accordingly, the analysis results show that penile cancer cases were significantly more likely to be overweight or obese as compared to controls. When BMI was treated as a continuous variable in the analysis, the risk of invasive penile cancer increased by an estimated 70% (OR 1.70, 95% CI 1.43–2.03, p = 0.0001) for every five-unit increase in BMI.

Conclusion: Higher BMI is associated with an increased risk of invasive penile cancer. These results may indicate that obesity is a modifiable risk factor for the development of penile cancer.
Too Frail for Surgery? Preoperative Perceptions and Expectations of Surgeons and Patients

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(Presented By: Daniel Canter)

Introduction: Surgical decision-making relies on subjective judgments by the physician and patient despite the availability of objective assessment tools. In this study, we sought to examine the concordance between an individual patient and his/her surgeon on the patient’s “fitness” for surgery. We then correlated these ratings with the patient’s objective frailty scores (FS).

Methods: Patients were prospectively enrolled from urology, general surgery, and surgical oncology clinics. In addition to the 5 component frailty scale, patients were asked to rate their ability to withstand the physical stress of the scheduled surgery. The operating surgeon then independently rated his/her assessment of the patient’s ability to withstand surgery in a blinded manner. The distance (mm) from the “fully able” and “not frail” edge of a 10 cm line was used as the rating given by the patient and surgeon, respectively. (Figure 1)

Results: 203 patients were included in this study. The majority of patients in this study were white (67%) and male (60.6%), and mean age was 61.6 ± 11.7 years. Patients’ self-assessment showed no correlation with their age (Spearman Correlation = 0.083, p-value = 0.239), however surgeons’ ratings showed a positive correlation with patient age (SC= 0.334, p = < 0.001). Patients’ scores were positively correlated with their FS (SC = 0.338, p = < 0.001), although surgeons’ ratings showed a stronger correlation (SC = 0.405, p = < 0.001). However, when stratified by age group, the positive correlation and predictive ability were lost (p-value = 0.198), indicating a subjective bias to rating patients frail based on age alone.

Conclusions: Although age is an established risk factor, our data demonstrate surgeons may mistakenly use it as a surrogate for an objective measure of physiologic reserve. Conversely, patients neglect the effect of age on surgical fitness, possibly leading to unrealistic expectations. Ultimately, a reliable, accurate and objective risk assessment tool, such as frailty, allows for improved surgical decision-making.

![Figure 1: Rating scale completed by patients and surgeons.](image)
Poster #60
THE NATURAL HISTORY OF RENAL ANGIOMYOLIPOMAS
Nicole Kim¹; Jaimin Bhatt²; Antonio Finelli¹; Kartik Jhaveri¹; Andrew Evans¹; York Pei¹; Patrick Richard¹; Laura Legere¹; and Michael Jewett¹
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(Presented By: Jaimin Bhatt)

Introduction: Renal angiomyolipomas (AML) are angiogenic tumors associated with constitutive activation of mammalian target of rapamycin complex, known to develop in tuberous sclerosis (TS) patients. Although commonly benign, AMLs can predispose patients to serious complications such as hemorrhage and very rarely lead to malignant cancer variants. The true natural history of these tumors is not well known. We hypothesize that sporadic AMLs are benign slow-growing tumors that do not require intensive follow-up or intervention.

Methods: This is a retrospective study of patients with renal AML that were followed at our institution from 2002 to 2013. Patient demographics, tumor progression (increase in size of maximal axial dimension or need for intervention), and genetic status data were collected using a unique web-crawler software (Montage application) and Radiology Information System, using search words ‘renal or kidney + angiomyolipoma’.

Results: The web-crawler yielded 2741 individual cases of AMLs reported on any radiology reports. Of these, we focused on cases that had 3 or more images in order to assess the natural history. Data were collected completely in 358 of 466 such cases. There was a female preponderance of 80.7%. There were 19 cases of tuberous sclerosis (TS). The mean age of the entire cohort at diagnosis was 58 years, compared to 31 for the TS group. Majority of AMLs were <4cm (85%). They were bilateral in 17%. Of those <4cm, only 1% required intervention, compared to 31.5% of AMLs >4cms. Of the remaining AMLs <4cm that did not require intervention, only 3.3% grew over time. In comparison, up to 73% of AMLs >4cm did not grow. However, for the TS group, the initial tumor size was larger (78.5% were >4cm), and both the growth and intervention rates were significantly higher. Up to 43% of all TS cases required intervention compared to 5% for entire cohort. The growth rates for TS were 67% and 50% for tumors < or >4cm respectively.

Conclusions: This series is the world’s largest single center study of AMLs. We believe that most sporadic AMLs are stable in size and seldom require intervention or intensive follow-up, but those associated with TS present with greater size, multiple foci, complications, and significant tumor progression, and may be potentially offered upfront targeted therapy. Further investigation into patients with higher growth rates may identify important genomic or phenotypic markers which can tailor surveillance strategies.

Poster #61
CAN PRE-OPERATIVE CT IDENTIFY POSITIVE LYMPH NODES IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA?
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(Presented By: John Sfakianos)

Introduction and Objectives: There is no consensus regarding the indications for lymph node dissection (LND) for upper tract urothelial carcinoma (UTUC) or the extent of LND necessary for adequate staging. We sought to evaluate the performance of CT scan in identifying positive LNs in UTUC patients undergoing radical nephroureterectomy (RNU).

Methods: We queried a prospectively maintained institutional database and identified 411 consecutive patients who underwent RNU from 1995–2013. The location of suspicious LNs identified on pre-operative axial imaging was categorized as para-caval (P−C), interaortocaval (IAC), para-aortic (P−A), hilar, and pelvic. This categorization was applied to the location of positive LNs on pathology and inclusion of regions in LND. The performance of pre-operative imaging in LN-positive patients was assessed.

Results: Of 411 patients who underwent RNU for UTUC, 279 (67.9%) underwent LND. The median number of LNs removed was 8 (IQR 3-14). There were 52 (18.6%) LN-positive patients with a median number of two positive LNs (IQR 1-4). Thirty patients had renal pelvic tumors (58%), 10 had ureteral tumors (19%), and 12 had tumors involving both the renal pelvis and ureter (23%). For 24 LN-positive patients with right-sided tumors, involved LNs were located in the P−C (16), IAC (4), hilar (8), and pelvic (1) regions. For 28 LN-positive patients with left-sided tumors, involved LNs were located in the P−A (18), IAC (3), hilar (8), and pelvic (3) regions. Pre-operative axial imaging (CT 47, MRI 4) was available for 51/52 LN-positive patients. The sensitivity of imaging for detecting LN-positive patients was, at best, 47.1%, as 27/51 of the LN-positive patients (52.9%) had normal imaging. The 24 patients with suspicious LNs had radiographic involvement of 40 LN regions, of which 32 were targeted by LND. The positive predictive value of imaging for LN positivity was 75%, as 23/32 of the suspicious regions that were included in LND had positive LNs.

Conclusions: Axial imaging prior to RNU has poor sensitivity for identifying UTUC patients with positive LNs and should not be used as a screening criterion for performance of LND. However, in patients with suspicious LNs identified on imaging, LND templates should be extended to include those regions. Prospective studies are needed to assess the distribution of positive LNs in patients with UTUC, stratified by laterality and tumor location, so that LND templates can be standardized.
**Poster Session I – Full Abstracts**

**Poster #62**

**EVALUATION OF THE PROGNOSTIC SIGNIFICANCE OF ALTERED MAMMALIAN TARGET OF RAPAMYCIN (MTOR) PATHWAY BIOMARKERS IN UPPER TRACT UROTHELIAL CARCINOMA (UTUC)**

Aditya Bagrodia¹; Laura-Maria Krabbe¹; Bishoy Gayed¹; Payal Kapur¹; Ira Bernstein¹; Xian-Jin Xie¹; Christopher Wood²; Jose Karam³; Eiji Kikuchi³; Alon Weizer⁴; Jay Raman⁵; Mesut Remzi⁶; Charles Guo⁶; Nathalie Rioux-Leclerq⁷; Andrea Haitel⁸; Marco Roscigno⁸; Francesco Montorsi⁹; Christian Bolenz¹⁰; Karim Bensalah⁷; Arthur Sagalowsky¹; Shahrokh Shariat⁶; Yair Lotan¹; and Vitaly Margulis¹

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(Presented By: Aditya Bagrodia)

**Objective:** Alterations in the MTOR and HIF pathways may have prognostic significance in bladder carcinoma. We evaluated the predictive value of altered MTOR−pathway biomarkers in upper tract urothelial carcinoma (UTUC).

**Methods:** Multi−institutional review of clinicopathological information on patients receiving extirpative surgery from 1990 to 2008. Immunohistochemistry for phosphorylated−S6, mTOR, phosphorylated−mTOR, PI3K, p4E−BP, phosphorylated−AKT, PTEN, HIF−1a, Raptor and Cyclin D was performed on tissue microarrays from RNU specimens. Predictive markers were identified by conducting univariate and multivariate analyses for event at two years. Significance of altered markers was assessed with Kaplan−Meier analysis and Cox regression analysis.

**Results:** Clinicopathologic information and immunohistochemical staining data was collected on 620 patients. Mean age was 69 years. Thirty−seven percent of patients had non organ−confined (T3/T4 and/or N+) disease. Seventy−four percent of patients had high grade disease and 22% had lymphovascular invasion (LVI) on final pathology. Over a median follow up of 27.3 months, 24.6% of patients recurred and 21.8% died of UTUC. On multivariable analysis, PI3K (OR 1.28, p=0.001) and Cyclin D (OR 3.45, p=0.05) were significant predictors of clinical outcomes. PI3K H score >1 was considered altered and Cyclin D H score <2 was considered altered based on integral proportion cutpoints. Cumulative marker score was defined as either low risk (no altered markers or one altered marker) or high risk (Cyclin D AND PI3K altered). Patients with high risk marker score had a significantly higher proportion of high grade disease (91% vs 71%, p<0.001), non−organ confined disease (61% vs 33%, p=0.001), LVI (35% vs 20%, p=0.001), and regional lymph node metastases (22% vs 6%, p<0.001). Kaplan−Meier analysis demonstrated a significant difference in CSM based on risk groups. On Cox regression multivariable analysis for CSM incorporating non organ−confined disease, grade, LVI, tumor architecture, and markers score, high risk biomarker score was an independent predictor of CSM (hazard ratio 1.5, 95% CI 1.04−2.3, p=0.03).

**Conclusions:** Alterations in MTOR−based marker profiles may allow for enhanced patient counseling, risk stratification, and individualized treatment regimens.

**Poster #63**

**ACTIVE SURVEILLANCE FOR LOW−RISK PROSTATE CANCER IN AFRICAN AMERICAN MEN: A MULTI−INSTITUTIONAL STUDY**

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(Presented By: Brian Odom)

**Introduction:** Active surveillance (AS) in men with low−risk prostate cancer (PCa) has become an accepted treatment option. However, the natural history of PCa in the African American men (AAM) suggests a more aggressive disease and higher stage at diagnosis in comparison to the non−AAM. We reviewed outcomes of AAM undergoing AS for low−risk PCa at three different medical centers.

**Methods:** Between July 2005 and October 2012, 214 men accepted AS at three institutions based on favorable clinical features and parameters after initial re−biopsy. Patients were followed with routine clinical assessment, serum prostate−specific antigen (PSA), and a repeat biopsy every 1−2 years. AS failure was defined as Gleason score >6, increase in total positive cores to >33%, increase in maximum cancer volume in any core to >50%, or a rise in PSA to >10 ng/mL. Disease reclassification (progression) and failure to remain on AS were compared between the two groups.
Results: Of 214 men, 75 were excluded due to various reasons, leaving 67 AAM and 72 non–AAM on AS. Median age at diagnosis was 64 and 67 years for AAM and non–AAM, respectively, and median follow–up was 34 and 46 months, respectively. During this time, 44 AAM (66%) remained on AS and 23 (34%) underwent treatment, of whom 6 (26%) were treated by patient choice and 17 (74%) due to disease reclassification. In the non–AAM group, 59 (82%) men remained on AS and 13 (18%) underwent treatment, of whom 8 (62%) were treated by patient choice and 5 (38%) due to disease progression. The 3–year freedom from overall treatment was 74% and did not differ by race (p=0.06). The 3–year freedom from disease progression was 85%, where AAM were at significantly higher risk of disease progression (HR=3.8; 95% CI: 1.4–10.4, p=0.01).

Conclusions: The study demonstrates a higher disease reclassification rate in AAM who choose AS for initially diagnosed low–risk PCa when compared to non–AAM. Even though the increasing acceptance and safety of AS has been demonstrated and adopted by many urologists and physicians, the natural history of PCa in AAM may require closer follow–up and more stringent criteria to avoid a missed opportunity for cure.

Poster #64
POTENTIAL OF IMPROVED DIAGNOSIS AND PROGNOSIS OF PROSTATE CANCER: MIRNA ANALYSIS OF TISSUE PRINTED TRUS BIOPSIES
Kai Hammerich¹; Christopher Lebeis²; John Humphrey²; Travis Sullivan²; Justin Zbrzezny²; Kelly Summerhayes-Greenfield²; Patrick Teebagy²; John Dugan²; John Libertino²; Antonia Holway²; and Kimberly Rieger-Christ²
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(Presented By: Kai Hammerich)

Introduction: Treatment options and clinical decisions surrounding prostate cancer are based on DREs, PSA levels and histopathological analysis of TRUS guided biopsies. However, molecular pathway analysis as a prognostic and diagnostic tool has traditionally been limited to prostatectomy specimens. The aim of this study was to evaluate microRNA (miRNA) expression levels associated with different histopathologies at the time of TRUS biopsy.

Methods: Prints of TRUS biopsies were collected by tissue printing under an IRB–approved protocol. Total RNA was extracted from TRUS biopsies and pooled for microarray analysis. Seven subgroups were created representing benign tissue, atypia, Gleason Sum (GS) 6, 7, and ≥8 adenocarcinoma, and patients with negative or positive lymph nodes (LN) on prostatectomy. MiRNA expression was verified by qRT–PCR on individual specimens.

Results: Tissue prints from 101 patients were obtained from this study where the biopsies were classified as benign (n=43), atypical (n=14) or cancer (n=44) by histopathology. MiRNA profiling identified 137 miRNAs expressed across all samples while 142, 58 and 23 were differentially expressed in GS 6 versus 8, GS 6 versus 7 and LN positive versus LN negative, respectively. Twenty–four miRNAs correlated with Gleason Sum. qRT–PCR on individual patient samples confirmed the differential relationships observed on the array.

Conclusions: TRUS biopsy samples showed differential miRNA expression among cores with diverse histopathologies. Several of these changes have previously been reported in prostatectomy specimens, validating this approach. Analysis of miRNA expression levels in TRUS specimens holds promise to improve diagnosis, prognosis, and characterization of prostate cancer.
**Poster Session I – Full Abstracts**

**Poster #65**  
**IMPACT OF PRIOR DOCETAXEL (D) ON SIPULEUCEL-T (SIP-T) PRODUCT PARAMETERS IN PROCEED PATIENTS (PTS)**  
Celestia Higano¹; Andrew J. Armstrong³; Matthew R. Cooperberg³; Philip W. Kantoff⁴; James L. Bailen⁵; Raoul S. Concepcion⁶; Vahan Kassabian⁷; Shaker R. Dakhil⁸; Steven E. Finkelstein⁹; Jeffrey L. Vacirca¹⁰; Robert M. Rifkin¹¹; Andrew Sandler¹²; Candice McCoy¹³; James B. Whitmore¹⁴; Robert C. Tyler¹⁵; and Oliver Sartor¹³  
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(Presented By: Celestia Higano)

**Introduction and Objectives:** Sip−T is an autologous cellular immunotherapy indicated for asymptomatic or minimally symptomatic mCRPC. The IMPACT trial excluded pts who received D ≤3 months prior to registration. PROCEED is an ongoing, phase 4 registry, enrolling pts treated with commercial sip−T. Use of D prior to sip−T is not restricted, so prior D affect on sip−T immune manufacturing parameters can be evaluated.

**Methods:** Pts treated with sip−T ≤ 6 mo were eligible to provide informed consent. Sip−T parameters assessed included: total nucleated cell (TNC) count, antigen presenting cell (APC) count (CD54+ large cells) & APC activation (upregulation of CD54).

**Results:** By Nov. 2012, 108/761 (14%) received D prior to sip−T and had similar median cumulative APC counts (1.83 [Q1, Q3: 1.16, 2.71] vs. 1.82 [1.27, 2.70] x 10⁹) and TNC counts (10.16 [7.30, 13.69] vs. 11.47 [8.56, 15.31] x 10⁹) vs. D naïve, whereas median cumulative APC activation appeared slightly lower (32.39 [25.05, 41.02] vs. 34.84 [28.71, 42.83]), but was well above the release criterion for each infusion (2.6 fold). The group was then split by Eastern Cooperative Oncology Group Performance Status (ECOG PS) and Gleason scores (table).

**Conclusions:** Pts with D prior to sip−T appeared to have product parameters comparable to pts without prior D, albeit with a slightly lower APC activation. Further analysis showed that pts receiving D within 3 months of sip−T had higher Gleason and ECOG scores. The clinical significance of these findings is unclear, but suggests that APC activation is not impaired following docetaxel.
Poster #66
IMPROVEMENT IN CLINICAL TNM STAGING DOCUMENTATION WITHIN A PROSTATE CANCER QUALITY IMPROVEMENT COLLABORATIVE
Christopher Filson¹; Brooke Boer²; Jon Curry³; Susan Linsell³; Zaojun Ye³; James Montie³; and David Miller³
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Objective: Documentation of clinical TNM stage is essential for evaluating and improving prostate cancer care, and is a recognized quality indicator. We assessed the effectiveness of a feedback and educational intervention to increase documentation of clinical TNM stage among urologists in a statewide quality improvement (QI) collaborative.

Methods: The Michigan Urological Surgery Improvement Collaborative (MUSIC) is a consortium of urology practices that aims to improve the quality and cost-efficiency of prostate cancer care. In pilot data collection activities, trained abstractors recorded medical record documentation of clinical TNM stage by participating urologists. First, we compared levels of TNM stage documentation in twelve MUSIC practices at baseline and after performance feedback and a collaborative-wide educational intervention. Second, we also fit a multivariable logistic regression model and examined patient and practice characteristics associated with documentation of TNM stage.

Results: We accrued 491 and 581 men with newly diagnosed prostate cancer during the baseline and post-feedback phases of data collection, respectively. At baseline, 58% of patients had clinical TNM staging in the medical record, ranging from 19−96% across 12 practices (Figure, p<0.05). After the intervention, documentation improved to 79% of patients overall, with seven individual practices achieving significant improvements (Figure, all p<0.05). The greatest improvements in documentation occurred among those treated in smaller practices (i.e., 1−4 urologists), where patients were nine times as likely to have clinical TNM staging documented after the intervention (OR 9.04, 95% CI 3.68 – 22.21).

Conclusion: Following collaborative review of staging criteria and feedback of baseline performance, urologists in MUSIC practices dramatically improved documentation of clinical TNM stage. This finding underscores the behavioral change possible with the collaborative QI model, and ensures the necessary risk stratification data for our ongoing efforts to improve care.
Introduction and Objectives: Gleason score is a common component of eligibility criteria for active surveillance (AS), a management strategy developed to minimize the ‘overtreatment’ of low-risk prostate cancer (PCa). A 2005 modification of the Gleason scoring system which limited the criteria for Gleason score 6, may be causing an ongoing grade migration in PCa. An ongoing Gleason grade migration may lead to the underuse of AS. Our objective was to use a population-based national database to compare trends in the three major low-risk qualifications (Gleason ≤6, PSA <10 ng/ml, and cT1−cT2a disease).

Methods: Using 2004–2010 data generated by the Surveillance, Epidemiology, and End Results (SEER) Program, we identified all patients with localized PCa and available information on Gleason score, PSA, and clinical stage. We measured trends in the proportion of men with Gleason score ≤6, PSA <10ng/ml, or cT1−cT2a disease. Logistic regression analyses were used to compare frequencies of the three individual low-risk classifications by year.

Results: We identified 310,875 men diagnosed with localized PCa and known risk classifications from 2004 to 2010. Over the study period, 76% (n=236,490), 67% (n=208,218), and 48% (n=148,488) of men were considered low-risk based on PSA, clinical stage, and Gleason score, respectively. From 2004 to 2010, the proportion of men with PSA <10ng/ml increased from 74% to 77% (OR 1.20, 95% CI 1.16–1.24, p<0.001), cT1−cT2a disease increased from 60% to 73% (OR 1.75, 95% CI 1.70–1.80, p<0.001), Gleason score ≤6 decreased from 54% to 43% (OR 0.64, 95% CI 0.62–0.66, p<0.001), and the median PSA decreased from 6.5 ng/ml to 6.2 ng/ml (Figure).

Conclusions: Among men diagnosed with localized PCa in the United States between 2004 and 2010, there has been an ongoing Gleason grade migration with fewer low-grade (Gleason score ≤6) cancers. The decreasing median PSA and increasing proportion of men with low-risk PSA (<10ng/ml) and clinical stage (T1−T2a) over the study period suggest men should have been more likely to have low-grade cancers. The observed grade migration may contribute to the underutilization of AS for low-risk patients, limiting the potential to minimize the ‘overtreatment’ of PCa.
Poster #68
TRENDS IN THE INITIAL MANAGEMENT OF LOW-RISK PROSTATE CANCER IN THE UNITED STATES: A POPULATION-BASED ANALYSIS
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(Presented By: Adam Weiner)

Introduction and Objectives: Non-curative initial management (NCIM) approaches such as active surveillance for low-risk prostate cancer (PCa) have been recommended by multiple clinical societies. Our objective was to use a population-based national database to estimate the proportion of men meeting eligibility criteria and electing NCIM between 2004−2010. We evaluated various factors for their association with NCIM utilization. In addition, we measured trends in the risk profile of localized prostate cancer patients as it relates to NCIM recommendation and adoption.

Methods: Using 2004−2010 data generated by the Surveillance, Epidemiology, and End Results (SEER) Program, we identified all patients diagnosed with localized and low-risk, localized PCa (Gleason ≤ 6, PSA < 10ng/ml, and cT1−cT2a disease) and measured trends in primary treatment. Logistic regression analyses were used to evaluate determinants of NCIM utilization as well as compare frequencies of Gleason ≤ 6, PSA < 10ng/ml, and cT1−cT2a disease by year.

Results: The number of men with localized PCa did vary greatly by year and amounted to 304,645 patients. Increased age, decreased PSA, early clinical stage, and recent year of diagnosis were strong determinants of NCIM. Over the course of the study period, 29% of localized PCa patients were low-risk. Of these men, 23.9% elected NCIM. Radiation and surgery use declined 10% and 1% respectively while NCIM increased from 19% to 31% (OR 2.03, 95% CI 1.91−2.16) (Figure). However, use of NCIM among all localized PCa increased only slightly (from 21% to 22%) (OR 1.16, 95% CI 1.12−1.20). The frequencies of PSA <10 ng/ml and clinical stage T1−T2a disease increased from 73.6% to 77.1% (OR 1.21, 95% CI 1.17−1.25) and 60.2% to 72.6% (OR 1.75, CI 1.70−1.81), respectively. The frequency of Gleason ≤ 6 decreased from 54.2% to 43.1% (OR 0.64, 95% CI 0.62−0.66).

Conclusions: Over the study period, use of NCIM among low-risk PCa patients increased greatly (from 19.3% to 30.8%), but increased only slightly for all localized PCa (from 21.4% to 22.6%). These contrasting results appear to be caused by an ongoing prostate cancer grade migration leading to fewer cancers being classified as low-risk.
Poster #69
THE FUTURE FACE OF PROSTATE CANCER IN THE US? DISPARITIES IN PRESENTING PROSTATE CANCER CHARACTERISTICS AMONG THE SOCIOECONOMICALLY DISADVANTAGED
Joshua Gonzalez; Greg Gin; Kristian Stensland; Rajiv Jayadevan; Michael Leapman; Simon Hall; Alfred Winkler; and Hugh Lavery
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(Presented By: Greg Gin)

Introduction and Objectives: The United States Preventive Services Task Force (USPSTF) recently recommended against routine prostate specific antigen (PSA) screening. Socioeconomically disadvantaged individuals often have less access to routine health screening. We analyzed the presenting prostate cancer (PCa) characteristics of an ethnically diverse cohort of men with low socioeconomic status and hypothesized that this group might represent an unscreened US population should the new USPSTF recommendations be widely adopted.

Methods: We retrospectively reviewed records of 625 consecutive men diagnosed with prostate cancer at an urban, public hospital in Queens, New York from 2002–2012. Participants were stratified according to presenting AJCC clinical staging, modified D’Amico risk group and PSA at presentation. We compared these parameters to previously reported data in PCa screening trials (the ERSPC and PLCO) with disparate results.

Results: Our cohort was older (mean 73 years, IQR 68–79) with PSAs much higher than standard screening populations (median 9.5 ng/ml, IQR 5.6–24.5). The majority of our patients represented underserved populations, with the largest groups being Black (63%), Asian (19%) and Hispanic (10%). Whites accounted for only 5%. 48% had a PSA > 10 and 12% had a PSA > 100; 20% had Gleason ≥ 8. A significant proportion of patients presented with advanced stage; 16% were diagnosed with stage IV and 4% with stage III disease. Among the clinically localized, 37% were low risk, 29% were intermediate risk and 15% were high risk. This was similar to the distribution in the control arm of the ERSPC (48%, 31%, 13%, respectively, with 8% metastatic). In contrast, the PLCO control group had only 1.9% stage III, 2.7% stage IV, and 11.5% Gleason ≥ 8.

Conclusions: In a predominantly minority population of low socioeconomic status, age and PSA at diagnosis, clinical stage, and risk group were higher than in previously reported cohorts. A large proportion (20%) of patients had advanced stage at presentation. Although our cohort over-represents minorities (particularly Blacks) relative to the US population, it suggests that socioeconomically disadvantaged Americans have prostate cancer characteristics not dissimilar to unscreened Europeans. Our cohort may reflect the future distribution of PCa should routine PSA screening be abandoned according to the USPSTF recommendation.
Poster #70
DEFINITION FOR BIOCHEMICAL SUCCESS FOLLOWING PRIMARY WHOLE GLAND PROSTATE CRYOABLATION
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(Presented By: David Levy)

Objective: To identify an evidence based definition of biochemical success following primary whole gland prostate cryoablation.

Methods: The Cold Registry was queried for a risk stratified cohort of treatment naïve patients who underwent primary whole gland prostate cryoablation with 5 year follow up data. Variables studied: age, PSA at diagnosis, Gleason score, D’Amico risk category and post cryoablation PSA values. Kaplan Meier curves were constructed with available follow up PSA data. The percent free from failure was then calculated from the Kaplan Meier product limit estimates (Phoenix definition). Hazard ratios were determined based upon 0.1 ng/ml nadir PSA increments and failure rates were studied. Hazard ratios were calculated based on proc PHReg.

Results: 891 (74.3%) of 1200 patients achieved a nadir PSA < 0.4 ng/ml which correlated with 5 year bPFS of 90.4%, 81.1%, and 73.6% for low, intermediate and high risk, respectively. If the nadir PSA was > 0.4 ng/ml the 24 month biochemical progression rates were 29.2% low, 46.4% intermediate and 48.9% high risk. A PSA < 0.3 ng/ml was associated with nearly equivalent bPFS but only incorporated 69% of the study cohort. Additional PSA cut points failed to reveal a statistically superior endpoint. Cohort demographics are depicted in Table 1. The Hazard ratios indicate an incremental rate of failure of 0.012 (95% CI 1.010 – 1.015) per 0.1 ng/ml PSA increase in nadir PSA level.

Conclusion: A nadir PSA < 0.4 ng/ml incorporates 74.3% of the study cohort. There is no statistical advantage of using < 0.3 ng/ml as an alternative. Biochemical progression at 24 months for nadir PSA < 0.4 ng/ml precludes utilization of a higher nadir PSA endpoint for this treatment modality. Further data analysis is ongoing through the COLD Registry data base.
**Introduction:** We have previously shown that acute and chronic baseline inflammation were associated with lower risk of prostate cancer (PC) in repeat prostate biopsies. In the present study, we evaluated whether baseline acute and chronic prostate inflammation among men with initial negative biopsy for PC was associated with PC volume at the 2−year repeat prostate biopsy in a clinical trial with systematic biopsies.

**Methods:** Retrospective analysis of 840 men 50−75 years−old with negative baseline prostate biopsy and positive 2−year repeat biopsy for PC in the Reduction by Dutasteride of PC Events (REDUCE) study. Acute and chronic prostate inflammation (coded as present or absent), overall tumor volume, number of biopsy cores involved, percent of involved cores, average core involvement and overall percent tumor involvement were determined by central pathology. The association of inflammation in baseline biopsies with 2−year repeat biopsy cancer volume variables was evaluated with Student t test and linear regression controlling for age, race, body−mass index (BMI), digital rectal exam (DRE), prostate volume, baseline and pre−repeat biopsy prostate−specific antigen (PSA) and treatment arm (dutasteride or placebo).

**Results:** Chronic, acute inflammation and both were detected in 505 (60%), 10 (1%) and 76 (9%) baseline biopsies, respectively. Presence of acute and chronic inflammation were significantly associated with each other (P<0.001). Patients with chronic inflammation had significantly larger glands (P<0.001). Both types of inflammation were unrelated to race, BMI, PSA or DRE. At 2−year biopsy, men with baseline chronic inflammation had significantly lower overall mean tumor volume (2.13µL vs 3.11µL; P=0.001), mean number of biopsy cores involved (1.78 vs 2.22; P<0.001), mean percent of cores involved (17.8% vs 22.1%; P<0.001), average core involvement (1.27µL vs 1.52µL; P=0.014) and overall mean percent tumor involvement (1.66% vs 2.46%; P<0.001) than those without baseline chronic inflammation. The results were virtually unchanged in multivariable analysis (data not shown). Baseline acute inflammation was not associated with overall tumor volume, number of biopsy cores involved, percent of cores involved, average core involvement or overall percent tumor involvement.

**Conclusion:** In a cohort of men with 2−year repeat prostate biopsy positive for PC after a negative baseline biopsy, baseline chronic inflammation was associated with lower PC volume.
Poster #72
LONG-TERM INCIDENCE OF HEMATURIA, URETHRAL STRICTURE, AND BLADDER CANCER FOLLOWING RADIATION THERAPY FOR PROSTATE CANCER
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(Presented By: Alexander Kandabarow)

Introduction and Objectives: Urinary tract toxicity following radiation therapy (RT) for prostate cancer (PCa) has been studied in depth; however, studies investigating the development of hematuria, urethral stricture, and bladder cancer following RT are limited. We describe the incidence of these events, identify risk factors, and measure the effect of RT modality in primary and post–prostatectomy RT patients.

Methods: Our institution counseled 1,559 patients regarding RT for PCa from 1992 to 2013, with 888 receiving RT and continuing follow up. RT modalities included external–beam RT (EBRT), brachytherapy, combination therapy, or post–prostatectomy RT. PCa characteristics, comorbidities, RT modality, and events of interest (hematuria, urethral stricture, and bladder cancer) were recorded. Stepwise Cox regression was used to evaluate if the events of interest were associated with independent variables and RT modality.

Results: Median follow–up time (IQR) after RT was 48 months (18–88). Median time (IQR) from completion of RT to hematuria was 36 months (16–63), to urethral stricture was 38 months (15–63), and to bladder cancer was 57 months (24–76). Overall 5– and 10–year risk (95% CI) for hematuria was 23% (19–27%) and 42% (36–48%), for urethral stricture was 7% (5–9%) and 12% (8–16%), and for bladder cancer was 2% (1–3%) and 5% (3–7%). On Cox analysis, age at RT (p=0.01, HR=1.03) and smoking (p<0.01, HR=2.9) were associated with hematuria, obesity with urethral stricture (p<0.01, HR=2.7), and age at RT with bladder cancer (p=0.03, HR=1.10). RT modality was not found to have an independent association with any of the three events of interest.

Conclusions: Hematuria, urethral stricture, and bladder cancer are conditions necessitating urologic evaluation and treatment following RT for PCa, with a risk of 42%, 12%, and 5% over 10 years, respectively. Comorbid conditions are associated with increased risk of these events. Post–prostatectomy RT does not seem to increase the risk of these conditions compared to primary RT.
Poster #73
VARIATION IN USE OF ACTIVE SURVEILLANCE AMONG MEN UNDERGOING EXPECTANT MANAGEMENT FOR EARLY-STAGE PROSTATE CANCER
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(Presented By: Christopher Filson)

Objective: To examine variation in use of active surveillance among Medicare−eligible men undergoing expectant management for early−stage prostate cancer.

Methods: Using linked Surveillance, Epidemiology and End Results and Medicare data, we identified 49,192 men diagnosed with localized prostate cancer from 2004 through 2007. Among 7,347 expectant management patients (i.e., no treatment within 12 months of diagnosis), we assessed the prevalence of active surveillance (i.e., repeat prostate biopsy and PSA tests) versus watchful waiting, including differences across health care markets (n=63). We fit multivariable logistic regression models to examine associations between receipt of active surveillance and patient demographics, cancer severity, and health−care market characteristics.

Results: During the study interval, use of active surveillance (versus watchful waiting) increased significantly among prostate cancer patients managed expectantly (9.7% in 2004 to 15.3% in 2007, OR 1.70, 95% CI 1.24 – 2.34). Active surveillance was less common among older patients (22.6% 66−69 years old vs. 8.1% >75 years old, OR 0.41, 95% CI 0.32 – 0.53), those with high−risk tumors (17.2% vs. 6.7% high−risk, OR 0.22, 95% CI 0.15 – 0.32), and more comorbidities (14.5% Charlson score 0 vs. 6.7% Charlson score 3+, OR 0.59, 95% CI 0.41 – 0.83). Patients of higher socioeconomic status were more likely to undergo active surveillance (8.6% lowest tertile vs. 16.8% highest tertile, OR 3.38, 95% CI 2.41 – 4.73). After adjusting for patient and tumor characteristics, significant differences in the predicted probability of active surveillance persisted across health care markets (from 2.4% to 30.1%) (Figure). We did not identify any statistically significant variation in use of active surveillance associated with specific health care market characteristics, including intensity of end−of−life care, Medicare reimbursements, and provider density (all p>0.05).

Conclusion: Active surveillance has been relatively uncommon among Medicare beneficiaries with localized prostate cancer and varies significantly based on patient demographics, tumor severity, and geographic location.

Figure. Regional variation in use of active surveillance among prostate cancer patients undergoing expectant management.

*Predicted probability of receipt of active surveillance after adjusting for patient and tumor factors and correcting for clustering at regional level.
Analytical Validation of the Oncotype DX Prostate Cancer Assay – A Prognostic Multi-Gene RT-PCR Test Optimized for Needle Biopsies

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(Presented By: Dejan Knezevic)

Introduction: The Oncotype DX Prostate Cancer assay is a clinically validated test developed for use with fixed paraffin-embedded (FPE) prostate needle biopsies. The assay measures expression of 12 cancer-related genes and 5 reference genes that are algorithmically combined to calculate a Genomic Prostate Score (GPS). We conducted an analytical validation study of the Oncotype DX Prostate Cancer assay to demonstrate its analytical accuracy, reliability and reproducibility.

Methods: RNA yield distributions in manually microdissected biopsies were assessed in 213 samples. Amplification efficiencies, analytical sensitivity, and bias of gene assays were measured by serially diluting an RNA sample and analyzing features of the linear regression between RNA expression measured by the crossing point (Cp) vs. the base 2 log of the RNA input per PCR assay well. Reproducibility and precision were assessed by testing 10 prostate cancer RNA samples over multiple instruments, reagent lots, operators and days (precision), and RNA input levels (reproducibility). Analytical precision and reproducibility were estimated using appropriately parameterized linear mixed models fit separately for each gene and for the GPS. Within-block reproducibility was estimated using 80 tumor-containing biopsy blocks.

Results: The lowest quartile of RNA yields from biopsies (6 5-micron sections) was 19–34 ng. All predefined analytical acceptance criteria were met using as little as 5 ng of RNA. Gene assays accurately quantified expression over a wide range of RNA inputs (from as low as 0.005 ng to 320 ng). Analytical accuracy was excellent with average biases at qPCR inputs representative of patient samples < 9.7% across all assays and amplification efficiencies were within ±6% of the median. The standard deviations for analytical precision and reproducibility were 1.86 and 2.11 GPS units (100-unit scale) respectively. Standard deviation for within-block reproducibility was 2.80 GPS units.

Conclusions: This novel diagnostic assay, designed for use with prostate needle biopsies, has been analytically validated using the very limited RNA inputs obtainable from biopsies containing as little as 1 mm of tumor. Analytical validation studies for the assay met the standards for conducting and reporting of such studies (McShane and Hayes, JCO 2012).

Magnetic Resonance Imaging Detected Prostate Evasive Anterior Tumors: Further Insights

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(Presented By: Ghazi al Edwan)

Objective: Clinical confusion continues to exist regarding the underestimation of cancers among patients on active surveillance and among men with repeated negative prostate biopsies despite worrisome prostate specific antigen (PSA) levels. We have previously described our initial (n=19) experience with magnetic resonance imaging (MRI)–based detection of tumors in the anterior prostate gland. We report our updated and expanded experience with these tumors in terms of multiparametric–MRI findings, staging and grading. Furthermore, we report early treatment outcomes with these unique cancers.

Methods: Our prostate MRI dataset of 1117 cases from January 2006 until December 2012 was reviewed and we identified 189 patients who fulfilled criteria for prostate evasive anterior tumors (PEATS).

Results: Among the 189 patients who had MR–detectable anterior tumors, 148 had biopsy proven disease in the anterior zone. Among these tumors, average PSA was 18.3 ng/ml and the majority of cancers were Gleason 7. Sixty eight patients elected for surgical therapy. Among these men, the majority of cancers had extra prostatic extension and 46% had positive surgical margins. Interestingly, upgrading of tumors that were biopsy Gleason 6 in the anterior zone was common, with 59% exhibiting upgrading to Gleason 7 or higher. Biochemical–free survival among men who elected surgery was not ideal with 20 % failing by 20 months.

Conclusion: PEATS tumors are found late and disproportionally high grade. Careful consideration to MRI testing should be given to men at risk for PEATS.
**Poster #76**

**ASSOCIATION OF MALE PATTERN BALDNESS AND RISK OF CANCER AND HIGH GRADE DISEASE AMONG MEN PRESENTING FOR PROSTATE BIOPSY**

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(Presented By: Ghazi al Edwan)

**Introduction:** Androgens have been implicated in both male pattern baldness (MPB) and prostate cancer. We set out to prospectively determine if men with independently assessed MPB are at higher risk for prostate cancer at biopsy and determine if any grade associations exist.

**Methods:** We prospectively enrolled 394 eligible patients (pts.) presenting for prostate biopsy and independently determined their MPB pattern using the validated Norwood classification (0 no balding; 1 mild vertex balding; 2 moderate vertex balding and 4 severe vertex balding) system. Univariate and multivariable models including Norwood score, age, prostate specific antigen (PSA) and digital rectal examination (DRE) abnormalities were calculated for the outcomes of cancer and high grade disease (Gleason >6). C−statistics analyses of our models were then compared with and without MPB pattern for marginal utility.

**Results:** Of the 394 participants, 194 pts (57.7%) had cancer and 110 pts (33.6%) had Gleason 7 disease or higher. Total cohort median PSA was 5.87 ng/ml, mean age was 62.7 years and 27.4% had DRE anomalies. On univariate analyses, Norwood patterns were increasingly associated with cancer and high grade disease with a dose−effect (P for trend <0.0001for cancer and p=0.0036 for high grade disease). On multivariable analyses, trends still held with all patients exhibiting Norwood scale 2 or higher at increased risk for cancer [Norwood 2 OR 2.77 p=0.0159 ; Norwood 3 OR 2.73 p=0.0137 ; and Norwood 4 OR 5.40 p<0.0001 ] . In predicting risk of high grade disease, only pts. with Norwood pattern 4 (Norwood 4 OR 4.50 p<0.0001 ) exhibited an increased risk, although trends persisted for lesser MBP scores (p for trend=(Norwood2 OR 2.77 p=0.0159 ) (Norwood2 OR 2.77 p=0.0159 ) 0.0036). Age and DRE abnormalities were also associated with cancer and high grade disease. In comparing the C−statistics of our models, significant improvement was noted in both cancer and high grade models.

**Conclusion:** MPB appears to be a strong and independent risk factor for cancer and high grade disease for men presenting for prostate biopsy. Further research is needed to understand the biology behind this observation and to incorporate these findings into clinical decision making.

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**Poster #77**

**ACTIVE SURVEILLANCE FOR LOW-RISK PROSTATE CANCER: UNIVERSITY OF MIAMI EXPERIENCE**

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(Presented By: Mark Soloway)

**Introduction:** The primary goal of active surveillance (AS) in patients with low−risk prostate cancer (PC) is to delay and possibly avoid morbidity of treatments with curative intent without significantly compromising the oncologic outcomes including the need for hormonal therapy and disease−specific survival. It is our philosophy that the patient’s safety is of the utmost importance. This is reflected in our AS protocol which is more conservative compared to most other AS programs. We present our current results.

**Methods:** We offer AS for patients with clinical stage T1c−T2a, Gleason score ≤6, ≤2 biopsy cores with ≤20% tumor present in each core and prostate−specific antigen (PSA) <15 ng/ml. From October 1998 to August 2013, 353 patients met these criteria. 316 patients with at least one repeat biopsy were included in this analysis. Patients were followed every 3−6 months with PSA and rectal exam. Repeat prostate biopsies were performed every 1−2 years.

**Results:** Most patients had T1c cancer with only one positive core. Almost 90% of patients were Caucasians. Over a median follow−up of 3.4 (interquartile range 2.1−5.3) years 90 (28%) patients had biopsy progression (Figure 1). 57 (63%) of these patients were found to have Gleason pattern 4/5 cancer while 33 (37%) had only increase in the volume of Gleason 6 cancer. The median time to progression was 2.2 (interquartile range 1.5−3.4) years. The majority of patients who progressed had a radical prostatectomy (40, 44%) or radiation therapy (26, 29%); 18 (20%) patients elected to continue active surveillance. The median time to treatment was 2.5 years. Type of treatment is not known for 6 patients. None of the patients included in the protocol had evidence of metastatic prostate cancer at the time of this writing.
**Conclusions:** This analysis provides further support for active surveillance in patients with low risk PC. In our opinion, careful identification of patients with low risk PC with close monitoring for progression allow the patient to delay or avoid treatment-related morbidity without compromising oncologic control.

**Poster #78**

**ANALYSIS OF INCIDENTAL PROSTATE CARCINOMA IN 1,106 PATIENTS UNDERGOING BPH SURGERY IN A DEVELOPING COUNTRY**

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(Presented By: Luiz Henrique Araujo)

**Introduction and Objectives:** The widespread use of screening for prostate cancer (PCa) resulted in a decreased incidence of incidental carcinoma of the prostate (iPCa) in patients who undergo surgery for benign prostatic hyperplasia (BPH). With the increasing use of laser vaporization techniques in developing countries, where screening is not a routine, some concerns have been raised regarding the actual incidence of iPCa, since these technics do not result in tissue samples for pathological analysis. The aim of the study is to evaluate the current incidence of iPCa in patients submitted to HPB surgery and analyze the characteristics of these patients.

**Methods:** We performed a retrospective analysis of 1,899 patients of whom 1,106 underwent surgery for BPH between 2007 and 2011 at a single institution. The types of BPH surgery were transurethral resection of prostate (TURP) or open prostatectomy (OP). All patients underwent a preoperative screening for CaP with prostate specific antigen (PSA), digital rectal examination and prostate biopsy if necessary, according AUA guidelines. Patients diagnosed with PCa before surgery were excluded from the sample. Patients with iPCa were evaluated for age, preoperative PSA (<10, 10−20 or > 20), type of surgery (TURP or OP); resected prostate weight; percent of tumor in the surgical specimen (≤ 5 %, 5−10% or > 10%) and Gleason score (<7 or ≥ 7).

**Results:** Of 1,106 patients, 51 (4.6%) had iPCa. The mean age of patients was 70.6 (54−90) years, mean preoperative PSA was 9.5 (1.2−37.9) ng/ml. Of these patients, 32 (65%) had PSA <10 ng/ml, 10 (20.4%) had PSA between 10−20 ng/ml and 7(14.6%) had PSA> 20 ng/ml. 31 (63.2%) patients had undergone TURP and 18 OP (36.8%). The average weight of resected prostate was 33.2 g. Regarding percent of tumor in the surgical specimen, 34 (68%) patients had ≤5%; 7 (14%) were between 5−10% and 9 (18%) had> 10% tumor in the specimen. 42 (84%) of patients with iPCa had Gleason <7, while 8 (16%) had Gleason ≥7.

**Conclusion:** This is the largest series to date analyzing this issue in a developing country. The actual incidence of iPCa is 4.6%. Patients who are candidates for laser vaporization of the prostate should be informed about this risk. Furthermore, 16% of these patients have Gleason score ≥ 7 and around 20% have > 10% of tumor in the surgical specimen, which may compromise the prognosis of these patients.
**Poster #79**
THE PRESENCE OF HGPIN AND ASAP ON PROSTATE BIOPSY DOES NOT AFFECT PROSTATECTOMY OUTCOMES FOR PATIENTS OTHERWISE ELIGIBLE FOR ACTIVE SURVEILLANCE

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(Presented By: Eugene Pietzak)

**Introduction:** Several criteria have been proposed to identify candidates for active surveillance (AS). However, little is known about the impact of concomitant high-grade prostatic intraepithelial neoplasm (HGPIN) or atypical small acinar proliferation (ASAP) on patients otherwise suitable for AS.

**Methods:** Patients with D'Amico low risk prostate cancer on ≥ 10-core biopsy who underwent radical prostatectomy (RP) at an academic center from 1991 to 2005 were evaluated for eligibility for AS by either Epstein criteria or the Memorial Sloan Kettering Cancer Center (MSKCC) criteria. Prostatectomy specimens of patients eligible for AS were compared to determine if the presence of clinical HGPIN or ASAP affected outcomes in either AS cohorts. Primary outcomes were pathological upstaging and Gleason upgrading at prostatectomy.

**Results:** Of 553 patients with low risk prostate cancer, 400 patients (72.3%) met MSKCC criteria and only 170 patients (30.7%) met Epstein criteria. Within each AS cohort, HGPIN was present on ~31% of biopsies and ~12% had ASAP. On univariate and multivariate analyses, HGPIN and ASAP had no impact on the rate of Gleason upgrading and pathologic upstaging in either Epstein or MSKCC AS eligible patients. Furthermore, there was no increased risk for biochemical recurrence.

**Conclusion:** Presence of HGPIN or ASAP does not increase the risk of upgrading, upstaging, or adverse pathology at time of prostatectomy for patients who meet AS criteria. If otherwise suitable, HGPIN and ASAP should not impact the decision to choose AS. However, analysis of prospective AS trials is required to determine impact on tumor progression.

**Poster #80**
SIGNIFICANCE OF PERCENTAGE GLEASON 4 IN PREDICTING ADVERSE PATHOLOGIC OUTCOMES: CAN WE EXPAND CURRENT CRITERIA FOR ACTIVE SURVEILLANCE?
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(Presented By: M. Francesca Monn)

**Introduction:** High volume Gleason pattern 4 disease is recognized as a predictor of negative clinical outcomes following prostatectomy. However, it is possible that low volume Gleason 3+4 disease behaves more similar to Gleason 3+3 tumors. Little evidence exists regarding a possible volume threshold for pattern 4 disease. We sought to explore if there is such a threshold volume of Gleason pattern 4 disease.

**Methods:** We identified patients with Gleason 3+3, 3+4, or 4+3 on final prostatectomy pathology between 2004 and 2009 performed by a single surgeon. Any patients with tertiary pattern Gleason 5 were excluded. Multivariable logistic regression was performed to examine the relationship between percent Gleason 4 present and adverse pathologic outcomes, defined as extra–prostatic extension, seminal vesicle invasion, or positive surgical margins, adjusting for other covariates.

**Results:** 609 patients met inclusion criteria for the study, of which 282 (46%) were Gleason 3+3, 267 (44%) Gleason 3+4, and 60 (10%) Gleason 4+3 (Figure). After adjusting for age, race, clinical stage, and pre–operative PSA, increasing percentage of Gleason 4 at final pathology predicted adverse pathology (p trend <0.001). Further, patients with Gleason 4+3 had similar odds of adverse pathology as patients with Gleason 3+4 disease with 21–30% (0.097) and 31–50% (0.349) pattern 4. Conversely, those patients with Gleason 3+3 (OR 0.04, 95%CI 0.02–0.10) and Gleason 3+4 with <10% (OR 0.24, 95%CI 0.11–0.53) or 11– 20% (OR 0.34, 95%CI 0.16–0.75) pattern 4 had a significant decrease in the odds of developing adverse pathology.

**Conclusions:** After adjusting for potential confounders, patients with Gleason 4+3 and high volume 3+4 disease have similar odds of adverse pathology at final pathology. Patients with low volume Gleason pattern 4 (<20%) are likely a distinct group of patients who behave more similar to Gleason 3+3. This may provide rationale for expansion of current active surveillance inclusion criteria. To be sure, we must recognize that adverse pathology remains only a surrogate marker for more definitive endpoints (i.e. prostate cancer–specific mortality and metastatic–free survival).
**Poster Session I – Full Abstracts**

**Poster #81**

**ONE-STEP ULTRASOUND-BASED HIGH DOSE RATE (HDR) PROSTATE BRACHYTHERAPY WITH DOSE ESCALATION TO THE DOMINANT INTRA-PROSTATIC LesION**

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(Presented By: Juanita Crook)

**Objectives:** To demonstrate feasibility of using HDR brachytherapy to deliver 25% higher than prescription dose to the dominant intra-prostatic lesion (DIL) as defined on multi-parametric MRI for intermediate and high risk prostate cancer.

**Methods:** 26 patients with predominantly unilateral disease consented to a University Ethics-approved Phase 2 study of selective dose escalation. HDR brachytherapy was performed in weeks 1 and 3 of treatment, each delivering one fraction of 10 Gy to the whole prostate. External beam consisted of 46Gy/23 fractions starting 3 days after the 1st HDR fraction. T2 FSE images were obtained using 1.5T endorectal MRI in the transverse, sagittal and coronal planes followed by dynamic contrast enhancement (DCE) 7 second scans following rapid injection of gadolinium. Apparent Diffusion Coefficient (ADC) maps were calculated. The DIL was contoured on the MRI and, following image registration, transposed to the preoperative TRUS performed in the treatment position. Intra-operative TRUS with source-delivery catheters in place was fused to the pre-op TRUS with the transposed DIL. The DIL was included in dose optimization criteria.

**Results:** All patients had predominantly unilateral intermediate or high risk disease. 25/26 patients had a visible DIL. Gleason score was 7 in 23, 8 or 9 in two. Stage was T2b/c in 15 and T1c/T2a in 10. Mean percentage of the prostate receiving the prescription dose (V100) was 98.2% (SD:1.1). Mean dose to 90% of the DIL (D90) was 13.2 Gy (SD: 1.7). Mean volume of the DIL was 2.9 cc (SD:1.8) representing 9.5% (SD: 7.6) of the prostate volume. The coverage of the DIL was excellent with a median of 97% (range:77–100%) receiving the planned escalation of 25%. Established dose constraints to rectum and urethra were respected in all cases. The main factor that limited DIL coverage was proximity to organs at risk. Central extension of the DIL near the urethra limited coverage in 5 cases and 2 patients had a posterior DIL that crossed the midline so that dose to the rectum limited escalation. However, these 7 cases still achieved a mean DIL D90 of 12.2 Gy.

**Conclusions:** Dose manipulation using US-planned HDR brachytherapy is readily achievable within the practice setting of a community cancer center. Dose escalation to the DIL to a mean of 132% of the prescribed dose for selected intermediate and high risk prostate cancer patients is feasible while respecting critical organ constraints. Further escalation is planned.
**Poster #82**  
**PROGNOSTIC UTILITY OF THE CELL CYCLE PROGRESSION (CCP) SCORE GENERATED FROM NEEDLE BIOPSY IN MEN TREATED WITH PROSTATECTOMY**  
Jay Bishoff; Stephen Freedland¹; Leah Gerber³; Pierre Tennstedt³; William Welbourn⁴; Julia Reid⁴; Markus Graefen³; Zaina Sangale⁴; Eliso Tikishvili⁴; Jimmy Park⁴; Adib Younus⁴; Alexander Gutin⁴; Jerry Lanchbury⁴; Guido Sauter³; Michael Brawer⁵; Steven Stone⁴; and Thorsten Schlomm³  
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(Presented By: Jay Bishoff)  

**Introduction:** We developed a prognostic RNA signature that is strongly associated with prostate cancer outcomes. The signature measures the expression levels of 31 genes involved in cell cycle progression (CCP). The CCP score has proven to have prognostic utility in predicting disease progression in various clinical settings utilizing biopsy, TURP and post prostatectomy specimens. Previous studies evaluating post-surgical outcomes were conducted using CCP gene expression measured in the prostatectomy specimen. Here, we demonstrate the ability of the CCP score to predict cancer progression, as measured by both BCR and metastatic disease after radical prostatectomy, using needle biopsy tissue.  

**Methods:** We evaluated the CCP score in three patient cohorts. These included men from the Martini Clinic in Hamburg Germany (MC, N=283) treated between 2005 and 2006, men from the Durham VA Medical Center (DVA, N=176) treated between 1992 and 2007, and finally, men from Intermountain Healthcare treated between 1999 and 2002 (IHC, N=123). The CCP score was derived from a simulated biopsy (MC) or diagnostic biopsy (DVA and IHC), and evaluated for association with biochemical recurrence (BCR) and metastatic disease in univariable analysis and after adjusting for other clinical information.  

**Results:** In all three cohorts, the CCP score was associated with BCR and metastatic disease. The association with BCR remained significant after adjusting for other prognostic clinical variables. In a meta-analysis that combined all three cohorts (N=582), the CCP score was a strong predictor of BCR in both univariable (HR per Interquartile Range (IQR) = 1.68 (95%CI: 1.41, 1.99), p−value < 10−6)) and multivariable analyses (HR per IQR = 1.53 (95% CI: 1.28, 1.84), p−value < 10−4)). CCP score was the strongest predictor of metastatic disease in both univariable analysis (HR per IQR = 6.32 (95% CI: 3.41, 11.71, p−value < 10−7)), and after adjusting for clinical variables (HR per IQR = 4.83 (95% CI: 2.40, 9.74, p−value < 10−5)).  

**Conclusions:** The CCP score derived from a needle biopsy sample was strongly associated with adverse outcome after surgery. It was the strongest predictor of eventual metastatic disease of the tested variables including Gleason and PSA. These results indicate that the CCP score can be used at disease diagnosis to better define patient prognosis and appropriate clinical care.

**Poster #83**  
**SURGERY BY LOW-VOLUME SURGEONS MAY EXPLAIN RACIAL DISPARITY IN POSTOPERATIVE COMPLICATIONS FOR BLACK MEN UNDERGOING RADICAL PROSTATECTOMY**  
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(Presented By: Nedim Ruhotina)  

**Introduction:** Racial & ethnic disparities related to prostate cancer treatment are well-described. Additionally, lower rates of postoperative complications are noted in men who undergo prostatectomy at high-volume centers or by high-volume surgeons. We assessed whether access to high volume providers accounts for ethnic disparities in postoperative complications from radical prostatectomy.  

**Methods:** Using a nationally representative dataset of hospital discharge information, the Perspective Database (Premier Inc, Charlotte, NC), we examined data for 483,968 men who underwent a radical prostatectomy (ICD9 60.5) between 2003–2010. Data were stratified based on patient characteristics (age, race, marital status, insurance status, Charlson Comorbidity Index), hospital characteristics (# of beds, teaching vs. nonteaching, urban vs. rural, & geographic region), surgical approach (robotic vs. nonrobotic), surgeon volume (low (<5), intermediate (5–24), & high(>24)), & complications (based on Clavien classifications I–V), if any. A logistic regression model accounting for clustering & survey weights was constructed to assess the association of surgeon volume & ethnicity on postoperative major complications (i.e., Clavien III–V).
**Poster Session I – Full Abstracts**

**Results:** On univariate analysis, we found that black men & Hispanic men had a greater incidence of postoperative major complications compared to white men (OR 1.4 [CI: 1.1−1.8] & OR 1.6 [CI: 1.03−2.6], respectively). In a multivariate model incorporating clinicodemographic & hospital information, black men continued to demonstrate a higher odds for major complication (OR 1.3 [CI: 1.02−1.7]). However, when further incorporating surgeon volume to the multivariate model, there was no longer any difference in the odds for a major complication associated for black men (OR 1.2 [CI: 0.97−1.6]). Patients who underwent surgery by intermediate−volume surgeons & high−volume surgeons had a lower incidence of postoperative major complications compared to those treated by a low−volume surgeon (OR 0.6 [CI: 0.5−0.7] & OR 0.4 [CI: 0.3−0.5], respectively). Compared to white men, the odds of undergoing surgery by a high−volume surgeon are lower for black men (OR 0.6 [CI: 0.5−0.8]).

**Conclusion:** Our data demonstrate that access to high−volume surgeons may explain the increased odds for postoperative major complications among black men undergoing radical prostatectomy. Further research related to barriers to health care access & further efforts at removing said barriers for black men is warranted.

**Poster #84**

**THE BURDEN OF SKELETAL−RELATED EVENTS IN PROSTATE CANCER PATIENTS WITH BONE METASTASES**

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(Presented By: Nawar Hanna)

**Objective:** To assess contemporary characteristics, hospital admissions, costs, and mortality in prostate cancer (CaP) patients with bone metastases and skeletal−related events (SREs).

**Methods:** Relying on the Nationwide Inpatient Sample (NIS), CaP patients with bone metastases between 1998 and 2010 were abstracted. Patients who experienced SRE were identified and hospital charges were calculated. Generalized linear regression analyses focused on in−hospital mortality.

**Results:** Between 1998 and 2010, a weighted estimate of 443,929 CaP visits with bone metastases was recorded. Of these, 15.9% experienced at least one SRE. The rate of SRE decreased from 18 to 15.4% (1998−2010, EAPC: −1.44%, P=0.005) and the SRE−associated mortality decreased from 8.5 to 4.7% (1998−2010, EAPC: −3.68%, P=0.004). Nevertheless, the inflation−adjusted charges associated with hospital visits of CaP patients with bone metastases rose by 92% to $1,512,449,106 (EAPC: +8.82%, P<0.001) and SRE charges rose by 94% to $369,256,799 (EAPC: +7.62%, P<0.001). Predictors of in−hospital mortality in SRE patients included age (OR: 1.02), comorbidities (≥3 vs. 0−1, OR: 1.72), SRE of the upper limb (OR: 1.75), SRE of the lower limb (OR: 1.35), spinal cord compression (OR: 1.48), radiation (OR: 0.68), surgery (OR: 0.32) and year of hospitalization (2010 vs. 1998, OR: 0.54)

**Conclusions:** From 1998−2010, the incidence of SRE and SRE−associated mortality in patients with CaP and bone metastases decreased. However, charges for SRE−associated hospitalizations have increased alarmingly. Future health care policies should strive to provide cost−effective prevention and management of SREs in this population.
Poster Session I – Full Abstracts

Poster #85
THE IMPACT OF ROBOTIC-ASSISTED RADICAL PROSTATECTOMY ON THE USE AND EXTENT OF PELVIC LYMPH NODE DISSECTION IN THE “POST-LEARNING CURVE” ERA

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(Presented By: Giorgio Gandaglia)

Introduction: Previous series during the initial learning curve era of minimally invasive techniques for treatment of prostate cancer (PCa) showed a declining use of pelvic lymph node dissection (PLND). The aim of our study was to reassess the impact of robotic-assisted radical prostatectomy (RARP) on the utilization rate of PLND and its extent in the post-learning curve era.

Methods: Relying on the Surveillance Epidemiology and End Results (SEER) Medicare-linked database, 5,804 patients with non-metastatic PCa undergoing open radical prostatectomy (ORP) or RARP between years 2008 and 2009 were identified. Multivariable logistic regression analyses tested the relationship between surgical approach (RARP vs. ORP) and: (1) the rate of PLND (pNx vs. pN0–1); and (2) the extent of PLND (limited vs. extended).

Results: Overall, 3,357 (57.8%) patients underwent a PLND. The proportion of patients treated with PLND was significantly higher among ORP vs. RARP patients: 71.2 vs. 48.6%, respectively (P<0.001). In addition, the median number of lymph nodes removed was significantly higher for patients treated with ORP vs. RARP: 5 vs. 4, respectively (P<0.001). In multivariable analyses, ORP was associated with 2.7- and 1.3-fold higher odds of undergoing PLND and of receiving an extended PLND compared to RARP, respectively (both P<0.001). Stratified analyses according to disease risk classifications revealed similar trends.

Conclusions: In the post-learning curve era, RARP remains associated with a decreased use of PLND and suboptimum extent. Efforts should be made to improve guideline adherence in performing a PLND whenever indicated according to tumor aggressiveness, despite surgical approach.

Poster #86
SURVIVAL BENEFIT OF RADICAL PROSTATECTOMY IN PATIENTS WITH CLINICALLY ADVANCED PROSTATE CANCER: ESTIMATIONS OF THE NUMBER NEEDED TO TREAT BASED ON COMPETING-RISKS ANALYSIS

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(Presented By: Giorgio Gandaglia)

Introduction: Radical prostatectomy (RP) and observation may be considered for treatment of locally advanced prostate cancer (PCa). The aim of our study was to describe the survival benefit associated with RP, as compared to initial observation, in patients with locally advanced PCa.
Methods: 1,382 patients with locally advanced PCa (clinical stage T3/T4) treated with RP or initial observation between 1995 and 2009 within the Surveillance, Epidemiology, and End Results (SEER)–Medicare were evaluated. Patients in both treatment arms (RP vs. observation) were matched using propensity−score methodology. Ten−year cancer−specific mortality (CSM) rates were estimated, and the number needed to treat (NNT) was calculated. Competing−risks regression analyses tested the relationship between treatment type and CSM. All analyses were repeated after stratifying patients according to Gleason score (≤7 vs. 8−10) and clinical stage (T3a vs. T3b/T4).

Results: Overall, the 10−year CSM rates were 11.8 vs. 19.3% for patients treated with RP vs. initial observation, respectively (P<0.001). The corresponding 10−year NNT was 13. The 10−year CSM rates for the same respective treatment groups were 8.9 vs. 13.9% for Gleason score ≤7, 16.8 vs. 27.8% for Gleason score 8−10, 10.1 vs. 15.8% for clinical stage T3a, and 17.0 vs. 29.3% for clinical stage T3b/T4, respectively (all Ps≤0.04). The corresponding NNTs were 20, 9, 17, and 8, respectively. In multivariable analyses, RP was an independent predictor of more favorable CSM in all categories (all Ps≤0.04).

Conclusions: Radical prostatectomy leads to a significant survival advantage compared to initial observation in patients with locally advanced disease. The highest benefit was observed in patients with clinical stage T3b/T4 and Gleason score 8−10 disease.

Poster #87
INSTITUTIONAL MODIFICATION OF ANTIBIOTIC PROPHYLAXIS PROTOCOL REDUCES INFECTIOUS COMPLICATIONS FOLLOWING TRANSRECTAL ULTRASOUND GUIDED PROSTATE BIOPSY
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(Presented By: Harras Zaid)

Introduction: There has been an increase in microbial resistance to quinolone antibiotics and subsequent rise in infectious complications following transrectal ultrasound guided prostate biopsy (TRUS pBx) in recent years. We sought to describe post−TRUS pBx infectious complications at Vanderbilt and compare our historic rates to a contemporary series following an institutional effort to modify our standard antibiotic prophylaxis protocol based on our local antibiogram.

Methods: We performed a retrospective comparison of a historic cohort of men between 2008−2010 who underwent TRUS pBx following antibiotic prophylaxis with at least 3 days of peri−procedural fluoroquinolone (standard antibiotic protocol − SP), versus a contemporary cohort of men between 2011−2013 who underwent prophylaxis with single dose ceftriaxone or gentamicin plus a single dose of oral fluoroquinolone at the time of biopsy (modified antibiotic protocol − MP). All men who underwent TRUS pBx during these time periods were included. Infectious complications were extracted from the patient chart. Univariate and multivariate statistical analyses were performed to determine significant predictors of infectious complications, in particular use of the SP versus MP.

Results: A total 2003 patients were included (1175 SP and 828 MP). Age, history of quinolone use, biopsy setting (operating room vs. outpatient), diabetic status, and number of previous biopsies was similar between the two groups. In the SP group, there were 75 infectious complications (6.1%) compared to 18 (2.2%) in the MP group (p < 0.05). 48% and 33% of cultures were fluoroquinolone resistant, respectively. On multivariate analysis, previous quinolone use and TRUS pBx performed in the operating room predicted higher infection rates (OR 1.93 and 2.00, respectively, p < 0.05). Furthermore, patients who underwent TRUS pBx with the MP had a significantly lower likelihood of infectious complications (OR 0.22, p < 0.05) when controlling for other known factors influencing infections.

Conclusion: Institutional modification of our antibiotic prophylaxis protocol reduced the risk of infectious complications in men undergoing TRUS prostate biopsy.
Introduction and Objectives: Measuring elasticity as a biomarker in prostate cancer has been a promising field of research. Magnetic resonance elastography (MRE) applies a modified phase-contrast imaging sequence to detect the propagation of shear waves in tissues of interest to measure elasticity differences. These waves are generated by a mechanical driver system. Mechanical drivers applied externally to the skin have shown little success due to attenuation of shear waves by soft tissues, and transurethral studies have been limited to ex-vivo or non-human models. Our objective was to demonstrate the feasibility of a transurethral actuator in human volunteers with a diagnosis of prostate cancer.

Methods: A total of 4 volunteers with a recent diagnosis of prostate cancer were recruited. After standard multiparametric magnetic resonance sequences were obtained with a 3 Tesla imager, a transurethral catheter attached to an external pneumatic driver system translated longitudinal motion to the prostate at frequencies ranging from 150–233 Hz. Modified phase-contrast imaging sequences were utilized to detect the propagation of the resulting shear waves. Quantitative elastograms were then generated by post-acquisition processing and compared to standard multi-parametric imaging.

Results: Gradient echo and echo-planar images detected shear waves with peak motion amplitudes of up to +/- 5 um. Satisfactory MRE elastograms were generated from all 4 volunteers, and they appear to indicate regions of increased elasticity in areas of known prostate cancer (Figure 1). All patients reported little to no discomfort from catheter placement or vibration amplitudes. No patients experienced complications from transurethral catheter placement, and all were able to proceed with radical prostatectomy following the study.

Conclusions: MRE utilizing a transurethral actuator is a safe and feasible imaging modality in human patients. The MRE sequences obtained demonstrated satisfactory propagation of shear waves and elastograms. More research is required including comparison of prostates from normal volunteers and gross correlation of histopathology with MRE in those patients undergoing radical prostatectomy.
Poster #89
TRANSPERINEAL MAPPING TEMPLATE PROSTATE BIOPSY REDUCES THE LIKELIHOOD OF INTERVENTION IN ACTIVE SURVEILLANCE CANDIDATES
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(Presented By: Brian M. Orr)

Objective: The role and indications for transperineal mapping template prostate biopsy (MTPB) in the diagnosis and surveillance of patients with prostate cancer (PCa) is controversial. MTPB has proven to be a more sensitive diagnostic test relative to standard 12-core transrectal ultrasound-guided biopsy (TRUSbx), most notably in the prostatic apex. However, some have suggested the MTPB may lead to over detection, and, as a result, overtreatment of low risk PCa. We sought to determine the impact of MTPB on the receipt of subsequent primary treatment in a PCa active surveillance (AS) cohort.

Methods: We evaluated 186 consecutive patients age 77 and younger in our AS database from 2000–2012 with >2 months follow-up. Patients were categorized according to whether or not they had undergone MTPB as either their initial diagnostic or their confirmatory biopsy (following initial TRUSbx, as per institutional AS protocol). We performed univariable and multivariable Cox regression to assess the association between MTPB and receipt of primary treatment at any point during follow-up. A backward model building procedure was used to determine the most parsimonious model.

Results: The mean age of the cohort was 64.7 years, and there were 56 MTPB patients. A total of 32/186 patients (17%) underwent treatment, and there were no differences in treatment rate during the first 18 months according to biopsy type (p=0.35). However, as shown in the Table, after controlling for age, PSA, Gleason grade, and the receipt of any repeat biopsy, MTPB was associated with a significant decrease in the likelihood of undergoing primary intervention during the entire follow-up period (HR 0.36, 95%CI 0.13–0.99).

Conclusion: There continues to be a critical need for technologies facilitating accurate risk stratification of low risk patients. While there is a theoretical increase in the likelihood of receiving initial primary treatment in patients undergoing MTPB, this initial increase was not observed here. Furthermore, over the long term, there was a significant decrease in the intervention rate among patients who underwent MTPB. These data suggest MTPB may be an important avenue for addressing the need to decrease overtreatment in AS candidates.
Poster #90
ANDROGEN SIGNALING IN PROSTATE CANCER DISPARITIES BETWEEN AFRICAN AMERICAN AND CAUCASIAN AMERICAN POPULATION
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(Presented By: Alice Semerjian)

Introduction and Objectives: Prostate cancer (PCa) is now the most frequently diagnosed cancer and the second most common cause of cancer deaths among men in United States. Notably, the incidence and mortality rate of PCa is particularly higher in African American (AA) men compared to Caucasian American (CA) men. The molecular pathology of PCa is complex, and several signaling networks have been associated with PCa development. Androgen receptor (AR) signaling is a critical pathway to regulate PCa progression as well as normal prostate epithelium growth and differentiation. Although AR signaling has been implicated as one of the critical mechanisms associated with PCa disparities, there was no microarray study to address the genomic regulation of AR signaling in the PCa disparities.

Methods: To elucidate the molecular mechanisms underlying PCa disparities, we employed an integrative genomic approach to investigate differential transcriptomes and deregulated signaling pathways between AA and CA prostate cancers.

Results: By combining gene expression profiling and pathway analysis, we have identified 1,188 genes differentially expressed in AA cancer vs. CA cancer, and interestingly, these transcriptional differences were over-represented in signaling pathways that converged on the AR signaling pathway. Gene promoter analyses have further revealed that 382 (out of the 1,188 differentially expressed genes) contained cis-acting AR-binding sequences, suggesting AR signaling may play an important role in PCa progression among AA men. Chromatin immunoprecipitation (ChIP) assays confirmed STAT1, RHOA, ITGB5, MAPKAPK2, CSNK2A1 and PIK3CB genes as novel AR targets in PCa disparities. Furthermore, our functional assays revealed that androgen-stimulated AR binding and up-regulation of RHOA, ITGB5 and PIK3CB genes were associated with increased invasive capacity in AA PCa cells, as siRNA-mediated knockdown of each gene resulted in a loss of androgen-stimulated invasion.

Conclusion: In conclusion, our findings demonstrate that transcriptional changes have preferentially occurred in multiple signaling pathways converging on AR signaling, and thereby contributing to AR-target gene activation and PCa aggressiveness in AA population.

Poster #91
IDENTIFICATION OF MEN WITH THE HIGHEST RISK OF EARLY DISEASE RECURRENCE AFTER RADICAL PROSTATECTOMY
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(Presented By: Debasish Sundi)

Objective: Men destined to have early biochemical recurrence (BCR) following radical prostatectomy (RP) may be optimal candidates for multimodal treatment. Here we assessed pre-operative predictors of early BCR within a surgical cohort who recurred. We sought to identify the cohort of high-risk prostate cancer (PCa) patients who are most likely to experience early BCR.

Methods: An institutional RP database containing over 20,000 patients was queried to identify 1471 men who had BCR after RP, and pre-operative predictors of early versus late BCR were assessed. Early BCR was defined as recurrence within one year after RP. Within the recurrence cohort, those with National Comprehensive Cancer Network (NCCN) high-risk features were more likely to experience early BCR. Therefore we identified all NCCN high-risk men in the database and abstracted detailed pathologic biopsy data in this cohort. Among 753 high-risk men, 41 alternate multivariable criteria were assessed for their ability to predict early BCR in crude and adjusted logistic regression models.

Results: Among high-risk men, the criteria that best identifies those likely to experience early BCR are primary Gleason pattern 5 on biopsy or ≥4 cores containing pattern 4 (odds ratio 3.17, p < 0.001). These criteria included 26.7% of NCCN high-risk men. Additionally, these criteria selected for men within the high-risk classification who were at significantly higher risk of subsequent metastasis (adjusted hazard ratio 3.04, p<0.001) and cancer-specific death (adjusted hazard ratio 3.27, p<0.001).

Conclusions: In men with PCa who present with high-risk features, pre-operative criteria have the ability to discriminate the subgroup most likely to experience early BCR after RP. Men at risk for early disease recurrence may be the most suitable candidates for multimodal therapy.
Poster #92
POPULATION-BASED COMPARISON OF ROBOTIC-ASSISTED VERSUS OPEN RADICAL PROSTATECTOMY SURGICAL MARGIN STATUS

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(Presented By: Jim Hu)

Introduction: Robotic-assisted surgery remains controversial due to exaggerated marketing claims, higher costs, hidden risks and few clinically significant benefits. Moreover, long-term cancer control outcomes are lacking for robotic-assisted radical prostatectomy (RARP) compared to open radical prostatectomy (ORP). The objective of our study is to examine the population-based, comparative effectiveness of RARP versus ORP for surgical margin status.

Methods: We identified 13,434 men with histologically confirmed, non-metastatic prostate cancer treated with RARP versus ORP during 2004 through 2009 from Surveillance, Epidemiology, and End Results (SEER)-Medicare linked data. Propensity-based analyses were performed to minimize treatment selection biases. Generalized linear regression models were computed for comparison of radical prostatectomy surgical margin status by surgical approach.

Results: During the study period, 5,556 and 7,878 men underwent RARP and ORP, respectively. In the propensity-adjusted cohort, the incidence of positive surgical margins was significantly lower among men undergoing RARP versus ORP (13.7% vs. 18.4%, odds ratio [OR]: 0.68, 95% confidence interval [CI]: 0.63–0.73, p<0.001). This reduction in the incidence of positive surgical margins of RARP over ORP was more pronounced among men with more advanced disease–6.6% lower absolute incidence of positive margins among men with intermediate- and high-risk disease (p<0.001, respectively) and 15.4% lower absolute incidence of positive margins among men with extracapsular extension (p<0.001). Moreover, RARP was associated with lower odds of positive surgical margins compared to ORP for pT2 (Odds Ratio [OR] 0.67, 95% Confidence Interval [CI] 0.61–0.74, p<0.001) and pT3a (OR 0.72, 95% CI 0.60–0.85, p<0.001) disease. Additionally, RARP was associated with lower odds of positive surgical margins for intermediate (OR 0.69, 95% CI 0.64–0.75, p<0.001) and high-risk (OR 0.69, 95% CI 0.64–0.75, p<0.001) disease.

Conclusion: Despite controversial adoption and higher costs, RARP was associated with improved surgical margin status relative to ORP among men with intermediate and high-risk disease. This has important implications for patient quality of life, health care delivery and costs with greater acceptance of active surveillance for low-risk disease and with greater adoption of adjuvant radiotherapy for positive surgical margins, consistent with level-one evidence.
Poster #93
LESS IS MORE: COMORBIDITY COUNT VS. CHARLSON SCORE TO PREDICT LONG-TERM, OTHER-CAUSE MORTALITY IN MEN WITH EARLY-STAGE PROSTATE CANCER
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(Presented By: Timothy Daskivich)

Introduction and Objectives: Clinicians need a simple yet accurate method to predict long-term, other-cause mortality to inform medical decision making in men with early-stage prostate cancer. We sought to compare Charlson score and comorbidity count in predicting long-term, other-cause mortality in men with early-stage disease.

Methods: We sampled 1,482 men with early-stage prostate cancer diagnosed in 1998–2004 at the Greater Los Angeles and Long Beach Veterans Affairs Medical Centers. We used competing risks analysis to compare cumulative incidence and variance for long-term, other-cause mortality associated with Charlson scores and comorbidity counts. We then compared mortality prediction among men with discordant scores to those with concordant scores.

Results: Comorbidity count and Charlson score were identical in 88.6% of cases (1,313 of 1,482 men, correlation 0.86) across all scores and in 91.7% of cases (1359 of 1,482 men, correlation 0.96) across scores of 0, 1, 2, and 3+. In competing risks analysis, men with the highest comorbidity counts had a slightly higher subhazard for other-cause mortality compared with those with the highest Charlson scores. Men with Charlson scores of 1, 2, and 3+ (vs. 0) had subhazard ratios of 2.3 (95%CI 1.6–3.2), 4.2 (95%CI 2.9–5.9), and 8.4 (95%CI 6.0–11.8). Men with comorbidity counts of 1, 2, and 3+ (vs. 0) had subhazard ratios of 2.5 (95%CI 1.8–3.5), 4.5 (95%CI 3.2–6.4), and 10.4 (95%CI 7.2–15.0). Variance for estimates of cumulative incidence was similar for both variables. Discordant pairs analysis revealed improved predictive discrimination for comorbidity count for men at the highest risk for mortality, among scores 0, 1, 2, and 3+.

Conclusions: Comorbidity count and Charlson score yield similar strength of association and variance in predicting long-term, other-cause mortality. Clinicians may consider using this simplified method of comorbidity assessment when counseling men about treatment choice for early-stage prostate cancer.
TUMOR INFILTRATING B-CELLS ARE INCREASED IN PROSTATE CANCER TISSUE

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(Presented By: Jason Woo)

Introduction and Objectives: CD20+ B−cell tumor infiltrating lymphocytes (TILs) have prognostic significance in melanoma, breast, non−small cell lung, and ovarian cancers. The presence of increased B−cell TILs has not been demonstrated in a systematic fashion in prostate cancer (CaP). Animal models have shown B−cell interactions may be a harbinger of hormone−refractory CaP. We investigate the density of B−cells within the CaP tissue utilizing a reproducible and quantitative computational method of identifying B−cells.

Methods: 53 paraffin−embedded radical prostatectomy specimens underwent CD20 immunohistochemical staining to identify B−cells. CaP tumors were identified and marked by a genitourinary pathologist manually. Slides were digitally scanned and a computer algorithm quantified the area of stained B−cells within the CaP and surrounding tissue. Patient clinicopathological features of each specimen were obtained. The primary outcome was B−cell density within CaP versus outside the cancer. Secondary outcome was B−cell density compared to outcomes including Gleason score, D’Amico risk groups, and recurrence.

Results: 8 (15.1%), 9 (17%) and 36 (67.9%) specimens were from patients with low, intermediate and high risk disease, respectively. 19 (35.8%) specimens were from any risk group with disease recurrence. For the entire cohort, the mean density (area of B−cells in mm2/area of prostate analyzed in mm2) within the tumor was higher (3.22, SE=0.29) than outside the tumor (2.24, SE=0.19) (paired t test; P<0.001). D’Amico low risk (0.0377 vs. 0.0246; p=0.151) and intermediate risk (0.0260 vs. 0.0214; p=0.579) did not show significantly more B−cells within the tumor. The high risk group (0.0301 vs. 0.0197; p<0.001) and patients who eventually had CaP recurrence (0.0343 vs. 0.0246; p=0.019) did show significantly more CD20+ B−cell staining within CaP tumors. B−cell density did not correlate to any other patient clinical parameters.

Conclusions: B−cells are present in higher density within CaP tissue than within benign prostate. The interaction of B−cells and CaP may serve as the basis of new therapeutic targets.
APPLICATION OF THE 2013 AMERICAN UROLOGICAL ASSOCIATION EARLY DETECTION OF PROSTATE CANCER GUIDELINE: HOW MANY YOUNG MEN WILL WE MISS?
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(Presented By: Gregory B. Auffenberg)

Introduction and Objectives: The American Urological Association (AUA) published new guidelines for the Early Detection of Prostate Cancer (CaP) in 2013. We apply these guidelines to a retrospective cohort of CaP patients and compare tumor characteristics of younger men no longer recommended for screening with men who remain candidates.

Methods: The Surveillance Epidemiology and End Results (SEER) database (November 2012 Release) was used to identify cases of screening detected CaP from October 2005 – December 2010. Patients were 40–69 years old. Men older than 69 were excluded. Two groups: “Unscreened” and “Screened” were created based on whether or not the AUA would still recommend screening. We evaluated characteristics of CaP across the groups. Chi-squared and Wilcoxon Rank-Sum test statistics were used for comparison. All percentages are relative to the number of patients with data available in that specific category.

Results: A total of 112,274 men with CaP were identified (Table). 10,052 (9.0%) of CaP patients would no longer be recommended for screening. Extrapolating the data from SEER to encompass the US population, we conclude that during the study period 35,900 screening detected CaP patients would not have been screened under the new guidelines (6,838 men per year). Relative to those still recommended for screening, Unscreened CaP patients had lower median PSA, less Gleason ≥ 7 CaP on biopsy and at prostatectomy, and lower rates of T3 and T4 tumors. Yet, 57.6% of Unscreened men that underwent prostatectomy had intermediate or high risk Gleason Scores. Nodal and distant metastases were rare among men Screened and Unscreened.

Conclusions: Despite less aggressive features compared to screened men, 57.6% of the newly Unscreened men had intermediate or high risk Gleason scores at prostatectomy with similar rates of nodal and distant metastasis. It is unknown if these cases would be found later when patients enter the recommend screening window, or if the Unscreened men with adverse disease characteristics would suffer worse outcomes due to delayed diagnoses.

<table>
<thead>
<tr>
<th>Total</th>
<th>Unscreened</th>
<th>Screened</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (ng/mL)</td>
<td>7.8</td>
<td>9.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Median (ng/mL)</td>
<td>5.2</td>
<td>5.8</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Gleason Score of Diagnostic Biopsy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 6</td>
<td>64.5%</td>
<td>56.0%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>7</td>
<td>30.2%</td>
<td>34.8%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥8</td>
<td>5.3%</td>
<td>9.2%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gleason Score of Surgical or Autopsy specimen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 6</td>
<td>42.2%</td>
<td>34.6%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>7</td>
<td>52.5%</td>
<td>57.9%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥8</td>
<td>5.1%</td>
<td>7.5%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pathologic Stage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤T2</td>
<td>86.5%</td>
<td>82.7%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T3</td>
<td>13.0%</td>
<td>16.5%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>T4</td>
<td>0.5%</td>
<td>0.8%</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table. Prostate Cancer Characteristics. Percentages based on patients with available data in each category
INITIAL EVALUATION OF THE ONCOTYPE DX PROSTATE GENOMIC PROSTATE SCORE FOR RISK STRATIFICATION IN PROSTATE CANCER PATIENTS CONSIDERED CANDIDATES FOR ACTIVE SURVEILLANCE

Ganesh Kartha; Yaw Nyame; and Eric Klein
Cleveland Clinic, Cleveland OH
(Presented By: Ganesh Kartha)

Introduction: With new evidence pointing toward over treatment, more physicians and patients are choosing active surveillance (AS) for management of very low to intermediate risk prostate cancer (CaP). Genomic profiling tools are now being used to risk stratify these patients to aid in management decision-making. The objective of this study is to report risk discrepancies between National Comprehensive Cancer Network (NCCN) criteria and the OncotypeDx Prostate Genomic Prostate Score (GPS) and how that may influence decision-making in our CaP population.

Methods: An inception cohort study was carried out on the first 56 patients from our institution with NCCN very low to intermediate risk CaP who were candidates for AS and underwent GPS testing on prostate biopsy specimens performed within 6 months of entry. GPS provided a score from 1−100 corresponding to a GPS−based risk group stratification. Study endpoints were: 1) distribution of GPS risk groups within each NCCN risk category; 2) frequency of change to lower or higher risk based on GPS; 3) effect of GPS on physician recommendations and patient choice on disease management.

Results: 52 of 56 patients had sufficient carcinoma present on biopsy specimens for a GPS analysis. GPS reassigned risk in 23% (12/52) of patients, with 10 changing from NCCN low risk to GPS very low risk and 2 reassigned to a higher GPS risk profile (Table 1). AS was recommended in 19 patients assigned to GPS very low risk group and 8 patients in the GPS−defined low risk group. Physicians recommended treatment to 7 patients in the GPS intermediate risk group. Patient choice was congruent with physician recommendation in all cases. No patients chose AS when assigned to a higher risk category. All 10 patients reassigned to a lower risk category chose AS.

Conclusion: In this CaP cohort, assessment of biological risk by GPS changed risk stratification in 23% of patients. Moving to a different risk category changed physician recommendation and patient choice in the corresponding direction (to surveillance or therapy) in all cases. More study and larger sample size are needed to fully assess the effect of GPS on clinical decision-making.

Table 1. Distribution of GPS risk within each NCCN risk category
**Poster #97**  
**IMPACT OF THE USPSTF 2012 PSA SCREENING STATEMENT ON TRUS BIOPSY FINDINGS ACROSS THE UNITED STATES**  
Tomy Perez¹; Rashed Ghandour¹; Jennifer Ahn¹; Edan Shapiro¹; Arindam RoyChoudhury¹; Michael Donovan²; and James McKiernan¹  
¹Columbia University, New York, NY; ²Exosome Diagnostics, New York, NY  
(Presented By: Tomy Perez)

**Introduction:** On May 22, 2012 the United States Preventative Services Task Force published a statement recommending against PSA screening for prostate cancer in all men, issued in light of randomized controlled trials suggesting lack of survival benefit from early detection of prostate cancer and concerns of overtreatment. The effects of this statement on urologist practice are unknown.

**Methods:** Data was prospectively acquired within an ongoing IRB−approved biomarker discovery protocol in 15 centers nationwide on men undergoing prostate biopsies. Retrospective analysis of 1040 subjects enrolled from October 2011 through January 2013 was performed, comparing demographic characteristics, PSA, and biopsy results between patients in the time period preceding publication of the 2012 USPSTF Recommendation Statement on PSA Screening to those after. Multivariate analysis was performed to determine if date of pre−biopsy PSA was associated with TRUS biopsy result.

**Results:** 758 patients were identified in the pre−USPSTF group and 282 in the post−USPSTF group. Mean age was the same in the two groups, (63.8 vs. 63.04, p=0.2). The percentage of Caucasian men in the post−statement period decreased 8.65% (77.44% to 68.79%, p=0.004). The percentage of African Americans and Hispanics was unchanged (p=0.21 and p=0.86, respectively). Other racial groups increased by 5.89% (4.75% to 10.64%, p<0.001). The percentage of patients with a positive family history for prostate cancer (16.75% vs 17.73%, p=0.71), and patients with positive DRE (34.96% vs. 38.65%, p=0.27) were unchanged. Mean pre−biopsy PSA was no different (7.88 ng/dl vs 9.3 ng/dl, p=0.53). No difference was found in the percentage of patients with a positive biopsy between the two periods (46.17% vs 45.39%, p=0.82). No association was found between the date of pre−biopsy PSA and biopsy result throughout the study period (p=0.32) or when analyzed on a monthly basis from the USPSTF statement onward (p=0.11−0.79). There was no difference in Gleason Score distribution or percentage of biopsy cores positive (32.57% vs. 33.9%, p=0.61). A statistically significant decrease in the mean number of cores biopsied was observed (12.22 to 11.91, p=0.03).

**Conclusions:** The USPSTF PSA recommendation statement does not seem to have affected the average pre−TRUS biopsy PSA or the findings at the time of biopsy at 15 centers across the U.S. There appears to have been a significant decline in the rate of TRUS biopsies in Caucasian men.

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**Poster #98**  
**PROSTATE CANCER AGGRESSIVENESS ON REPEAT BIOPSY: A COMPARISON BETWEEN MEN WITH NEGATIVE INITIAL BIOPSIES AND THOSE WITH HGPIN/ASAP**  
Ganesh Kartha; Ahmed El-Shafei; and J. Stephen Jones  
Cleveland Clinic, Cleveland, OH  
(Presented By: Ganesh Kartha)

**Introduction:** There is a known association of multifocal high−grade prostatic intraepithelial neoplasia (HGPIN) and atypical small acinar proliferation (ASAP) on development of prostate cancer (CaP) on repeat biopsy. The objective of this study was to determine if HGPIN and/or ASAP would be associated with more aggressive CaP (higher grade, larger cancer volume) when compared to patients with a truly negative initial biopsy.

**Methods:** Retrospective chart review on 1112 patients who received at least 2 prostate biopsies between 1997 and 2011 was performed. This cohort was divided into 2 groups: 1) men with a negative initial biopsy and 2) men with evidence of HGPIN and/or ASAP on initial biopsy. Group 2 was further subcategorized into 1) ASAP only, 2) unifocal HGPIN, 3) multifocal HGPIN, 4) ASAP with unifocal HGPIN and 5) ASAP with multifocal HGPIN on initial biopsy.

**Results:** 30.3% of patients with HGPIN and/or ASAP developed cancer on repeat biopsy compared to 20.4% of patients with a negative initial biopsy (p < 0.002). The proportion of men with HGPIN and/or ASAP that developed Gleason >=7 CaP (10.3%) was similar to those with a negative initial biopsy (8.7%, p=0.4143). In patients that did develop CaP, men with a negative initial biopsy were more likely to have aggressive CaP (Gleason score >=7) and a larger disease burden (>33% of an individual biopsy core with evidence of cancer; > 50% of total cores with evidence of cancer) compared to men with HGPIN and/or ASAP on initial biopsy (Table 1).
Conclusion: In men that develop prostate cancer, there is a trend towards less aggressive cancer (higher grade, larger cancer volume) in those with HGPIN and/or ASAP compared to those with negative initial biopsy, however this trend did not reach statistical significance.

Table 1. In men with cancer on repeat biopsy, a comparison of disease aggression (Gleason >=7) and burden (>33% of biopsy core with cancer; > 50% of cores with cancer) between those with a negative initial biopsy and those with HGPIN and/or ASAP.

<table>
<thead>
<tr>
<th>Negative Initial Biopsy</th>
<th>&gt;33% of biopsy core with cancer</th>
<th>&gt;50% of cores with cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGPIN and/or ASAP on initial biopsy</td>
<td>33.9%</td>
<td>8.6%</td>
</tr>
<tr>
<td>p value</td>
<td>&lt;0.166</td>
<td>&lt;0.003</td>
</tr>
</tbody>
</table>

Poster #99
PRESENTATION, EVALUATION AND TREATMENT OF LEYDIG CELL AND SERTOLI CELL TESTICULAR CANCER: AN ANALYSIS OF 192 PATIENTS FROM THE NATIONAL CANCER DATABASE
Harras Zaid1; C.J. Stimson1; Sam Kaffenberger1; Sanjay Patel2; Zachary Reardon1; Daniel Barocas1; Matthew Resnick1; and Sam Chang1
1Vanderbilt University, Dept. of Urologic Surgery, Nashville, TN; 2University of Chicago, Dept. of Urologic Surgery, Chicago, IL
(Presented By: Harras Zaid)

Introduction: Stromal tumors of the testis account for less than 1% of all testicular cancer, and as a result, their natural history and ideal treatment are not well defined. We sought to characterize disease and treatment patterns of Leydig cell and Sertoli cell testicular cancer in a large national database.

Methods: We analyzed all adult patients diagnosed with testicular cancer in the National Cancer Database (NCDB) between 1998−2011. From this group, we extracted patients without other lifetime cancer diagnoses who underwent radical orchiectomy with a pathologic diagnosis of seminoma GCT (SGCT, n=19425), non−seminoma GCT (NSGCT, n=14459), and stromal tumor (ST, n=192), defined by ICD coding in this dataset as Leydig cell, Sertoli cell, and poorly differentiated Leydig−Sertoli cell.

Results: ST accounted for 0.56% of testicular cancer diagnoses in this cohort. The 192 patients with ST were distributed as follows: Leydig cell (n=152, 79%); Sertoli cell (n=34, 18%) and poorly differentiated Leydig−Sertoli (n=6, 3%). Mean age at diagnosis for ST was 45.0 years (SD 15.6), compared to 38.0 years (SD 10.2) for SGCT and 30.4 years (SD 9.31) for NSGCT (p < 0.05). At time of diagnosis, 50% (n=96) of patients with ST had clinical stage 1 disease, 5.2% (n=10) had clinical stage 2 or 3 disease, and 45.8% (n=86) had incomplete staging data. Comparatively, clinical stage 1 disease accounted for 47% of men with SGCT and 35% of men with NSGCT (p < 0.05). Following orchiectomy and diagnosis with ST, 84% of patients (n=157) underwent surveillance without any additional therapy; 11.2% (n=21) underwent subsequent RPLND without other adjuvant therapy; and 4.8% (n=9) underwent multi−modality treatment including some combination of chemotherapy, radiation, or RPLND. Overall survival data was available for patients treated between 1998−2006 (n=63 for ST), with n=55 (87.3%) still alive with mean follow−up of 58.7 months (SD 29.1). This compares with 97.2% OS for SGCT (mean follow−up 66.2 months, SD 24.5) and 94.3% OS for NSGCT (mean follow−up 63.6 months, SD 25.9), p < 0.05.

Conclusion: Leydig cell and Sertoli cell ST tend to present more commonly as clinical stage 1 disease and in older men compared to SGCT and NSGCT. While 5 year overall survival for ST approaches 90% it is still significantly lower than SGCT and NSGCT.
Objective: The need for repeat RPLND is often associated with prior inadequate resection and significantly reduces survival in this population. In this study we aim to evaluate the impact of early reoperation (e−Reop) in patients who were deemed unresectable at outside institutions.

Methods: The Indiana University Testis Cancer Database was queried to identify patients who underwent re−operative RPLND due to GCT from 1987 to 2011. The final study cohort included 55 patients who were referred to Indiana University after an initial resection was considered incomplete due to unresectable disease. Patients were defined as having e−Reop if it was performed within 12 months of the initial unsuccessful operation. Statistical analysis included Fisher’s exact test for categorical variables and the Kaplan−Meier method and log−rank test were used for survival analysis. Median follow up for the cohort was 73.7 months (range 0.2−230.0).

Results: The median age at presentation was 27 years (IQR: 22–32). Twenty−nine patients underwent e−Reop and 26 delayed re−operation. Median time to re−operative RPLND was 7.7 months (2.9−12.0) in the e−Reop group vs. 37.6 (12.9−207.7) in the delayed one. There were no statistical differences between groups with regards to pathological findings at time of initial resection (p=0.261), rate of induction (p=0.297) or salvage chemotherapy (p=0.111), or incidence of marker positivity prior to re−operative surgery (p=0.120). When comparing patients undergoing e−Reop with delayed surgery, necrosis was identified in 5 (17.2%) vs 3 (11.5%); teratoma in 13(44.8%) vs. 6(23.1%) and active cancer in 11(37.9%) vs. 17(65.4%) (p=0.134) .The 5−year cancer−specific survival in the e−Reop group was 67.5% compared to 39.9% in the delayed group (p=0.049).

Conclusion: There is an increased incidence of cancer in the retroperitoneal specimen in the delayed surgery group. We were unable to determine the reason for delayed referral. Improved oncologic results may be achieved when early referral to a high volume center is applied to GCT patients subjected to a recognized suboptimal RPLND.
Poster #101
10-YEAR TRENDS IN POST-CHEMOTHERAPY RETROPERITONEAL LYMPH NODE DISSECTION COMPLICATIONS AND ADDITIONAL PROCEDURES
Clint Cary; Richard Bihrle; and Richard Foster
Indiana University Department of Urology, Indianapolis IN
(Presented By: Clint Cary)

Introduction: Post-chemotherapy retroperitoneal lymph node dissection (PC-RPLND) is a technically challenging operation and remains a mainstay in the treatment of men with metastatic testicular cancer. We sought to determine if trends in perioperative complications and/or additional procedures have changed over time with post-chemotherapy surgery.

Methods: Patients undergoing PC-RPLND from 2003 to 2011 were identified in the Indiana University Testis Cancer Database. Patients with pure seminoma (N=24) and/or lack of pathologic data (N=4) were excluded. An additional 23 patients were excluded with incomplete records. Additional procedures were defined as a procedure performed at the time of surgery in addition to the RPLND (i.e. nephrectomy, aortic replacement, etc). Trends in the incidence of perioperative complications and additional procedures were assessed over time using regression tests of trend. Univariable and multivariable logistic regression was used to determine factors associated with undergoing additional procedures.

Results: After exclusion criteria, 769 patients were included in the final study cohort. Overall, the incidence of perioperative complications and additional procedures were 3.6% (28 out of 769) and 23.4% (180 out of 769), respectively. The incidence of perioperative complications per year ranged from 0%−7.1% with no significant trend in any direction (ptrend=0.06). The incidence of additional procedures per year ranged from 17.2%−31.8% with no significant trend in any direction (ptrend=0.72). On univariable analysis, preoperative retroperitoneal (RP) mass size, elevated markers at time of RPLND, type of surgical template, nerve-sparing, and RP pathology were significantly associated with the odds of undergoing an additional procedure. After adjusting for covariates, preoperative RP mass size, elevated markers, and RP pathology remained significantly associated with the odds of an additional procedure. RP mass size of >10cm was the strongest predictor (Odds Ratio 7.8; 95% CI 2.9 – 21.1).

Conclusion: The incidence of perioperative complications is low with no significant trend over the last 10 years. A substantial number of patients require additional procedures during PC-RPLND, which has remained stable at our institution over time. Patients with large RP masses, necrosis or cancer in the RP specimen, and elevated markers are at risk of needing additional procedures during PC surgery.

Poster #178
SPOP MUTATIONS IN PROSTATE CANCER ACROSS ETHNICALLY AND GEOGRAPHICALLY DIVERSE PATIENT COHORTS
Mirjam Blattner¹; Daniel Lee¹; Catherine O'Reilly¹; Kyung Park¹; Theresa MacDonald¹; Francesca Khani¹; Kevin Turner¹; Peter Wild²; Douglas Scherr³; Ghil Suk Yoon⁴; Ove Andrén⁴; Juan Miguel Mosquera¹; Brian Robinson¹; Christopher Barbieri¹; and Mark Rubin¹
¹Weill Medical College of Cornell University and New York-Presbyterian Hospital, New York, NY; ²University Hospital Zurich, Zurich, Switzerland; ³Kyungpook National University School of Medicine, Daegu, Korea; ⁴Örebro University Hospital, Örebro, Sweden
(Presented By: Christopher Barbieri)

Introduction and Objectives: Recurrent mutations in the Speckle-Type POZ Protein (SPOP) gene have been reported in up to 15% of prostate cancers, however, the frequency and features of cancers with these mutations across different populations is unknown. In addition, detection of point mutations in archival samples can be technically challenging, making mutational analysis of well annotated archival tissue difficult.

Methods: 720 prostate cancer samples from six different international cohorts spanning Caucasian, African American, and Asian patients, including both PSA-screened and unscreened populations, were screened for their SPOP mutation status. An assay employing HRM and Sanger sequencing was optimized to screen for somatic mutations in recurrently altered areas of the SPOP gene. Status of SPOP was correlated to molecular features (ERG rearrangement, PTEN deletion, CHD1 deletion) as well as clinical and pathologic features.

Results: The overall frequency of SPOP mutations was 8.1% in 720 patient's samples, ranging from 4.6% in the African American cohort to 14.4% in the WCMC cohort. There were no significant differences in frequency between ethnicities or cohorts (p=0.14). SPOP mutation was inversely associated with ERG rearrangement (p=0.01), and SPOP mutant cancers had higher rates of CHD1 deletions (p<0.01). There were no significant differences in rates or time to biochemical recurrence (BCR) in SPOP wild-type (wt) vs mutants (p=0.18, 0.30 respectively). The mutational assays showed excellent sensitivity and specificity in high quality samples. Limitations of this study include missing mutational data due to sample quality and lack of power to identify a difference in clinical outcomes.

Conclusions: SPOP is mutated in 4.6–14.4% of prostate cancer patients with different ethnic and demographic backgrounds. There was no significant difference between the cohorts in either the SPOP mutant frequency, and no significant association of SPOP mutations with clinical or pathologic parameters. Mutually exclusivity of SPOP with ERG rearrangement as well as a high correlation with CHD1 deletion reinforces SPOP as a distinct molecular subclass of prostate cancer. Further studies with larger number of patient samples will be needed to establish correlation of SPOP mutations and clinical outcome.
CONFIRMATION OF THE FREE HORMONE HYPOTHESIS: DECREASES IN PSA CORRELATE WITH FREE TESTOSTERONE RATHER THAN TOTAL TESTOSTERONE IN MEN WITH ADVANCED PROSTATE CANCER TREATED WITH GTX-758

Robert Getzenberg; Alvin Matsumoto¹; Christopher Coss²; Michael Hancock²; James Dalton²; and Mitchell Steiner²
¹Clinical Research Unit, V.A. Puget Sound Health Care System and University of Washington School of Medicine; ²GTx Inc, Memphis, TN
(Presented By: Robert Getzenberg)

Objectives: Androgen deprivation therapy (ADT) improves disease−free survival but disease progression is related, in part, to ineffective castration. The free hormone hypothesis states that the biological activity of steroid hormones is affected by its unbound (free) rather than its protein−bound concentration. Serum total testosterone (T) concentrations predominantly reflect the T bound to plasma proteins and do not accurately predict prostatic levels of T.

Methods: In a Phase II study (G200705), men with advanced prostate cancer (n=159) were randomized to receive 1000 mg or 2000 mg GTx−758 daily or leuprolide as their initial ADT. Serum total T (mass spectrometry), free T (equilibrium dialysis), SHBG and PSA concentrations were measured. A second Phase II study (G20007) was performed in men (n=9) with CRPC who then received GTx−758 2000 mg daily.

Results: Although both treatments reduced serum total T levels to < 50 ng/dL, leuprolide decreased them to a greater extent. However, GTx−758 caused greater reductions in serum PSA, suggesting that total T concentrations did not accurately reflect the suppression of androgen activity. Both dosages of GTx−758 reduced free T levels to a greater extent (mean of 0.7 and 0.4 pg/ml at day 60, and 0.4 and 0.4 pg/ml on day 90, respectively) than leuprolide (mean of 1.4 pg/ml on day 60 and 1.4 pg/ml on day 90; p values <0.03). Similar clinical results were observed in CRPC patients where GTx−758 daily resulted in a 71% decrease in %free T and clinically relevant PSA reductions in men maintained on ADT with LHRH agonists. As a result of adverse events at higher doses of GTx−758, the trial was stopped early.

Conclusion: The ERα agonist, GTx−758, reduced the biologically active form of T, free T, to significantly lower levels than leuprolide. Reductions in PSA appeared to be more highly associated with changes in free T. These data provide compelling evidence to support the free hormone hypothesis and suggest that serum free T concentrations would provide a better measure of therapeutic efficacy in ADT than total T. A Phase II clinical trial utilizing lower doses of GTx−758 (G200712) is currently being performed.
Poster Session II
Friday, December 6, 2013
4:30 p.m. - 6:30 p.m.
Poster Walks
See page 147 for full abstracts

Poster #26
PREDICTIVE AND PROGNOSTIC SIGNIFICANCE OF EARLY POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY IN ADVANCED TRANSITIONAL CELL CARCINOMA
Patrizia Giannatempo¹; Alessandra Alessi¹; Rosalba Miceli¹; Daniele Raggi¹; Elena Farè¹; Nicola Nicolai¹; Gianluca Serafini¹; Barbara Padovano¹; Luigi Piva¹; Davide Biasoni¹; Tullio Torelli¹; Mario Catanzaro¹; Silvia Stagni¹; Massimo Maffezzini¹; Luigi Mariani¹; Alessandro Gianni¹; Guru Sonpavde²; Roberto Salvioni¹; Flavio Crippa¹; and Andrea Necchi¹
¹Fondazione IRCCS Istituto Nazionale dei Tumori, Milan; ²UAB Comprehensive Cancer Center
(Presented By: Patrizia Giannatempo)

Poster #102
A PANEL OF TISSUE BIOMARKERS TO ENHANCE PROGNOSTIC STRATIFICATION IN LOCALLY-ADVANCED AND METASTATIC UROTHELIAL CANCEORS (UC) UNDERGOING PERI-OPERATIVE AND FIRST-LINE PLATINUM-BASED CHEMOTHERAPY
Patrizia Giannatempo; Biagio Paolini; Luigi Mariani; Elena Farè; Nicola Nicolai; Luigi Piva; Mario Catanzaro; Davide Biasoni; Tullio Torelli; Silvia Stagni; Massimo Maffezzini; Alessandro Gianni; Roberto Salvioni; Maurizio Colecchia; and Andrea Necchi
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan
(Presented By: Patrizia Giannatempo)

Poster #103
TRENDS IN THE PERFORMANCE OF PARTIAL CYSTECTOMY IN THE UNITED STATES FROM 2001-2010
Izak Faiena¹; Eric A. Singer¹; Michael E. Karella¹; Thomas L. Jang¹; Victor Dombrovsky²; and Robert E. Weiss¹
¹Rutgers-CINJ New Brunswick NJ; ²Rutgers-RWJUH New Brunswick NJ
(Presented By: Izak Faiena)

Poster #104
IMPACT OF 2004 ISUP-WHO CLASSIFICATION ON BLADDER CANCER GRADING AND POTENTIAL IMPACT ON TREATMENT - A SINGLE INSTITUTION ANALYSIS
Soum Lokeshwar¹; Robert Ruiz-Cordero²; Merce Jordà²; and Mark Soloway¹
¹Department of Urology, University of Miami, Miami, Florida; ²Department of Pathology, University of Miami, Miami, Florida
(Presented By: Mark Soloway)

Poster #105
OUTCOME OF PATIENTS WITH CLINICALLY NODE-POSITIVE BLADDER CANCER WHO UNDERGO CONSOLIDATIVE SURGERY AFTER PRE-OPERATIVE CHEMOTHERAPY: MD ANDERSON CANCER CENTER EXPERIENCE
Philip Ho¹; Daniel Willis²; Jeevitha Patil²; Karen Tart²; Sahil Parikh²; Jay Shah²; Scott Delacroix³; Arlene Siefker-Radtke³; Colin Dinney³; Louis Pisters³; and Ashish Kamat³
¹MD Anderson Cancer Center, Houston, TX; ²MD Anderson Cancer Center, Houston, Texas; ³LSU Health Sciences Center, New Orleans, Louisiana
(Presented By: Philip Ho)

Poster #106
PRE-CLINICAL AND CLINICAL TRANSLATION OF A TISSUE ENGINEERED NEO-URINARY CONDUIT USING ADIPOSE DERIVED SMOOTH MUSCLE CELLS ON A BIODEGRADABLE SCAFFOLD
Trinity Bivalacqua¹; Gary Steinberg¹; Norm Smith¹; Elias Rivera¹; D. Jain¹; A. Robertson¹; J. Basu¹; A. Bruce¹; K. Guthrie¹; R. Payne¹; T. Spencer¹; Tim Bertram¹; and Mark Schoenberg¹
¹Johns Hopkins Hospital, Baltimore, MD; ²University of Chicago, Chicago, IL; ³Tengion, Winston, NC
(Presented By: Trinity Bivalacqua)
Poster #107
THE USE OF INTRAVESICAL MITOMYCIN C FOLLOWING TRANSURETHRAL RESECTION OF BLADDER TUMORS IN THE UNITED STATES: A POPULATION-BASED ANALYSIS
Nedim Ruhotina¹; Steven Chang²; Benjamin Chung³; Wei Jiang⁴; and Jonathan Rosenberg⁵
¹MA; ²Brigham and Women’s Hospital; ³Stanford University Medical Center, Stanford, Ca; ⁴Center for Surgery and Public Health; ⁵Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Nedim Ruhotina)

Poster #108
INCREASING USE OF PERIOPERATIVE CHEMOTHERAPY IN PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR INVASIVE BLADDER CANCER
Zachary Reardon¹; Sanjay Patel²; Harras Zaid¹; CJ Stimson¹; Daniel Barocas¹; Matthew Resnick¹; Sam Chang¹; and Michael Cookson²
¹Vanderbilt University Medical Center, Department of Urology, Nashville, TN; ²University of Chicago Medical Center, Section of Urology, Chicago, IL; ³University of Oklahoma College of Medicine, Department of Urology, Norman, OK
(Presented By: Zachary Reardon)

Poster #109
A RESTRICTIVE TRANSFUSION APPROACH IS SAFE IN OPEN RADICAL CYSTECTOMY
Sumeet Syan; Siri Drangsholt; Jie Cai; Gus Miranda; and Siamak Daneshmand
University of Southern California, Los Angeles, CA
(Presented By: Sumeet Syan)

Poster #110
TREATMENT DELAY FOR MUSCLE INVASIVE BLADDER CANCER: IMPLICATIONS FOR REGIONALIZATION OF CARE
Jeffrey Tomaszewski; Elizabeth Handorf¹; Anthony Corcoran¹; Reza Mehrizin¹; Daniel Canter²; Justin Bekelman³; Alexander Kutikov¹; Robert Uzzo¹; and Marc Smaldone¹
¹Fox Chase Cancer Center, Philadelphia, PA; ²Albert Einstein Medical Center, Philadelphia, PA; ³University of Pennsylvania, Philadelphia, PA
(Presented By: Jeffrey Tomaszewski)

Poster #111
DECREASING LENGTH OF HOSPITAL STAY FOLLOWING RADICAL CYSTECTOMY USING MULTIMODAL ENHANCED RECOVERY PROTOCOL
Hooman Djaladat; Hamed Ahmadi; Anne Schuckman; and Siamak Daneshmand
USC Institute of Urology
(Presented By: Hooman Djaladat)

Poster #112
WNT PATHWAY LIGANDS (6 & 10A) AND THEIR ASSOCIATED ENHANCER RNA ARE EXPRESSED IN LOW GRADE BUT NOT HIGH GRADE BLADDER CANCER PHENOTYPES - NEW INSIGHTS INTO BLADDER CANCER PROGRESSION?
Aidan Noon¹; Yu Liu²; Liang Zhang³; Masahiro Narimatsu⁴; Eduardo Aguiar⁵; James Catto⁶; Alexandre Zlotta⁵; and Jeff Wrana²
¹University of Toronto, Toronto, Ontario; ²Lunenfeld-Tanenbaum Research Institute, Mount Sinai Hospital, Toronto, Ontario; ³Sheffield University, Sheffield, South Yorkshire; ⁴Mount Sinai Services, Mount Sinai Hospital, Toronto, Ontario
(Presented By: Aidan Noon)

Poster #113
RADICAL CYSTECTOMY OUTCOMES OF POTENTIAL CANDIDATES FOR BLADDER PRESERVATION THERAPY
Eugene Pietzak; Zachary Smith; S. Bruce Malkowicz; and Thomas Guzzo
Hospital of University of Pennsylvania, Department of Surgery, Division of Urology, Philadelphia, PA
(Presented By: Eugene Pietzak)

Poster #114
URETERAL INTERPOSITION GRAFTING USING TUBULARIZED PORCINE URINARY BLADDER-DERIVED MATRIX: A PILOT STUDY
Benjamin Ristau¹; Scott Johnson²; Stephen Badylok²; and Tatum Tarin¹
¹University of Pittsburgh Medical Center; ²University of Pittsburgh
(Presented By: Benjamin Ristau)
**Poster #115**  
**THE PROGNOSTIC VALUE OF BLADDER CANCER STEM CELL MARKER IN NEOADJUVANT CHEMOTHERAPY FOR BLADDER CANCER**  
Ross Krasnow; Anup Shah; Seth Lerner; Erica Lay; and Keith Chan  
Baylor College of Medicine, Houston, TX  
(Presented By: Ross Krasnow)

**Poster #116**  
**LYMPH NODE STROMAL CELLS SUPPORT MUSCLE INVASIVE UROTHELIAL CELL CARCINOMA IMPLANTATION AND GROWTH IN ORTHOTOPIC XENOGRAFTS**  
Jessie Gills¹; Xin Zhang²; M’Liss Hudson³; Stephen Bardot⁴; and Li Li⁵  
¹Ochsner Clinic Foundation, New Orleans, LA; ²Ochsner Department of Translation Research; ³Ochsner Department Urology  
(Presented By: Jessie Gills)

**Poster #117**  
**THE IMPACT OF CLINICALLY SIGNIFICANT ALTERATIONS OF PRIMARY PATHOLOGICAL REVIEW OF TRANSURETHRAL BLADDER RESECTION SPECIMENS UPON REPEAT REVIEW AT A TERTIARY CARE CENTER**  
LaMont Barlow; Edan Shapiro; Jennifer Ahn; and James McKiernan  
Columbia University Medical Center, New York, NY  
(Presented By: LaMont Barlow)

**Poster #118**  
**CLINICAL FEATURES OF LEIOMYOSARCOMA OF THE URINARY BLADDER: ANALYSIS OF 183 CASES**  
Dayron Rodriguez; Mark A. Preston; Glen W. Barrisford; and Adam S. Feldman  
Massachusetts General Hospital – Department of Urology, Boston MA.  
(Presented By: Dayron Rodriguez)

**Poster #119**  
**COMPLICATIONS OF RADICAL CYSTECTOMY IN THE NEOADJUVANT CHEMOTHERAPY ERA: THE MOFFITT CANCER CENTER EXPERIENCE**  
Patrick N. Espiritu¹; Gautum Agarwal¹; Jorge L. Lockhart²; Julio M. Pow-Sang¹; Philippe E. Spiess¹; Wade J. Sexton¹; and Michael A. Poch¹  
¹H. Lee Moffitt Cancer Center, Tampa, FL; ²University of South Florida, Tampa, FL  
(Presented By: Patrick N Espiritu)

**Poster #120**  
**BLADDER CANCER TRIFECTA: A NEW CONCEPT FOR REPORTING OUTCOMES OF RADICAL CYSTECTOMY AND URINARY DIVERSION**  
Adrian Fairey¹; Donald Skinner²; Susan Groshen³; Kenneth Faber²; Jie Cai²; Gus Miranda³; and Eila Skinner³  
¹University of Alberta; ²USC, Los Angeles, CA; ³Stanford, Stanford, CA  
(Presented By: Adrian Fairey)

**Poster #121**  
**NEUACT, A PHASE 2 RANDOMIZED, OPEN-LABEL TRIAL OF DN24-02 IN PATIENTS (PTS) WITH SURGICALLY RESECTED HER2+ UROTHELIAL CANCER (UC): UPDATED ANALYSIS OF PRODUCT PARAMETERS, HER2 EXPRESSION AND SAFETY**  
Leonard Gomella¹; Padmanee Sharma²; David Quinn²; Seth Lerner³; Michael Press³; Robert Sims⁴; Todd DeVries⁵; Nadeem Sheikh⁶; Melissa Chen⁷; Michael Locker⁷; and Locker Bajorin⁸  
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(Presented By: Leonard Gomella)
Poster Session II – Summary

Poster #122
LYMPH NODE DISSECTION DURING RADICAL CYSTECTOMY FOLLOWING PREVIOUS RADIATION THERAPY: A POPULATION-BASED STUDY USING THE SEER DATABASE
Devin Patel; Lambros Stamatakis; Sam Brancato; Adam Metwalli; and Piyush Agarwal
Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Devin Patel)

Poster #123
INSULIN-LIKE GROWTH FACTOR MRNA-BINDING PROTEIN 3 (IMP3) EXPRESSION HELPS PROGNOSTICATION IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA
Daniel Lee; Evanguelos Xylinas; Francesca Khani; Malte Rieken; Douglas Scherr; Sharokh Shariat; and Brian Robinson
Cornell, New York, NY
(Presented By: Daniel Lee)

Poster #124
ADENOCARCINOMA OF THE BLADDER: EFFECT OF LYMPH NODE YIELD AND RADIOTHERAPY ON SURVIVAL
Devin Patel; Michael D. Weintraub; Srinivas Vourganti; and Piyush K. Agarwal
Urologic Oncology Branch, National Cancer Institute, Bethesda, MD
(Presented By: Michael D. Weintraub)

Poster #125
PREOPERATIVE NEUTROPHIL-LYMPHOCYTE RATIO (NLR) CORRELATES WITH TUMOR STAGE AND GRADE AT TIME OF TRANSURETHRAL RESECTION OF BLADDER TUMORS
Tracy M. Downs¹, E. Jason Abel¹, Daniel Shapiro¹, David F. Jarrard¹, Viraj Master² and Daniel Canter³
¹University of Wisconsin, Madison, WI; ²Emory University, Atlanta, GA; ³Einstein Healthcare/Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Tracy M. Downs)

Poster #126
IDENTIFYING HIGH-RISK PATIENTS FOR HOSPITAL READMISSION FOLLOWING RADICAL CYSTECTOMY AND URINARY DIVERSION
Katie Omernick; E. Jason Abel; David F. Jarrard; and Tracy M. Downs
University of Wisconsin, Madison, WI
(Presented By: Tracy M. Downs)

Poster #127
THE TNM LYMPH NODE CLASSIFICATION FOR RENAL CELL CARCINOMA: DOES LESS SPECIFIC NODAL PARAMETERS ALLOW SIMILAR PROGNOSTICATION?
Suzanne Stewart¹; Christine Lohse²; Sarah Psutka¹; John Cheville³; Stephen Boorjian¹; R. Houston Thompson¹; and Bradley Leibovich¹
¹Department of Urology, Mayo Clinic, Rochester, MN; ²Department of Biostatistics, Mayo Clinic, Rochester, MN; ³Department of Pathology, Mayo Clinic, Rochester, MN
(Presented By: Suzanne Stewart)

Poster #128
POTENTIAL PITFALLS OF RISK ASSESSMENT FOR SMALL RENAL MASS (SRM) USING RENAL MASS BIOPSY (RMB) FINDINGS
Anna Drewry; Tracy M. Downs; William Christensen; David F. Jarrard; and E. Jason Abel
Madison, WI
(Presented By: E. Jason Abel)

Poster #129
THE INCIDENCE AND IMPACT OF PATHOLOGIC UPSTAGING OF CLINICAL T1 KIDNEY TUMORS
Krishna Ramaswamy¹; Emil Kheterpal¹; Hai Pham¹; Sanjay Mohan¹; Michael Sittelman¹; Samir Taneja¹ and William C Huang¹
¹New York University, New York, NY; ²University of California, San Francisco, CA
(Presented By: Krishna Ramaswamy)
Poster #130
DETERMINANTS OF RENAL FUNCTIONAL DECLINE AFTER OPEN PARTIAL NEPHRECTOMY: A COMPARISON OF WARM, COLD, AND NON-ISCHEMIC MODALITIES
Ramzi Jabaji¹; Michael Liss¹; Kerrin Palazzi¹; Hak Lee¹; Jason Woo¹; Reza Mehrzarin³; Hossein Mirheydar¹; Sean Stroup³; James Masterson¹; Ryan Kopp¹; Anthony Patterson²; James L’Esperance³; and Ithaar Derweesh²
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(Presented By: Ramzi Jabaji)

Poster #131
THE ASSOCIATION BETWEEN VISCERAL AND SUBCUTANEOUS ADIPOSITY AND CLINICOPATHOLOGICAL OUTCOMES IN AN AMERICAN COHORT OF NON-METASTATIC CLEAR CELL RENAL CELL CARCINOMA
Roy Mano¹; A. Ari Hakimi¹; Emily C. Zabor²; Marta A. Bury³; Olivio F. Donati³; Christoph A. Karlo³; Helena Furberg³; and Paul Russo¹
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(Presented By: Roy Mano)

Poster #132
IS SMOKING A RISK FACTOR FOR ALL RENAL CELL CARCINOMA SUBTYPES?
Neel Patel; Terrance Creighton; Michael Hanzly; Diana Mehedint; Thomas Schwaab; and Eric Kauffman
Roswell Park Cancer Institute, Buffalo, NY
(Presented By: Neel Patel)

Poster #133
IMPACT OF RENAL SURGERY ON OVERALL, ONCOLOGIC, AND CARDIAC MORTALITY IN PATIENTS WITH STAGE I RENAL CELL CARCINOMA AND WITHOUT PREOPERATIVE RENAL INSUFFICIENCY
Jason Woo¹; Michael Liss¹; Nishant Patel¹; Reza Mehrzarin³; Hak Lee¹; Anthony Patterson²; Jim Wan²; and Ithaar Derweesh¹
¹Department of Urology, University of California - San Diego, San Diego, CA; ²Department of Urology, University of Tennessee Health Science Center, Memphis, TN
(Presented By: Jason Woo)

Poster #134
COMPUTER ASSISTED RENAL VOLUMETRIC ASSESSMENT TO PREDICT POSTOPERATIVE RENAL FUNCTION PRIOR TO EXTERVATIVE RENAL SURGERY
Michael A. Liss; Dominique Caovan; Kerrin Palazzi; Michael Gabe; Hak Lee; Nishant Patel; Rob Deconde; David Karow; Giovanna Casola; and Ithaar Derweesh
UC San Diego, La Jolla, CA
(Presented By: Michael A. Liss)

Poster #135
PLATELET COUNT AS A PROGNOSTIC INDICATOR FOR RESPONSE TO NEOADJUVANT TYROSINE KINASE INHIBITOR THERAPY IN RENAL CELL CARCINOMA
Hak Lee¹; Nishant Patel²; Ryan Kopp³; Michael Liss³; Reza Mehrzarin³; Ramzi Jabaji³; Song Wang³; Kerrin Palazzi³; Fuad Elkoury³; Jason Woo³; Michelle McDonald³; Anthony Patterson³; and Ithaar Derweesh³
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(Presented By: Hak Lee)

Poster #136
POSTOPERATIVE COMPLICATIONS OF RADICAL NEPHRECTOMY WITH ATRIAL THROMBECTOMY: A CONTEMPORARY POPULATION-BASED ANALYSIS
Tudor Borza¹; Benjamin Chung²; and Steven Chang³
¹Brigham and Women’s Hospital, Department of Urology, Boston, MA; ²Stanford University Medical Center, Stanford, CA; ³Brigham and Women’s Hospital, Boston, MA
(Presented By: Tudor Borza)
Poster #137
CHARACTERISTICS AND OUTCOMES OF RENAL CELL CARCINOMA IN THE PEDIATRIC AND YOUNG ADULT POPULATION
Kelly Harris; Joan Ko; Mark Ball; Michael Gorin; and Mohamad Allaf
Johns Hopkins University Department of Urology
(Presented By: Kelly Harris)

Poster #138
DIAGNOSTIC RENAL BIOPSY AND THE TREATMENT OF SMALL KIDNEY CANCERS
Marc A. Bjurlin¹; Elena Elkin²; Atoria Atoria²; Paul Russo³; Samir Taneja¹; and William Huang¹
¹Division of Urologic Oncology, Department of Urology, New York University, New York, NY; ²Center for Health Policy and Outcomes, 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
(Presented By: Marc A. Bjurlin)

Poster #139
A PREDICTIVE NOMOGRAM FOR URINE LEAK IN COMPLEX PARTIAL NEPHRECTOMY
Paulina Gorney Brown; M. Minhaj Siddiqui; Annerleim Walton-Diaz; Hong Truong; W. Marston Linehan; and Adam R. Metwalli
NIH NCI Urology Oncology Branch, Bethesda, MD
(Presented By: Paulina Gorney Brown)

Poster #140
EVALUATION OF SURVEILLANCE GUIDELINES FOR RENAL CELL CARCINOMA FOLLOWING PARTIAL NEPHRECTOMY
Marc Nelson; Jennifer Mason; and Tracey Krupski
University of Virginia, Charlottesville, VA
(Presented By: Marc Nelson)

Poster #141
COMPARISON OF COMPLICATIONS AND PERIOPERATIVE OUTCOMES AFTER RADICAL AND PARTIAL NEPHRECTOMY USING THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM (NSQIP) DATABASE
Mark Ball; Max Kates; Michael Gorin; Hiten Patel; Phillip Pierorazio; and Mohamad Allaf
The James Buchanan Brady Urological Institute and Department of Urology, The Johns Hopkins School of Medicine, Baltimore, MD
(Presented By: Mark Ball)

Poster #142
IMPACT OF RECURRENT COPY NUMBER ALTERATIONS AND CANCER GENE MUTATIONS ON THE PREDICTIVE ACCURACY OF PROGNOSTIC MODELS IN CLEAR CELL RENAL CELL CARCINOMA
A. Ari Hakimi¹; Roy Mano²; Giovanni Ciriello²; Mithat Gonen³; Nina Mikkilineni¹; John P. Sfakianos¹; Philip H. Kim¹; Robert J. Motzer⁴; Paul Russo⁵; Victor E. Reuter⁵; James J. Hsieh⁶; and Irina Ostrovnaya³
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(Presented By: Roy Mano)

Poster #143
CLINICOPATHOLOGICAL PRESENTATION OF RENAL CELL CARCINOMA (RCC) IN PATIENTS WITH A SITE SPECIFIC SINGLE NUCLEOTIDE POLYMORPHISM (SNP) IN THE MET ONCOCENE
Alexander Sankin; A. Ari Hakimi; Roy Mano; Nina Mikkilineni; Michael Chevinsky; Paul Russo; Jonathan Coleman; Kenneth Offit; James Hsieh; and Robert Klein
MSKCC, New York, NY
(Presented By: Alexander Sankin)
Poster #144
T1A PATIENTS WITH METASTATIC RCC AT DIAGNOSIS MARKEDLY DIFFER FROM PATIENTS WHO PRESENT WITH LOCALIZED MALIGNANT SRMS
Jeffrey Tomaszewski; Robert Uzzo; Brian Egleston; Reza Mehrazin; Marc Smaldone; David Chen, Rosalia Viterbo; Richard Greenberg; and Alexander Kutikov
Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Jeffrey Tomaszewski)

Poster #145
LYMPHOPENIA AS AN INDEPENDENT PREDICTOR OF WORSE SURVIVAL IN PAPILLARY RENAL CELL CARCINOMA
Reza Mehrazin¹; Robert Uzzo¹; Alexander Kutikov¹; Jeffrey Tomaszewski¹; Serge Ginzburg²; Karen Ruth¹; Essel Al-Saleem¹; Phillip Abbosh¹; Timothy Ito¹; David Chen¹; Rosalea Viterbo¹; Richard Greenberg¹; Marc Smaldone¹; and Tahseen Al-Saleem¹
¹Fox Chase Cancer Center, Philadelphia, PA; ²Albert Einstein Medical Center, Philadelphia, PA
(Presented By: Reza Mehrazin)

Poster #146
GROWTH KINETICS AND OUTCOMES OF CLINICAL T1B RENAL MASSES UNDER ACTIVE SURVEILLANCE (AS)
Reza Mehrazin; Marc Smaldone; Alexander Kutikov; Jeffrey Tomaszewski; Tianyu Li; Timothy Ito; Phillip Abbosh; Rosalia Viterbo; Richard Greenberg; David Chen; and Robert Uzzo
Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Reza Mehrazin)

Poster #147
CASE SERIES OF PRIMARY PRIMITIVE NEUROECTODERMAL TUMORS OF THE KIDNEY
Ian Vela¹; Timothy F. Donahue¹; Roy Mano¹; A. Ari Hakimi¹; Daniel Casella²; Timothy Lyon²; Ryan P. Kopp¹; Donna E. Hansel³; Mary Keohan¹; Ithaar H. Derweesh³; Paul Russo¹; and Tatum Tarin²
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²University of Pittsburgh Medical Center, Pittsburgh, PA; ³University of California San Diego, San Diego, CA
(Presented By: Ian Vela)

Poster #148
HISTOLOGIC DISTRIBUTION OF METASTATIC RCC SHOWS A DIFFERENCE BETWEEN N+ AND M+ DISEASE: AN ANALYSIS OF THE SEER DATABASE
Michael Daugherty; and Gennady Bratslavsky
SUNY Upstate Medical University, Syracuse, NY
(Presented By: Michael Daugherty)

Poster #149
DELAYING NEPHRECTOMY FOR A PROLONGED PERIOD OF TIME DOES NOT ADVERSELY AFFECT TREATMENT OUTCOME OF LARGE RENAL MASSES
Roy Mano¹; Emily Vertosick²; A. Ari Hakimi¹; Itay A. Sternberg¹; Daniel D. Sjoberg²; Melanie Bernstein¹; Guido Dalbagni¹; Jonathan A. Coleman¹; and Paul Russo¹
¹Urology Service, Department of Surgery, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Roy Mano)

Poster #150
THE METASTATIC POTENTIAL OF CHROMOPHOBE RCC IS DEPENDENT ON TUMOR SIZE: RESULTS FROM THE SEER DATABASE
Michael Daugherty¹; Alexander Kutikov³; and Gennady Bratslavsky¹
¹SUNY Upstate Medical University, Syracuse, NY; ³Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Michael Daugherty)
**Poster #151**

**DISTRIBUTION OF COMMON HISTOLOGIES OF SMALL RENAL MASSES: A COMPARISON BY AGE**

Simpa Salami; Nithin Theckumparampil; Christopher Babu; Michael Shavolian; Paras Shah; Arvin George; Oksana Yaskiv; and Manish Vira

Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY

(Presented By: Nithin Theckumparampil)

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**Poster #152**

**INTEROBSERVER VARIABILITY OF R.E.N.A.L., PADUA, AND CENTRALITY INDEX NEPHROMETRY SCORES**

Massimiliano Spaliviero; Bing Ying Poon; Omer Aras; Pier Luigi Di Paolo; Giuliano B. Guglielmetti; Christian Z. Coleman; Christoph A. Karlo; Melanie L. Bernstein; Daniel D. Sjoberg; Oguz Akin; and Jonathan A. Coleman

Memorial Sloan-Kettering Cancer Center, New York, NY

(Presented By: Massimiliano Spaliviero)

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**Poster #153**

**RE-EXAMINING THE OPTIMAL PATHOLOGIC DEFINITION OF A NEGATIVE SURGICAL MARGIN FOR SMALL RENAL MASSES**

Helyn Alvarez¹; Lu Wang²; Jingyang Feng²; Maria Picken²; and Gopal Gupta²

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(Presented By: Helyn Alvarez)

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**Poster #154**

**PREDICTING DRUG RESISTANCE IN METASTATIC RENAL CELL CARCINOMA: PERSONALIZED MEDICINE BY XENOGRAFTING PATIENT TUMORS INTO CHICKEN EMBRYOS**

Clarisse Mazzola¹; Chantalle Willie¹; Connor MacMillan²; Khurram Siddiqui¹; Michele Billia¹; Jonathan Izawa¹; Nicholas Power¹; and Hon Leong¹

¹University of Western Ontario, London, Ontario, Canada; ²London, Ontario, London, Ontario, Canada

(Presented By: Clarisse Mazzola)

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**Poster #155**

**THE DEGREE OF PREOPERATIVE HYDRONEPHROSIS PREDICTS ADVERSE PATHOLOGIC FEATURES AND WORSE ONCOLOGICAL OUTCOMES IN HIGH-GRADE UPPER TRACT UROTHELIAL CARCINOMA**

Oussama M. Darwish¹; Laura-Maria Krabbe²; Paul H. Chung³; Mary E. Westerman³; Aditya Bagrodia¹; Bishoy A. Gayed¹; Ahmed Q. Haddad¹; Ramy F. Youssef¹; Payal Kapur¹; Arthur I. Sagalowsky¹; Yair Lotan¹; and Vitaly Margulis¹

¹UT Southwestern Medical Center, Dallas, TX; ²UT Southwestern Medical Center, Dallas, TX and University of Muenster Medical Center, Muenster, Germany

(Presented By: Paul H. Chung)

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**Poster #156**

**TUMOR COMPLEXITY BY R.E.N.A.L NEPHROMETRY SCORE PREDICTS MALIGNANT DISEASE AND HIGH GRADE PATHOLOGY FOR SMALL RENAL MASSES 3 CM OR LESS IN SIZE**

Andres Correa¹; Amir Toussi²; Bishoy Gayed¹; Milon Amin³; Ronald L. Hrebinko¹; Anil Parwani¹; and Jodi Maranchie¹

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(Presented By: Andres Correa)

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**Poster #157**

**SNP MICROARRAY GENOMIC ANALYSIS DETECTS CHROMOSOMAL ABERRATIONS ASSOCIATED WITH AN UNFAVORABLE PROGNOSIS IN CLEAR CELL RENAL CELL CARCINOMA**

James Rosoff¹; Austin Younger²; Austin DeRosa³; Olivia MaDan³; Stephen Savage³; and Daynna Wolff³

¹Yale School of Medicine, New Haven, CT; ²Medical University of South Carolina, Charleston, SC

(Presented By: James Rosoff)
Poster Session II – Summary

Poster #158
PATIENT IDENTIFICATION AND ELIGIBILITY CHALLENGES IN THE SYNCHRONOUS MRCC POPULATION: AN UPDATE FROM THE ONGOING ADAPT PHASE 3 STUDY EXPERIENCE
Brian Lane¹; Robert Figlin²; Chris Wood³; and Robert Uzzo⁴
¹Spectrum Health, Grand Rapids, MI; ²Department of Medicine, Samuel Oschin Comprehensive Cancer Institute, Cedars-Sinai Medical Center, Los Angeles, CA; ³Department of Urology, University of Texas MD Anderson Cancer Center, Houston, TX; ⁴Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Brian Lane)

Poster #159
TUMOR NECROSIS AND LYMPHOVASCULAR INVASION ARE PREDICTORS OF LYMPH NODE METASTASIS IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA
Gautum Agarwal; Patrick Espiritu; Adam Luchey; Julio Powsang; Wade Sexton; Michael Poch; Jasreman Dhillon; and Philippe Spiess
Moffitt Cancer Center, Tampa, FL
(Presented By: Gautum Agarwal)

Poster #160
TRENDS IN THE UTILIZATION OF DIAGNOSTICS FOR UPPER TRACT UROTHELIAL CARCINOMA
Goutham Vemana¹; Sam Bhayani¹; Jack Baty²; Joel Vetter¹; and Seth Strope³
¹Washington University in St. Louis College of Medicine, Division of Urologic Surgery, St. Louis, MO; ²Washington University in St. Louis College of Medicine, Division of Biostatistics, St. Louis, MO
(Presented By: Goutham Vemana)

Poster #161
PENILE CANCER MANAGEMENT TRENDS IN THE U.S. 2000-2010
Elizabeth Ferry; and Hui Zhu
Case Western Reserve University/University Hospitals, Cleveland OH
(Presented By: Elizabeth Ferry)

Poster #162
SURGICAL EXCISION OF INTRAMURAL URETER AND A BLADDER CUFF DURING NEPHROURETERECTOMY IS AN INDEPENDENT PREDICTOR OF ONCOLOGICAL OUTCOMES IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA
Laura-Maria Krabbe¹; Mary E. Westerman³; Aditya Bagrodia⁵; Bishoy A. Gayed⁶; Dina Khali²; Payal Kapur³; Shahrokh F. Shariat⁷; Ganesh V. Raj⁵; Arthur I. Sagalowsky⁸; Jeffrey A. Cadeddu⁹; Yair Lotan³; and Vitaly Margulis³
¹UTSW Medical Center Dallas and University of Muenster Medical Center, Muenster, Germany; ³UTSW Medical Center, Dallas, TX; ⁹Medical University of Vienna, Vienna, Austria
(Presented By: Laura-Maria Krabbe)

Poster #163
READABILITY OF ONLINE UROLOGIC ONCOLOGY PATIENT EDUCATION MATERIALS
Amanda Pruthi; Josip Vukina; Abram McBride; Max McKibben; Mathew Raynor; Michael Woods; Matthew Nielsen; Eric Wallen; and Angela Smith
Chapel Hill, NC
(Presented By: Josip Vukina)

Poster #164
LESION-BASED COMPARISON OF THREE MULTI-PARAMETRIC MRI SCORING SYSTEMS FOR THE DETECTION OF PROSTATE CANCER ON MR/TRUS FUSION BIOPSY
Nikhil Waingankar¹; Simpa Salami¹; Mathew Fakhoury¹; Arvin George²; Oksana Yaskiv¹; Baris Turkbey²; Eran Ben-Levi¹; Robert Villani¹; Karin Beecher¹; Robert Moynan¹; Nancy Lee¹; Louis Kavoussi¹; David Siegel¹; and Ardeshr Rastinehad¹
¹Hofstra North Shore LI School of Medicine, New Hyde Park, NY; ²Urologic Oncology Branch and Molecular Imaging Program, National Institutes of Health / National Cancer Institute, Bethesda, MD
(Presented By: Nikhil Waingankar)
Poster #165
COMPARISON OF TOXICITY BETWEEN SINGLE MODALITY RADIATION THERAPY AND COMBINED MODALITY RADIATION THERAPY AMONG LOW RISK PROSTATE CANCER PATIENTS
Jeffrey Tomaszewski; Renjian Jiang¹; Kevin Ward¹; and Daniel Canter²
¹Emory University, Atlanta, GA; ²Albert Einstein Medical Center, Philadelphia, PA
(Presented By: Jeffrey Tomaszewski)

Poster #166
COMPARISON OF MRI/US FUSION PROSTATE BIOPSIES OBTAINED FROM AXIAL AND SAGITTAL APPROACHES
Cheng Hong¹; Sheng Xu¹; Baris Turkbey²; Annerleim Walton-Diaz²; Nabeel Shakir³; Daniel Su³; Peter Choyke²; Peter Pinto³; and Bradford Wood¹
¹Center for Interventional Oncology, Clinical Center, National Institutes of Health, Bethesda, MD; ²Molecular Imaging Program, National Cancer Institute, National Institutes of Health, Bethesda, MD; ³Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Cheng Hong)

Poster #167
EXPRESSION OF ERG ONCOPROTEIN AND SPINK1 IN HIGHER GRADE PROSTATE CANCER IN CAUCASIAN AMERICAN AND AFRICAN AMERICAN MEN
James Farrell¹;²; Denise Young¹; Youngmei Chen¹; Michael Degon¹;²; Jennifer Cullen¹; Gyorgy Petrovics¹; Inger Rosner¹;²; David McLeod¹;²; Isabella Sesterhenn²; and Shiv Srivastava¹
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(Presented By: James Farrell)

Poster #168
IS CLINICAL STAGE T2C PROSTATE CANCER INTERMEDIATE- OR HIGH-RISK DISEASE?
Zachary Klaassen¹; Abhay A. Singh²; Lauren Howard²; Martha K. Terris¹; William J. Aronson³; Matthew R. Cooperberg⁴; Christopher L. Amling⁵; Christopher J. Kane⁶; Lionel L. Banez⁷; and Stephen J. Freedland⁷
¹Medical College of Georgia - Georgia Regents University, Augusta, GA; ²Duke University Medical Center, Durham, NC; ³University of California, Los Angeles School of Medicine, Los Angeles, CA; ⁴University of California, San Francisco, San Francisco, CA; ⁵Oregon Health & Sciences University, Portland, OR; ⁶University of California, San Diego, San Diego, CA; ⁷Durham Veterans Affairs Medical Center, Durham, NC
(Presented By: Zachary Klaassen)

Poster #169
FDG-PET/CT IS AN INTEGRATIVE PROGNOSTIC AND STAGING IMAGING TECHNIQUE TO EVALUATE BIOLOGICAL HIGH RISK PROSTATE CANCERS BEFORE LOCAL THERAPIES
Frederic Pouliot; Jean-Mathieu Beauregard; Annie-Claude Blouin; Vincent Fradet; Yves Fradet; Louis Lacombe; Claude Lemay; Rabi Tiguent; and Thierry Dujardin
Laval University, Quebec, Canada
(Presented By: Frederic Pouliot)

Poster #170
ADOPTION OF ROBOT-ASSISTED SURGERY AND ITS IMPACT ON TREATMENT PATTERNS FOR NEWLY DIAGNOSED LOCALIZED PROSTATE CANCER
Scott Eggener¹; Jim Hu²; Chan Shen²; and Tina Shih¹
¹University of Chicago, Chicago, IL; ²University of California, Los Angeles, CA; ³MD Anderson Cancer Center, Houston, TX
(Presented By: Scott Eggener)
Poster #171
A PHASE I STUDY OF TC-99M-MIP-1404 SPECT/CT TO IDENTIFY AND LOCALIZE HIGH-GRADE CANCER IN THE PROSTATE GLAND
Kevin Slawin¹; Gustavo Ayala²; Sontoshi Patro³; John Babich⁴; Tom Armor⁴; Nancy Stambler⁴; and Robert Israel⁴
¹Vanguard Urology, Houston, TX; ²University of Texas Medical School, Houston, TX; ³Vanguard Urologic Institute, Houston, TX; ⁴Progenics Pharmaceuticals, Inc. Tarrytown, NY
(Presented By: Kevin Slawin)

Poster #172
ASSESSING THE IMPACT OF A GENOMIC CLASSIFIER ON POSTOPERATIVE PHYSICIAN DECISION-MAKING FOR PROSTATE CANCER PATIENTS IN CONTEMPORARY CLINICAL MANAGEMENT
Ketan K. Badani¹; Darby J.S. Thompson²; Christine Buerki³; and Amar Singh⁴
¹Columbia University Medical Center, New York, NY; ²EMMES Canada, Burnaby, BC, Canada; ³GenomeDx Biosciences Inc., Vancouver, BC, Canada; ⁴Erlanger Medical Center, Chattanooga, TN
(Presented By: Ketan K. Badani)

Poster #173
PERFORMANCE OF MAGNETIC RESONANCE IMAGING/ULTRASOUND (MR/TRUS) FUSION-GUIDED PROSTATE BIOPSIES IN PATIENTS WITH A PREVIOUS NEGATIVE PROSTATE BIOPSY
Simpa Salami¹; Nikhil Waingankar¹; Arvin George²; Oksana Yaskiv¹; Baris Turkbey³; Eran Ben-Levi¹; Robert Villani¹; Mathew Fakhoury¹; Karin Beecher¹; Robert Moynan¹; Louis Kavoussi¹; David Siegel¹; and Ardeshir Rastinehad¹
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(Presented By: Simpa Salami)

Poster #174
PREDICTING PROGRESSION IN PATIENTS FOLLOWED WITH ACTIVE SURVEILLANCE FOR LOW-RISK PROSTATE CANCER
Itay Sternberg¹; Changhong Yu²; Gal Keren Paz¹; Philip Kim¹; Melanie Bernstein¹; Paul Lakin²; Michael Kattan²; Behfar Ehdaie¹; Vincent Laudone¹; Peter Scardino¹; James Eastham¹; and Karim Touijer¹
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(Presented By: Itay Sternberg)

Poster #175
MORTALITY BENEFIT OF SCREENING MEN WITH A FAMILY HISTORY OF PROSTATE CANCER AS A SURROGATE FOR HIGH GENETIC RISK IN THE PLCO TRIAL
Michael A. Liss¹; Sij Hemal²; Spencer Krane³; and A. Karim Kader⁴
¹UC San Diego, La Jolla, CA; ²Wake Forest University, Winston-Salem, NC
(Presented By: Michael A. Liss)

Poster #176
PELVIC EXENTERATION IN PATIENTS WITH NON-METASTATIC, LOCALLY ADVANCED CASTRATION-RESISTANT PROSTATE CANCER
Timothy F. Donahue; Michael J. Morris; William M. Hilton; Howard I. Scher; and Bernard H. Bochner
Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Timothy F. Donahue)

Poster #177
SHORT TERM ONCOLOGIC OUTCOMES WITH IRREVERSIBLE ELECTROPORATION ABLATION OF PROSTATE CANCER
Joseph Mashni¹; Dawud Lankford²; Steven Poon¹; Brandon Menachem¹; and Jonathan Coleman¹
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(Presented By: Dawud Lankford)
Poster #179
THE PREDICTIVE ROLE OF TERTIARY GLEASON GRADE 5 PATTERN IN MEN WITH GLEASON SCORE 7 AND GLEASON SCORE 8-10 AFTER RADICAL PROSTATECTOMY
Peter Hinds; Benjamin Davies; Elen Woldemichael; and Joel Nelson
UPMC (University of Pittsburgh Medical Center), Pittsburgh, PA
(Presented By: Peter Hinds)

Poster #180
VALIDATION OF DIFFERENTIAL EXPRESSION OF MICRORNA PROFILES IN PROSTATE CANCER SPECIMENS
Nikhil Waingankar¹; Nicholas Broccoli²; Soroush Rais-Bahrami³; Kevin Smith²; Michaela Oswald³; Houman Khalili²; Annette Lee³; Theresa Chan⁴; Oksana Yaskiv⁵; Peter Gregersen²; and Manish Vira²
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(Presented By: Nikhil Waingankar)

Poster #181
UTILIZATION OF PSA TESTING AND PROSTATE BIOPSY OUTSIDE OF AUA RECOMMENDED AGE GROUPS
Rajiv Jayadevan; Kristian Stensland; Michael Leapman; Gregory Baldwin; Martin Casey; Simon Hall; and Michael Palese
Icahn School of Medicine at Mount Sinai, New York, NY
(Presented By: Rajiv Jayadevan)

Poster #182
PROSTARIX: METABOLOMICS FOR PROSTATE BIOPSY RISK STRATIFICATION
Jonathan McDunn¹; Lisa Ford¹; Qibo Zhang¹; Kelli Goodman¹; Zhen Li¹; Susan Orton¹; Mark Jalkut²; and Robert Wolfert¹
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(Presented By: Jonathan McDunn)

Poster #183
OBESITY IS A RISK FACTOR FOR PROGRESSION FOR MEN ON ACTIVE SURVEILLANCE FOR LOW RISK PROSTATE CANCER
Bimal Bhindi¹; Girish Kulkarni¹; Robert Hamilton¹; Ants Toi²; Theodorus van der Kwast³; Andrew Evans³; Karen Hersey¹; Michael Jewett¹; Alexandre Zlotta¹; John Trachtenberg¹; Antonio Finelli¹; and Neil Fleshner¹
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(Presented By: Bimal Bhindi)

Poster #184
INFECTION-RELATED HOSPITALIZATIONS AFTER PROSTATE BIOPSY IN A STATE-WIDE QUALITY IMPROVEMENT COLLABORATIVE
Paul R. Womble¹; Maxwell W. Dixon¹; Susan Linsell¹; Zaojun Ye¹; James E. Montie¹; Brian R. Lane²; David C. Miller¹; and Frank N. Burks³
¹University of Michigan, Ann Arbor, MI; ²Spectrum Health Medical Group, Grand Rapids, MI; ³Oakland University William Beaumont School of Medicine, Royal Oak, MI
(Presented By: Paul R. Womble)

Poster #185
OVERALL SURVIVAL: A POOLED ANALYSIS OF FIVE RANDOMIZED TRIALS OF THE GONADOTROPHIN-RELEASING HORMONE ANTAGONIST DEGARELIX VS. LUTEINIZING HORMONE-RELEASING HORMONE (LHRH) AGONISTS
Neal Shore; Laurence Klotz¹; Kurt Miller²; E. David Crawford³; Bertrand Tombal¹; Cathrina Karup⁴; Anders Malmberg⁵; and Bo-Eric Persson⁶
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(Presented By: Neal Shore)
Poster Session II – Summary

Poster #186
SERIAL MULTIPARAMETRIC PROSTATE MRI AND MRI/ULTRASOUND FUSION BIOPSY AS A TOOL TO FOLLOW PROSTATE CANCER PROGRESSION FOR MEN ON ACTIVE SURVEILLANCE
Nabeel Shakir¹; Annerleim Walton-Diaz¹; Soroush Rais-Bahrami¹; Baris Turkbey²; Jason Rothwax³; Cheng William Hong³; Lambros Stamatakis¹; Arvin George¹; Chinonyerem Okoro¹; Dima Raskolnikov¹; M. Minhaj Siddiqui¹; Daniel Su¹; Richard Simon⁴; Bradford Wood⁵; Peter Choyke⁶; and Peter Pinto⁷
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(Presented By: Nabeel Shakir)

Poster #187
MAGNETIC RESONANCE IMAGING/ULTRASOUND-FUSION BIOPSY BETTER PREDICTS WHOLE GLAND PATHOLOGY COMPARED TO SYSTEMIC 12-CORE TRANSRECTAL ULTRASOUND BIOPSY
Daniel Su¹; Arvin George¹; M. Minhaj Siddiqui¹; Soroush Rais-Bahrami¹; Lambros Stamatakis¹; Cheng William Hong³; Jason T. Rothwax³; Chinonyerem Okoro¹; Dima Raskolnikov¹; Nabeel Shakir¹; Annerleim Walton-Diaz¹; Richard M. Simon³; Baris Turkbey⁴; Bradford J. Wood⁵; Peter L. Choyke⁶; and Peter A. Pinto⁷
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(Presented By: Daniel Su)

Poster #188
INTERMITTENT ANDROGEN DEPRIVATION WITH THE GONADOTROPHIN-RELEASING HORMONE (GNRH) ANTAGONIST DEGARELIX: RESULTS OF STUDY CS37
E. David Crawford¹; Neal Shore²; Celestia Higano³; Anders Neijber⁴; and Vladimir Yankov⁵
¹University of Colorado, Aurora, CO, USA; ²Carolina Urologic Research Center, Myrtle Beach, SC, USA; ³Seattle Cancer Care Alliance, Seattle, WA, USA; ⁴Ferring Pharmaceuticals, Copenhagen, Denmark; ⁵Ferring Pharmaceuticals, Parsippany-Troy Hills, NJ, USA
(Presented By: E. David Crawford)

Poster #189
PROLARIS CCP SCORE STRATIFIES RISK FOR PROSTATE CANCER PATIENTS AT BIOPSY: INITIAL COMMERCIAL RESULTS
E. David Crawford¹; Neal Shore²; Peter Scardino³; John W. Davis⁴; Jonathan Tward⁵; Lowndes Harrison⁶; Kelsey Moyes⁷; Lisa Fitzgerald⁸; Steve Stone⁹; and Michael Brawer⁷
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(Presented By: E. David Crawford)

Poster #190
CLINICAL UTILITY OF CELL CYCLE PROGRESSION GENES (CCP) IN FACILITATING PROSTATE CANCER TREATMENT DECISIONS
Neal Shore¹; Raoul Concepcion²; Daniel Saltzstein³; M. Scott Lucia⁴; Arletta van Breda⁵; William Welbourn⁶; and Michael Brawer⁷
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(Presented By: Neal Shore)
Poster #191
THE DECIPHER PROSTATE CANCER CLASSIFIER PREDICTS BIOCHEMICAL FAILURE IN PATIENTS FOLLOWING POST OPERATIVE RADIATION THERAPY
Robert Den¹; Felix Feng²; Timothy Showalter³; Mark Mishra⁴; Edouard Trabulsi¹; Costas Lallas¹; Leonard Gomella¹; Ruth Birbe¹; Peter McCue¹; Mercedes Gadesiš; Karen Knudsen¹; and Adam Dicker¹
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(Presented By: Robert Den)

Poster #192
TARGETED MAGNETIC RESONANCE IMAGING/ULTRASOUND FUSION BIOPSY SIGNIFICANTLY OUTPERFORMS RANDOM 12-CORE BIOPSY FOR PREDICTION OF TOTAL PROSTATE CANCER TUMOR VOLUME
Chinonyerem Okoro¹; Soroush Rais-Bahrami¹; Arvin George¹; Annerleim Walton-Diaz¹; M. Minhaj Siddiqui¹; Nabeel A. Shakir¹; Jason T. Rothwax¹; Dima Raskolnikov¹; Lambros Stamatakis¹; Daniel Su¹; Baris Turkbey²; Peter L. Choyke²; Bradford J. Wood³; Maria Merino⁴; and Peter A. Pinto¹
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(Presented By: Chinonyerem Okoro)

Poster #193
INDEPENDENT VALIDATION OF A GENOMIC CLASSIFIER IN AN AT RISK POPULATION OF MEN CONSERVATIVELY MANAGED AFTER RADICAL PROSTATECTOMY
Cristina Magi-Galluzzi¹; Jianbo Li²; Andrew Stephenson³; Kasra Yousefi⁴; Michael Kattan²; and Eric Klein³
¹Anatomic Pathology, Cleveland Clinic, OH; ²Quantitative Health Sciences, Cleveland Clinic, OH; ³Glickman Urological And Kidney Institute, Cleveland Clinic, Cleveland, OH; ⁴GenomeDx Biosciences, Vancouver, BC
(Presented By: Eric Klein)

Poster #194
AFRICAN AMERICAN MEN WITH VERY LOW-RISK PROSTATE CANCER: DO NOT EXHIBIT ADVERSE ONCOLOGIC OUTCOMES
Cesar E. Ercole; Maria Carmen Mir; Eric A. Klein; and Andrew J. Stephenson
Cleveland Clinic, Cleveland, OH
(Presented By: Cesar E. Ercole)

Poster #195
A PHASE II, RANDOMIZED, DOUBLE-BLIND, PLACEBO CONTROLLED TRIAL OF METHYLPHENIDATE FOR REDUCTION OF FATIGUE IN PROSTATE CANCER PATIENTS RECEIVING LHRH-AGONIST THERAPY
Patrick Richard; Shabbir Alibhai; Antonio Finelli; Micheal Jewett; Alexandre Zlotta; Girish Kulkarni; Jaimin Bhatt; and Neil Fleshner
University of Toronto, Toronto, Canada
(Presented By: Patrick Richard)

Poster #197
OUTCOMES OF SALVAGE PROSTATE CRYOABLATION AFTER PRIMARY EXTERNAL BEAM RADIATION OR BRACHYTHERAPY: IS THERE A DIFFERENCE?
Matthew Ingham¹; Erik Grossgold¹; Robert Given¹; and Stephen Jones²
¹Eastern Virginia Medical School, Norfolk, VA; ²Cleveland Clinic Foundation, Cleveland, OH
(Presented By: Matthew Ingham)

Poster #198
OUTCOMES AFTER POST – OPERATIVE RADIATION THERAPY
Hao Nguyen; Clint Cary K.; Appa Ayesha A.; Cowan Janet E.; Welty Christopher; Roach III Mack; Shinohara Katsumi; and Carroll Peter R.
UCSF Medical Center, San Francisco, CA
(Presented By: Hao Nguyen)
**Poster #199**
**FACTORS ASSOCIATED WITH BIOPSY PROGRESSION ON ACTIVE SURVEILLANCE**
Christopher Welty; Janet Cowan; Hao Nguyen; Shinohara Katsuto; Nannette Perez; Kirsten Greene; Maxwell Meng; Matthew Cooperberg; and Peter Carroll
UCSF, San Francisco, CA
(Presented By: Christopher Welty)

**Poster #200**
**EVOLVING MANAGEMENT PARADIGMS FOR STAGE 1 TESTICULAR CANCER: THE IMPACT OF CLINICAL TRIAL EVIDENCE ON INSTITUTIONAL PRACTICE PATTERNS**
Gautum Agarwal; Oscar Valderrama; Sabine Nguyen; Adam Luchey; Julio Pow-Sang; Philippe Spiess; Michael Poch; and Wade Sexton
Moffitt Cancer Center, Tampa, FL
(Presented By: Gautum Agarwal)

**Poster #201**
**DO SEMINOMA GERM CELL ELEMENTS AFFECT PERIOPERATIVE OUTCOMES FOLLOWING POST-CHEMOTHERAPY RETROPERITONEAL LYMPH NODE DISSECTION FOR METASTATIC TESTIS CANCER?**
Gautum Agarwal¹; David Buethe¹; Christopher Russell²; Patrick Espiritu¹; Adam Luchey¹; Philippe Spiess¹; Julio Pow-Sang¹; Michael Poch¹; and Wade Sexton¹
¹Moffitt Cancer Center, Tampa, FL; ²University of South Florida, Tampa, FL
(Presented By: Gautum Agarwal)

**Poster #202**
**THE INFLUENCE OF ACCESS TO CARE ON ADHERENCE TO CLINICAL PRACTICE GUIDELINES FOR TESTIS CANCER**
Zachary Reardon¹; Harras Zaid¹; CJ Stimson¹; Sanjay Patel²; Samuel Kaffenberger¹; Daniel Barocas¹; Matthew Resnick¹; and Sam Chang¹
¹Vanderbilt University Medical Center, Department of Urology, Nashville, TN; ²University of Chicago Medical Center, Section of Urology, Chicago, IL
(Presented By: Zachary Reardon)
Poster #26
PREDICTIVE AND PROGNOSTIC SIGNIFICANCE OF EARLY POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY IN ADVANCED TRANSITIONAL CELL CARCINOMA
Patrizia Giannatempo¹; Alessandra Alessi¹; Rosalba Miceli¹; Daniele Raggi¹; Elena Farè¹; Nicola Nicolai¹; Gianluca Serafini¹; Barbara Padovano¹; Luigi Piva¹; Davide Biasoni¹; Tullio Torelli¹; Mario Catanzaro¹; Silvia Stagni¹; Massimo Maffezzini¹; Luigi Mariani¹; Alessandro Gianni¹; Guru Sonpavde²; Roberto Salvioni¹; Flavio Crippa¹; and Andrea Necchi¹
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(Presented By: Patrizia Giannatempo)

Introduction: [18F]fluorodeoxyglucose positron emission tomography/computed tomography (FDG−PET/CT) is increasingly used by many centers for (re)staging metastatic transitional cell carcinoma (TCC). A risk−adapted treatment for TCC may guide new trial designs for early−recognized unresponsive patients. We aimed to prospectively identify early PET/CT as a predictor of response and outcome.

Methods: Patients with newly−diagnosed advanced/metastatic TCC receiving first−line chemotherapy underwent CT and FDG−PET/CT at baseline, a restaging with FDG−PET/CT after 2 cycles only, and a CT (± FDG−PET/CT) at the end of treatment and during follow up. The end−points were PET metabolic response, RECIST response, progression−free (PFS) and overall survival (OS). PFS and OS rates were estimated with the Kaplan−Meier method; univariable (UVA) and multivariable (MVA) Cox models were fitted. Pre−specified variables were presence of visceral metastases, nodal or soft tissue disease, and early PET/CT response.

Results: In the time−frame 05/2010−10/2012, 31 patients with ECOG−PS 0 received a modified MVAC regimen according to Institutional protocol, every 3 weeks. After 2 cycles of MVAC, 6 patients (19.3%) had a complete (CR) and 17 (54.8%) a partial metabolic response (PR) (74% total responders; 95% CI, 55.4−88.1%), 4 had stable disease (SD), 4 progressed. Metabolic response (CR + PR) was associated with final CT response (p=0.007 at Fisher exact test). Metabolic CR was followed by a RECIST CR in all but one cases and metabolic progression at PET2 corresponded to a RECIST PD in all four patients and they all switched to second line chemotherapy. Median follow up was 18 months (IQR: 10−47). Those with metabolic response had a median (95% CI) PFS of 8 (7−11) months compared to 3 (2−5) months of patients without response (p=0.024). Early PET responders had a significant benefit in 6−month PFS (p<0.001) and 15−month OS (p=0.016 at Klein test). A significant association was observed between early PET response and longer PFS in both UVA and MVA (p=0.027 and p=0.023, respectively). Results are limited by small numbers.

Conclusion: PET response after 2 cycles of first−line cisplatin−based chemotherapy in advanced TCC might confer an independent prognostic impact on PFS and OS. Results warrant a validation series, a comparison with the impact of early RECIST response as well as a detailed cost−efficacy analysis prior to devise a new strategy of first−line treatment.
Poster #102
A PANEL OF TISSUE BIOMARKERS TO ENHANCE PROGNOSTIC STRATIFICATION IN LOCALLY-ADVANCED AND METASTATIC UROTHELIAL CANCERS (UC) UNDERGOING PERI-OPERATIVE AND FIRST-LINE PLATINUM-BASED CHEMOTHERAPY
Patrizia Giannatempo; Biagio Paolini; Luigi Mariani; Elena Farè; Nicola Nicolai; Luigi Piva; Mario Catanzaro; Davide Biasoni; Tullio Torelli; Silvia Stagni; Massimo Maffezzini; Alessandro Gianni; Roberto Salvioni; Maurizio Colecchia; and Andrea Necchi
Fondazione IRCCS Istituto Nazionale dei Tumori, Milan
(Presented By: Patrizia Giannatempo)

Introduction: Information on the prognostic role of druggable pathways for selection and treatment of patients (pts) is needed. A systematic evaluation of biomarker expression has been commenced at our tertiary cancer center and here we report on the early results.

Methods: Samples from primary tumor and/or metastases were evaluated for expression of a panel of biomarkers (BMKs) by immunohistochemistry (IHC) including: ERCC1, EGFR, HER2/neu, VEGFR, PDGFR, p53, p63, cKIT, PTEN. Two cohorts were selected: pts with locally advanced (T2-4N+M0) UC receiving peri-operative cisplatin-based chemotherapy (CT) (cohort 1) and metastatic pts receiving first-line platinum-based CT (cohort 2). IHC results were assessed according to standard protocols and dichotomized as positive (≥1+) or negative for all markers. Tumor was deparaffinized and specific antigen retrieval determined for individual antibodies. Fisher exact test was used to evaluate the association with response for pts with measurable disease. Cox regression model analyzed staining results with PFS and OS in uni/multivariable analysis (UVA/MVA), adjusted for prognostic variables (lymph-node status [cohort 1], Bajorin score [cohort 2]).

Results: From 03/2000 to 03/2013, 86 cases were retrieved (N=30 in cohort 1 and N=56 in cohort 2). Rates of staining positivity were: 37/63 (59%) ERCC1, 34/50 (68%) EGFR, 41/53 (77%) HER2/neu, 45/62 (72%) VEGFR, 11/56 (18%) PDGFR, 26/48 (54%) p53, 41/48 (85%) p63, 9/47 (19%) cKIT, and 11/38 (29%) PTEN. BMKs were uniformly distributed (p always >0.05) and no association between staining and response was found in assessable pts. Median follow-up was 29.5 mos (IQR: 12–51). There were no significances in outcomes in cohort 2, while in cohort 1 PDGFR (adjusted HR: 30.41, 95% CI, 2.8–>100) and p63 (adjusted HR: 0.12, 95% CI, 0.02–0.87) were associated with PFS while only p63 retained significance for OS in UVA (p=0.005, HR hardly estimable due to small numbers). BMKs were independent each other and of clinical variables.

Conclusions: A significant proportion of UC pts harbor potentially druggable targets although it is unclear if targeting them translates to improved outcomes. New signals were obtained in relation to prognosis of UC, partly discordant with available literature. A greater sample size and a validation cohort will be required to confirm the prognostic significance of PDGFR and p63 in patients undergoing peri-operative treatment.

Poster #103
TRENDS IN THE PERFORMANCE OF PARTIAL CYSTECTOMY IN THE UNITED STATES FROM 2001-2010
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(Presented By: Izak Faiena)

Introduction: Radical cystectomy is the standard surgical treatment for muscle-invasive bladder cancer. Though partial cystectomy should be reserved for limited indications, prior studies have reported that almost 20% of patients with invasive bladder cancers are treated with partial cystectomy, as opposed to radical cystectomy. We investigate contemporary trends in the use of radical cystectomy versus partial cystectomy in the United States (US) over a 10-year period.

Methods: Data for this analysis were captured from the Nationwide Inpatient Sample (NIS). Using ICD-9-CM procedure codes, we identified patients undergoing radical (75,698) and partial cystectomy (10,368) from 2001-2010. NIS parameters including patient age, geographic location, teaching versus non-teaching hospital, insurance status, and inpatient complications were compared. Chi-square analyses and Cochran-Armitage trend tests were employed.

Results: Radical cystectomy rates increased from 84.8% in 2001 to 90.3% in 2010, while partial cystectomy decreased from 15.2% to 9.7% (P<0.0001). Elderly patients were more likely to undergo partial cystectomy. For example, 9.2%, 11%, and 23% of patients aged 60-69, 70-79, and 80 or older, respectively, underwent a partial cystectomy. Regional variation in rates of partial cystectomy existed. The greatest rates of partial cystectomy utilization were found in the Northeast (12.8%) and South (12.8%) followed by the Midwest (11.5%) and West (11.0%). The frequency of partial cystectomy was higher in non-teaching hospitals versus teaching hospitals (18.9% vs 9.0%; P<0.0001) and in rural hospitals versus urban hospitals (20.2% vs 11.6%; P<0.0001). Finally, insurance status was not predictive of receipt of partial cystectomy. Overall postoperative complication rates were higher among patients treated with radical cystectomy compared to partial cystectomy (38.6% vs 21.3%; P<0.001).

Conclusions: Despite the potential advantages in cancer control offered by radical cystectomy, partial cystectomy is still being performed in 10–15% of patients with invasive bladder cancer. Elderly patients, those treated in non-teaching hospitals, and in certain geographic US regions were more likely to receive a partial cystectomy. The reasons for these disparities cannot be definitively ascertained using this dataset alone. More research is needed to identify the factors that may be impacting the quality of care received by invasive bladder cancer patients in the US.
IMPACT OF 2004 ISUP-WHO CLASSIFICATION ON BLADDER CANCER GRADING AND POTENTIAL IMPACT ON TREATMENT - A SINGLE INSTITUTION ANALYSIS

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(Presented By: Mark Soloway)

Introduction: Implementation of the 2004 WHO–ISUP system resulted in classification of bladder tumors (BTs) into two categories: low-grade (LG) and high-grade (HG). This classification eliminated the intermediate-grade (G2) category from the 1973 WHO system. Grading BT specimens is subjective and there are inter-observer differences. Few studies have evaluated whether the implementation of the 2004 WHO–ISUP classification, has resulted in a grade migration, with an increase in the percentage of BTs being categorized as HG. In this study, we reviewed histopathology information of tumor specimens from BCa patients treated at our institution between 2000 and 2012. Given that the guidelines for the treatment and follow up of LG BT patients differs from that of patients with HG any shift will have ramifications for the patients.

Methods: 6 pathologists reviewed 1097 BT cases from 686 patients from 2000 – 2012. The grade and stage was as follows: LG: 256; HG: 841; Ta: 387; T1: 247; CIS: 102; ≥ T2: 361. Logistic-regression univariate and multivariate analyses were performed to determine the correlation between the year of diagnosis and clinical and pathological parameters.

Results: Non-linear regression analysis showed that from 2005 – 2008, the % of LG tumors progressively decreased each year. Univariate analysis showed that age, gender, or detection of CIS, concomitant CIS, or muscle invasive tumors did not significantly alter over the study period. For the entire study period, there was a significant increase in the percent of Ta/T1 cases that were diagnosed as HG (P<0.0001). This change in grading was most apparent after 2007. The % of LG Ta/T1 decreased from 57.8±9.5 to 23.2±9.9; (P=0.0002) with a corresponding increase in %HG-Ta/T1 tumors (42.2±9.5 vs 76.8±9.9). The decrease in the detection of Ta/T1 tumors was clearly due to more Ta tumors being categorized as HG after 2008 (P=0.0006).

Conclusion: This single institution study over a 12-year period indicates that following the implementation of 2004 ISUP–WHO system, there is a significant increase in our pathologists grading Ta BTs as HG. If confirmed our findings indicate that the 2004 system has probably impacted the treatment of BT patients.

OUTCOME OF PATIENTS WITH CLINICALLY NODE-POSITIVE BLADDER CANCER WHO UNDERGO CONSOLIDATIVE SURGERY AFTER PRE-OPERATIVE CHEMOTHERAPY: MD ANDERSON CANCER CENTER EXPERIENCE

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(Presented By: Philip Ho)

Introduction and Objectives: We previously reported results of our phase II study in patients with retroperitoneal lymph node (RPLN) metastasis from bladder cancer (BC) undergoing consolidative surgery after pre-operative chemotherapy. Here we present an expanded cohort of patients who underwent consolidative surgery after chemotherapy for clinically node-positive BC.

Methods: We reviewed results of patients from our IRB approved protocol including those with clinical evidence of nodal metastasis in the pelvis or retroperitoneum (M1), without visceral metastasis, from 1995–2010. The endpoint of the study was cancer-specific survival (CSS) calculated from time of surgical consolidation.

Results: A total of 55 patients with either clinical pelvic lymph node (PLN) metastasis (n=29) or PLN and RPLN metastasis (n=26) were identified. Median CSS was 19 months for all patients; 21 for PLN alone and 16 for PLN and RPLN disease. Kaplan–Meier estimate of 5-year CSS was 31% for the entire group with no difference between PLN alone and PLN with RPLN disease. According to AJCC 2010 criteria, clinical nodal stage was N1: 16, N2: 5, N3: 8, and M1 (RPLN): 26. Majority (94%) of patients received cisplatinum-based chemotherapy. At cystectomy, all patients underwent a PLN dissection (PLND) with 12 patients (all clinical M1 RPLN) undergoing concurrent RPLN dissection (RPLND) to the renal hilum. In all, 30 of 55 (55%) patients were pN0 at the time of surgical extirpation while 26% (5 of 19) were pN+ despite radiologic complete response after chemotherapy. 5-year CSS was 57% for pN0 disease and 9% for pN+ disease (p<0.0001). Median survival in patients with residual tumor in PLN (n=17) was 10.5 months vs. 7 months for RPLN (n=8) (median survival not reached in pN0 patients, p<0.001). 17 patients who developed recurrences outside the surgical field did so after a median of 8 months. While no recurrences occurred within the lymphadenectomy template, 2 of 14 (14%) patients with clinical M1 RPLN disease who did not undergo RPLND had recurrences in RPLN basin; both died within 6 months despite salvage chemotherapy.

Conclusion: Post-chemotherapy consolidative surgical resection may result in 5-year disease-free survival in patients with clinical evidence of node-positive disease, including those with RPLN positive disease, who have major response to chemotherapy.
Introduction and Objectives: Surgical treatment of muscle-invasive bladder cancer is radical cystectomy with urinary reconstruction. Urinary diversion involves gastrointestinal tract which can result in long-term complications. An incontinent urinary diversion which regenerates non-absorptive mucosa from a product known as Neo-Urinary Conduit (NUC) has been developed. NUC is produced by seeding an autologous population of adipose (AD)-sourced smooth muscle cells (SMC) onto a biodegradable PLGA scaffold. We provide macroscopic and histological assessment of results from an animal model and from humans enrolled in a phase 1 clinical trial showing tissue regenerative outcomes.

Methods: SMC was isolated from fat, ex vivo expanded, and grown on a biodegradable PLGA scaffold. The porcine model involved ureteral implantation into a scaffold lined with AD-SMC. NUC wrapped with omentum or peritoneum provides blood supply for tissue regeneration. Same technique is performed in human patients after radical cystectomy. Analysis of regenerated tissue using histomorphology and immunohistochemical markers for urothelium (cytokeratin 7), epithelium, (cytokeratin) and smooth muscle (calponin 1) was performed.

Results: NUC implantation in pigs and humans resulted in regeneration of an incontinent urinary-tissue-lined diversion. Regenerated tissue demonstrated formation of urinary tissue containing all layers of genitourinary tract. Luminal surface was covered by urothelium (CK7+) and smooth muscle bundles (calponin +) were visualized and predominantly observed in the proximal and mid segments of NUC. At 7-weeks post implantation, human explant showed evidence of early stages of urinary tissue. Urothelium was observed throughout the NUC, followed by non-layered smooth muscle cells in the remaining body of the NUC. At 7-months post-implantation a mature organ composed of urinary tissue was obtained. Urothelium and tunica muscularis layer was fully developed and characterized by the presence of layered smooth muscle bundles surrounded by a fibrovascular stroma of the regenerated conduit’s wall.

Conclusion: The findings in human explants are consistent with the translational porcine model and support the use of AD-derived SMC seeded onto a scaffold to provide an innate regenerative response. Translation of technology from a porcine model is demonstrated through native-like tissue regeneration in humans enrolled in a Phase 1 first in human clinical trial.
Poster #107
THE USE OF INTRAVESICAL MITOMYCIN C FOLLOWING TRANSURETHRAL RESECTION OF BLADDER TUMORS IN THE UNITED STATES: A POPULATION-BASED ANALYSIS
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(Presented By: Nedim Ruhotina)

Introduction and Objectives: Multiple phase III trial have demonstrated that a single intravesical instillation of mitomycin C (MMC) within 24 hours after transurethral resection of non–muscle–invasive bladder tumor reduces the risk of locally recurrent disease. We analyzed a contemporary population–based cohort to determine the prevalence of this practice in the United States.

Methods: We analyzed patient–level data from a proprietary national inpatient discharge database, which collects data from over 400 non–federal hospitals throughout the United States. We captured all men who underwent a transurethral resection of bladder tumor (TURBT) or cystoscopy with bladder biopsy between January 1, 2003, and December 31, 2010. We identified the use of intravesical MMC within 24 hours of endoscopic therapy through a detailed review of the hospital charge data. The data were analyzed with descriptive statistics and logistic regression models.

Results: There were a total of 57,953 procedures included with a weighted sample size of 491,098 with 79.8% representing TURBTs and 20.2% cystoscopy with bladder biopsies. During the study period, there was a gradual overall increase in the use of MMC from 2% in 2003 to 3.9% in 2010. There was a significantly higher odds of MMC use for TURBT (odds ratio [OR] 2.12, p<0.001). Multivariate logistic regression revealed a lower likelihood of post–operative MMC use in urban hospitals (OR 0.7, p<0.001), non–teaching institution (OR 0.83, p<0.001), as well as hospitals in the Northeast (vs West, OR 0.69, p<0.001) and Midwest (vs West, OR 0.64, p<0.001). Hospital size (i.e., number of beds) did not influence the use of MMC. Patients <40–years of age had significantly lower odds (vs 60 to 70–years of age, OR 0.17, p<0.001) of receiving MMC.

Conclusions: Despite the abundance of data supporting the use of intravesical MMC within 24 hours after endoscopic management of bladder tumors, adoption of this practice in the United States is severely limited. Our findings are particularly concerning as the patients who would most likely benefit from MMC are the ones least likely to receive it: young patients with the most time for recurrence and those undergoing cystoscopy with bladder biopsy, which is common treatment for low volume, low grade bladder cancer. Barriers to more widespread use may include institutional restrictions, availability of mitomycin C, and physician biases.

Poster #108
INCREASING USE OF PERIOPERATIVE CHEMOTHERAPY IN PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR INVASIVE BLADDER CANCER
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(Presented By: Zachary Reardon)

Introduction and Objective: Variation exists in the use of perioperative chemotherapy (POC), defined as either neoadjuvant (NAC) or adjuvant chemotherapy (AC), for invasive bladder cancer (BC). Despite survival benefit demonstrated with use of NAC (Level 1) and AC (Level 2A), there has been slow adoption of guideline recommendations for use of POC over the last decade. We evaluated trends in overall POC utilization and variables that influence access to care in the use of POC among BC patients.

Methods: We analyzed patients diagnosed with ≥ cT2 bladder diagnosed between 2006– 2010, from the National Cancer Data Base registry. We included patients with histology–proven urothelial cell carcinoma, clinical stage ≥ cT2/cN0/cM0 who underwent radical cystectomy. Demographic covariates related to access to care were examined.
Results: A total of 5692 patients met our inclusion criteria, of which 2056/5692 (36.1%) received POC. POC use increased from 29.5% in 2006 to 39.8% in 2010. Overall, 962/5692 (16.9%) received NAC and 1094/5692 (19.2%) AC. NAC use increased from 10.1% in 2006 to 20.8% in 2010, while AC remained stable between 18.1−21.3% (Figure 1). Univariate analysis demonstrated significantly higher use of POC with later year of diagnosis, younger age, lower comorbidity index, being insured, shorter distance from the hospital, treatment at a comprehensive community cancer center, geographic location outside of the North East, and higher levels of income and education (p<0.05). On multivariate analysis, controlling for factors associated with use of POC, all variables except facility type, income, and education remained statistically significant (p<0.05).

Conclusion: The use of POC increased from 2006–2010, however this is due to increasing use of NAC, while AC use has remained stable. There appears to be significant variation in use of POC for ≥ cT2/cN0/cM0 based on access to care.

Poster #109
A RESTRICTIVE TRANSFUSION APPROACH IS SAFE IN OPEN RADICAL CYSTECTOMY
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(Presented By: Sumeet Syan)

Introduction and Objective: Data suggests that perioperative blood transfusion (PBT) at time of radical cystectomy (RC) is associated with poorer overall and oncologic outcomes. By refining our RC technique and employing a judicious approach to perioperative use of blood products we aimed to minimize PBT. Herein we compare perioperative outcomes of patients undergoing RC in a restrictive transfusion approach to those undergoing RC during an earlier period of liberal transfusion use at the same institution.

Methods: From April 2010 to December 2012, 104 consecutive RC were performed by a single surgeon using a restrictive transfusion approach (Era 2). A historical cohort of patients undergoing RC between 2003 and 2010 (Era 1) was matched for age, sex, co-morbidities, clinical stage and neoadjuvant chemotherapy status (n=87 in each arm). Retrospective review of perioperative data and 90 day complications using Clavien−Dindo classification was performed. Student t−test and linear regression modeling were used to compare outcomes.

Results: A tissue sealant device and hemostatic agents were used intra−operatively in all Era 2 patients. Median EBL was lower in Era 2 at 400 mL (range=150–1200) vs. 1000 mL (500−4300) (p<0.0001). Mean operative time was shorter in Era 2 at 319 min (183–509) vs. 355 min (193−682) in Era 1, p=0.001. Median preoperative, immediate post−operative and discharge hematocrits were higher in Era 1 at 38.5, 34.4 and 33.1 compared to 29.7, 28.7 and 28.1, respectively, in Era 2 (p<0.0001 for all). The rate of PBT was 92% in Era 1 compared to 31% in Era 2, with a mean of 4 units pRBC (0–24) transfused in Era 1 compared to 0.6 (0−21) units in Era 2 (p<0.0001). Ninety day complication rates were similar at 28.7% and 30.46% (p>0.05). There were no differences in the incidence of low or high grade complications between eras or in rates of cardiac complications which were rare at 5.2% and 5.8% (p>0.05 for all). Readmission rates were similar at 11.5% and 10.9% (p>0.05). Linear regression revealed predictors of PBT in Era 2 to be age (OR=1.09, 95% CI 1.02−1.12), female gender (OR=9.6, 95% CI 1.72−53.37), prior neoadjuvant chemotherapy (OR=4.4, 95% CI 3.03−6.20) and preoperative hematocrit (OR=0.86, 95% CI 0.74−0.92) (all p<0.05).

Conclusions: Reducing intraoperative blood loss coupled with a restrictive transfusion approach can safely minimize PBT in RC without increasing the rate of cardiovascular or total perioperative complications.
Poster #110
TREATMENT DELAY FOR MUSCLE INVASIVE BLADDER CANCER: IMPLICATIONS FOR REGIONALIZATION OF CARE
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(Presented By: Jeffrey Tomaszewski)

Introduction: Population based data suggest that mortality increases when radical cystectomy (RC) is delayed longer than three months. Hypothesizing that regionalization of care may delay timely treatment in patients with muscle invasive bladder cancer (MIBC), our objective was to identify the association between hospital type and treatment delay ≥3 months using a large national tumor registry.

Methods: Using the National Cancer Database, all patients with stage ≥II urothelial carcinoma treated with RC from 2003−2010 were identified. Hospitals were categorized by type and highest RC volume tertile into community, comprehensive low (CLV) or high volume (CHV), and academic low (ALV) or high volume (AHV) groups. Generalized estimating equations were used to test the association between hospital category and treatment delay (from diagnosis to RC or initiation of neoadjuvant chemotherapy), adjusting for year, demographic (gender, race, ethnicity, insurance, socioeconomic status, region, and urban rural status), clinical (age, comorbidity), and pathologic (grade, stage) characteristics.

Results: Of 22,251 patients identified, 14.2% of patients experienced a treatment delay of ≥3 months. Further, this proportion increased over the study period (13.5% [2003−2006] versus 14.8% [2007−2010], p=0.005). 17.8% of patients treated at AHV hospitals experienced a delay to definitive treatment compared to ALV (16.0%), CHV (11.6%), CLV (11.8%), and community (12.3%) hospitals respectively (p<0.001). Following adjustment, patients were more likely to experience a treatment delay when treated at AHV (OR 1.4 [CI 1.1−1.7]) and ALV (OR 1.2 [CI 1.03−1.5]) hospitals compared to community hospitals. Additional covariates associated with treatment delay included male gender (OR 1.1 [CI 1.07−1.17]), African American race (OR 1.5 [CI 1.3−1.7]), Hispanic ethnicity (OR 1.6 [CI 1.3−2.0]), insurance status (Medicaid OR 1.4 [CI 1.1−1.8], Medicare OR 1.3 [CI 1.09−1.54], no insurance OR 1.3 [CI 1.06−1.66]), and Charlson comorbidity count ≥2 (OR 1.3 [CI 1.08−1.45]).

Conclusions: Patients with MIBC were more likely to experience a treatment delay of ≥3 months if treated at AHV hospitals. Strategies to expedite timely treatment in patients at the time of referral to academic high volume centers may be a means to improve quality of care. Racial and insurance disparities in access to timely treatment are evident which are currently the focus of ongoing investigation.

Poster #111
DECREASING LENGTH OF HOSPITAL STAY FOLLOWING RADICAL CYSTECTOMY USING MULTIMODAL ENHANCED RECOVERY PROTOCOL
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(Presented By: Hooman Djaladat)

Objective: To evaluate a peri-operative protocol to expedite recovery of bowel function and decrease length of stay (LOS) without increasing readmission and complication rates after radical cystectomy and urinary diversion for bladder cancer.

Methods: From May 2012 to August 2013, a peri-operative protocol was applied to 126 unselected consecutive patients who underwent open radical cystectomy and urinary diversion for bladder cancer with meticulous prospective follow−up. The enhanced recovery after surgery (ERAS) protocol focuses on avoiding bowel preparation and NGT, early feeding, minimizing narcotics for pain, and the use of a μ-opioid antagonist. Patients with any adjunct surgery (10), previous diversion (2) or prolonged postoperative intubation (4) were excluded. Time to bowel movement (BM) and regular diet, LOS, and 30−day readmission and complication rates were captured. The outcomes of interest were compared to a historical cohort.
**Results:** A total of 110 (84 male) patients were included. Median age was 69 y/o (range, 31−90). 40 (36%) patients were ≥ 75 y/o and 75 (68%) patients underwent continent urinary diversion. 90 (82%) patients had BM and 87 (79%) were advanced to regular diet by postoperative day (POD) 2. Median LOS was 4 days and 63/110 (57%) discharged at or before POD 4. Only five patients had postoperative ileus that needed NGT placement. The most common 30−day complications were anemia requiring transfusion (19%), UTI (13%) and dehydration (9%), with the latter two also being the most common etiologies for readmission. Major complications (≥ Clavien grade III) were seen in 15 (13%) patients and were significantly higher in patients ≥75 y/o compared to their younger counterparts (22% vs. 8%; P=0.05). There was no difference in other measured outcomes with respect to age (≥75 vs. <75 y/o) and type of urinary diversion (continent vs. incontinent)

**Conclusion:** Our current ERAS protocol resulted in significant reduction in time to BM and LOS without increasing early readmission and complication rates.

### Poster #112

**WNT PATHWAY LIGANDS (6 & 10A) AND THEIR ASSOCIATED ENHANCER RNA ARE EXPRESSED IN LOW GRADE BUT NOT HIGH GRADE BLADDER CANCER PHENOTYPES - NEW INSIGHTS INTO BLADDER CANCER PROGRESSION?**

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**Introduction and Objectives:** A recent whole transcriptome next generation sequencing (WT−RNASeq) was performed on formalin fixed paraffin embedded bladder cancer (BC) specimens. This analysis revealed transcriptomical differences between BCs of low grade (LG) and high grade (HG). Gene members (WNT6 and WNT10A) of the wnt signalling pathway were significantly expressed more in LG tumours compared to HG samples. The Wnt pathway has many important and diverse physiological roles (polarity, migration, embryogenesis, cell proliferation, stem cells et al) Abnormal wnt signalling has been shown to induce cancer and have varied oncological functions, which appear to be tissue specific, but include epithelial to mesenchymal transition (EMT). Enhancer RNAs (eRNAs) have recently been discovered as methods of cell based transcriptional regulation. An eRNA associated with WNT6 & WNT10A was also found to be expressed with LG patient tumours offering a possible insight into the role of eRNAs in BC. Investigate the mechanisms and functional consequence of wnt6 and wnt10A using BC cell lines.

**Methods:** Commercially available human BC cell lines underwent immunofluorescence (IF) staining with epithelial and mesenchymal marker antibodies (vimentin, e−cadherin, Yap, phylloidin) to assess the morphology of these cell lines. Gene expression profiling of the BC cell lines was performed (miSEQ, illumina) to analyse expression patterns of wnt pathway genes. PCR primers were designed to quantify the expression of WNT6 & WNT10A enhancer RNAs (eRNAs). Transcriptional interference of the Wnt associated eRNA was carried out with siRNAs and small molecular inhibitors of ENCODE projected tested transcription factors known to bind the eRNA.

**Results:** IF staining revealed a spectrum of EMT amongst BC cell lines. RT112 was shown to be intermediate to the epithelial like HTB−2 and the mesenchymal appearance of T24. miSEQ analysis of the wnt pathway showed wnt6 and wnt10A expression in HTB2 and RT112 but not in T24. qPCR demonstrated high expression of WNT6 & WNT10A eRNA that could not be detected in T24 and control cell line (HEK293T).

**Conclusions:** Wnt ligands 6 & 10A are also significantly expressed in LG human bladder cancer cell lines but not in a HG cell line. This pattern (high expression in LG phenotype) was also seen in the related eRNA expression. Differential eRNA regulation by grade specific transcription factors may explain this finding and is the subject of continuing research.
Poster #113
RADICAL CYSTECTOMY OUTCOMES OF POTENTIAL CANDIDATES FOR BLADDER PRESERVATION THERAPY
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(Presented By: Eugene Pietzak)

Introduction: Interest in bladder preservation therapy (BPT) for advanced urothelial–type bladder cancer (UBC) is increasing as clinical trials report favorable outcomes. These outcomes are often compared to the current standard, radical cystectomy (RC). However, BPT patients represent a carefully selected group, which limits comparisons between BPT & RC. Our objective was to analyze the outcomes of RC in patients who met this strict criteria.

Methods: We identified 471 consecutive patients with UBC who underwent RC with curative intent from 1988 to 2008 at a single academic center. Patients considered eligible for BPT were clinical stage T2 without concomitant carcinoma in–situ (CIS), hydronephrosis, multiple invasive tumors, or mixed histology. Patients with one or more possible contraindications were considered ineligible. Renal function was not factored into eligibility criteria. Clinicopathologic characteristics and survival outcomes for BPT–eligible patients were compared to ineligible patients.

Results: 275 patients had cT2 tumors, of which 157 (57.1%) were ineligible for BPT (54 [19.6%] for CIS, 77 [28%] for hydronephrosis, 29 [10.6%] for multiple invasive tumors, 55 [20%] for mixed histology, and 51 [18.5%] had ≥2 contraindications). BPT–eligible & ineligible patients did not statistically differ with regards to age, gender, race, BMI, smoking status, American Society of Anesthesiologists (ASA) score, or neoadjuvant chemotherapy status. At time of RC, BPT–eligible patients were less likely to have positive lymph nodes (p=0.01), pathologic lymphovascular invasion (p=0.02), upstaging to pT3/pT4 disease (p=0.002), & bladder cancer–specific mortality (<0.001).

Median overall survival (OS) for all cT2 patients was 46.5 months. Median OS for the BPT–eligible group was 52.5 months compared to only 33.7 for those ineligible (HR=0.73; 95% CI 0.52–1.03 [p=0.07]). Two–year cancer specific survival (CSS) for all cT2, BPT–eligible, and BPT–ineligible patients was 71.8%, 85.4%, & 62.3%, respectively. Fine–Gray competing risk analysis revealed better CSS for BPT–eligible patients compared to those ineligible (Sub–HR=0.46; 95% CI 0.29–0.72 [p=0.001]).

Conclusion: RC provides excellent CSS for patients potentially eligible for BPT. In operative candidates, this should be included in an informed discussion of treatment options. In the absence of randomized trials, comparisons between RC & BPT must consider selection bias.
Introduction and Objectives: Urinary reconstruction is an often necessary sequela of surgical extirpation in urologic oncology. Currently, reconstruction relies on autologous non-urologic tissues. Engineering tissues that more closely replicate indigenous tissue for use in urinary tract reconstruction is an attractive proposition. We present our initial porcine experience using tubularized urinary bladder matrix (UBM) interposed between the ureter and bladder.

Methods: ECM preparation: Porcine urinary bladders were harvested and external connective tissues removed. The urothelial layer was denuded in 1N saline. The serosa, muscularis propria, and muscularis mucosae were mechanically delaminated. The remaining mucosa and lamina propria (UBM) were disinfected and washed. Multilayer tubes in lengths of 1, 2, 5, and 10cm were created by wrapping hydrated sheets of UBM in four revolutions around a 10mm tube. The construct was vacuum dried for 10−12h prior to sterilization. A pig was anesthetized and a midline laparotomy made. The right ureter was tied off and transected at the intramural tunnel. The proximal aspect of the ureter was spatulated and sutured to tubularized UBM in an end-to-end fashion. The distal tubularized UBM was reimplanted into the dome of the bladder. The abdominal incision was closed and the animal emerged from anesthesia. Animals were sacrificed at 4 weeks and the implanted tissue was removed for gross and histologic analysis.

Results: Four pigs were used in the study. Grossly, all had evidence of graft narrowing at the UBM–bladder interface with proximal hydroureteronephrosis. Microscopic analysis with hematoxylin and eosin staining demonstrated deposition of urothelium as well as neovascularization. Immunohistochemical results are currently pending.

Conclusions: There is evidence of tissue-specific remodeling in the interposition grafts of our tubularized urinary bladder matrix. All ureteral−UBM anastomoses remained patent at 4 weeks. Larger scale study is needed to elucidate the mechanism of distal stricture in these UBM grafts. Continued work in tissue engineering is necessary in order to provide higher quality care for patients who require urologic reconstruction.
THE PROGNOSTIC VALUE OF BLADDER CANCER STEM CELL MARKER IN NEOADJUVANT CHEMOTHERAPY FOR BLADDER CANCER

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(Presented By: Ross Krasnow)

Introduction and Objective: The survival benefit of neoadjuvant chemotherapy (NAC) in bladder cancer is limited to those who achieve downstaging ≤pT1. Recently, we have shown how Cytokeratin 14 (K14) can be utilized as a surrogate marker for bladder cancer stem cells (CSC). Expansion of cancer stem cells is correlated with poor prognosis and progression. Cytotoxic chemotherapy does not target cancer stem cells. However, the clinical impact of CSC on response to NAC is unknown. We investigated the relationship of the CSC marker K14 in tumor specimens on response to NAC, and the impact of CSCs on survival and downstaging.

Methods: 15 patients who underwent NAC with a cisplatin–based regimen for urothelial bladder carcinoma were identified. Pre-chemotherapy TURBT and post-chemotherapy cystectomy specimens were evaluated at the protein level by immunohistochemistry using formalin fixed paraffin–embedded specimens. Four patterns of K14 protein expression were identified: negative, basal–restricted, infiltrated low (<25%), and infiltrated high (>25%). A percentage of each pattern in relation to the total tumor volume was analyzed. Median (IQR) follow-up was 16.6 (12.6–26.4) months.

Results: 5 (33%) patients achieved downstaging ≤pT1, and 3 (20%) were pT0 at time of cystectomy. The 5 patients (30%) who died from disease had a large volume of the K14 high infiltrated pattern in their tumors (47.8%+/−35.1 vs 3.4%/±7.3,p=0.002). A K14 high infiltrated pattern in ≥10% of the tumor was associated with a worse recurrence free survival (p=0.037) and disease specific survival (p=0.019). Of the patients who were node positive at time of cystectomy (n=6,40%), progressed (n=6,40%), and/or died of disease (n=5,30%), 5 of 8 (62.5%) demonstrated expansion of the K14 compartment vs. 0% of the remaining 7 patients (p=0.01). None of the tumors with pathologic downstaging ≤ pT1 had K14 expansion.

Conclusion: In this initial data set, we found that an infiltrated pattern of K14 as a putative marker for CSC in urothelial bladder cancer is associated with poor clinical outcomes and lower response to neoadjuvant chemotherapy. The CSC compartment of some tumors may expand after administration of neoadjuvant chemotherapy.
Poster #116
LYMPH NODE STROMAL CELLS SUPPORT MUSCLE INVASIVE UROTHELIAL CELL CARCINOMA IMPLANTATION AND GROWTH IN ORTHOTOPIC XENOGRAFTS
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(Presented By: Jessie Gills)

Introduction: Half of patients with muscle invasive urothelial cancer (MIUC), despite attempted curative therapy for clinically localized disease, will develop metastases and die within 5 years. Lymph node (LN) involvement, the first site of metastatic urothelial cancer (UC), affects 25% of MIUC patients and predicts poor 5-year survival and chemotherapeutic drug resistance. LNs are composed of motile immune cells from lymphatic or systemic circulation and stromal cells building the backbone of the LN. LN stromal cells have been shown to enhance tumor cell growth, tumorigenicity, and chemotherapeutic drug resistance in breast and colon cancer models. We sought to establish an orthotopic human MIUC xenograft model to investigate LN stromal cell effects on MIUC growth and metastasis in vivo.

Methods: Luciferase-tagged human UC cell line UM–UC–3 cells were instilled intravesically in the presence or absence of a human LN stromal cell line, HK cells (3×10⁵). Tumor growth was monitored by bioluminescence imaging (BLI) system and recorded as BLI value (photons) weekly for up to 6 weeks. Tumors were excised and weighed. Hematoxylin and eosin (H&E) and immunohistochemical (IHC) staining were performed on frozen and paraffin-embedded tumor specimens.

Results: H&E and IHC staining results showed xenograft tumor resembles the original specimen in pathologic characterizations along with preservation of epithelial cell marker CD326. In comparison to without HK cells, the addition of HK cells significantly facilitate the UM–UC–3 cell tumor growth measured by BLI values (Fig. 1) and tumor weights (Table 1), especially at a lower concentration of UM–UC–3 cells (1×10³ cells, p-value <0.0001). The presence of HK cells also enhanced UC angiogenesis indicated by CD31+ mouse blood vessel formation.

Conclusion: We established a reproducible orthotopic human MIUC xenograft model that can monitor MIUC growth and metastasis without loss of tumor characteristics. Our data suggest that LN stromal cells enhance MIUC growth, angiogenesis, and metastasis. This model along with LN stromal cells will be used to study the mechanism of MIUC growth, metastasis, and to test new targeted therapies in co-clinical trials.

![Graph showing tumor growth with and without HK cells](image)

<table>
<thead>
<tr>
<th>HK Presence</th>
<th>Tumor Weight (g)</th>
<th>Mean BLI</th>
<th>p-value</th>
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<tbody>
<tr>
<td>With HK</td>
<td>0.001</td>
<td>1.06</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Without HK</td>
<td>0.000</td>
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Table 1: Comparison of tumor weights produced by varying concentrations of UM–UC–3 cells cocultivated with or without HK cells.
Poster #117
THE IMPACT OF CLINICALLY SIGNIFICANT ALTERATIONS OF PRIMARY PATHOLOGICAL REVIEW OF TRANSURETHRAL BLADDER RESECTION SPECIMENS UPON REPEAT REVIEW AT A TERTIARY CARE CENTER
LaMont Barlow; Edan Shapiro; Jennifer Ahn; and James McKiernan
Columbia University Medical Center, New York, NY
(Presented By: LaMont Barlow)

Introduction and Objective: Internal review of outside pathology slides is a common practice among urologic oncologists at tertiary care facilities, and discrepancies have a potential to directly affect the choice of subsequent treatment. While repeat prostate biopsy review has been extensively studied in recent years, there is little data available on the impact of repeat reviews of bladder biopsies. The purpose of the current study is to perform a standardized comparison of original and internal pathology reviews of identical bladder specimens to characterize the impact of repeat review on treatment decisions.

Methods: Using the Columbia Urologic Oncology Database, a retrospective analysis of 91 consecutive patients who underwent bladder biopsies or resections at outside institutions from 2008–2012 with secondary referral to a single urologist and internal review at our institution was conducted. Characteristics of both original pathology reports and internal reviews were collected and compared by blinded reviewers. A discrepancy in one of the following characteristics was considered treatment–altering: presence of muscularis in specimen or tumor involvement in muscularis. Additional clinically–significant discrepancies including presence of secondary histology, presence of carcinoma in situ, lymphovascular invasion, micropapillary features, change in tumor stage, and overall accumulative discrepancy rate were also analyzed.

Results: 64/91 (70%) patients had at least one of the predefined clinically–significant discrepancies. 27/91 (30%) patients had at least one treatment–altering discrepancy, including 25 with discrepant muscle in specimen and 11 with discrepant muscle invasion. A cost analysis demonstrated that repeat review of non−diagnostic specimens saves an average of $2,988 per specimen by preventing unnecessary repeat resections in nearly 30% of cases.

Conclusions: Repeat pathological review of primary bladder specimens at a tertiary care center has the potential to alter clinical care for the majority of patients. Further studies are needed to determine if these discrepancies and the decisions they influence have a significant impact on patient outcomes.

Poster #118
CLINICAL FEATURES OF LEIOMYOSARCOMA OF THE URINARY BLADDER: ANALYSIS OF 183 CASES
Dayron Rodríguez; Mark A. Preston; Glen W. Barrisford; and Adam S. Feldman
Massachusetts General Hospital – Department of Urology, Boston MA.
(Presented By: Dayron Rodríguez)

Introduction: Experience with management of urinary bladder leiomyosarcomas is rare. Therefore, in order to better elucidate the disease characteristics of urinary bladder leiomyosarcomas we utilized a large population–based cancer registry to examine the epidemiology, natural history, pathological characteristics, prognostic factors and treatment outcomes.

Methods: The Surveillance, Epidemiology, and End Results (SEER) database (1973–2010) was used to identify cases by tumor site and histology codes. The association between clinical and demographic characteristics and long−term survival was examined.

Results: A total of 183 histology confirmed cases were identified between 1973 and 2010. The annual age−adjusted incidence rate was 0.23 cases per 1,000,000, and did not significantly change over time. Median age of the patients was 65 years (range 7–94). Of the patients with a known tumor stage (N = 164), 50% had a regional or distant stage; 63.2% of patients with known histology grade (N = 106), had poorly or undifferentiated histology. The majority of patients (92.9%) received cancer directed surgery, with 34.4% having radical or partial cystectomy. Only 7.7% of patients received radiation therapy in combination with surgery. The median disease specific survival was 46 months. Five and ten−year cancer specific survival rates were 47%, and 35%. On multivariate analysis, a worst outcome was associated with increasing age, an undifferentiated tumor grade, distant stage, and failure to undergo cancer directed surgery.

Conclusion: This series represents the largest cohort of leiomyosarcoma of the urinary bladder studied to date. Leiomyosarcoma commonly presented as high grade and advanced stage. A worst outcome was associated with increasing age, an undifferentiated tumor grade, distant stage, and failure to undergo cancer directed surgery.
**Poster Session II – Full Abstracts**

**Poster #119**

**COMPLICATIONS OF RADICAL CYSTECTOMY IN THE NEOADJUVANT CHEMOTHERAPY ERA: THE MOFFITT CANCER CENTER EXPERIENCE**

Patrick N. Espiritu¹; Gautam Agarwal¹; Jorge L. Lockhart²; Julio M. Pow-Sang³; Philippe E. Spiess¹; Wade J. Sexton¹; and Michael A. Poch¹

¹H. Lee Moffitt Cancer Center, Tampa, FL; ²University of South Florida, Tampa, FL

(Presented By: Patrick N Espiritu)

**Introduction:** Radical cystectomy (RC) for urothelial carcinoma of the bladder is associated with significant perioperative morbidity. The purpose of this study was to describe early complication rates of RC in the neoadjuvant chemotherapy era.

**Methods:** Using an IRB approved database a retrospective review of patients who received neoadjuvant chemotherapy followed by RC between 2001–2013 was evaluated to determine incidence of early complications. Using Martin criteria all complications within 30 days of surgery were identified and graded by the Clavien–Dindo system. Chi-square and logistic regression analyses were performed to analyze relationships between preoperative covariates including age, gender, status, grade and stage of tumor, smoking status, Charlson Comorbidity Index (CCI), serum creatinine, BMI, American Society of Anesthesiologists (ASA) Score, previous surgery, prior pelvic radiation, chemotherapy regimen, preoperative creatinine, intraoperative variables and incidence of early postoperative complications.

**Results:** 169 patients were included in the study with median age 67 years (IQR 59–74) and 45 patients (27%) were female. Ileal conduit diversion was performed in 120 patients (71%). Mean estimated blood loss was 900 cc (SD 579). Median hospital stay was 7 days (IQR 6–9). Ninety–two patients (54%) experienced at least one complication. Twenty–eight patients (16%) experienced a major complication (Clavien grade ≥ IIIa) and 4 patients died (2%). The most common complication was ileus occurring in 22 patients (13%) and anemia requiring transfusion in 13 patients (7%). On multivariable analysis, intraoperative transfusion of > 4 units of packed red blood cells (p <0.01, OR 4.60) was associated with developing any complication. Carboplatin based chemotherapy regimen (p <0.01, OR 4.85) and operative time (p=0.02, OR 1.59) were associated with developing a major complication on multivariable analysis.

**Conclusions:** Using standardized reporting methodology the incidence of early complications (<30 days) in patients receiving neoadjuvant chemotherapy followed by RC is similar to previous reports in the literature. Carboplatin based chemotherapy regimen and operative time were associated with developing a major complication. Patients receiving carboplatin rather than cisplatin based chemotherapy may have medical comorbidities not identified by CCI or ASA score that lead to increased incidence of early complications.

**Poster #120**

**BLADDER CANCER TRIFECTA: A NEW CONCEPT FOR REPORTING OUTCOMES OF RADICAL CYSTECTOMY AND URINARY DIVERSION**

Adrian Fairey¹; Donald Skinner³; Susan Groshen²; Kenneth Faber²; Jie Cai³; Gus Miranda²; and Eila Skinner³

¹University of Alberta; ²USC, Los Angeles, CA; ³Stanford, Stanford, CA

(Presented By: Adrian Fairey)

**Introduction and Objectives:** Three important goals for patients undergoing treatment for invasive bladder cancer include freedom from tumor recurrence, preservation of renal function, and an absence of major treatment-related complications. The probability of a bladder cancer patient achieving all three of these goals (i.e., a bladder cancer trifecta or BCT) might be more relevant to the patient than any individual outcome alone, and would allow comparison between various treatments for this disease. We used data from a recently completed randomized trial to study this concept for patients undergoing cystectomy and neobladder reconstruction.

**Methods:** The USC–STAR study was a parallel–group, randomized controlled, superiority trial designed to compare two types of orthotopic ileal neobladder in patients undergoing radical cystectomy for bladder cancer. Between February 2002 and November 2009, 484 patients with clinical stage TanyNanyM0 bladder cancer were enrolled. For the current analysis, patients were excluded if they did not have complete 3–year follow-up data. 260 patients were analyzed for the likelihood of achieving a BCT. A BCT was defined as no evidence of disease recurrence, preservation of renal function (absence of decrease in estimated glomerular filtration rate (eGFR) ≥10 ml/min per 1.73 m2), and absence of any high grade complication (no grade 3−5 complications on the Clavien−Dindo system) at 3 years. On multivariable analysis, a logistic regression model was created to evaluate factors associated with BCT.

**Results:** Median patient age was 66 years (range, 25 to 89 years) and median baseline eGFR was 86 ml/min per 1.73 m2. The BCT rate at 3 years was 35% (91 out of 260). In patients who did not achieve a BCT, 48 had disease recurrence, 31 had renal function decline, and 90 had one or more high grade complication. In multivariable logistic regression analysis that included age, sex, comorbidity status, type of urinary diversion, pathologic TNM stage, and lymphovascular invasion, no factors were identified as independent predictors of BCT at 3 years.

**Conclusions:** We propose a new concept for reporting the outcomes of treatment for invasive bladder cancer, the “bladder cancer trifecta”. The BCT may permit more accurate patient counseling prior to treatment. Using this measure, an optimal outcome in all three areas after radical cystectomy and urinary diversion can be achieved in only a minority of cases.
Poster #121
NEUACT, A PHASE 2 RANDOMIZED, OPEN-LABEL TRIAL OF DN24-02 IN PATIENTS (PTS) WITH SURGICALLY RESECTED HER2+ UROTHELIAL CANCER (UC): UPDATED ANALYSIS OF PRODUCT PARAMETERS, HER2 EXPRESSION AND SAFETY
Leonard Gomella¹; Padmanee Sharma³; David Quinn¹; Seth Lerner⁴; Michael Press⁴; Robert Sims⁴; Todd DeVries⁵; Nadeem Sheikh⁶; Melissa Chen³; Michael Locker⁶; and Locker Bajorin5
¹Thomas Jefferson University, Philadelphia, PA; ²University of Texas MD Anderson Cancer Center, Houston, TX; ³University of Southern California Norris Comprehensive Cancer Center, Los Angeles, CA; ⁴Baylor College of Medicine, The Scott Department of Urology, Houston, TX; ⁵Dendreon Corporation, Seattle, WA; ⁶Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Leonard Gomella)

Introduction and Objectives: HER2 overexpression in high-risk UC pts may be a negative prognostic factor. DN24–02 is an investigational HER2–targeted autologous cellular immunotherapy consisting of antigen presenting cells (APCs) cultured with BA7072, a recombinant HER2–derived antigen linked to GM-CSF. NeuACT (N10–1; NCT01353222) compares adjuvant DN24–02 to surveillance in HER2+ UC pts at high risk of relapse. The primary endpoint is overall survival; enrollment is ongoing. Updated HER2 expression, product potency and safety data are presented.

Methods: Eligibility criteria include radical surgical resection of a primary UC (bladder or upper tract), with either ≥pT2 or pN+ staging and HER2 expression ≥1+ by immunohistochemistry (IHC). Pts randomized to DN24–02 undergo leukapheresis for each of the 3 DN24–02 infusions given at 2–week intervals. Product potency is assessed by APC activation (ratio of CD54 expression on post– and pre–culture cells). Cellular and humoral immune responses are measured at multiple time points. Adverse events (AEs) are assessed using CTCAE v4.03. The trial is funded by Dendreon.

Results: As of July 2013, tumor specimens from 226 pts had been screened. Of these, 75% (95% CI: 69–81%) had HER2 expression score ≥1+ (by IHC) in the primary tumor, with 32% having a ≥2+ score and 8% having a 3+ score. HER2 expression levels were evaluated in the 37% of pts with available lymph node samples: 84% (95% CI: 75–91%) had a score ≥1+ in the lymph nodes, with 49% and 14% with ≥2+ and 3+ scores, respectively. Nodal stage and lymph node HER2 expression correlated (p=0.025). Pts with HER2 expression of 1+ appear to have comparable levels of immune response to BA7072 as those with higher HER2 levels. Product potency was assessed in 21 pts who have completed DN24–02 therapy. APC activation was observed for all 3 infusions but was typically greater at infusions 2 (median 14.97; range: 6.48–23.97) and 3 (14.50; 8.24–21.80) vs infusion 1 (7.01; 4.04–14.34). The most common AEs (>20% of pts) were chills (44%), fatigue (40%), nausea (36%), vomiting (24%) and headache (24%); most occurred ≤1 day after infusion.

Conclusions: The trial suggests high frequencies (≥75%) of HER2 expression ≥1+ in primary tumor and lymph node samples, confirming HER2 expression is common in UC. These preliminary analyses suggest that DN24–02 product potency is indicative of an immunologic prime–boost effect, and most AEs are infusion–related occurring ≤1 day after infusion.

Poster #122
LYMPH NODE DISSECTION DURING RADICAL CYSTECTOMY FOLLOWING PREVIOUS RADIATION THERAPY: A POPULATION-BASED STUDY USING THE SEER DATABASE
Devin Patel; Lambros Stamatakis; Sam Brancato; Adam Metwalli; and Piyush Agarwal
Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Devin Patel)

Introduction and Objectives: Radiation therapy (XRT) can result in a desmoplastic tissue reaction, which can make surgical dissection more challenging. When performing a radical cystectomy (RC) for bladder cancer, a history of pelvic XRT may impact the decision to attempt lymphadenectomy (LND) and when performed, the lymph node yield (LNY) may be less than expected in XRT-naïve patients. We sought to describe the practice patterns of LND in patients undergoing RC following pelvic XRT in the Surveillance Epidemiology and End Results (SEER) database.

Methods: Data was collected in SEER 18 registries from 1988–2010 to identify patients undergoing RC for bladder cancer. RC following XRT for bladder cancer or other pelvic malignancy was compared to RC without prior XRT. The frequency of LND during RC was obtained and when performed, the LNY was recorded.

Results: A total of 192 patients who underwent RC following XRT were found. These patients tended to be older and present more often with extravesical disease. No difference was seen in nodal involvement, metastasis or tumor grade. At time of RC, patients with a history of XRT underwent LND less frequently (65.1% vs. 79.5%, p < 0.0001). This difference remained significant when controlling for patient age and tumor stage. When LND was done, the overall median LNY was lower in the group of RC following XRT compared to the group of RC without prior XRT (7 vs. 11, p = 0.0007). The disparity between the two groups was greatest in patients with pT2 disease (4.5 vs. 11, p=0.0012), pN0 disease (7 vs. 10, p=0.0007), and those over age 70 (7 vs. 10, p=0.012). No significant difference in LNY between the two groups was seen in patients with pT3–4 or pN+ disease. Following previous XRT, a trend towards worse survival was seen in patients with fewer than 4 lymph nodes removed during RC and those who did not undergo LND.
**Conclusion:** This population-based study shows that fewer patients with previous XRT undergo LND at the time of RC compared to a XRT-naive population. When LND is performed in the previously irradiated group, the LNY is less than in cases without previous XRT. Among patients with previous XRT, a trend toward worse survival was observed among those with lower LNY or when LND was omitted, although the reason for this observation is unclear. Further studies are needed to define the role of LND in this population and the additional surgical risk that may be associated in a previously irradiated field.

**Poster #123**

**INSULIN-LIKE GROWTH FACTOR MRNA-BINDING PROTEIN 3 (IMP3) EXPRESSION HELPS PROGNOSTICATION IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA**

Daniel Lee; Evanguelos Xylinas; Francesca Khani; Malte Rieken; Douglas Scherr; Sharokh Shariat; and Brian Robinson

Cornell, New York, NY

(Presented By: Daniel Lee)

**Introduction and Objectives:** Upper tract urothelial carcinoma (UTUC) is a clinically heterogeneous disease, without high quality trials that provide definitive prognostic criteria. Insulin-like growth factor mRNA binding protein 3 (IMP3) has been associated with outcomes in urothelial carcinoma of the bladder, but was not yet studied in UTUC. The objective was to evaluate the association of the oncofetal protein IMP3 with oncologic outcomes in patients with UTUC treated with radical nephroureterectomy (RNU).

**Methods:** We investigated the expression of IMP3 and its association with clinical outcomes using tissue microarrays constructed from 753 consecutive patients treated with RNU at 7 international institutions between 1991 and 2008. Uni- and multivariable Cox-regression analyses evaluated the association of IMP3 protein expression with disease recurrence, cancer-specific and all-cause mortality.

**Results:** IMP3 was expressed in 12.2% of UTUC (N=76). The expression was tumor-specific and was correlated with higher stages/grades. Within a median follow-up of 27 months (IQR 12–53), 191 patients (25.4%) experienced disease recurrence, and 165 (21.9%) died of the disease. Patients with IMP3 demonstrated significantly worse recurrence-free survival (27.4% vs. 75.1%, p<0.01), cancer-specific survival (34.5% vs 78.9%, p<0.01), and overall survival (15.6% vs 64.8%, p<0.01) at five years compared to those without IMP3. In multivariable Cox regression analyses, which adjusted for the effects of standard clinicopathologic features, IMP3 expression was independently associated with disease recurrence (HR 1.85, p<0.01), cancer-specific mortality (HR 2.11, p<0.01), and all-cause mortality (HR 2.09, p<0.01).

**Conclusions:** IMP3 expression is associated with disease recurrence, cancer-specific and all-cause mortality in UTUC. IMP3 may help improve risk-stratification and prognostication of UTUC patients treated with RNU.
Poster #124
ADENOCARCINOMA OF THE BLADDER: EFFECT OF LYMPH NODE YIELD AND RADIOTHERAPY ON SURVIVAL
Devin Patel; Michael D. Weintraub; Srinivas Vourganti; and Piyush K. Agarwal
Urologic Oncology Branch, National Cancer Institute, Bethesda, MD
(Presented By: Michael D. Weintraub)

Introduction and Objectives: Adenocarcinoma accounts for approximately 2% of bladder tumors and prognosis is generally poor. Treatment options include radical cystectomy (RC) or local tumor resection. (1) Compare overall survival based on tumor stage; (2) compare survival of patients receiving adjuvant radiation therapy (XRT) to those not receiving radiation; (3) correlate lymph node yield and survival in patients who underwent RC.

Methods: Data was obtained from the SEER 18 registry database from 1973 to 2010. Tumors were identified using site (C670−C679) and histology (8140−8147) codes. Patients with a history of prior malignancy were excluded. Tumors were staged using SEER extent of disease code to determine TNM stage. Site-specific surgery, lymph node dissection, and adjuvant radiation coding were obtained to determine treatment.

Results: In patients without nodal disease, overall survival was significantly improved in non-muscle invasive (Ta/T1) compared to muscle invasive (T2) disease (median survival 76 vs. 47 months, p<0.0001). Survival in non-metastatic T3/T4 node-negative disease did not significantly differ from non-metastatic T3/T4 node-positive disease (22 vs. 22 months). Survival was lowest in metastatic disease (6 months, p=0.0001). Treatments included RC (19.0%), RC + XRT (1.9%), local resection (63.6%), or local resection + XRT (15.5%). A trend towards improved survival was seen in patients undergoing RC alone compared to RC + XRT (median survival 50 vs. 37 months, p=0.0345). Survival was significantly improved in patients undergoing local resection alone compared to local resection + XRT (46 vs. 17 months, p<0.0001). In patients who did not undergo lymphadenectomy at the time of RC the median survival was 40 months. In patients undergoing lymphadenectomy, only a modest trend towards increased median survival was observed. Survival was similar in patients with either 1−3, 4−8 or 9+ lymph nodes removed during surgery (median survival 44 vs. 50 vs. 56 months, p=0.2358).

Conclusions: Primary adenocarcinoma of the bladder harbors a poor prognosis. Higher stage at presentation is associated with decreased survival. In patients treated with RC, an increased lymph node yield was not associated with a significant increase in survival. Adjuvant radiotherapy did not improve survival across all treatment groups, though this may reflect a higher disease grade in patients who were offered this treatment following surgery.

Poster #125
PREOPERATIVE NEUTROPHIL-LYMPHOCYTE RATIO (NLR) CORRELATES WITH TUMOR STAGE AND GRADE AT TIME OF TRANSURETHRAL RESECTION OF BLADDER TUMORS
Tracy M. Downs¹, E. Jason Abel¹, Daniel Shapiro¹, David F. Jarrard¹, Viraj Master² and Daniel Canter³
¹University of Wisconsin, Madison, WI; ²Emory University, Atlanta, GA; ³Einstein Healthcare/Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Tracy M. Downs)

Introduction: NLR is an indicator of systemic inflammation and has prognostic value for a variety of malignancies. Its usefulness for patients with TCC of the bladder has not been extensively studied. The purpose of our study was to evaluate the predictive utility of pre-operative NLR in determining tumor grade and stage at the time of TURBT.

Methods: The records of consecutive patients who underwent TURBT were reviewed from the University of Wisconsin and the Atlanta Veterans’ Administration Medical Center (2000–2012). NLRs were calculated by dividing neutrophil percentage by the percentage of lymphocytes measured in the differential of a CBC. NLR was compared across tumor stage, tumor grade and ethnicity.

Results: 297 consecutive patients met study criteria. 89% and 86%, were males and Caucasian. Mean age, BMI, and WBC were 66.7 years, 28.5 kg/m², and 8.1. 41%, 22%, and 37% of patients had Ta, T1, and T2 tumor stage at TURBT. NLRs were different across T-stages (Ta−2.4, T1−3.3, T2−4.0; p <0.001). NLRs were different across tumor grades (LG−2.4 vs HG−3.5, p=0.006). NLR remained statistically different across T−stages when only high−grade tumors were analyzed (p=0.005). Caucasians had higher NLRs than African−Americans (3.4 vs 1.9; p <0.001).

Conclusions: Pre-operative higher NLRs appear to be associated with more advanced tumor stage and higher tumor grade at the time of TURBT. African−American patients have lower NLRs across all tumor stages and grades compared to Caucasian counterparts. While additional studies are warranted, this initial study appears to demonstrate a prognostic value to this simple to obtain serum test.
IDENTIFYING HIGH-RISK PATIENTS FOR HOSPITAL READMISSION FOLLOWING RADICAL CYSTECTOMY AND URINARY DIVERSION

Katie Omernick; E. Jason Abel; David F. Jarrard; and Tracy M. Downs
University of Wisconsin, Madison, WI
(Presented By: Tracy M. Downs)

Introduction: Recent legislation penalizing hospitals for higher than predicted 30-day readmissions has increased focus on preventing readmissions in surgical patients. The objective of our study was to determine if specific clinical, operative or postoperative variables could be identified to develop a risk stratification model for readmission rates following radical cystectomy.

Methods: We performed a multicenter retrospective analysis of national ACS-NSQIP data from 2011. To evaluate diversion type as a variable for readmission, we used an age cutoff < 60 years old, due to a higher frequency of continent diversions. Our primary outcome of interest was readmission within 30 days of radical cystectomy.

Results: We identified 610 patients who underwent radical cystectomy in 2011. The overall readmission rate was 22.8% (N=139). The average age was 67.5 years old, 80% male and 31.6% were obese. The average time from operation to discharge was 8.91 days. On multivariate analysis age <60 years (OR=1.781, 95% CI 1.083–2.931) and an increased number of postoperative complications were found to independently predict readmission. Compared with patients with no complications, those with one complication were more frequently readmitted (OR = 2.5, 95% CI 1.425–4.269). Readmission increased further with two or more complications (OR= 11.1, 95% CI 6.315–19.670). To determine whether patients <60 years with continent diversions were readmitted more frequently due to a greater prevalence of continent urinary diversions, the age groups were stratified by urinary diversion type: continent or incontinent. The <60 years continent diversion group had a considerably higher readmission rate (OR=2.7, 95% CI 1.191–6.125).

Conclusions: We found that patients <60 years with continent urinary diversions and patients who suffered postoperative complications are at a high risk for readmission after radical cystectomy. Our early findings suggest these variables might aid in identifying patients at the highest risk of readmission following radical cystectomy and urinary diversion.
Introduction and Objective: The tumor-node-metastasis (TNM) system is an important staging classification and prognostic tool for renal cell carcinoma (RCC). In 2009, pathologic N (pN) classification became less specific, reflecting only the absence (pN0) or presence of lymph node metastases (pN1). It is unclear if this change from the 2002 classification, which specified number of lymph node metastases (pN0 = 0, pN1 = 1 and pN2 > 1), caused a loss of prognostic ability. Herein, we compare the prognostic capacity of the 2002 and 2009 pN systems as well as lymph node density (LND) for RCC.

Methods: We reviewed our institutional database of 620 patients treated with radical or partial nephrectomy and lymphadenectomy for M0 clear cell RCC between 1970–2008. Associations between 2002 and 2009 pN systems and LND with local recurrence-free survival (LRFS), progression-free survival (PFS), cancer specific survival (CSS) and overall survival (OS) were assessed using Kaplan Meier and Cox proportional hazards models. The prognostic ability of each pN stage and LND was evaluated with the concordance (c) index.

Results: Of the 602 patients, 503 (81%) were classified as pN0, 58 (9%) and 59 (10%) as 2002 pN1 and pN2, respectively and 117 (19%) as 2009 pN1. Median number of lymph nodes removed was 4 (IQR 1–12) and median number positive was 1 (IQR 1–3). Median follow up after surgery was 8.6 years (IQR 6.1–12.9) during which time 419 patients died including 275 who died of RCC. On univariate analysis (Table), both the 2002 and 2009 pN systems showed significant associations with LRFS, PFS, CSS and OS (p < 0.001 for all) and resulted in similar c indexes. Significant associations remained with CSS for both the 2002 and 2009 pN systems in multivariate analysis (p < 0.001 for both; c indexes: 0.774, 0.775, respectively). LND showed no significant association with disease outcome.

Conclusion: The less specific nodal classification of the 2009 TNM system shows similar prognostication for disease outcome as compared with the 2002 pN classification. Although, LND did not show to be an effective prognostic variable, evaluation of other nodal parameters may demonstrate better predictive behavior.
Poster #128

POTENTIAL PITFALLS OF RISK ASSESSMENT FOR SMALL RENAL MASS (SRM) USING RENAL MASS BIOPSY (RMB) FINDINGS
Anna Drewry; Tracy M. Downs; William Christensen; David F. Jarrard; and E. Jason Abel
Madison, WI
(Presented By: E. Jason Abel)

Introduction and Objective: RMB has emerged as a common technique with low morbidity for pretreatment evaluation of SRM (<4cm). However, it is important to consider the limitations of RMB for risk assessment when interpreting tumor stage, grade, and non−diagnostic findings from RMB. The objective of the study was to evaluate the accuracy of RMB grade, stage, and non−diagnostic findings comparing pathologic findings from RMB to surgery for SRM.

Methods: The records for all patients with SRM who had RMB or surgery from 2000−2013 were reviewed and clinical and pathological information were analyzed for associations with non−diagnostic findings, upstaging or upgrading. Percutaneous RMB was performed using CT or US using core (>95%) or FNA biopsy needles.

Results: A total of 383 RMB and 367 surgeries for SRM were identified. In patients who had surgery for SRM, 310/367 (84.4%) had RCC on surgical pathology and 11.6% of these increased from cT1a to pT3/4. There was no difference in the median size or time from RMB to surgery in patients who were upstaged.

In 91 patients that had Fuhrman grade assigned to both RMB and surgical specimens, surgical pathology grade was different from RMB grade in 44% of patients. When considering only high (3/4) or low (1/2) grade, 21% of patients increased from high to low grade on surgical pathology.

Of 383 SRM RMB, the non−diagnostic rate was 16.7%. Of these 33% had RCC diagnosed on subsequent biopsy or surgery. The non−diagnostic rate was not associated with SRM size, type of imaging, year of biopsy, the experience of the radiologist who performed the biopsy or the pathologist evaluating the tissue. There were no reports of tumor seeding and 2 patients had complications requiring intervention from RMB.

Conclusions: In patients with SRM, RCC are commonly upstaged or upgraded from RMB findings. In patients without serious comorbidities, the benefit of information gained by RMB may be outweighed by the risk of not identifying aggressive tumors.

Poster #129

THE INCIDENCE AND IMPACT OF PATHOLOGIC UPSTAGING OF CLINICAL T1 KIDNEY TUMORS
Krishna Ramaswamy¹; Emil Kheterpal¹; Hai Pham²; Sanjay Mohan¹; Michael Sitfelman¹; Samir Taneja¹ and William C Huang¹
¹New York University, New York, NY; ²University of California, San Francisco, CA
(Presented By: Krishna Ramaswamy)

Objective: Elective partial nephrectomy is commonly performed for cT1 kidney tumors. Subsequently, an increasing number of occult pT3a tumors are treated with partial nephrectomy with unknown consequences. The object of this study was to report the incidence and outcomes of a contemporary cohort of patients with pathologic upstaging of a cT1 tumor, and to identify factors associated with upstaging.

Methods: Using an IRB−approved Renal Tumor Database of 945 patients, we identified 494 patients undergoing either partial nephrectomy (PN) or radical nephrectomy (RN) for cT1 kidney tumor. Oncologic follow−up, clinical and pathologic features were examined and multivariable logistic regression analysis was performed to identify risks factors for pathological upstaging controlling for age, gender, body mass index, and type of nephrectomy.

Results: 66 (13.3%) patients with cT1 tumors were upstaged to pT3a after surgical treatment; 44 (66.7%) patients were treated with PN and 22 patients (33.3%) treated with RN. The median follow−up was 52 months. None of the 66 patients with pathologic upstaging developed recurrence – all were disease free at last follow−up. After adjusting for clinical and pathologic variables, tumor size greater than 4 centimeters (OR 1.450, 95% CI: 1.180−1.783, p<0.0001), positive surgical margins (OR 5.118, 95% CI 2.088−12.547, p <0.0001) and clear cell histology (OR 4.461, 95% CI: 1.498−13.461, p<0.007) were associated with pathologic upstaging.

Conclusion: In our contemporary cohort of patients with cT1 tumors, roughly 1 of every 10 patients were pathologically upstaged following treatment. Patients with larger tumors, those with clear−cell subtype and a positive surgical margin appear to be at greatest risk for upstaging. Following an intermediate period of follow−up, pathologic upstaging and nephrectomy type do no appear to result in worsened oncologic outcomes.
Poster #130
DETERMINANTS OF RENAL FUNCTIONAL DECLINE AFTER OPEN PARTIAL NEPHRECTOMY: A COMPARISON OF WARM, COLD, AND NON-ISCHEMIC MODALITIES
Ramzi Jabaji¹; Michael Liss¹; Kerrin Palazzi¹; Hak Lee¹; Jason Woo¹; Reza Mehrzain²; Hossein Mirheydar¹; Sean Stroup³; James Masterson¹; Ryan Kopp¹; Anthony Patterson²; James L’Esperance³; and Ithaar Derweesh¹
¹Department of Urology, University of California San Diego School of Medicine, La Jolla, CA; ²Department of Urology, University of Tennessee Health Science Center, Memphis, TN; ³Department of Urology, Naval Medical Center San Diego, San Diego, CA
(Presented By: Ramzi Jabaji)

Introduction and Objectives: Renal functional decline after partial nephrectomy (PN) may be related to a variety of non-modifiable and modifiable factors, particularly ischemia time (IT) and temperature. We sought to determine the impact of these factors on renal functional degeneration after PN.

Methods: Multicenter retrospective analysis (n=347) was performed, identifying patients who underwent open PN using warm−ischemic, cold−ischemic, and clampless techniques. Primary outcome was development of de novo CKD (estimated glomerular filtration rate, eGFR <60 ml/min/1.73 m2, by MDRD equation) at last follow up. Secondary outcome was change in eGFR between preoperative value and value at last follow up. Univariate and multivariable analysis (MVA) were performed examining factors associated with ischemia technique and the development of de novo CKD.

Results: Median follow−up 34.7 months. 241 patients underwent warm−ischemic, 31 cold−ischemic, and 75 clampless PN. Patient characteristics were similar between groups. No significant differences were noted in incidence of preoperative CKD (p=0.146) and mean preoperative eGFR (0.377). Lower mean RENAL nephrometry scores were noted in the clampless group compared to the cold (6.4 vs. 7.9; p=0.005) and warm (6.4 vs. 7; p=0.037) ischemia groups. Cold ischemia cohort had longer median IT than the warm cohort (50 vs. 25 min; p=0.001). There were no significant differences in proportion of patients developing de novo CKD (warm 13.8%, cold 12.5%, clampless 8.7%, p=0.542). Mean change in eGFR from baseline to last follow up was not significantly different between the groups (warm −15.1, cold −12.7, clampless −13.2, p=0.364). MVA demonstrated that neither ischemic modality nor IT ≥30 minutes was associated with development of de novo CKD, while RENAL scores of increasing complexity (RENL score 7−9, OR 4.3, p=0.003; RENAL score ≥10 OR 15.4, p<0.001) were independently associated with de novo CKD.

Conclusions: Increasing tumor complexity, as indicated by the RENAL score, has more impact on post PN renal functional outcome than ischemia time or technique. Prospective investigation is requisite to elucidate risk and protective factors for renal functional degeneration after PN.

Poster #131
THE ASSOCIATION BETWEEN VISCERAL AND SUBCUTANEOUS ADIPOSY AND CLINICOPATHOLOGICAL OUTCOMES IN AN AMERICAN COHORT OF NON-METASTATIC CLEAR CELL RENAL CELL CARCINOMA
Roy Mano¹; A. Ari Hakimi¹; Emily C. Zabor²; Marta A. Bury³; Olivio F. Donati³; Christoph A. Karlo³; Helena Furberg²; and Paul Russo¹
¹Urology Service, Department of Surgery, Memorial Sloan-Kettering Cancer Center, New York, NY; ²Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center, New York, NY; ³Department of Radiology, Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Roy Mano)

Introduction and Objectives: Elevated body mass index (BMI) is a risk factor for renal cell carcinoma (RCC), and associated with a better prognosis. Recently, visceral adiposity has been correlated with clinicopathological features of RCC. We evaluated the associations between visceral and subcutaneous adiposity and clinicopathological characteristics of non−metastatic clear cell RCC patients.

Methods: We retrospectively reviewed the medical records of 220 clear cell RCC patients from Memorial Sloan–Kettering Cancer Center who had a pre-operative BMI and computerized tomography (CT) scan. Patients with stage IV disease were excluded (n=19). Visceral (VFA) and subcutaneous fat area (SFA) were computed from the CT scan by two radiologists whose readings exhibited high inter−reader agreement. Correlations between obesity measures were assessed with Pearson correlation. Associations between obesity measures and tumor grade and stage were evaluated using logistic regression models adjusted for sex. Overall survival probabilities were estimated using the Cox regression and the log−rank test was used for group comparisons.
**Results:** A total of 150 men and 51 women were included in the study cohort. Median BMI was 29.9 kg/m²; median VFA and SFA were 19,009 mm² and 27,913 mm², respectively. Women had higher SFA (p=0.010) but lower VFA (p<0.001) as compared to men. For both men and women, SFA was highly correlated with BMI (r=0.804) while VFA was moderately correlated with BMI (r=0.542). The correlation between SFA and VFA was only 0.367. Neither SFA nor VFA were significantly associated with stage or grade. While not statistically significant, SFA was inversely associated with overall survival, a pattern similar to prior reports of BMI (Table 1).

**Conclusions:** Neither SFA nor VFA were significantly associated with stage, grade or overall survival in our analysis. Our findings suggest that SFA and BMI may be similar metrics, both showing an inverse relation with overall survival in RCC.

<table>
<thead>
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<th>Obesity measure</th>
<th>HR (95% CI)*</th>
<th>p-value</th>
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<td>TFA (per 10,000)</td>
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<td>SFA (per 10,000)</td>
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<tr>
<td>VFA (per 10,000)</td>
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<tr>
<td>VFA% (per 10%)</td>
<td>1.13 (0.60 – 1.96)</td>
<td>0.503</td>
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</tbody>
</table>

*Adjusted for sex.

TFA – total fat area; SFA – subcutaneous fat area; VFA – visceral fat area

**Poster #132**

**IS SMOKING A RISK FACTOR FOR ALL RENAL CELL CARCINOMA SUBTYPES?**

Neel Patel; Terrance Creighton; Michael Hanzly; Diana Mehedint; Thomas Schwaab; and Eric Kauffman
Roswell Park Cancer Institute, Buffalo, NY
(Presented By: Neel Patel)

**Introduction:** Smoking is among the best established risk factors for renal cell cancer (RCC), however the risk among individual RCC subtypes, particularly non-clear cell RCC histologies, has not been thoroughly examined. We investigated the incidence and extent of nephrectomy patient smoking in relation to RCC subtype diagnosis.

**Methods:** Clinical and pathologic data from 820 consecutive nephrectomy patients were retrospectively reviewed from a single institutional database, including 710 with RCC and 110 cancer−free controls. Smoking status (never, former, active) and extent of usage (pack−years) at surgery were recorded prospectively on all patients and tested for statistical association with individual RCC subtypes or benign pathology.

**Results:** A smoking history was reported by 421/820 (51%) patients, including 161/820 (20%) active smokers, with an overall mean usage of 12.9 pack−years. Compared to never smokers, active smokers were on average younger (55 vs. 61 years, p<0.01) and more frequently African American (12% vs. 5%, p<0.01). Smoking status was not associated with the presence, size or stage of disease, but did correlate with distinct histologic diagnoses. Specifically, active smoking was significantly more common among clear cell (21%) and papillary (25%) RCC patients compared to cancer−free controls (13%, p=0.037 and 0.044, respectively). In contrast, just 2 of 35 (5.7%) chromophobe RCC patients were active smokers, significantly lower than clear cell (p=0.028) or papillary (p=0.022) RCC, and statistically similar to cancer−free controls (p=0.36). Similarly, any (active or former) smoking history was again less common in chromophobe (31%) than clear cell (53%, p=0.022) or papillary (57%, p=0.010) RCC patients. Compared to cancer−free patients, mean pack−year usage was significantly higher among clear cell, papillary or collecting duct RCC patients (15, 14 and 50 vs. 8.4; p=0.010, 0.025 and <0.01 respectively), but not among chromophobe RCC patients (9.3 vs. 8.4, p=0.82).

**Conclusion:** Traditional understanding of smoking as a risk factor for RCC applies to clear cell and papillary RCC subtypes, but not chromophobe RCC. These findings underscore distinct molecular carcinogenic mechanisms underlying the different RCC subtypes and may have implications for preoperative risk stratification of nephrectomy candidates.
Impact of Renal Surgery on Overall, Oncologic, and Cardiac Mortality in Patients with Stage I Renal Cell Carcinoma and Without Preoperative Renal Insufficiency

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(Presented By: Jason Woo)

Introduction and Objective: Impact of surgically induced chronic kidney disease (CKD−S) is controversial. We examined impact of renal surgery on overall, cancer−related, and cardiac mortality in patients with stage I renal cell carcinoma (RCC) and who did not have preoperative CKD (estimated glomerular filtration rate <60 ml/min/1.73 m² by MDRD equation).

Methods: Retrospective analysis of 524 patients [293 Radical Nephrectomy (RN)/231 Partial Nephrectomy (PN), mean age 56 years, mean follow−up 6.8 years] who underwent surgery at two institutions from 7/1992−6/2007. Data were analyzed within treatment subgroups. Primary endpoint was all−cause mortality (ACM). Secondary outcomes included cardiovascular (CV) mortality and cancer−specific mortality. Kaplan−Meier analysis was performed to assess time to event for overall survival (OS) and cancer−specific survival (CSS), comparing patients that developed stage III CKD−S, stage IV CKD−S, and no CKD (eGFR > 60). Multivariable analysis (MVA) was conducted for risk factors for ACM.

Results: No significant demographic differences were noted. Tumor size (cm) was larger for RN (4.8 vs. PN 3.3, p<0.001). ACM was higher in RN (8.5% vs. PN 1.7%, p=0.001). CV mortality was higher in RN (5.5% vs. 0.9%, p=0.004). Worsening postoperative CKD was associated with lower OS and CSS (Figure 1). 5−year OS was 84% in patients with stage IV CKD−S, 96% with stage III CKD−S, and 100% in patients with no CKD−S (Figure 1a, p<0.0001). 5−year CSS was 92%, 97% and 100% in patients with stage IV CKD−S, stage III CKD−S, and no CKD, respectively (Figure 1b, p<0.0001). MVA for ACM identified stage IV CKD−S (OR 27.3, 95% CI 9.8−75.6, P<0.001), BMI ≥ 30 kg/m² (OR 3.7, 95% CI 1.3−10.4, P = 0.014), preoperative hyperlipidemia (OR 3.7, 95% CI 1.1−12.5, P = 0.039), postoperative proteinuria (OR 6.0, 95% CI 1.1−34.5, P=0.043), and RN (OR 6.2, 95% CI 1.7−23.2, P = 0.007) as independent risk factors.

Conclusion: Stage I RCC patients without preexisting CKD who underwent RN had significantly higher ACM and CV mortality, compared to a contemporary PN cohort. In all patients, development of postoperative CKD was associated with worsened OS and CSS.
Objective: To incorporate a computer-assisted volumetric assessment of potential spared parenchyma from preoperative CT scans to predict chronic kidney disease (CKD) at 6 months from extirpative renal surgery.

Methods: We performed a retrospective analysis of radical or partial nephrectomy patients with compatible CT scans from our institution. We used the Vitrea v.6.3 computer software program (Vital Images, Inc., Minnetonka, Minnesota) to create a 3D volume of the tumor, 1 cm margin, ipsilateral kidney, and contralateral kidney (cm³). The primary outcome is postoperative CKD (estimated glomerular filtration rate<60 mL/min/1.73 m² by MDRD equation). We perform a linear regression using the preoperative GFR, total RENAL nephrometry score, and volumes (excluding tumor) to predict 6-month GFR tested with 5-fold cross validation. The predicted GFR was compared to postoperative GFR for prediction of CKD to calculated test characteristics and area under the curve (AUC).

Results: We included 130 patients (79 Partial and 51 Radical) from our database from 3/2000 to 2/2013 and a median eGFR follow-up of 6.1 (4.2–36) months. Median age was 58 (IQR: 49–67), 83 (61%) men, and 53 (57%) Caucasian. Median tumor volume was 24.6 (IQR: 7–82) cm³. The most significant correlates of post operative renal function were preoperative eGFR (p<0.001), ipsilateral volume (p<0.001), and estimated margin volume (p<0.001). RENAL nephrometry score (p=0.285) and contralateral renal volume (p=0.418) were non-significant. In multivariant linear regression, the predicted GFR correlated with postoperative GFR at 6 months (R²=0.518, p<0.001). Using the model, prediction postoperative CKD noted an AUC of 0.752 (95% CI 0.662–0.842; p<0.001) with accompanying sensitivity (86.7%), specificity (63.6%), positive predictive value (76.5%), and negative predictive value (77.8%).

Conclusion: Preoperative GFR and computer assisted predicted renal volume spared are able to predict 6-month postoperative occurrence of CKD. We anticipate using this technique to provide valuable information regarding the risk of CKD in clinical decision making regarding partial or radical nephrectomy and post-operative expectations.
Poster #135
PLATELET COUNT AS A PROGNOSTIC INDICATOR FOR RESPONSE TO NEOADJUVANT TYROSINE KINASE INHIBITOR THERAPY IN RENAL CELL CARCINOMA

Hak Lee¹; Nishant Patel²; Ryan Kopp³; Michael Liss³; Reza Mehrzarin³; Ramzi Jabaji³; Song Wang³; Kerrin Palazzi³; Fuad Elkoury³; Jason Woo³; Michelle McDonald³; Anthony Patterson⁴; and Ithaar Derweesh²
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(Presented By: Hak Lee)

Introduction: Biomarkers may be useful for risk assessment and as prognostic indicators prior to and during systemic cancer therapies. We evaluated utility of platelet count (Plt) as a biomarker for response to neoadjuvant tyrosine kinase inhibitor (TKI) therapy for renal cell carcinoma (RCC).

Methods: Multi-center retrospective study of RCC patients undergoing neoadjuvant TKI therapy from 5/2005−8/2013. Plt was measured at baseline and at the end of the first TKI cycle. Change in platelet count (ΔPlt) was defined as post−treatment Plt minus pre−treatment Plt. Primary outcome was response of disease to TKI, defined by RECIST criteria for partial response (PR), stable disease (SD), and progressive disease (PD). Patient demographic and clinical characteristics were analyzed between subgroups with stable/increased (+ΔPlt) and decreased (−ΔPlt) counts. Factors associated with changes in tumor response were evaluated on multivariate analysis (MVA). Sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV) were calculated for ΔPlt and disease response (PR/SD or PD).

Results: A total of 69 patients treated with TKI therapy having pre− and post−treatment platelet values. Overall, 15 patients (22%) were noted to have +ΔPlt and 54 (78%) had −ΔPlt after neoadjuvant TKI therapy. Of the 15 patients in the +ΔPlt group, 11 had PD and 4 had SD/PR. Patients with +ΔPlt count from baseline had a lower post TKI treatment creatinine (1.0 vs. 1.3, p=0.041) than −ΔPlt count patients. There were no other differences in clinical or demographic variables between these two groups (comorbidities, ECOG performance status, baseline tumor size, number of metastases, pT stage, tumor grade and number of TKI cycles). PD was more common among +ΔPlt (86.7% vs. −ΔPlt 33.3%, p=0.001), and SD/PR was more common in −ΔPlt (66.7% vs. +ΔPlt 0%, p=0.002). On MVA, +ΔPlt above baseline was a significant predictor of PD (OR 6.96, p=0.028). A Kaplan Meier analysis demonstrated a lower overall survival in +ΔPlt versus −ΔPlt (p=0.009), with median survival of 5.7 and 13.8 months for +ΔPlt and −ΔPlt, respectively. +ΔPlt had sensitivity of 41.9%, specificity of 94.7%, PPV of 86.7% and NPV of 66.7% for PD after neoadjuvant TKI therapy.

Conclusion: Patients with −ΔPlt were more likely to respond to TKI therapy and had longer median survival. Further investigation is requisite to determine the utility of ΔPlt as a biomarker for RCC response to TKI.

Poster #136
POSTOPERATIVE COMPLICATIONS OF RADICAL NEPHRECTOMY WITH ATRIAL THROMBECTOMY: A CONTEMPORARY POPULATION-BASED ANALYSIS

Tudor Borza¹; Benjamin Chung²; and Steven Chang³
¹Brigham and Women’s Hospital, Department of Urology, Boston, MA; ²Stanford University Medical Center, Stanford, CA; ³Brigham and Women’s Hospital, Boston, MA
(Presented By: Tudor Borza)

Introduction: The mainstay treatment for patients with stage T3c renal cell carcinoma (i.e., Level IV thrombus) is a radical nephrectomy with atrial thrombectomy (RN−AT). Although this procedure is widely recognized to have substantial morbidity and mortality, little data exist on the actual rates of postoperative complications. Using a contemporary population−based cohort, we sought to determine the postoperative complication rate among patients undergoing RN−AT.

Methods: Following institutional review board exemption, we queried the Premier Perspective Database (Premier, Inc, Charlotte, NC), a database with a 20% sample of US hospital discharges, to identify patients that underwent nephrectomy (ICD9 55.51) between January 1, 2003 and December 31, 2010. We limited our analysis to patients who concurrently underwent cardiopulmonary bypass, determined through billing codes, as these patients were assumed to have undergone a RN−AT. We captured patient and hospital data as well as determined 90−day postoperative complications defined by the Clavien Classification System through review of ICD9 codes and disposition data.

Results: Our study cohort included a weighted sample size of 1417 patients; the majority were men (63.7%) and Caucasian (61.9%) with a mean age of 58 years. One−third of patients had metastatic disease while one−quarter had significant comorbidities (i.e., Charlson Comorbidity Score (CCS) ≥2). Among the study cohort, 90−day major complication (Clavien grade 3−5) was present in 38% of patients with half (19%) suffering mortality (Clavien grade 5). The predictors of a major complication included age <50 years (vs >70 years, Odds Ratio [OR] 3.1, p=0.01), CCS ≥3 (vs CCS 0, OR 5.7, p<0.0001), and surgery in an urban hospital (vs rural, OR 8.5, p=0.047). Increased complication rate was not associated with gender, race, metastatic disease, teaching institution, or hospital size.
Conclusions: We confirm that RN−AT is associated with significant morbidity and mortality. The mortality rate for this procedure exceeds those reported for other complex surgeries including pancreaticoduodenectomy, liver transplantation, and esophagectomy. The higher complication rate seen in younger patients is likely secondary to selection bias. This information is important for preoperative counseling for patients considering RN−AT. Future studies are needed to compare the outcomes of RN−AT versus systemic therapy given the advent of targeted therapeutic options.

Poster #137
CHARACTERISTICS AND OUTCOMES OF RENAL CELL CARCINOMA IN THE PEDIATRIC AND YOUNG ADULT POPULATION
Kelly Harris; Joan Ko; Mark Ball; Michael Gorin; and Mohamad Allaf
Johns Hopkins University Department of Urology
(Presented By: Kelly Harris)

Introduction and Objectives: Renal cell carcinoma (RCC) is a malignant neoplasm with a peak incidence in the sixth and seventh decade of life. Less than 5% of all RCC cases occur in patients under age 40. Previous studies have evaluated characteristics and outcomes of RCC in the young adult population, but have relatively low power with conflicting results, demonstrating the need for further descriptive studies. In this study, we review our experience with patients under the age of 40 who have been diagnosed with RCC. The patient characteristics, pathologic features, and recurrence outcomes are described.

Methods: Our institutional renal mass database was queried for patients who underwent surgical intervention between 2003 and 2013 for renal cell carcinoma at age 40 or younger. A total of 119 patients were identified. Data extracted included demographic information, details of initial presentation, surgical intervention, pathologic characteristics, and recurrence outcomes.

Results: Of the 3117 patients in our institutional renal mass database, 157 (5.0%) patients were age 40 or younger at the time of surgical intervention. The median was 37.1, with a range of 10.2 to 41.0 years. The male to female ratio was 1.77:1. 42.0% of patients presented with symptoms related to their renal mass. A total of 119 (75.8%) patients were found to be RCC, and 50% of all tumors were non-clear cell RCC. The majority (18.8%) of these were papillary RCC. Xp11.2 translocations were present in five (4.1%) patients. RCC in these patients most commonly was treated at an early stage with 58.6% at stage pT1a and 15.5% at stage pT1b. The vast majority (80%) of patients never had recurrence and have remained cancer−free since at a median follow−up of 44.7 months.

Conclusions: Historically, children and young adults have displayed a tendency toward locally advanced, high−grade disease with unfavorable histological subtypes. We report that patients under 40 years of age are not more likely to present with symptoms and that non−clear cell carcinoma accounts for half of all RCC subtypes. Tumors are generally lower grade with little to no invasion or metastasis, recurrence is low, and prognosis is generally good for these patients.
Poster #138
DIAGNOSTIC RENAL BIOPSY AND THE TREATMENT OF SMALL KIDNEY CANCERS
Marc A. Bjurlin¹; Elena Elkin²; Atoria Atoria²; Paul Russo³; Samir Taneja¹; and William Huang¹
¹Division of Urologic Oncology, Department of Urology, New York University, New York, NY; ²Center for Health Policy and Outcomes, 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
(Presented By: Marc A. Bjurlin)

Introduction and Objectives: Renal biopsy may aid in the diagnosis of kidney cancer, but its impact on the clinical management of small kidney tumors is not well established. Our objective was to identify patient characteristics associated with receipt of diagnostic renal biopsy and the influence of biopsy on subsequent surgery.

Methods: In Surveillance, Epidemiology and End Results (SEER) cancer registry data linked with Medicare claims, we identified patients aged 66 years or older diagnosed with a renal parenchymal tumor less than 4 cm between 2000 and 2007. Diagnostic biopsy was defined by a Medicare claim within 1 month prior through 6 months following cancer diagnosis. Surgical management was defined by a claim for partial or radical nephrectomy or tumor ablation in the first 6 months following diagnosis. We also identified the specialty of the health care provider associated with the first claim for a renal mass or tumor.

Results: Of 5,179 patients with a tumor <4cm, 1,489 (29%) had a diagnostic renal biopsy, and 4,450 (86%) were managed surgically. Predictors of diagnostic renal biopsy included age, tumor size ≥2cm (adjusted odds ratio AOR 1.16 [95% CI 0.70−1.00], p=0.0524) and a low comorbidity burden (AOR 1.16 [95% CI 1.00−1.34], p=0.0507). Patients whose first renal mass diagnosis was made by a urologist had lower odds of renal biopsy (AOR 0.52 [95% CI 0.40−0.68], p<0.0001). In stratified analysis, patients who did not have a renal biopsy were less likely to have surgery if their tumor was <2cm (AOR 0.54 [95% CI 0.41−0.72], p<0.0001) but more likely with a low comorbidity burden (AOR 1.34 [95% CI 1.01−1.77] p=0.0407). Among patients who had a biopsy, greater comorbidity was associated with lower odds of surgery (AOR 0.56 [95% CI 0.37−0.85] p=0.0058). Tumor size was not a predictor of surgery in patients who did have a renal biopsy. Controlling for patient, disease and provider characteristics, biopsy was associated with lower odds of having surgery (AOR 0.63 [95% CI 0.53−0.76], <0.0001), and the use of surgery decreased over time.

Conclusions: In this population–based cohort of older patients with small kidney tumors, diagnostic biopsy was more common among patients who were older, had greater comorbidity or larger tumors. Patients who had a biopsy were less likely to be managed surgically than those who did not. Diagnostic renal biopsy may aid in the selecting appropriate candidates for non–surgical management of small kidney cancers.

Poster #139
A PREDICTIVE NOMOGRAM FOR URINE LEAK IN COMPLEX PARTIAL NEPHRECTOMY
Paulina Gorney Brown; M. Minhaj Siddiqui; Annerleim Walton-Diaz; Hong Truong; W. Marston Linehan; and Adam R. Metwalli
NIH NCI Urology Oncology Branch, Bethesda, MD
(Presented By: Paulina Gorney Brown)

Introduction and Objective: Urine leak after partial nephrectomy is an infrequent complication that occurs more often with increasing tumor complexity. Management is often conservative, but large volume urine leaks may require placement of a ureteral stent. Improved preoperative risk assessment may prompt ureteral stent placement at time of initial surgery thus avoiding an additional surgical procedure in the peri−operative period for high risk patients. In this study, we develop a nomogram to predict postoperative urine leaks after complex partial nephrectomy.

Methods: A total of 50 multifocal complex partial nephrectomies were performed by a single surgeon (ARM) between June 2011 and September 2012. Urine leak was defined as any elevation of creatinine above serum in the Jackson-Pratt drain output. Age, gender, body mass index (BMI), number of prior kidney operations, number of tumors removed, estimated blood loss (EBL), surgical approach, and operative time were evaluated as risk factors. Logistic regression was used for univariate and multivariate analysis. For the predictive model used in the nomogram, parameters that were significantly associated with postop urine leak (p<0.05) or with a trend towards significance (p<0.1) were included.

Results: The mean age was 49.5 years old with means of 2 surgeries and 13 tumors removed per kidney per operation. There were 38 open and 12 robotic cases. Postoperative urine leak was seen in 8 patients. All cases were successfully managed either conservatively or with percutaneous and/or ureteral stent drainage. EBL averaged 1142 mL in the no−leak group and 2213 mL in the leak group (p=0.002), Mean number of tumors resected was 11 in the no−leak group and 26 in the leak group (p=0.01), and mean number of prior ipsilateral kidney operations was 1.8 in the no−leak group and 2.6 in the leak group (p<0.01). No other significant differences were noted. A nomogram with good predictive characteristics (c−index=0.85) was generated based on EBL, number of tumors resected, and number of prior kidney procedures (Figure 1).
Conclusions: Risk of urine leak increases with increased EBL, number of resected tumors and number of prior renal surgeries. A nomogram strongly predicts post-operative urine leak for complex partial nephrectomy.

**Poster #140**
EVALUATION OF SURVEILLANCE GUIDELINES FOR RENAL CELL CARCINOMA FOLLOWING PARTIAL NEPHRECTOMY
Marc Nelson; Jennifer Mason; and Tracey Krupski
University of Virginia, Charlottesville, VA
(Presented By: Marc Nelson)

**Introduction:** Renal cell carcinoma (RCC) is increasingly detected in its early stages due to the widespread use of imaging studies for nonrelated medical issues. Published surveillance guidelines to detect local and metastatic tumor recurrence following partial nephrectomy differ in both frequency and imaging modalities recommended. These strategies, therefore, result in cumulative tradeoffs of cost, effectiveness in diagnosing cancer recurrence, radiation exposure, and patient burden.

**Methods:** We used a Monte Carlo Simulation Model to predict expected oncologic outcomes, monetary costs, and radiation exposure of three highly-cited surveillance guidelines: those published by researchers at the American Urological Association (AUA), the Canadian Urological Association (CUA), and the European Association of Urology (EAU), as compared to no surveillance. The sample patient was a 55 year old male who underwent PN for Stage T1 RCC with a ten year surveillance horizon. Surveillance strategies, tumor growth rates, radiation exposure, imaging effectiveness, and death probabilities were obtained from current publications. Imaging costs were calculated using 2012 Medicare reimbursement rates.

**Results:** The simulation model for the ten year surveillance period predicted that published surveillance strategies reduce RCC related mortality from 21.09% in those without surveillance to 7.35%, 4.63%, and 4.87% in those followed by AUA, CUA, and EAU guidelines, respectively. At the time of diagnosis in subjects with tumor recurrence, the expected cost, radiation exposure, and tumor size differed among the three surveillance strategies as well (see Table 1).

**Conclusions:** Current surveillance guidelines following PN for RCC differ in frequency and modality of chest and abdominal imaging. Given the increasing economic burden of healthcare in the U.S., in addition to concerns about radiation exposure, we feel that the CUA guideline is currently the most efficacious and balanced published surveillance strategy. National consensus is needed to standardize RCC surveillance.

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<td>3.3 (3.2-3.3)</td>
<td>1.78 (1.76-1.80)</td>
<td>3.81 (3.78-3.84)</td>
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<tr>
<td>EAU</td>
<td>$770 (763-776)</td>
<td>2.9 (2.8-3.1)</td>
<td>1.66 (1.64-1.68)</td>
<td>3.28 (3.26-3.31)</td>
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Poster #141
COMPARISON OF COMPLICATIONS AND PERIOPERATIVE OUTCOMES AFTER RADICAL AND PARTIAL NEPHRECTOMY USING THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM (NSQIP) DATABASE
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The James Buchanan Brady Urological Institute and Department of Urology, The Johns Hopkins School of Medicine, Baltimore, MD
(Presented By: Mark Ball)

Introduction: Minimally-invasive surgery (MIS) is the standard of care for the treatment of most renal masses. While the use of MIS partial nephrectomy (PN) is increasing, it remains an underutilized treatment modality. Compared to MIS radical nephrectomy (RN), MIS PN has been shown to have a steeper learning curve and associated with higher complications in early series. Because experience with MIS PN is increasing, we hypothesized that complications and perioperative outcomes would be similar between groups.

Methods: The American College of Surgeons’ National Surgical Quality Improvement Database (NSQIP) is a prospectively maintained, validated database of pre-operative to 30-day postoperative surgical outcomes that was designed to improve surgical care. We queried NSQIP for the years 2007–2011, using CPT codes 50543 (MIS PN) and 50546 and 50545 (MIS RN) to identify the study cohort. Demographics, perioperative outcomes and complications of PN and RN were analyzed. Tumor characteristics including size, stage, histology and grade are not available in NSQIP.

Results: A total of 3,723 MIS nephrectomies were performed during the study period: 2313 (62%) RN and 1410 (38%) PN. The utilization of PN increased during the study period from 6% in 2007 to 42% in 2011. While operative time was longer for PN than RN, length of stay and blood transfusion rate were less for PN. The 30 day complications rate for RN and PN were similar (4.3 vs 3.8%, p=0.43). Among specific complications, PN was associated with higher rate of DVT/PE (1.1 v 0.5%, p = 0.036), and RN was associated with higher rates of superficial wound infections (1.8 v 0.7%, p=0.005) as well as renal failure defined as rise in serum creatinine of > 2mg/dl or need for dialysis (1.1 v 0.4%, p=0.033). On multivariate logistic regression, predictors of any complication were age (OR 1.03, 95%CI 1.02−1.05) and medical comorbidities other than hypertension or diabetes (OR 1.85, 95%CI 1.16−2.94). PN was not associated with higher complication rate.

Conclusions: The utilization of MIS PN among hospitals participating in NSQIP is increasing. In these institutions, MIS PN is associated with decreased LOS, decreased blood transfusions and similar post-operative complications rates. In the well selected patient, MIS PN is a safe, well-tolerated procedure.

Poster #142
IMPACT OF RECURRENT COPY NUMBER ALTERATIONS AND CANCER GENE MUTATIONS ON THE PREDICTIVE ACCURACY OF PROGNOSTIC MODELS IN CLEAR CELL RENAL CELL CARCINOMA
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(Presented By: Roy Mano)

Introduction and Objectives: Several recently reported recurrent genomic alterations in clear cell renal cell carcinoma (ccRCC) have been linked to pathological and clinical outcomes. We aimed to determine if any of the recurrent cancer gene mutations or copy number alterations identified in the Cancer Genome Atlas (TCGA) ccRCC dataset could add to the predictive accuracy of the current prognostic models.

Methods: Four hundred thirteen patients with whole exome, copy number array analyses, and clinical variables were available for interrogation. Sixty-five recurrent genomic alterations were identified based on prevalence and combined into 35 alterations including 12 cancer gene mutations. The genomic markers were modeled using the elastic-net algorithm with preoperative variables (tumor size + age) and in the postoperative setting using the externally validated Mayo Clinic stage, size, grade, and necrosis (SSIGN) prognostic scoring system. These models were subjected to internal validation using bootstrap.

Results: Several markers correlated with adverse cancer-specific survival (CSS) and time to recurrence (TTR) on univariate analysis. However, most lost significance when controlling for tumor size +/- age in the preoperative models or SSIGN score in the postoperative setting. The addition of multiple genomic markers selected by the elastic-net algorithm failed to substantially add to the predictive accuracy of any of the preoperative or postoperative models for CSS or TTR.

Conclusions: While, recurrent copy number alterations and cancer gene mutations are biologically significant, they do not appear to improve the predictive accuracy of existing clinical CSS or TTR models in ccRCC.
Poster Session II – Full Abstracts

Poster #143

CLINICOPATHOLOGICAL PRESENTATION OF RENAL CELL CARCINOMA (RCC) IN PATIENTS WITH A SITE SPECIFIC SINGLE NUCLEOTIDE POLYMORPHISM (SNP) IN THE MET ONCOGENE

Alexander Sankin; A. Ari Hakimi; Roy Mano; Nina Mikkilineni; Michael Chevinsky; Paul Russo; Jonathan Coleman; Kenneth Offit; James Hsieh; and Robert Klein
MSKCC, New York, NY

(Presented By: Alexander Sankin)

Introduction and Objectives: The recently characterized SNP rs11762213 in the MET oncogene, which leads to the synonymous aminoacid change G144A, has been shown to decrease disease-free interval after nephrectomy in renal cell carcinoma. We sought to evaluate if any association exists between the presence of this SNP and the clinicopathological presentation of RCC.

Methods: Germline DNA (from serum plasma or healthy renal parenchymal tissue) was prospectively collected in patients undergoing nephrectomy at a single institution (MSKCC) from 2001−2013. SNP rs11762213 was genotyped using a pre-designed TaqMan allelic discrimination genotyping assay from Applied Biosystems. Based on examination of the fluorescence intensity plots, individuals were called homozygous wild-type or heterozygous. Patient charts were then reviewed for clinicopathological and demographic data.

Results: We identified 184 patients undergoing nephrectomy with germline DNA available for genotyping. The polymorphism rs11762213 was present (SNP+) in 16 patients (8.7%) (Table 1). There was no evidence for individuals homozygous for the alternate allele in these samples, as would be expected for this sample size and the low minor allele frequency. The median tumor size was 2.5 and 3.4 cm (p=0.043) in the SNP+ and SNP− groups, respectively. Median follow up was 24.3 and 13.6 months (p=0.232). There was no significant difference in T stage, N stage, M stage, and histology between the SNP+ and SNP− group. Of the cohort with clear cell RCC (n=151), 12/15 (80%) of SNP+ patients had tumors of low Fuhrman grade (G1 & G2) compared to 67/136 (49%) of SNP− patients (p=0.029). The overall (p=0.179), disease specific (p=0.444) and recurrence free survival (p=0.242) did not significantly differ between the SNP+ and SNP− groups.

Conclusions: The MET SNP rs11762213 seems to correlate with smaller tumor size and lower Fuhrman grade in clear cell RCC, although it does not appear to be associated with other putative features of adverse pathology, including stage and histology. While previous reports speculate that this SNP portends a higher risk of recurrence after nephrectomy, this may be due to factors independent of stage and grade.
Poster #144
T1A PATIENTS WITH METASTATIC RCC AT DIAGNOSIS MARKEDLY DIFFER FROM PATIENTS WHO PRESENT WITH LOCALIZED MALIGNANT SRMS

Jeffrey Tomaszewski; Robert Uzzo; Brian Egleston; Reza Mehrazin; Marc Smaldone; David Chen, Rosalia Viterbo; Richard Greenberg; and Alexander Kutikov
Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Jeffrey Tomaszewski)

Objective: Enthusiasm for active surveillance of SRMs is tempered by existence of patients with T1a masses who present with metastatic disease. As a result, some experts have advocated for more aggressive treatment strategies for SRMs. Here, using a large administrative dataset, we set out to compare cohorts of patients with T1a renal masses who present with localized vs. metastatic RCC.

Methods: The Surveillance, Epidemiology and End Results database was analyzed for small (<4cm) renal tumors diagnosed between 1988 and 2010. Cancer specific and overall survival along with other available clinicopathologic variables were compared between patients with clinically localized or metastatic disease at the time of presentation.

Results: Of the 52,344 patients identified, 49,681 (94.9%) and 2,663 (5.1%) presented with localized and metastatic disease, respectively. After a mean follow-up of 4.7±4.2 years (range 0.02 – 22.9 years), 5yr cancer−specific death rates were, as expected, markedly higher in patients presenting with metastatic disease (73.6% vs. 4.5%; p<0.001). Following adjustment for age, gender, marital status, race, grade, year of diagnosis, and number of prior cancers, in patients with small renal tumors, increased risk of overall (HR 5.0 [4.3−5.9]) and cancer specific mortality (HR 17.2 [CI 15.2−19.3]) were noted for patients presenting with metastatic disease (FIGURE 1). Comparing patients with metastatic and localized disease, significant differences in gender (65.5 vs. 60.6% male; p<0.001), marital status (56.1 vs. 63.2% married; p<0.001), tumor grade (3.0 vs. 16.4% well differentiated; p<0.001), age (68.4 ± 13.5 yrs vs. 62.3 ± 13.6 yrs; p<0.001), year of diagnosis (p<0.001) and tumor size (2.9 ± 1.0cm vs. 2.7 ± 0.9cm; p<0.001) were observed, while no differences were seen in race.

Conclusions: Patients with T1a renal masses who present with concomitant metastatic disease represent a minority (~5%) of patients with malignant SRMs and markedly differ from those who present with localized disease. Metastatic SRM patients present a potential opportunity for better understanding of RCC biology, but should not necessarily bias management of localized SRM cohorts.
**Poster #145**
LYMPHOPENIA AS AN INDEPENDENT PREDICTOR OF WORSE SURVIVAL IN PAPILLARY RENAL CELL CARCINOMA
Reza Mehrazin¹; Robert Uzzo¹; Alexander Kutikov¹; Jeffrey Tomaszewski¹; Serge Ginzburg²; Karen Ruth¹; Essel Al-Saleem¹; Phillip Abbosh¹; Timothy Ito¹; David Chen¹; Rosalea Viterbo¹; Richard Greenberg¹; Marc Smaldone¹; and Tahseen Al-Saleem¹
¹Fox Chase Cancer Center, Philadelphia, PA; ²Albert Einstein Medical Center, Philadelphia, PA
(Presented By: Reza Mehrazin)

**Objective:** Lymphopenia signifies inflammatory response and is an index of poor systemic immunity which can be associated with poor survival outcomes. The aim of this study was to evaluate the prognostic relevance of preoperative absolute lymphocyte count (ALC) in patients with papillary renal cell carcinoma (RCC).

**Methods:** We retrospectively analyzed our institutional, prospectively maintained, renal cancer database and identified patients with pathologic diagnosis of papillary RCC after partial or radical nephrectomy. Patients with preoperative ALC value within 3 months prior to surgery were eligible for the study. ALC of 1,300 cells/µl was used as the cutoff value (our lowest laboratory reference value). We evaluated the correlation between ALC and age, gender, Charlson comorbidity index (CCI), pathologic T stage, nuclear grade, and overall TNM stage. Differences in overall survival (OS) by ALC status were assessed using the log−rank test. Cox proportional hazards modeling was used for multivariable analyses.

**Results:** We identified 314 out of 2,732 patients with a pathologic diagnosis of papillary RCC after partial or radical nephrectomy from 1997 to 2013. Those undergoing multiple surgical procedures (multifocal or bilateral disease) or missing preoperative ALC were excluded from the study. A total 205 patients met inclusion criteria with a median follow up of 37.3 months. As a continuous variable, low absolute lymphocyte count was associated with higher pT stage (p=0.038), TNM stage (p=0.029) and older age (p=0.022). Lymphopenia below 1,300 cells/µl was also associated with pT stage (p=0.008) and TNM stage (p=0.018). On multivariable analysis, independent of stage, older age, and CCI, lymphopenia was associated with inferior overall survival (HR 2.1 [CI 1.1−4.03], p=0.037).

**Conclusions:** In our series of patients with papillary renal cell carcinoma, lymphopenia was associated with lower overall survival independent of stage, age, and charlson comorbidity index. ALC significantly increases the accuracy of already established prognostic factors and can be helpful for patient counseling and design of clinical trials.

**Poster #146**
GROWTH KINETICS AND OUTCOMES OF CLINICAL T1B RENAL MASSES UNDER ACTIVE SURVEILLANCE (AS)
Reza Mehrazin; Marc Smaldone; Alexander Kutikov; Jeffrey Tomaszewski; Tianyu Li; Timothy Ito; Phillip Abbosh; Rosalia Viterbo; Richard Greenberg; David Chen; and Robert Uzzo
Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Reza Mehrazin)

**Objectives:** Compared to T1a lesions, the natural history of untreated T1b renal masses is poorly understood. We sought to assess the growth kinetics and outcomes of cT1b or larger cortical renal tumors which continue to remain on radiographic AS compared to those who underwent definitive surgery after a period of AS.

**Methods:** Our institutional, prospectively maintained, renal tumor database was reviewed to identify enhancing solid & cystic masses managed expectantly from 2000−2012. cT1a masses, transitional cell carcinoma or those suspected for metastatic or systemic disease were excluded from analysis. Based on standard radiographic staging, localized tumors > 4.0 cm (≥T1b) that were radiographically followed for > 6 months were included for analysis. Clinical & pathological records were reviewed to determine tumor growth rate and clinical outcomes in those remained on AS or those who underwent delayed surgical intervention. Mean for tumor size on presentation, annual linear tumor growth rate (LGR), Charlson comorbidity index (CCI), number of images obtained, and follow−up (FU) were calculated. Chi−square test & Logistic regression were used for uni− and multivariate analyses (MVA).

**Results:** Of 457 patients managed with AS, 67 cT1b tumors (in 63 patients) were identified. 43 pts (67%) were managed solely with AS, while 21 pts (33%) progressed to intervention. The median age at presentation patients managed with AS and intervention was 77 and 60 years respectively (p=0.0002), while no difference was observed in median CCI (3 vs. 2, p=0.6). No difference was observed in tumor size at presentation between patients managed with AS and those undergoing delayed intervention (5.9 vs. 5.4 cm, p=0.8). In contrast, the mean LGR significantly differed between patients managed expectantly and those progressing to intervention (0.37 vs. 0.73 cm/yr; p=0.02). On MVA, age (OR=0.9,CI:0.8−0.98) and LGR (OR=11,CI:1.8−60) were significant predictors of surgical intervention. With a mean FU period of 38.9 ± 24.0 months (range 6−105), 9 patients died (14%) from other cause and no patient progressed to metastatic disease.

**Conclusions:** Localized cT1b or larger renal masses show comparable growth rates to small tumors managed expectantly with low rates of progression to metastatic disease with short term follow up. An initial period of AS to determine tumor growth kinetics is a reasonable option in select patients with significant competing risks and limited life expectancy.
Poster #147
CASE SERIES OF PRIMARY PRIMITIVE NEUROECTODERMAL TUMORS OF THE KIDNEY
Ian Vela¹; Timothy F. Donahue¹; Roy Mano¹; A. Ari Hakimi¹; Daniel Casella²; Timothy Lyon²; Ryan P. Kopp¹; Donna E. Hansel³; Mary Keohan¹; Ithaar H. Derweesh³; Paul Russo¹; and Tatum Tarin²
¹Memorial Sloan-Kettering Cancer Center, New York, NY; ²University of Pittsburgh Medical Center, Pittsburgh, PA; ³University of California San Diego, San Diego, CA
(Presented By: Ian Vela)

Introduction: Primitive neuroectodermal tumor (PNET) of the kidney is a rare disease typically characterized by a young age of onset and an aggressive clinical course. Because there are few case series and the optimal management is not well defined, we reviewed the combined experience of two large tertiary centers in the diagnosis and management of pts with renal PNET.

Methods: We conducted a retrospective review of patients with surgically managed renal PNET treated between 1998–2012.

Results: There were 5 female and 3 male pts diagnosed at a median of 38 years (21 – 71 years). All pts had symptoms at presentation including abdominal pain (87.5%), anorexia (67.5%), and hematuria (50%). An abdominal mass was palpable in 50%. At presentation, 2 pts had metastatic disease, 3 had an IVC thrombus, and 2 had a renal vein thrombus. One pt had a history of a spinal PNET treated six years prior. The average radiographic size of the renal masses was 13.5cm (range 8.3−23cm) and 6 were left sided. All pts underwent radical nephrectomy and 50% had concurrent resections of the pancreas (3), spleen (2), colon (1), diaphragm (1), and/or psoas (1). Lymph nodes were positive in 25%, negative in 12.5%, and not reported in 67.5%. Three pts underwent percutaneous biopsy and the diagnosis of PNET was made in all 3 cases. One pt who had preoperative chemotherapy had complete tumor necrosis on final pathology. FISH analysis demonstrated EWS−FLI−1 and EWSR1 rearrangements in 2 and 3 pts, respectively. Four pts received chemotherapy prior to and 4 after surgery based on guidelines for the Ewing’s family of tumors. Radiation was performed for adjuvant (n=2) and palliative purposes (n=1). Kaplan Meier estimates for 3 and 5 year overall survival were 62.5%, respectively. Genetic sequencing of tumors is ongoing.

Conclusions: Renal PNET is a rare tumor that should be considered in younger patients presenting with a large renal mass associated with an IVC thrombus. The diagnosis can be made by percutaneous biopsy but more commonly it is established after nephrectomy. Treatment is multi-modal and chemotherapy is based on the Ewing’s family of tumors guidelines. Patients who present with metastatic disease have a poor overall prognosis.

Poster #148
HISTOLOGIC DISTRIBUTION OF METASTATIC RCC SHOWS A DIFFERENCE BETWEEN N+ AND M+ DISEASE: AN ANALYSIS OF THE SEER DATABASE
Michael Daugherty; and Gennady Bratslavsky
SUNY Upstate Medical University, Syracuse, NY
(Presented By: Michael Daugherty)

Objective: Metastatic RCC occurs in approximately 1/3rd of all cases of patients diagnosed. The extent of metastasis and prognosis of the patient is dependent on Fuhrman grade and also histologic type. Some histologic types are more indolent and possess less metastatic potential. It is hypothesized that these differences in metastatic potential will manifest in different rates of nodal and distant metastasis for the various histologies.

Methods: SEER−18 registries database was queried for all patients diagnosed with metastatic RCC between the years 2004 and 2010. Histologies selected were Clear Cell, Papillary, Chromophobe, Sarcomatoid and Collecting Duct. Patients were separated into two cohorts: those that had M+ disease (regardless of nodal status) and those that had N+ disease with an M0 status. There were 4135 and 645 patients with M+ and N+ disease, respectively. Histologic distribution between the cohorts was compared using a Chi−square analysis.

Results: There were significant differences seen between the two cohorts in histologic distribution (p<0.0001, Figure 1). There was a larger percentage of patients with papillary tumors in the N+ group (p<0.0001). In addition, there was a smaller percentage of patients with clear cell tumors in the N+ group (p<0.0001). However, there was no difference seen when comparing sarcomatoid tumors in both groups (p=0.161).
Conclusion: The difference in histologic tumor rates is driven predominantly by the greater than three−fold increase in the number of papillary tumors in the N+ M0 cohort. This can be explained by either the early spread of papillary tumors to lymph nodes, preferential environment for papillary metastases within the lymph nodes, or the limited ability of papillary tumors to metastasize distantly. Further molecular studies are needed to analyze the predilection for preferential metastatic sites observed in different histologic RCC subtypes.

Poster #149
DELAYING NEPHRECTOMY FOR A PROLONGED PERIOD OF TIME DOES NOT ADVERSELY AFFECT TREATMENT OUTCOME OF LARGE RENAL MASSES
Roy Mano¹; Emily Vertosick²; A. Ari Hakimi¹; Itay A. Sternberg¹; Daniel D. Sjoberg²; Melanie Bernstein¹; Guido Dalbagni¹; Jonathan A. Coleman¹; and Paul Russo¹
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(Presented By: Roy Mano)

Introduction and Objectives: Delaying surgery for cancer adversely affects treatment outcome in some malignancies. However, in renal tumors, surgical waiting time (SWT) of up to 3 months does not negatively affect prognosis. Whether delaying surgery for longer periods of time influences treatment outcome, has not been previously studied. We aimed to evaluate the association between prolonged SWT and treatment outcome for large renal masses (>4cm), and identify which patients are more likely to be affected by prolonged SWT.

Methods: We reviewed the charts of 1,461 adult patients treated with a partial or radical nephrectomy for a non−metastatic renal mass >4cm, who had a documented CT scan or MRI done at the time of initial diagnosis. Patients with SWT>1 year (n=38) and missing data (n=65) were excluded. SWT was defined as the time between initial diagnosis and nephrectomy. The study endpoints included recurrence free survival (RFS) and cancer specific survival (CSS). Cox proportional hazards regression was used to assess the effect of SWT on RFS and CSS, adjusting for pre−operative characteristics. We also evaluated whether each characteristic modified the effect of SWT. The clinical utility of any significant interaction was assessed by comparing the concordance index between the base model and the model including the interaction term.

Results: A total of 896 males and 462 females, at a median (IQR) age of 60 (52, 69) years were included in the study cohort. Median BMI was 28.9 (25.5, 32.7) and median tumor size on initial scan was 6.2cm (5, 8.7). The median SWT was 2 (1, 3) months; 281 patients (21%) had a SWT longer than 3 months. Frequent causes for treatment delay >3 months included delayed referral, pre−operative clearance and risk reduction and treatment of comorbidities. During a median follow−up of 4 (1.7, 7.6) years, 192 patients (14%) had disease recurrence and 115 patients (8.5%) died of their disease. On univariate analysis, SWT was not significantly associated with RFS or CSS. Gender and BMI had a statistically significant effect modification on SWT and CSS (p=0.048), however this lead to only a slight increase in discrimination over the base model, limiting its clinical relevance.

Conclusion: A prolonged SWT is not associated with a worse outcome when treating non−metastatic renal tumors >4cm. Our findings suggest that delaying nephrectomy in order to optimize surgical risk and treat co−morbidities is safe in this setting.
Poster #150
THE METASTATIC POTENTIAL OF CHROMOPHobe RCC IS DEPENDENT ON TUMOR SIZE: RESULTS FROM THE SEER DATABASE
Michael Daugherty¹; Alexander Kutikov²; and Gennady Bratslavsky¹
¹SUNY Upstate Medical University, Syracuse, NY; ²Fox Chase Cancer Center, Philadelphia, PA
(Presented By: Michael Daugherty)

Introduction: Chromophobe RCC tends to be an indolent tumor with a lower propensity of metastasis. As a result, these tumors are often over treated especially when a radical nephrectomy is performed to remove the mass. We hypothesize that there is a difference in tumor size between localized and metastatic tumors and that larger tumors experience a higher rate of metastasis.

Methods: SEER 18−registries database was queried for all patients age ≥20 years treated surgically for chromophobe RCC between the years 2000−2009. Tumors with unknown extension, grade, nodal status and size were excluded from analysis. In addition, patients with unknown race, sex and age were also excluded. Patients were divided into two cohorts based on metastatic status. There were a total of 1,740 patients with localized tumors and 59 patients with metastatic tumors. Patient demographics and tumor characteristics were compared using chi−square analysis. Tumor size was compared between the two groups using an unpaired t−test.

Results: There were no differences in patient demographics between the groups, but there was a difference in tumor grade distribution (p<0.001). The mean localized tumor size was 5.9 cm (95% CI 5.7−6.0 cm), whereas the average metastatic tumor size was 11.7 cm (95% CI 10.4−13 cm). The interquartile range for tumor size was 3−8 cm and 8−14.5 cm, for localized and metastatic tumors respectively. The 2 groups were significantly different when comparing the tumor size distribution (p<0.001).

Conclusion: Present SEER analysis reveals that the size of chromophobe RCC affects the metastatic potential of the tumor. These results can offer an alternative management strategy of patients found to have chromophobe RCC on needle biopsy. These patients may undergo active surveillance until the tumor reaches size of 8cm or larger, in order to avoid unnecessary surgery to remove cancers with limited metastatic potential.

Poster #151
DISTRIBUTION OF COMMON HISTOLOGIES OF SMALL RENAL MASSES: A COMPARISON BY AGE
Simpa Salami; Nithin Theckumparampil; Christopher Babu; Michael Shavolian; Paras Shah; Arvin George; Oksana Yaskiv; and Manish Vira
Hofstra North Shore LIJ School of Medicine, New Hyde Park, NY
(Presented By: Nithin Theckumparampil)

Introduction: Understanding the histology of small renal masses (SRMs) in the elderly may be useful when selecting patients for extirpative surgery. Hence, we sought to evaluate the differences in pathological features of SRMs between the elderly and younger patient population that may influence the decision to pursue surgery.

Methods: A retrospective review of patients undergoing partial or radical nephrectomy for a SRM at our institution between January 2008 and September 2012 was performed. Masses were confirmed on cross−sectional imaging. Inclusion criteria were the presence of masses ≤ 4 cm. Data were collected on age and pathological features of the mass on histopathological examination. The elderly patient population was defined as those ≥ 70 years of age. Chi−square tests were used to compare the pathological features of SRMs between the elderly and younger population.

Results: A total of 587 participants with information available for review were analyzed, with a median age of 61 (range: 15 − 87) years, of which 61.7% (362/587) were males. The mean and median SRM were 2.5cm each (range: 0.1 − 4.0 cm). Most of the participants had partial nephrectomy (90.5%; 531/587). Twenty−one percent (125/583) of tumors were benign. The common histologies encountered were: Clear cell (51.5%), Papillary (19.1%), Oncocytoma (13.5%), Chromophobe (5.6%), Angiomyolipoma (AML; 3.1%), benign cysts (2.6%) and others (4.6%). There were 133 (22.7%) participants aged ≥ 70 years. The age−distribution of the common histologies between participants is as shown in figure 1. Although not statistically significant, participants ≥ 70 years were: less likely to have a malignant pathology (OR = 0.72; P = 0.164) or AML (P =0.079) but were more likely to have oncocytomas (P=0.004). There were no statistically significant differences in the distribution of the other histologies.
**Conclusion:** There appear to be some differences in the histopathological features of SRMs between those ≥ 70 years and those who are younger, with the former more likely to have a benign disease. This information might be useful when counseling elderly patients on the management of SRMs.

Figure 1. Comparison of common histologies of small renal masses by age

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**Poster #152**

**INTEROBSERVER VARIABILITY OF R.E.N.A.L., PADUA, AND CENTRALITY INDEX NEPHROMETRY SCORES**

Massimiliano Spaliviero; Bing Ying Poon; Omer Aras; Pier Luigi Di Paolo; Giuliano B. Guglielmetti; Christian Z. Coleman; Christoph A. Karlo; Melanie L. Bernstein; Daniel D. Sjoberg; Oguz Akin; and Jonathan A. Coleman

Memorial Sloan-Kettering Cancer Center, New York, NY

(Presented By: Massimiliano Spaliviero)

**Objectives:** To assess the interobserver variability of R.E.N.A.L., PADUA, and centrality index (C−Index) nephrometry system among observers with varying degree of clinical experience.

**Methods:** Following Institutional Review Board approval, the records of 90 consecutive surgical patients who underwent Computed Tomography (CT) and partial nephrectomy (PN) at our institution were reviewed. CT images of renal masses were independently scored by 1 radiology fellow (RF), 2 urology fellows (FEL), 1 radiology resident (RES), and 1 non-medical student (NMS) using the R.E.N.A.L., PADUA, and C−Index in blinded fashion. Using RF scores as reference, interclass correlation coefficient (ICC) was calculated to determine the level of agreement within each system among all readers, RF and other physicians (FEL + RES), and between RF and NMS. Confidence intervals (CI) for differences in ICC were estimated using bootstrap resampling. A multivariable linear regression was used to correlate RF scores with ischemia time and post-operative eGFR.

**Results:** The mathematical model C−Index showed the highest level of agreement (ICC = 0.773) amongst readers. A lower ICC of 0.677 was reached with the PADUA system although the difference in ICC (0.096) compared to the C−Index was not significant (95% CI: −0.003, 0.158). Compared to the C−Index, a significantly lower level of agreement (ICC = 0.660) was found with R.E.N.A.L (difference 0.113, 95% CI: 0.011, 0.171). Although NMS had lower agreement with the RF standard compared to that amongst RF and the other physicians (FEL + RES), this was not statistically significant (95% CI for R.E.N.A.L: −0.076, 0.159; for PADUA: −0.116, 0.115; for C−Index: −0.147, 0.133). RF scores on all three scoring systems were significantly correlated with ischemia time (coefficient per R.E.N.A.L. point: 3.38, 95% CI: 2.02, 4.74, p < 0.0001; coefficient per PADUA point: 3.12, 95% CI: 1.68, 4.55, p < 0.0001; coefficient per C−Index unit: −2.41, 95% CI: −3.81, −1.00, p = 0.001). Only RF scores using the C−Index were associated with postoperative eGFR at 6 weeks after adjusting for baseline eGFR (coefficient per C−Index unit: 1.81, 95% CI: 0.12, 3.51, p = 0.036).

**Conclusions:** Scoring systems with more geometrical tumor measurements achieved the highest ICC agreement and predicted for renal function outcomes.
RE-EXAMINING THE OPTIMAL PATHOLOGIC DEFINITION OF A NEGATIVE SURGICAL MARGIN FOR SMALL RENAL MASSES
Helyn Alvarez¹; Lu Wang²; Jingyang Feng²; Maria Picken²; and Gopal Gupta²
¹Loyola Stritch School of Medicine, Maywood, IL; ²Loyola University Medical Center, Maywood, IL
(Presented By: Helyn Alvarez)

Introduction and Objectives: The optimal surgical margin for small renal masses is contested. Enucleation of small renal masses (SRMs) is gaining acceptance as it maximally preserves nephrons. However, there remains a concern for surgeons and pathologists about the oncologic adequacy of enucleation margins. Our objective is to describe, characterize and critically examine the intactness of the pseudocapsule of small renal masses.

Methods: We retrospectively identified 23 SRMs that were extirpated utilizing a robotic assisted enucleation partial nephrectomy technique. Tumor pseudocapsule characteristics in this cohort were compared to a historical cohort of SRMs treated with conventional partial nephrectomy (52 tumors) and radical nephrectomy (78 tumors). All masses were 4cm or less in diameter and histology type examined were clear cell, chromophobe, papillary I or papillary II.

Results: Mean pathological tumor size was 3.1cm (range of 0.5 cm− 4.0 cm). In the enucleation cohort, pseudocapsule thickness range was 0.00mm – 1.10mm. 70% of the tumors had an intact pseudocapsule, 4% had a focal absence of the pseudocapsule but without infiltration into the renal parenchyma and 26% had infiltration through the pseudocapsule. In the partial cohort, pseudocapsule thickness range was of 0.00mm – 2.50mm. 48% of the tumors had an intact pseudocapsule, 12% had a focal absence of the pseudocapsule but without infiltration into the renal parenchyma and 40% had infiltration through the pseudocapsule. In the radical cohort, pseudocapsule thickness range was of 0.00mm – 1.50mm. 54% of the tumors had an intact pseudocapsule, 17% had a focal absence of the pseudocapsule but without infiltration into the renal parenchyma and 29% had infiltration through the pseudocapsule.

Conclusion: The ideal treatment of small renal masses would be maximally nephron sparing and be performed with minimally invasive techniques. Robotic assisted enucleation partial nephrectomy accomplishes these goals. It is important for surgeons and pathologist to understand the characteristics of the pseudocapsule, which constitutes the oncological margin. Results show that the majority of the SRMs have an intact pseudocapsule but further study is warranted.
Poster #154
PREDICTING DRUG RESISTANCE IN METASTATIC RENAL CELL CARCINOMA: PERSONALIZED MEDICINE BY XENOGRAFTING PATIENT TUMORS INTO CHICKEN EMBRYOS
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(Presented By: Clarisse Mazzola)

Introduction and Objective: The prognosis of patients diagnosed with metastatic renal cell carcinoma (mRCC) is generally poor, especially if cancer cells are already or eventually become resistant to targeted therapy. Determining the full range of drug sensitivities and resistance that pre-exist in the RCC tumor cells prior to implementation of targeted therapy in the same patient.

Methods: We developed a patient-derived xenograft model using chicken embryos. Different RCC cell lines (XP127, XP158, XP121, 786-0,...) were tested on our model using two different techniques: primary RCC patient-derived cells engraftment in the chorioallantoic membrane (CAM), and RCC cells vein injections. Each cell line was prepared for xenografting by washing with PBS prior to addition of 0.05% Trypsin+10mM EDTA. Cell pellets were washed with PBS twice. Matrigel (BD Biosciences Inc.) was added to the cell pellet in a 1:1 ratio for the tumor implantation assay and mixed extensively with a filtered tip micropipette. D9 chicken embryos were used for tumor implantation. Regarding the intravenous injection assay, a concentration of 1 million cells per milliliter was used and D12 chicken embryos were used. To evaluate drug sensitivities in vivo, cell lines were pre-treated overnight with 5 microL sunitinib. Intravital imaging was performed to assess tumor size and quantify angiogenesis (tumor microvessel density). Tumor take rates were determined 6-8 days post implantation and 24 hours after vein injections.

Results: Tumor take rates varied amongst cell lines. A representative 786-0 tumor implanted in the CAM is presented in Figure 1 (picture obtained after injection of lectin–rhodamine). XP127’s which are sunitinib resistant maintained a similar level of tumor take (53%) but revealed smaller tumors, whereas XP158’s which are sensitive to sunitinib exhibited a low level of tumor take (13%) compared to its non-treatment control (35%). Further results will be available at the time of the SUO meeting.

Conclusion: Though in this first part of our experiment we only tested sunitinib, we believe our patient-xenograft model could be a useful tool to be able to tailor upfront the best targeted treatment for each patient with metastatic RCC.
Poster Session II – Full Abstracts

Poster #155
THE DEGREE OF PREOPERATIVE HYDRONEPHROSIS PREDICTS ADVERSE PATHOLOGIC FEATURES AND WORSE ONCOLOGICAL OUTCOMES IN HIGH-GRADE UPPER TRACT UROTHELIAL CARCINOMA
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(Presented By: Paul H. Chung)

Introduction and Objective: There have been multiple reports implicating the role of hydronephrosis (HN) as a predictor of outcome in patients diagnosed with upper tract urothelial carcinoma (UTUC). However, this was done in mixed populations (low/high-grade) and degree of HN (DOH) was not taken into account. We evaluated the impact of severity of hydronephrosis on systemic and bladder relapse in patients with UTUC.

Methods: We retrospectively reviewed the records of 141 patients with localized UTUC from our center that underwent extirpative surgery. Preoperative imaging was used to evaluate ipsilateral DOH. We analyzed the association between DOH (none/mild vs. moderate/severe), pathological findings and oncological outcomes in high-grade vs. low-grade patients. Bladder recurrence was assessed separately from local or systemic (L/S) recurrence.

Results: High-grade UTUC was present in 80% of patients, 35% had muscle-invasive disease (≥pT2), and 29% had non-organ-confined disease (≥pT3 and/or positive lymph nodes). At a median follow-up of 34 months (range, 1–149), 35% of patients experienced intravesical recurrence, 20% developed L/S recurrence, and 17% died of UTUC. No difference in outcomes was seen between patients without HN and mild HN. DOH was none/mild in 55% and moderate/severe in 45% of cases. In patients with high-grade UTUC, moderate/severe HN was associated with advanced pathologic stage (P<0.001) and positive lymph node status (p=0.01). On Kaplan–Meier analysis, DOH was a predictor of L/S recurrence-free survival (RFS) (HR 5.5, P=0.019; Figure 1) and cancer-specific survival (CSS) (HR 5.2, P=0.022) but not intravesical recurrence. On multivariable analysis with preoperatively known factors controlling for grade and tumor location, DOH was independently associated with L/S RFS (HR 2.8, P=0.016) and CSS (HR 2.5, P=0.044).

Conclusions: Moderate/severe HN was associated with features of advanced disease and predicted worse oncological outcomes in patients with high-grade UTUC. Since preoperative imaging is a routinely available diagnostic tool, this can serve as a surrogate parameter for advanced disease and can help to counsel patients towards preoperative chemotherapy and radical surgery.
TUMOR COMPLEXITY BY R.E.N.A.L NEPHROMETRY SCORE PREDICTS MALIGNANT DISEASE AND HIGH GRADE PATHOLOGY FOR SMALL RENAL MASSES 3 CM OR LESS IN SIZE

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(Presented By: Andres Correa)

Introduction: The small renal mass poses a diagnostic and management dilemma, as it may represent a wide spectrum of pathologies. Management of these lesions continues to be debated with options including active surveillance, surgical resection or ablation. Recently R.E.N.A.L. Nephrometry score calculator, has been proposed as a useful tool to determine pathology and high grade malignancy. We intend to validate the use of the R.E.N.A.L. Nephrometry score calculator as a predictor of pathology and high grade malignancy in masses 3 cm or less in diameter.

Methods: We retrospectively reviewed patients that underwent surgical resection of renal masses under 3 cm in diameter between 2008 and 2012 at a single institution. Patients with imaging available for analysis were included in the study. Tumor complexity was determined according to the R.E.N.A.L. Nephrometry score calculator. Statistical analyses were performed to test the association between tumor complexity and tumor pathological characteristics. All pathology specimens were reviewed by a single urological pathologist for diagnosis, histological subtype, TNM stage, nuclear grade, angio-lymphatic invasion or extra-capsular extension.

Results: A total 196 renal tumors had histological and radiological information available for analysis. 35 masses were benign (18%), accounting for 19 % of all low and 14% of intermediate complexity masses. Increasing tumor complexity failed to predict malignancy (p=0.385). On subtype analysis high endophytic/exophytic ratio and closeness to the collecting system predicted malignancy (p<0.01). The most common histology was conventional carcinoma accounting for 51% of all low, 65% intermediate and 79% high complexity masses. Fifty masses were found to be high grade (HG) which accounted for 31% of all RCC. On multivariate analysis high complexity R.E.N.A.L. Nephrometry score predicted high grade pathology and clear cell histology (each p<0.05). On subtype analysis of low and intermediate complexity masses, no individual or combination of tumor characteristics predicted HG malignancy.

Conclusions: On evaluation of masses less than 3 cm diameter, R.E.N.A.L. Nephrometry score predicted malignancy on masses highly endophytic and central in nature. High complexity Nephrometry scores predicted HG pathology and clear cell histology when comparing all RCCs. However, R.E.N.A.L. Nephrometry score failed to predict HG pathology when comparing low and intermediate complexity masses.
**Poster #157**

**SNP MICROARRAY GENOMIC ANALYSIS DETECTS CHROMOSOMAL ABERRATIONS ASSOCIATED WITH AN UNFAVORABLE PROGNOSIS IN CLEAR CELL RENAL CELL CARCINOMA**

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(Presented By: James Rosoff)

**Introduction:** Surgical treatment remains the primary intervention for renal cell carcinoma (RCC), though a significant proportion of tumors exhibit recurrence or progression despite adequate local control. Newer immune-based and molecular targeted therapies have shown promise for the treatment of advanced disease states. Nevertheless, overall response remains low. Genomic analysis shows promise for identifying specific chromosomal aberrancies in RCC that have been associated with less favorable outcome.

**Methods:** Between June 2011 and June 2013, 84 patients at our institution underwent partial nephrectomy or radical nephrectomy for RCC. Demographic data and pathologic information were recorded including TNM stage, Furhman grade, and tumor size. Tumor samples were analyzed with high-resolution single nucleotide polymorphism (SNP) microarray (Illumina Omni-1) and assessed for concordance with histological diagnosis. The SNP microarray data was then used to identify specific chromosomal mutations occurring consistently in high-risk patients. Fisher’s exact test was used to compare the rates of chromosomal aberrations with clinical disease status and tumor characteristics.

**Results:** There was concordance between histology and microarray data in 68 of 84 RCC cases (81%). Of the ten truly discordant results, five resulted in a change of histologic diagnosis. The five most common aberrations among 62 cases of ccRCC were: loss of 3p (87% of tumors), loss of 14 (47%), gain of 5q (45%), loss of 8p (40%) and loss of 18q (26%). There was a significant association of chromosome 14 deletion (14−) with pathologic T stage (p=0.004), histologic grade (p=0.013) and disease status (p=0.05). Those patients with locally advanced disease (≥ pT3a) demonstrated loss of 14 in 79% of cases versus 54% with pathologic stage T2b or less. No Fuhrman Grade 1 tumors exhibited loss of chromosome 14 (0 of 1), while 7 of 24 Grade 2 tumors (29%), 14 of 29 Grade 3 tumors (48%) and all six Grade 4 tumors (100%) demonstrated 14−. Furthermore, 10 of 19 patients with 14− (53%) were alive with disease recurrence or had died of ccRCC, while only 4 of 32 without 14− (13%) had evidence of recurrent disease.

**Conclusions:** Microarray detection of chromosomal abnormalities in kidney tumors can be used to clarify histologic diagnoses in RCC. Furthermore, patterns of chromosomal alterations can be used to assess risk and determine prognosis for individual patients.
**Results:** Since December 2012, more than 85 sites in North America and other select countries have been activated and >100 patients have been consented and tumor samples have been successfully collected. To date, nearly 50% of these patients have been excluded after surgery and tumor collection from participation in the treatment phase of the ADAPT study for the following reasons: non-clear cell histology (n=20), cardiac history (n=6), thromboembolic events and initial eligibility criteria (n=4), >4 preoperative risk factors (n=4), as well as other eligibility criteria (n=15) making them unable to initiate treatment with TKIs.

**Conclusions:** Patients with mRCC frequently have features that may prohibit the safe or effective initiation and administration of TKIs. Exclusion criteria have been amended to optimize enrollment. Further details regarding study progress, baseline patient characteristics, eligibility disposition and updated figures will be presented.

**Poster #159**

**TUMOR NECROSIS AND LYMPHOVASCULAR INVASION ARE PREDICTORS OF LYMPH NODE METASTASIS IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA**

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(Presented By: Gautum Agarwal)

**Introduction:** Upper tract urothelial carcinoma (UTUC) is a rare tumor, however when present requires prompt treatment. Currently, there are no accurate preoperative measures of microscopic lymph node metastasis (LNM). Developing better prediction tools to determine those patients at risk for having LNM could affect treatment decisions, whether the patient receives neoadjuvant chemotherapy (NAC) or proceeds first with radical nephroureterectomy (RNU)

**Methods:** We conducted a single institution IRB approved retrospective review of patients at Moffitt Cancer Center who underwent RNU 1990–2012. We identified 120 patients with sufficient data who underwent RNU for UTUC and recorded age, gender, tumor location, tumor size, grade, stage, presence of concomitant carcinoma in situ, lymphovascular invasion (LVI), and tumor necrosis (TN). Descriptive statistics were performed as well as univariate and multivariate analyses utilizing the chi square test and logistic regression, respectively. Statistical significance was set at p ≤ 0.05.

**Results:** The median age at surgery was 71 (IQR 64–78). Forty patients (33.4%) had non–organ confined UTUC and 15 (12.5%) had lymph node positive UTUC. LVI was present in 26 (21.7%) of RNU specimens and TN was identified in 9 (7.5%). On univariate analysis, LVI (p < 0.001) and TN (p = 0.049) were significantly associated with LNM. On multivariate analysis, TN (p = 0.002) and LVI (p = 0.041) were independent predictors of LNM.

**Conclusions:** The two significant pathological variables of TN and LVI, associated with LNM in this study, are also important for other carcinomas. For bladder, penile, and testicular cancers LVI has been found to be a high risk feature. These findings for other carcinomas are translatable to UTUC. Understanding the factors associated with LNM may allow for better preoperative staging with ureteroscopic biopsy to check for LVI and/or TN as well as more scrutiny of the preoperative imaging for signs of necrosis to aid in selecting patients who may benefit from NAC as well as extended lymphadenectomy at the time of surgery.
Poster #160
TRENDS IN THE UTILIZATION OF DIAGNOSTICS FOR UPPER TRACT UROTHELIAL CARCINOMA
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(Presented By: Goutham Vemana)

Introduction: The evolution and adoption of better endoscopes and imaging allow for improved diagnostic capacity for upper tract urothelial cancer (UTUC). We evaluated the changes in diagnostic modalities used to establish a diagnosis of UTUC. Additionally, we assessed how these changes affected the stage of patients receiving definitive surgery.

Methods: Using linked SEER–Medicare data from 1992–2009, we identified patients between the age of 66–90 who underwent surgical treatment for UTUC. Among this cohort we assessed the types of diagnostics: endoscopy, computed tomography urogram (CTU), magnetic resonance urography (MRU), intravenous pyelogram (IVP), and retrograde pyelogram (RGP), used to evaluate their disease. Additionally, we dichotomized the final stage at surgery as lower stage disease (Ta, CIS, or unknown stage) or higher stage disease (T1 or greater). Tests for trend were calculated for the five diagnostic modalities. Logistic regression models were fit to determine the impact of diagnostic modalities on stage at surgery.

Results: We found a downward trend in utilization of IVP and RPG over time (p < 0.001) with IVP having largest decline in use (Figure1). Endoscopy, CTU, and MRU all demonstrated increased utilization over time (p <0.0001). The incidence of lower stage disease is also increasing (p = 0.0246). However, regression analysis suggests endoscopy and use of CTU and MRI were not significantly associated with lower stage disease at definitive surgery (p=0.26 and p=0.17 respectively).

Conclusions: Modern diagnostics (endoscopy, CTU, MRU) have supplanted traditional methods of establishing a diagnosis of UTUC. Although these newer adopted technologies have a greater sensitivity in diagnosis of UTUC, other factors are contributing to the lower stage of patients at definitive surgery.
Poster #161
PENILE CANCER MANAGEMENT TRENDS IN THE U.S. 2000-2010
Elizabeth Ferry; and Hui Zhu
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(Presented By: Elizabeth Ferry)

Introduction: Penile cancer is a rare cancer in the U.S., but a significant source of morbidity and mortality for those affected. There is known variation in the incidence and survival rates within the U.S., but no overall improvement in survival rates since 1990. The cause for this stagnation is unknown, however, potential sources include understaging and undertreatment, particularly in the community based hospitals.

Objectives: This study aims to assess the trend in the stage-dependent surgical treatment from 2000 – 2010, as well as to determine if there is variability in the choice of surgical management based on the type of treating hospital.

Methods: The National Cancer Database online database was queried. Diagnosis by year, first course surgery by stage, in all hospitals from 2000 – 2010 was first obtained. Data was grouped into No Surgery, Penile Sparing (local tumor destruction, local tumor excision, and simple/partial surgical removal of primary site), Partial Penectomy, and Total Penectomy (surgery stated to be debulking, and radical surgery). Data was then obtained for first course surgery by stage in community hospitals (C), comprehensive centers (CP), and teaching research hospitals (TR), individually. Groups were similar as above, with the exclusion of the No Surgery group.

Results: There were 1405 patients with recorded first course surgical treatments in community hospitals, 3930 in comprehensive hospitals, and 3667 in teaching research hospitals. Graphically, there has been no change in the trend in the surgical management of penile cancer from 2000 – 2010 in high or low stage penile cancers. Consistent use of penile-sparing techniques in all hospitals in lower stages, and variable, but high, utilization of penile-sparing techniques for more advanced stage penile cancer between hospital types is observed (Figure).

Conclusions: Corresponding to the stagnation in the survival rates of penile cancer, the surgical management trends have not changed over the past decade. Contrary to 2013 NCCN Guidelines, penile-sparing surgery continues to be performed in all types of treating hospitals for higher stage penile cancers, which may represent an undertreatment of potentially fatal penile cancers.
SURGICAL EXCISION OF INTRAMURAL URETER AND A BLADDER CUFF DURING NEPHROURETERECTOMY IS AN INDEPENDENT PREDICTOR OF ONCOLOGICAL OUTCOMES IN PATIENTS WITH UPPER TRACT UROTHELIAL CARCINOMA

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(Presented By: Laura-Maria Krabbe)

Introduction and Objectives: Radical nephroureterectomy (RNU) with removal of the ipsilateral ureter with a bladder cuff is the current gold standard of treatment for patients with upper tract urothelial carcinoma (UTUC). With recent developments in minimally invasive surgery, new techniques for management of the distal ureter have been developed. The objective was to evaluate the impact of distal ureter management on oncological outcomes (intravesical recurrence, non-intravesical recurrence and cancer-specific survival) in patients with RNU for UTUC.

Methods: Retrospective review of patient records and operative reports was performed on 122 patients that received RNU. Data was compared between two groups using substratification by distal ureter management (transvesical bladder cuff (TVBC) versus non-transvesical bladder cuff (NTVBC)).

Results: Mean patient age was 69.0 years and 63.1% were male. Median follow-up was 32.0 months. The majority of patients (n=76, 62.3%) received a TVBC and 46 (37.7%) patients received NTVBC during RNU. There were no significant differences in clinical-pathological variables between both groups except for a higher rate of lymphadenectomy during surgery in the TVBC group (38.2 vs. 15.2%). On multivariate analysis intravesical recurrence (IVR) was not affected by distal ureter management, but was affected by tumor multifocality (HR 2.2, 95%CI 1.2–4.0, p=0.013). However, non-intravesical recurrence-free survival (non-IV RFS) and cancer-specific survival (CSS) were independently influenced by T-stage (HR 4.9, 95%CI 1.5–16.3, p=0.010 for non-IV RFS and HR 6.3, 95%CI 1.7–23.1, p=0.005 for CSS) and management of the distal ureter (HR 3.2, 95%CI 1.3–8.8, p=0.010 for non-IV RFS and HR 3.4, 95%CI 1.3–8.8, p=0.010 for CSS).

Conclusions: In our study, surgical management of the distal ureter without excision of a TVBC resulted in significantly worse non-IV RFS and CSS but had no influence on IVR. This is hypothesis generating and supports further prospective study as to standardization of bladder cuff resection during RNU.

Financial funding: none
Poster #163
READABILITY OF ONLINE UROLOGIC ONCOLOGY PATIENT EDUCATION MATERIALS
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(Presented By: Josip Vukina)

Introduction and Objectives: With over 80% of Americans using online resources for health information, the importance of patient education materials (PEMs) cannot be overstated. Health literacy research suggests that materials should be provided at or below the seventh grade reading level, but actual reading levels are often found to be much higher. Our objective was therefore to determine the readability (by grade level) of online PEMs from reputable oncologic websites with stratification by cancer type and information category.

Methods: PEMs for bladder, kidney, prostate, and testicular cancer were obtained from the American Cancer Society, American Society of Clinical Oncology, National Cancer Institute, and the AUA Urology Care Foundation. Further information was gathered from the Bladder Cancer Advocacy Network, Prostate Care Foundation, Kidney Cancer Association, and Testicular Cancer Resource Center. Text from each website was analyzed using Readability Studio, a software package that determines readability grade level. Mean scores were calculated for each cancer type, and stratified by information category (i.e. general, causes/risk factors, diagnosis and staging, treatment, and post-treatment).

Results: Overall, mean grade level for all cancer types was 11.63, ranging from 11.13 for kidney cancer to 12.05 for prostate cancer. With respect to information category, “Causes, risk factors and prevention” (12.26) and “Treatment” (13.02) demonstrated the highest reading levels with “General” (10.78) and “Diagnosis and Staging” (10.79) the lowest. Readability grade levels for categories stratified by cancer type are shown in the chart below. When evaluating cancer information readability by website, average readability score was lowest for the American Cancer Society (9.94) and highest for the AUA Urology Care Foundation (13.44).

Conclusions: Readability grade level among urologic oncology PEMs is higher than health literacy recommendations, with the most difficult information categories including “Causes, risk factors and prevention” and “Treatment.” PEMs must be simplified to enable better patient understanding of urologic oncology information.
Poster #164
LESION-BASED COMPARISON OF THREE MULTI-PARAMETRIC MRI SCORING SYSTEMS FOR THE DETECTION OF PROSTATE CANCER ON MR/TRUS FUSION BIOPSY
Nikhil Waingankar¹; Simpa Salami¹; Mathew Fakhoury¹; Arvin George¹; Oksana Yaskiv¹; Baris Turkbey²; Eran Ben-Levi¹; Robert Villani¹; Karin Beecher¹; Robert Moylan¹; Nancy Lee¹; Louis Kavoussi¹; David Siegel¹; and Ardeshir Rastinehad¹
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(Presented By: Nikhil Waingankar)

Introduction: Multiparametric MRI (MP−MRI) of the prostate has evolved into an effective tool in the detection and staging of prostate cancer. Three scoring systems have previously demonstrated utility in risk stratification of patients: Prostate Imaging Reporting and Data System (PI−RADS), 5 point Likert scale, and the NIH MP−MRI cancer suspicion scoring systems. The purpose of this study is to compare MP−MRI scoring systems for their ability in detecting prostate cancer in targeted lesions

Methods: All patients underwent MP−MRI of the prostate, including tri−planar T2−weighted, dynamic contrast enhanced (DCE), and diffusion−weighted imaging. Images were read by 3 experienced GU radiologists (AR, RV, EBL), who assigned scores using a 5 point Likert scale, PI−RADS score, and modified NIH scoring system. The modified NIH scoring system is based on lesion suspicion in each phase, with overall suspicion classified as low, moderate or high. PI−RADS and the 5 point Likert scores are based on the 2012 ESUR guidelines. Patients with suspicious findings underwent MR/TRUS fusion−guided biopsy and standard 12−core biopsy. All imaging scores and biopsy results were recorded in our prospectively collected database, and included in a multivariate model with PSA, free PSA, PSA velocity, PSA density, family history, prior negative biopsy, suspicion on DRE, target lesion volume, age, and race. Sensitivity, specificity, and receiver operating characteristic (ROC) analyses were performed to compare all scoring systems.

Results: 105 participants underwent MR/TRUS fusion−guided biopsy of 153 lesions and had both radiological and histological data for analysis. 77 lesions were noted to be negative and 76 were positive. On multivariate analysis, each scoring system was found to be an independent predictor of cancer: PI−RADS (p<0.0001), NIH (p=0.0001), and lesion suspicion score (p<0.0001). ROC analysis demonstrated AUC of 0.76, 0.71, and 0.68 for lesion suspicion score, PI−RADS, and NIH scores, respectively (p=0.07).

Conclusions: Lesion suspicion score, PIRADS score, and NIH cancer suspicion scoring systems all have clinically acceptable sensitivity and specificity in detecting prostate cancer on MP−MRI. ROC analysis demonstrates no significant differences among the three scoring systems. MP−MRI is a useful adjunct study in the workup of prostate cancer patients, and serves as an important platform to guide further diagnostic evaluation with MR/TRUS fusion−guided biopsy.

Poster #165
COMPARISON OF TOXICITY BETWEEN SINGLE MODALITY RADIATION THERAPY AND COMBINED MODALITY RADIATION THERAPY AMONG LOW RISK PROSTATE CANCER PATIENTS
Jeffrey Tomaszewski; Renjian Jiang¹; Kevin Ward¹; and Daniel Canter²
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(Presented By: Jeffrey Tomaszewski)

Introduction: Radiation related toxicities can greatly impact health related quality of life. We compare radiation related toxicities among men over the age of 65 with low−risk prostate cancer (PC) treated with single or multimodal radiation therapy.

Methods: The Surveillance, Epidemiology and End Results (SEER)−Medicare linked database was used to analyze 5089 men over the age of 66 with low−risk, clinically localized PC treated with brachytherapy (BT), external beam radiation therapy (EBRT), or combined therapy between 2004 and 2007. Multivariate logistic regression was used to assess the relationship between treatment type and toxicity.

Results: Overall 2231 (43.8%), 2206 (43.4%), and 652 (12.8%) patients were treated with EBRT, BT, and combined therapy, respectively. A significant regional difference in utilization of radiation by modality was observed (p<0.01), and patients in Atlanta (48.3%), rural (52.9%) and greater California (2.7%) were least likely to receive combination therapy. African American men (11.4% vs. 8.7% [EBRT] and 7.4% [BT]; p<0.001) and married men (82.5% vs. 75.4% [EBRT] and 80.6% [BT]; p<0.001) were more likely to be treated with combined modality therapy. Patients treated with combined modality therapy experienced significantly higher rates of GU Incontinence (55.5% vs. 29.1% [EBRT] and 48.6% [BT]; p<0.01), GU Obstruction (21.5% vs. 14.5% [EBRT] and 19.8% [BT]; p<0.01), and Erectile Dysfunction (22.4% vs. 15.0% [EBRT] and 21.7% [BT]; p<0.01). Following adjustment, EBRT was associated with a significant protective effect against GI Bleeding (OR 0.60 [CI 0.42−0.85]), GU Cystitis (OR 0.38 [CI 0.21−0.70]), GU Incontinence (OR 0.35 [CI 0.29−0.42]), GU Obstruction (OR 0.60 [CI 0.48−0.76]) and ED (OR 0.66 [CI 0.52−0.83]) when compared to combination therapy.

Conclusions: Men with clinically localized low−risk PC have high rates of cancer−specific survival regardless of treatment type. The use of combined modality radiation therapy in such patients is discordant with clinical guidelines and associated with a significantly increased burden of associated toxicity when compared to radiation monotherapy. Prudent patient selection and judicious use of combined therapy among men with clinically localized low−risk PC represents a targetable area to reduce the burden of overtreatment.
COMPARISON OF MRI/US FUSION PROSTATE BIOPSIES OBTAINED FROM AXIAL AND SAGITTAL APPROACHES

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(Presented By: Cheng Hong)

Objective: Magnetic resonance imaging/ultrasound (MRI/US) fusion systems target suspicious prostate MRI lesions to improve cancer detection. However, the influence of transducer geometry on diagnostic yield, Gleason scores, and percentage of positive core length is unknown. Cores obtained from axial and sagittal approaches in an end−fire transducer were compared.

Methods: 855 patient encounters were enrolled in an IRB−approved clinical study of MRI/US fusion biopsy between 8/2008 − 3/2013. Eligible patients had clinical suspicion or a history of prostate cancer. Repeat encounters and patients with prior therapy were excluded, leaving 719 patients for analysis. Multi−parametric MRI was used to assign a suspicion level based in part on the number of positive sequences. Two cores were obtained from each lesion using the fusion platform: one in the axial plane and one in the sagittal plane. Cancer detection rates, Gleason score, and percentage of positive cores were compared. Subjects also underwent standard of care 12−core systematic biopsy. Detection rates were compared using the two one−sided test for equivalence testing, using a tolerable difference of 5%.

Results: The median age was 62 years (IQR 57 − 67), with a median PSA level of 6.6ng/ml (IQR 4.2 – 10.9). Of 1736 graded lesions, 29.5% were graded as low suspicion lesions, 59.9% as moderate suspicion, and 10.7% as high suspicion. The detection rates for axial and sagittal biopsy overall and for low, moderate, and high suspicion were 26.6% vs. 27.4%, 9.6% vs. 9.4%, 28.3% vs. 28.6%, and 73.5% vs. 70.8%. Overall agreement was 89.1% (kappa = 0.73). Detection rates overall, and for low and moderate suspicion, were statistically equivalent. Axial biopsies detected 154 low, 188 moderate, and 130 high Gleason score tumors, whereas sagittal biopsies did for 152, 180, and 142 respectively. The core was at least half tumor in 43.8% of axial cores and 44.3% of sagittal cores. Subgroup analyses by suspicion levels also showed comparable results.

Conclusion: The detection rates of MRI/US fusion biopsies are statistically similar regardless of the imaging approach used, and when positive, yielded comparable Gleason scores, and percentages of positive cores.
INTRODUCTION: Observed differences in incidence and disease aggressiveness of prostate cancer at presentation suggest different pathways of carcinogenesis between African American and Caucasian American men. ERG is the most common oncogene expressed in prostate cancer. Prior studies suggested that ERG is more common in prostate cancer of Caucasians than in African Americans. Recent studies also suggest that SPINK1, the gene that encodes tumor-associated trypsin inhibitor, is common in ERG negative cancers. We sought to describe the expression of ERG and SPINK1 in the proteome of higher grade prostate cancer, stratified by race.

METHODS: The Center for Prostate Disease Research database was queried to identify patients with higher grade disease who underwent radical prostatectomy, and clinical data from 1304 patients were evaluated. Selected patients had a Gleason score of 8−10 or 4+3 disease. A total of 63 African Americans met study criteria and 63 Caucasians were matched against them. Immuno−histochemistry was performed to detect ERG and SPINK1 oncoprotein in representative whole mount prostate specimens.

RESULTS: The index tumor was ERG positive in 41 of 126 patients (33%), and SPINK1 positive in 72 of 126 (57%). The frequency of ERG positive index tumors in higher grade disease was significantly greater among Caucasian men compared to African American men (49% vs.16%, P < .0001), whereas SPINK1 was more common among African American men (65% vs. 49%, P = 0.07). ERG and SPINK1 positivity were not predictive of biochemical recurrence, but SPINK1 was identified in 2 of 7 patients with cancerous lymph nodes. Overall, ERG and SPINK1 expression varied greatly across ethnicity in this higher grade cohort, and SPINK1 was present in a much greater proportion of patients than previously reported.

CONCLUSION: Our study underscores that molecular typing of prostate cancer and identification of race may enhance our understanding of phenotypic variations and outcomes.
Poster #168
IS CLINICAL STAGE T2C PROSTATE CANCER INTERMEDIATE- OR HIGH-RISK DISEASE?
Zachary Klaassen¹; Abhay A. Singh²; Lauren Howard³; Martha K. Terris⁴; William J. Aronson⁵; Matthew R. Cooperberg⁶; Christopher L. Amling⁷; Christopher J. Kane⁸; Lionel L. Banez⁹; and Stephen J. Freedland⁹
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(Presented By: Zachary Klaassen)

Introduction and Objectives: Clinical stage T2c (cT2c) is an indeterminate factor in the algorithm for prostate cancer (CaP) risk stratification. According to the D’Amico risk stratification and the AUA guidelines, cT2c is high−risk, whereas the NCCN and EUA classify cT2c as intermediate−risk. Since determining whether cT2c is intermediate− or high−risk has implications for treatment, it is important to define what exact risk cT2c portends. Thus, we sought to assess whether cT2c tumors, without associated other high−risk factors (cT2c not otherwise specified (cT2c−nos)), behave as intermediate− or high−risk by analyzing biochemical recurrence (BCR) after radical prostatectomy (RP).

Methods: We retrospectively analyzed 2759 men who underwent RP from 1988 to 2011 from the Shared Equal Access Regional Cancer Hospital (SEARCH) database. Comparisons in time to BCR between cT2c−nos patients and intermediate−risk (PSA 10−20 ng/ml or Gleason sum (GS) =7 or cT2b), and high−risk (PSA>20 ng/ml, GS 8−10, cT3) patients was performed using log−rank test and Cox proportional hazards analyses. Given changes in CaP, we adjusted for year of surgery (continuous) and to adjust for case mix among centers contributing to SEARCH we included a categorical term for center.

Results: A total of 99 men (4%) were classified as cT2c−nos. During a median follow−up of 66 months (IQR: 34−101 months), cT2c−nos patients had similar BCR risk as intermediate−risk (p=0.27), but significantly lower BCR risk versus high−risk patients (p<0.001, Figure). After adjusting for year and center and compared to low−risk disease, the HRs for cT2c−nos patients was similar to those with intermediate−risk (HR 1.90 vs. 2.28). When specifically compared to intermediate− and high−risk patients, and after adjusting for year and center, cT2c−nos patients had outcomes comparable to intermediate−risk (p=0.44), but significantly better than high−risk patients (HR 0.55; 95%CI 0.38,0.78; p=0.001).

Conclusions: BCR risk for patients with clinical stage T2c was comparable to men who had intermediate−risk disease and significantly better than men with high−risk CaP. These findings suggest men with cT2c disease should be offered treatment options for intermediate−risk CaP.
**Poster #169**

**FDG-PET/CT IS AN INTEGRATIVE PROGNOSTIC AND STAGING IMAGING TECHNIQUE TO EVALUATE BIOLOGICAL HIGH RISK PROSTATE CANCERS BEFORE LOCAL THERAPIES**

Frederic Pouliot; Jean-Mathieu Beauregard; Annie-Claude Blouin; Vincent Fradet; Yves Fradet; Louis Lacombe; Claude Lemay; Rabi Tiguert; and Thierry Dujardin
Laval University, Quebec, Canada
(Presented By: Frederic Pouliot)

**Objective:** For many cancers, FDG–PET/CT staging accuracy is accepted but not for prostate cancers (PCa). Recently, FDG–PET/CT potential for recurrent and metastatic PCa staging was renewed. We therefore hypothesized that FDG–PET/CT might be useful in the pretreatment evaluation of biological high risk PCa before local therapies.

**Methods:** Fifty-four patients with Gleason sum ≥8 at biopsy underwent a FDG–PET/CT and a bone scan as an initial staging procedures. 41 underwent radical prostatectomy (RP) and pelvic lymph node (LN) dissection, while 13 patients underwent non–surgical treatments. FDG–PET findings (Increased uptake and SUVmax) were correlated with clinicopathological characteristics at RP.

**Results:** At biopsy, 73 and 27% of patients had Gleason sum 8 and 9, pre–operative PSA was 16 ng/mL (median = 7.5) and 34, 34, 26 and 6% of patients had clinical stages T1, T2, T3 or T4. Increased FDG uptake was found in the prostate, LN and bones in 44, 15 and 6% of patients. Average intraprostatic SUVmax was 4.5±3.8. After RP pathological specimens correlation with PET findings, sensitivity, specificity, positive and negative predictive values were 27, 100, 100 and 78% for LN metastasis. Higher clinical stage, pathological Gleason sum and pattern and the percentage of cancer were significantly associated with intraprostatic FDG uptake (IPFU) (all p < 0.037). Patients without IPFU were downgraded to Gleason ≤ 7 in 72.4% of cases at RP (vs 18.4% with IPFU, p=0.0001). No patients with IPFU had primary pattern 3 had RP pathology. On average, patients with Gleason ≤7 at final pathology had a SUVmax of 3.53 ± 1.32 while patients with Gleason>7 had a SUVmax of 6.62 ± 6.25 (p=0.020). Using a SUVmax threshold of ≥4 for intraprostatic index lesion, SUVmax≥4 was statistically associated with Gleason sum ≥ 8 and to a higher percentage of intraprostatic cancer. Index lesion SUVmax≥4 could also predict pathological Gleason ≥ 8 with a sensitivity, specificity, PPV and NPV of 66.7, 76.9, 57.0 and 83.3 %, respectively. Finally, presence and absence of IPFU were associated with a 5y–cancer–free survival probability of 26.9 and 70.2 % (p<0.05), respectively, using the post–RP CAPRA–S predicting tool.

**Conclusions:** Our results suggest for the first time that FDG–PET/CT can predict intraprostatic pathological downgrading and may predict failure to RP. These results also suggest a dual prognostic and staging role for FDG–PET/CT in high–risk PCa imaged before local therapies.

**Poster #170**

**ADOPTION OF ROBOT-ASSISTED SURGERY AND ITS IMPACT ON TREATMENT PATTERNS FOR NEWLY DIAGNOSED LOCALIZED PROSTATE CANCER**

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(Presented By: Scott Eggener)

**Introduction:** The number of U.S. hospitals that acquired robotic surgical systems grew from less than 50 in 2001 to 1,400 in 2009. Our objective was to examine the association between increasing number of robotic surgical systems and the treatment patterns for localized prostate cancer.

**Methods:** We obtained state–level data of patients with newly diagnosed stage I–III prostate cancer using National Cancer Database, 2002–2010. We then characterized the state–level treatment pattern as the proportion of patients having surgery, radiation and expectant management as their first course of treatment and applied regression analyses to examine the association between the number of machines and treatment pattern.

**Results:** Between 2002 and 2010, the average number of robotic systems per state increased from 2 to 26.3, while the rate of surgery increased from 37.5% to 52.4%, radiation therapy decreased from 43.3% to 30.2%, and expectant management increased from 7.0% to 9.3%. For every 10 additional robotic systems installed in a state, there was a 2.5% increase in rates of surgery (p<0.01), accompanied by a 1.4% (p=0.02) and 0.9% (p=0.01) decrease in the rate of radiation and expectant management, respectively. Subgroup analyses suggest that the crowding–out of radiation and expectant management by robotic adoption was observed primarily in men with stage I/II (organ confined) prostate cancer.

**Conclusion:** During a period of rapid acquisition of robotic systems, we found the number of machines available at the state–level was significantly associated with higher rates of surgery for localized prostate cancer, and lower rates of radiation therapy and expectant management.
A PHASE I STUDY OF TC-99M-MIP-1404 SPECT/CT TO IDENTIFY AND LOCALIZE HIGH-GRADE CANCER IN THE PROSTATE GLAND

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¹Vanguard Urology, Houston, TX; ²University of Texas Medical School, Houston, TX; ³Vanguard Urologic Institute, Houston, TX; ⁴Progenics Pharmaceuticals, Inc. Tarrytown, NY
(Presented By: Kevin Slawin)

Introduction: Management of prostate cancer requires accurate assessments of the presence, location, grade and extent of the disease. Overtreatment of indolent disease and underestimation of aggressive small volume disease is a major concern. Improved imaging techniques that can reliably detect and characterize early disease are needed. Novel, highly-targeted molecular imaging agents have shown promise in detecting and discriminating low volume metastatic disease. In this Phase I study, SPECT/CT imaging of 99mTc−MIP−1404, a small−molecule which binds to PSMA, was compared with step−section histopathology in 8 patients (pts) undergoing radical prostatectomy.

Methods: 9 pts were enrolled. One pt was excluded because prostatectomy was not performed. For each patient, target to background ratios (T:B) were calculated in 6 segments of the prostate gland from SPECT/CT of the pelvis acquired 2 hrs after injection of 20mCi of 99mTc−MIP−1404. Imaging results in segments and right and left lobes were compared with Primary Gleason Grades (PGG) and total Gleason Scores (GS) recorded by a blinded pathologist, using the same 6−segment template. Sensitivity, specificity, accuracy for a T:B threshold of 5.9 were calculated by a receiver operator characteristic in segments.

Results: SPECT/CT imaging with 99mTc−MIP−1404 correctly identified the presence of primary prostate cancer in 8/8 pts. Imaging discriminated high−grade prostate cancer (GS ≥ 7) from moderate and low−grade (GS < 7) or no disease with an accuracy of 93.8% in lobes and 81.3% in segments. Accuracy increased to 89.6% in segments with dominant primary lesions with PGG <4 or ≥4 (see table below).

Conclusions: In this study, SPECT/CT imaging with 99mTc−MIP−1404 and a calculated T:B threshold of 5.9 accurately characterized segments of the prostate gland with moderate or low−grade or no disease from those containing higher−grade disease. This technology has previously shown promise in identifying metastatic lesions, and together with these results, suggest that this approach has the potential to provide prognostic information for both local and distant disease in a single scan, which may be valuable in aiding clinical decision making.

<table>
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<tr>
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<th>Lobe (Gleason Score ≥7)</th>
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<th>Segment (Dominant Grade ≥4)</th>
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<td>89.3</td>
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<tr>
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<td>81.3 (39/48)</td>
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<td>AUC ± SE</td>
<td>0.969 ± 0.04</td>
<td>0.870 ± 0.05</td>
<td>0.942 ± 0.04</td>
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*99mTc-MIP-1404, H&E Staining, PSMA Expression
Poster #172

ASSESSING THE IMPACT OF A GENOMIC CLASSIFIER ON POSTOPERATIVE PHYSICIAN DECISION-MAKING FOR PROSTATE CANCER PATIENTS IN CONTEMPORARY CLINICAL MANAGEMENT

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(Presented By: Ketan K. Badani)

Introduction and Objective: Current clinical guidelines recommend adjuvant radiation for men with adverse pathology (pT3 or positive surgical margin disease). In reality, clinical management is highly variable and inconsistent among practitioners. This prospective, multi-center study examines the impact of the Decipher™ genomic classifier (GC) on physician decision-making for postoperative prostate cancer patient management. Obtain a census of contemporary patient management for patients recommended by guidelines for adjuvant radiation and compare it to a new clinical paradigm that incorporates genomic information.

Methods: A prospective, pre-post design was used to assess urologist treatment recommendations for adjuvant radiation candidates. Study participants included twelve urologists from 11 US institutions (private practice and community hospitals). A pre-specified interim analysis was conducted for 132 treatment recommendations based on evaluation of 11 patients with adverse pathology (>64 years at diagnosis) treated by one of the study participants. Treatment recommendations were obtained for contemporary management (pre-GC) initially and then after the GC results were provided for the same de-identified cases (post-GC). Presentation of patient cases was randomized to minimize recall bias.

Results: A total 32.6% (95% CI: 25–41%, 99.5% CI: 22–44%) of recommendations changed following review of GC results. Specifically, among case evaluations with a pre-GC recommendation involving treatment, 33.3% (95% CI: 23–45%) of recommendations changed to observation post-GC. Notably, for case evaluations with a pre-GC recommendation of radiation alone (n=56), 39% (95% CI: 27–53%) changed to observation post-GC. Among the case evaluations where observation was initially chosen (n=64), treatment was recommended for 15.6% of case evaluations post-GC, equally divided between radiation therapy alone and radiation combined with hormone therapy. Further a trend was visible that knowledge of the GC results improved the consistency for observation and radiation treatment recommendations among physicians.

Conclusions: The additional genomic information provided by GC impacts physician treatment recommendations in contemporary settings. Furthermore, these interim findings confirm the results of the DECIDE study, that knowledge of the Decipher test significantly changes urologist’s postoperative treatment decisions in the adjuvant setting for a Medicare population.
Introduction: Majority of patients undergoing prostate biopsy because of elevated PSA have negative results. This is because a standard 12–core biopsy with an 18–gauge needle samples only about 0.04% of the prostate. In this study, we sought to evaluate the cancer detection rate of MRI/TRUS fusion–guided prostate biopsy platform in patients with at least one previous negative prostate biopsy.

Methods: A total of 105 patients were enrolled into MRI/TRUS fusion–guided prostate biopsy trial. Of these, 56 patients had a history of previous negative prostate biopsies. These men underwent a 3T pelvic MRI with endorectal coil including a T2, DWI, and DCE sequences. Three radiologists (EB, RV, AR) reviewed and interpreted the MRI images. Lesions identified on MRI were graded by number of positive sequences: low (<2), moderate/high suspicion (3). The MR/TRUS fusion tracking system (UroNav, Gainesville Fl) was used to perform the fusion–guided prostate biopsies. The ‘protocol’ biopsy included a standard 12–core biopsy and the MR/US fusion biopsy of the suspicious MR targeted lesions. Our institution’s pathologist reviewed all biopsy slides.

Results: Among those with and without cancer, the mean age was 66.5 and 63.8 years respectively (P=0.0512). Similarly, the mean PSA were 11.9 and 9.4 ng/mL respectively (P > 0.05) Of the 56 patients with previous negative biopsy, 64.3 % (36/56) were diagnosed with CaP. The number of previous negative biopsy was not predictive of CaP on biopsy (Mean 1.75 in each group; P > 0.05). Fifteen patients were classified as low suspicion by MRI, of which 5 patients (33.3%) were found to have Ca. However, only 13.3% (2/15) were clinically significant. Also 41 patients were classified as moderate/high suspicion by MRI, of which 31 (75.6 %) patients were found to have cancer. The odds ratio (OR) of finding CaP on biopsy with a moderate/high suspicion on MRI by NIH criteria was 6.2 (95% CI of OR: 1.7, 2.5; P =0.0038). MR/TRUS–fusion biopsy missed 10 CaP detected by standard 12–core biopsies, but only 3 (30%) of these were clinically significant. Conversely, of the 11 CaP missed by standard 12–core biopsies but detected by fusion biopsy, 9 (81.8%) were clinically significant.

Conclusion: The MR/TRUS fusion–guided biopsy platform can improve prostate cancer detection in patients with a previous negative biopsy, especially clinically significant prostate cancer; and may help avoid unnecessary repeat biopsies.
Introduction and Objectives: Due to the inability to predict progression and need for treatment, patients with low-risk prostate cancer (LRPC) managed by active surveillance (AS) are subjected to repeated biopsies and their possible complications. We developed a nomogram predicting the risk of progression in patients on AS for LRPC.

Methods: A retrospective review of all patients enrolled in an AS program at Memorial Sloan-Kettering Cancer Center (MSKCC) between 1993 and 2012 was conducted. Demographic, clinical, and pathologic data for patients who met the inclusion criteria for AS (cT1 or cT2a, prostate-specific antigen [PSA]<10, Gleason≤6, no more than 3 positive biopsy cores and no >50% involvement of any single core) on the diagnostic and the confirmatory biopsies were collected and used to develop a nomogram for predicting progression-free probability. Multivariable logistic regression analysis was used to model the association between each risk variable (age, PSA levels, clinical stage, biopsy features) and disease progression. Progression was defined as failure to meet the inclusion criteria during follow up.

Results: A total of 1095 patients were enrolled in an AS program at MSKCC during the study period, of which 680 met the inclusion criteria for AS on both the diagnostic and the confirmatory biopsies and had available follow-up. At a median follow-up of 3 years 101 patients progressed. A nomogram predicting the progression–free probability is presented in Figure 1. A concordance index of 0.596 was calculated.

Conclusions: Conditioned upon external validation, this nomogram can be used to counsel patients on their risk of progression and their surveillance protocol can be adjusted appropriately, possibly avoiding unnecessary biopsies and preventing biopsy-related complications.
Poster #175
MORTALITY BENEFIT OF SCREENING MEN WITH A FAMILY HISTORY OF PROSTATE CANCER AS A SURROGATE FOR HIGH GENETIC RISK IN THE PLCO TRIAL
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(Presented By: Michael A. Liss)

Objectives: The United States Preventative Services Task Force recently recommended against PSA screening, while the American Urologic Association (AUA) currently recommends screening particularly for men to be at high-risk. We investigate the effect of screening genetic high-risk men on prostate cancer (PCa) mortality.

Methods: Following IRB approval, we obtained data from a large, randomized PCa screening study (PLCO). High-risk men were defined as those with positive family history of PCa. Our primary outcome was PCa specific mortality and primary intervention was PSA based screening. Statistical analysis includes Kaplan–Meier log rank and associated cox proportional hazards.

Results: We identified 73,200 men with complete data from the PLCO trial. A total of 297 (0.4%) study subjects died of PCa. The median age was 62 (range 29–78) with median follow up of 12.6 (range 11.3–13.3) years. Overall 8,432 (11.3%) subjects were high-risk with 5326 (6.9%) having a family history of PCa. Subjects with less known inheritance included 8909 men (23%) who did not have a brother and 1217 men (1.6%) who did not know their family history. As previously reported, screening did not improve mortality in the trial (0.4% vs. 0.4%, log–rank p=0.800). The most significant factors of PCa mortality in the cohort were age at entry (HR 1.13, 95% CI 1.11–1.16; <0.001), self-declared black race (3.02, 95%CI 2.05–4.44;p<0.001) and a trend for number of family members with PCA (HR 1.34, 95%CI 0.95–1.88; p=0.096). We then investigated only those men with a family history of PCa to determine the effect of screening. We noted a trend to significant benefit of PSA-based screening in these men (log–rank; p=0.057) compared to those with no family history (log–rank; p=0.761).(Figure 1). Screening provided a 50% (HR 0.48, 95% CI 0.22–1.07; p=0.072) reduction in prostate cancer death but did not reach statistical significance.

Conclusions: These data support the AUAs position and suggest that screening men at genetic high-risk to PCa may yield benefits in terms of PCA mortality. Given that only 7% of men had a family history, newer biomarkers are needed to better identify those men who would benefit most from PCa screening.
Poster #176
PELVIC EXENTERATION IN PATIENTS WITH NON-METASTATIC, LOCALLY ADVANCED CASTRATION-RESISTANT PROSTATE CANCER
Timothy F. Donahue; Michael J. Morris; William M. Hilton; Howard I. Scher; and Bernard H. Bochner
Memorial Sloan-Kettering Cancer Center, New York, NY
(Presented By: Timothy F. Donahue)

Introduction: A proportion of pts who present with localized prostate cancer (PCa) do not develop metastatic disease and recur locally after definitive primary therapy, local salvage therapy, hormones, and systemic interventions. We report our experience in pts with non-metastatic, locally advanced castration resistant prostate cancer (CRPC) treated with radical cystectomy or pelvic exenteration (RC/PEx).

Methods: IRB approved retrospective review of all pts at MSKCC between 1999–2012 undergoing RC/PEx for non-metastatic, locally recurrent CRPC after definitive and salvage therapies. Pts were excluded if RC/PEx was done for complications of definitive therapy alone, such as radiation-induced fistula or cystitis.

Results: Of 31 pts who had RC/PEx for a primary diagnosis of PCa, 20 met inclusion criteria. Median age was 66 yrs (49–82). Initial therapy was RP (4), XRT (6), brachytherapy (4), brachytherapy/XRT (3), ADT/chemo (2), and ADT alone (1). Five pts had salvage XRT. All received ADT at relapse after primary or salvage therapy, and 11 had chemotherapy prior to RC/PEx. RC/PEx was performed a median of 8.16 yrs (0.7–24.5) after PCa diagnosis. Pts had pT2b (1), pT3 (5), and pT4 (14) disease at surgery. Lymph nodes were clinically negative in all pts but pathologically positive in 6, negative in 9, and not resected in 5. Concurrent resections included rectum (12), pelvic wall (6), pubis (1), and iliac vein (1). 85% of pts had symptoms attributable to locally progressive PCa at RC/PEx including pain, GU or GI obstruction and bleeding. All symptomatic pts had alleviation of disease related symptoms until recurrence. After a median follow-up of 3.12 yrs (0.7–13.4), 9 pts are alive (4 are disease free, 5 alive with disease), 9 dead of disease, and 2 dead of other causes. Median time to death after RC/PEx was 2.8 yrs (0.8–5.9). For 14 pts who relapsed, metastases developed a median of 398 days (110–1679) after RC/PEx. Ten pts received chemotherapy and 16 had ADT after surgery for local recurrence or distant metastases. Median time to systemic chemotherapy after RC/PEx was 346 days (96–1709).

Conclusions: For pts with non-metastatic, locally advanced CRPC, radical pelvic surgery to resect symptomatic disease is feasible and appears clinically beneficial. In addition to local control, such an approach may confer significant disease free intervals and relief of symptoms. Even after systemic relapse, performance status was sufficient to undergo systemic therapy.

Poster #177
SHORT TERM ONCOLOGIC OUTCOMES WITH IRREVERSIBLE ELECTROPORATION ABLATION OF PROSTATE CANCER
Joseph Mashni¹; Dawud Lankford²; Steven Poon¹; Brandon Menachem¹; and Jonathan Coleman¹
¹Memorial Sloan Kettering Cancer Center, New York, NY; ²New York Medical College, Valhalla, NY.
(Presented By: Dawud Lankford)

Introduction: Electroporation (EP) is a non-thermal, minimally invasive and FDA approved treatment for soft tissue ablation. Treatment effect is mediated through permeabilization of the cellular membrane after application of microsecond pulses of electrical current. EP is being used for treatment of localized prostate cancer. Here we report on the early oncologic outcomes.

Methods: After IRB approval, we reviewed the data from patients treated with EP for prostate cancer from 2011 to 2013. All patients underwent prostate MRI and a repeat standardized transrectal ultrasound guided prostate biopsy. Primary treatment endpoint was achieving no cancer in the treated lobe on follow up biopsy. Eligible patients included those with organ confined prostate cancer who refused standard treatment or locally recurrent disease after previous treatment (salvage). Treatment was applied under anesthesia to lobe with dominant focus of cancer utilizing a minimum of 70 pulses between probe sets with at least 1500 V/cm, and tailored to gland size and designated treatment area. Graded complications were reported using a standardized system. Post-treatment MRI was scheduled within 1 month after procedure and re-biopsy scheduled at 6 months.

Results: 26 patients underwent IRE ablation of the prostate: 22 focal ablations and 4 salvage procedures. Median age was 63 years and the interquartile range (IQR) was 59–68. Median PSA was 4.2 (IQR 3.1–6.2), 19 patients were Gleason 3+3, 5 were 3+4, and 2 were 4+3. Median follow up is 12 months (IQR 4.5–15.5). Post operative MRI revealed no residual suspicious lesions in treated lobe in 22 patients, 3 had peripheral enhancement near ablation zone without definite tumor, 1 had a suspicious lesion which was targeted with biopsy and found to be negative. Post-operative biopsy, available in 17 patients revealed 15 (88%) with no cancer detected in treated area, 2 (12%) had residual cancer (both Gleason 3+3=6, ≤10%). Two grade 3 complications occurred including transurethral resection of worsening pre-existing bladder neck contracture following salvage EP, and surgical intervention for epididymorchitis. There was 1 grade 2 UTI, and 5 grade 1 complications: urinary retention (4 patients) and epididymitis (1 patient).

Conclusion: Early experience with EP for treatment of localized prostate cancer in highly selected patients shows encouraging results in regard to absence of cancer on subsequent biopsy, patient safety and tolerability.
THE PREDICTIVE ROLE OF TERTIARY GLEASON GRADE 5 PATTERN IN MEN WITH GLEASON SCORE 7 AND GLEASON SCORE 8-10 AFTER RADICAL PROSTATECTOMY

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UPMC (University of Pittsburgh Medical Center), Pittsburgh, PA
(Presented By: Peter Hinds)

Objective: The presence of a tertiary Gleason grade (TGG) 5 pattern is associated with poor PSA recurrence free survival. We evaluated the significance of TGG 5 pattern by analyzing its association with lymph node involvement (LNI), positive surgical margin (PSM), seminal vesicle invasion (SVI), biochemical recurrence (BCR), metastatic recurrence (MR) and prostate cancer specific mortality (PCSM) in men with clinically localized non-metastatic prostate adenocarcinoma after radical retropubic prostatectomy.

Methods: Clinical and pathologic data of 2,730 men from the years 1999 to 2013 were extracted from our IRB approved prospectively maintained prostate cancer database. All men had non-metastatic localized prostate cancer prior to undergoing radical retropubic prostatectomy. Three groups were created: Group 1: any Gleason score with TGG 5 pattern versus any Gleason score without TGG 5 pattern, group 2: Gleason score 7 with TGG 5 pattern versus Gleason score 7 without TGG 5 pattern, and group 3: Gleason score 8-10 with TGG 5 pattern versus Gleason score 8-10 without TGG 5 pattern. The association between categorical variables was analyzed by Chi-Square or Fisher’s exact and for two group comparisons the Mann-Whitney U tests. A p value < 0.05 was considered statistically significant.

Results: Median follow up was 58.7 months. For groups 1 and 2, there was a statistically significant association between LNI, BCR, PSM, SVI, ECE and MR and the presence of TGG 5 pattern. Additionally there was shorter median time to BCR (22.4 v 42.6 months, p=0.003) for patients with Gleason 7 disease and a TGG 5 pattern (group 2). There were no associations between TGG 5 pattern and any variable within the Gleason 8-10 group (group 3). There was no statistically significant difference in PCSM within any groups despite a trend towards worse PCSM in patients with Gleason 7 disease and a TGG 5 pattern.

Conclusion: The additional presence of TGG 5 pattern in the radical prostatectomy specimen of patients with Gleason 7 disease predicts poor oncologic outcomes including a trend towards worse prostate cancer specific mortality. This association between TGG 5 pattern and oncologic outcomes is absent in Gleason 8-10 disease.
VALIDATION OF DIFFERENTIAL EXPRESSION OF MICRORNA PROFILES IN PROSTATE CANCER SPECIMENS

Nikhil Waingankar¹; Nicholas Broccoli²; Soroush Rais-Bahrami²; Kevin Smith²; Michaela Oswald²; Houman Khalili²; Annette Lee²; Theresa Chan²; Oksana Yaskiv²; Peter Gregersen²; and Manish Vira²

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(Presented By: Nikhil Waingankar)

Introduction: MicroRNAs (miRNA) are small, noncoding nucleic acids that regulate expression of genes. Altered expression of miRNA has been implicated as a factor in carcinogenesis. We previously demonstrated 27 miRNA with differential expression that varied greater than two-fold between areas of benign and cancerous prostate glands in 64 patients. The goal of this study was to validate these findings in a selected group.

Methods: RNA was extracted from prostate cancer foci and areas of benign glands from paraffin embedded prostatectomy specimens from 29 selected patients. Five patients each were selected Gleason 3+3, 3+4, 4+3, and 4+4 or higher. The remaining nine selected patients went on to develop metastatic disease. Expression profiles for 577 miRNA were analyzed using Taqman OpenArray. Data analysis was performed using the mean-centering method for normalizing miRNA across the original and validation cohorts.

Results: Significant overlap was found between the original and validation cohorts for miRNA that were upregulated at least two-fold between benign and cancerous glands (Table 1, p<0.05). There were no differences in miRNA expression between T2 and T3 cases. Comparison of Gleason 6 vs Gleason 8+ showed significant difference in expression of mir-185, mir106b, and mir-181a. Interestingly, among subset of patients that developed metastatic disease, the benign prostate glands demonstrated significant overexpression of mir-21 as compared to the benign glands of the localized cohort. Mir-21 is a known oncomir shown to be overexpressed in other metastatic tumors.

Conclusions: This study validates our findings on differential expression of miRNA between cancerous and benign glands. There was a significant difference in expression of three miRNAs between Gleason 6 and 8 cancers, and no differences were found between T2 and T3. miRNA may represent a unique signature in the benign glands of patients with metastatic disease.
Introduction and Objectives: The incidence of prostate cancer (PCa) increases with age; however, the usefulness of PSA-based population screening appears limited to younger men with anticipated favorable life expectancy. Competing hazards to mortality limit the ability to offer definitive treatment, and detection of non-lethal tumors may expose aging and/or unfit patients to unnecessary toxicities. Healthy older patients may undergo testing, though the value of screening beyond a certain age is controversial. We evaluated the rates of PSA tests and prostate biopsy (PBx) in patients who may not be optimally suited for PCa screening according to the most recent AUA recommendations.

Methods: An institutional electronic data warehouse was queried for clinical data for all men with PSA test results from 7/1/2005 to 6/30/2013. Data collected included the presence of comorbidities at the time of PSA, as well as progression to PBx. Chi-square, ANOVA, and binary logistic regression were used assess the associations between clinical variables and PSA testing and PBx among age groups.

Results: 27,078 men underwent serum PSA tests, of whom 7,895 (29.2%) were ≥70 years old, and 5,585 (20.6%) had a serious comorbidity including congestive heart failure (CHF), chronic kidney disease (CKD) or end-stage renal disease (ESRD). Of those ≥70 years old who had PSA screens, 1306 (17%) had CHF, 1551 (20%) had CKD, and 409 (5%) had ESRD. Of 790 men (2.8%) who went on to have PBx, 299 (38%) were >70 years old, and 111 (14.1%) had a serious comorbidity (CHF, CKD, ESRD). On multivariate analysis, CHF and ESRD decreased the likelihood of PBx (OR 0.634 and 0.435 respectively, p<0.001, 95% CI) while the presence of DM and CKD had no effect on PBx. Many patients with multiple comorbidities still underwent PSA screening and PBx (Table 1).

Conclusion: PSA testing and prostate biopsies were commonly performed in men outside the current age range (55 to 69 years) according to AUA recommendations. In the midst of controversy surrounding over-detection and overtreatment of PCa, clinicians must be more selective in identifying patients in whom a PSA test and subsequent biopsy is necessary and appropriate.
Posters Session II – Full Abstracts

Poster #182

PROSTARIX: METABOLOMIC URINALYSIS FOR PROSTATE BIOPSY RISK STRATIFICATION
Jonathan McDunn¹; Lisa Ford¹; Qibo Zhang¹; Kelli Goodman¹; Zhen Li¹; Susan Orton¹; Mark Jalkut²; and Robert Wolfert¹
¹Metabolon, Inc. Durham, NC; ²Associated Urologists of North Carolina, Raleigh, NC
(Presented By: Jonathan McDunn)

Introduction and Objectives: Sarcosine and other metabolites have been identified as biomarkers of prostate cancer. A panel of these markers measured in urine obtained after an attentive digital rectal exam (DRE) can improve the pre–biopsy risk assessment of patients with moderately elevated prostate specific antigen (PSA). We developed an analytically validated method for the quantitation of these analytes using high performance liquid chromatography and tandem mass spectrometry (HPLC–MS/MS) and applied that technique to a cohort of 120 patients prior to biopsy.

Methods: Post–DRE urines were collected from men (PSA 2–15 ng/mL) prior to prostate biopsy under an IRB–approved protocol. Sediment pellets were isolated from 10mL aliquots by centrifugation and extracted into methanol containing a cocktail of isotopically labeled internal standards. The samples were randomized across ten analytical runs, balanced for PSA and biopsy outcome. The metabolites in the Prostarix™ panel (sarcosine, alanine, glycine and glutamate) were measured by HPLC–MS/MS. Standard curves spanning a 500–fold range were used for quantitation and assay stability was assessed using quality control (QC) samples with analyte abundances spanning the analytical range. Analyte abundances were combined with ultrasound–determined prostate volume and PSA in a logistic regression algorithm, assigning each subject a likelihood of having a positive result on their subsequent prostate biopsy.

Results: Analytes were measured in all samples and each analytical run met QC criteria. Of the 120 patients in the study, 66 had biopsy–proven prostate cancer (55%). Algorithmic stratification of the study cohort gave a receiver operator characteristic curve with an area of 0.78. The group of patients with the lowest Prostarix scores had a 15% rate of positive biopsy outcomes while the group of patients with the highest Prostarix scores had an 89% chance of positive biopsy outcomes. The distribution of Prostarix scores coded by outcome is shown in the Figure.

Conclusions: These data clinically validate this approach (Prostarix) to risk stratify pre–biopsy patients regarding their prostate biopsy outcomes.
Poster #183

OBESITY IS A RISK FACTOR FOR PROGRESSION FOR MEN ON ACTIVE SURVEILLANCE FOR LOW RISK PROSTATE CANCER

Bimal Bhindi¹; Girish Kulkarni¹; Robert Hamilton¹; Ants Toi²; Theodorus van der Kwast³; Andrew Evans³; Karen Hersey¹; Michael Jewett¹; Alexandre Zlotta¹; John Trachtenberg¹; Antonio Finelli¹; and Neil Fleshner¹

¹Division of Urology, Department of Surgical Oncology, University Health Network, University of Toronto, Toronto, ON, Canada; ²Department of Medical Imaging, University Health Network, University of Toronto, Toronto, ON, Canada; ³Department of Pathology, University Health Network, University of Toronto, Toronto, ON, Canada

(Presented By: Bimal Bhindi)

Introduction: Active surveillance (AS) aims to avoid prostate cancer (PC) treatment morbidity while not missing the opportunity for cure if treatment is needed. Predictors of progression are needed to help guide decision-making. The objective was to determine if obesity is a predictor for progression in men undergoing AS.

Methods: Men undergoing AS for low risk PC (no Gleason pattern >=4, <=3 cores involved or <=1/3 of total number of cores involved, and no core with >50% cancer involvement) were identified. Those diagnosed by TURP were excluded. Height and weight were measured to compute body-mass index (BMI). The outcomes were pathological progression on follow up biopsy (defined as no longer meeting low risk criteria) and clinical progression (defined as intent to initiate active therapy). Univariate statistics, Kaplan Meier (KM) curves and multivariable Cox-proportional hazards models adjusting for baseline characteristics (age, digital rectal exam, PSA, ethnicity, family history of PC, prostate volume, prior biopsy, and initial number of positive biopsy cores) were used. Since the proportional hazards assumption was not met using one model, separate models for before and after 18 months of follow up were used for each outcome.

Results: In this cohort of 565 men with 34.6 months of median follow up, 124 (21.9%) were obese (BMI>=30). Pathological and clinical progression occurred in 168 (29.7%) and 174 (30.8%) men, respectively. Obese men more often had clinical (48 (38.7%) vs. 126 (28.6%), p=0.031) and pathological (45 (36.3%) vs. 123 (27.9%), p=0.071) progression compared to non-obese men. There was no significant association between obesity and time to progression during the first 18 months. However beyond 18 months, obesity was associated with shorter time to pathological (p=0.004) and clinical (p=0.003) progression in KM analyses. In adjusted Cox models, each 1-unit increase in BMI was associated with a hazard ratio of 1.10 (95%CI=1.04-1.17, p=0.001) and 1.10 (95%CI=1.03-1.16, p=0.002) for pathological and clinical progression, respectively.

Conclusions: While no difference in risk of progression was noted during the first 18 months, our study found a significantly increased risk of progression beyond 18 months with each unit increase in BMI, possibly suggesting a risk of long-term biologic progression rather than reclassification. Further work is needed to determine if dietary modification or exercise can alter this risk.
Poster #184

INFECTION-RELATED HOSPITALIZATIONS AFTER PROSTATE BIOPSY IN A STATE-WIDE QUALITY IMPROVEMENT COLLABORATIVE

Paul R. Womble¹; Maxwell W. Dixon¹; Susan Linsell¹; Zaojun Ye¹; James E. Montie¹; Brian R. Lane²; David C. Miller¹; and Frank N. Burks³

¹University of Michigan, Ann Arbor, MI; ²Spectrum Health Medical Group, Grand Rapids, MI; ³Oakland University William Beaumont School of Medicine, Royal Oak, MI

(Presented By: Paul R. Womble)

Objective: Transrectal prostate biopsy is the cornerstone of diagnosing prostate cancer in the PSA era. However, serious post-biopsy infectious complications are reported to be increasing, and a better understanding of the true incidence and microbiology of these events is needed to guide quality improvement in this area and ultimately better early detection practices.

Methods: Using data from the Michigan Urological Surgery Improvement Collaborative (MUSIC) registry, we identified all men who underwent transrectal ultrasound-guided prostate biopsy at 21 practices in Michigan from March 2012 through June 2013. Trained data abstractors recorded pertinent data, including prophylactic antibiotics and all biopsy-related hospitalizations within 30 days of the procedures. For a subset of patients, these events were validated with follow-up telephone calls and claims data. We identified all men admitted for an infectious complication and obtained the relevant culture data. We then compared the frequency of infection-related hospitalization rates across MUSIC practices and according to receipt (or lack thereof) of antibiotic prophylaxis in concordance with guidelines from the American Urologic Association.

Results: The overall 30-day hospital admission rate following prostate biopsy was 0.97%, ranging from 0% to 4.2% across 21 MUSIC practices (Figure). Ninety-five percent of admissions were for infectious complications; the vast majority of cultures for these patients identified fluoroquinolone-resistant organisms. Guideline concordant antibiotics were administered in 96.3% of biopsies. Patients receiving non-compliant antibiotic regimens were significantly more likely to be hospitalized for infectious complications (3.8% vs. 0.89%, p = 0.0026).

Conclusions: Infection-related hospitalizations occur in ~1% of men undergoing prostate biopsy in Michigan. Our findings suggest that many of these events could be avoided by implementing new protocols (e.g., culture-specific or augmented antibiotic prophylaxis) that both adhere with AUA Guidelines and address fluoroquinolone resistance.
Objective: Clinical studies show differences in disease control markers between the gonadotrophin−releasing hormone antagonist, degarelix, and luteinizing hormone−releasing hormone (LHRH) agonists. Here, we report overall survival from a pooled analysis of trials of degarelix vs. LHRH agonists in men with prostate cancer (PCa).

Methods: Data were pooled from five prospective, phase III/IIIb, randomized trials (n=1925) of degarelix vs. leuprolide or goserelin in men with PCa. Patients received 3 (n=467) or 12 (n=1458) months' treatment. The Cox−proportional hazards model, adjusted for confounding baseline factors, estimated hazard ratios (HR) of event outcomes.

Results: The full analysis set comprised 1920 patients (degarelix n=1263, LHRH agonist, n=657). Overall survival was higher with degarelix (HR=0.47 [95% confidence interval; CI 0.25–0.90; p=0.022]). Death occurred in 18 patients (1%) receiving degarelix vs. 19 (3%) receiving a LHRH agonist. Only four deaths (degarelix n=3, LHRH agonist, n=1) were from PCa progression. In the subgroup of patients with baseline testosterone >2 ng/mL, overall survival was also higher with degarelix (HR=0.36, 95% CI 0.17–0.75; p=0.006). Age was another significant interaction effect with treatment; in patients aged >70 years (58% of patients) the HR was 0.29 (95% CI 0.12–0.70; p=0.005). In patients with underlying cardiovascular disease (CVD) at baseline (29.6% of all patients) the HR for risk of death with degarelix vs. agonists was 0.40 (95% CI 0.16–1.01; p=0.051; Figure).

Conclusion: Mortality from any cause is lower with degarelix vs. LHRH agonists. Mortality risk is reduced in patients with pre-existing CVD with degarelix compared to agonists.

Figure. Mortality with degarelix vs. LHRH agonists by baseline CVD (history at baseline of: myocardial infarction; ischemic or hemorrhagic cerebrovascular conditions; embolic and thrombotic events, arterial; or other ischemic heart disease).
SERIAL MULTIPARAMETRIC PROSTATE MRI AND MRI/ULTRASOUND FUSION BIOPSY AS A TOOL TO FOLLOW PROSTATE CANCER PROGRESSION FOR MEN ON ACTIVE SURVEILLANCE

Nabeel Shakir¹; Annerleim Walton-Diaz¹; Soroush Rais-Bahrami¹; Baris Turkbey²; Jason Rothwax¹; Cheng William Hong³; Lambros Stamatakis¹; Arvin George¹; Chinonyerem Okoro¹; Dima Raskolnikov¹; M. Minhaj Siddiqui¹; Daniel Su¹; Richard Simon⁴; Bradford Wood³; Peter Choyke²; and Peter Pinto¹

¹Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Molecular Imaging Program, National Cancer Institute, National Institutes of Health, Bethesda, MD; ³Center for Interventional Oncology, National Cancer Institute & Clinical Center, National Institutes of Health, Bethesda, MD; ⁴Biometric Research Branch, Division of Cancer Treatment and Diagnosis, National Institutes of Health, Bethesda, MD

(Presented By: Nabeel Shakir)

Introduction and Objectives: Active surveillance (AS) is an option for patients with low risk prostate cancer (PCa); however, determining disease progression is challenging. At the NCI, multiparametric MRI (MP−MRI) followed by our prostate biopsy protocol (MR−US fusion−guided plus 12 core extended sextant biopsy) has been used to confirm eligibility for AS. Herein, we evaluate the utility of these modalities in monitoring patients on AS.

Methods: Patients who underwent MP−MRI of the prostate with biopsy per our protocol between 2007−2012 were reviewed. We selected a subset of patients who met Johns Hopkins criteria for AS (Gleason score≤6, PSA density≤0.15, tumor involvement of ≤2 cores, and ≤50% of any single core) based on outside 12−core TRUS biopsy. Patients with Gleason score≤6 confirmed at first NCI biopsy session were followed with subsequent MP−MRI and biopsy. MRI progression was defined as an increase in MP−MRI suspicion level, lesion diameter, or number of lesions. Pathologic progression was defined as an increase to Gleason score ≥7 in either 12−core or MR−fusion biopsy. We determined the association between MRI and pathologic progression.

Results: 696 patients were identified, of which 129 met JHU criteria for AS by outside biopsy. Mean age was 61.6 years (range 45−77) and mean PSA 5.16ng/ml (range 0.2−20.) 28/129 (21.7%) patients had Gleason score ≥7 at first NCI biopsy session. 31 patients had at least two biopsy sessions (mean follow up, 18 months, range 12−54 months) of which 9/31 (29%) had an increase in Gleason score, all to 3+4=7 (Table 1.) MR−fusion biopsy detected more pathologic progression than did standard biopsy (7/9 vs.3/9.) The positive predictive value of MP−MRI for pathologic progression was 50%, while the negative predictive value was 84%. The sensitivity and specificity of MP−MRI for increase in Gleason score was 67% and 73%, respectively.

Conclusions: Stable findings on MP−MRI are associated with Gleason score stability in patients with low−risk PCa choosing AS. The majority of patients who had pathologic progression were detected on MR−fusion biopsy, which may suggest that random biopsies are unnecessary in this population. Larger studies are necessary to validate these findings.

<table>
<thead>
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<th>Gleason Increase</th>
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<td>6</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
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<table>
<thead>
<tr>
<th></th>
<th>Fusion only</th>
<th>12-core only</th>
<th>Both</th>
</tr>
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<td>4</td>
<td></td>
</tr>
<tr>
<td>12-core only</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Both</td>
<td>0</td>
<td>1</td>
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Table 1: MRI versus pathologic progression in patients with serial biopsy.
Introduction and Objectives: Historically, pathologic findings from standard 12-core prostate biopsies are upgraded in 25–33% of patients after radical prostatectomy (RP). MRI/US fusion prostate biopsy has been shown to upgrade prostate cancer compared to standard 12-core biopsy in 32% of patients. MRI/US fusion biopsy may offer a more accurate representation of whole gland pathology. We evaluate the rate of pathologic upgrade in standard 12-core biopsy and MRI/US fusion biopsy when compared with whole gland pathology from RP.

Methods: Patients who underwent random prostate biopsy, fusion biopsy and subsequently RP for prostate cancer from 2012 to 2013 were included. Pathology was reviewed by a single pathologist. The cohort was divided into clinically significant high-grade (Gleason score ≥ 4+3) and clinically insignificant low-grade (Gleason score ≤3+4) sub-cohorts. Pathological upgrade was defined as any increase in Gleason sum or primary Gleason score. McNemar’s test was used to compare the proportion of patients who were upgraded from random biopsy to RP versus the proportion that were upgraded from fusion biopsy to RP.

Results: 68 patients underwent standard 12-core and fusion prostate biopsy then subsequently RP. Mean PSA was 9.2ng/ml. There are total of 43 patients with clinically insignificant low-grade and 25 patients with clinically significant high-grade. Fusion biopsy upgraded 19 patients (28%) compared to 12-core biopsy, 8 of these patients had negative 12-core biopsy. Pathology on the RP specimen upgraded 18 of the 12-core results (26%) compare to only 8 fusion biopsy results (11%). (Graph 1, p =0.0095) 14 patients (20%) who had clinically insignificant low-grade disease on 12-core biopsy were upgraded to clinically significant high-grade on RP. Only 2 patients (3%) with clinically insignificant low-grade from fusion biopsy were upgraded on RP. (p< 0.0005)

Conclusions: Prostate cancer detected on MRI/US fusion prostate biopsy has significantly lower rates of pathologic upgrade than standard 12-core biopsy when both were compared to prostatectomy specimens. MRI/US fusion biopsy may represent whole gland pathology more accurately compared to 12-core biopsy.
**Poster Session II – Full Abstracts**

**Poster #188**

**INTERMITTENT ANDROGEN DEPRIVATION WITH THE GONADOTROPHIN-RELEASING HORMONE (GnRH) ANTAGONIST DEGARELIX: RESULTS OF STUDY CS37**

E. David Crawford¹; Neal Shore²; Celestia Higano³; Anders Neijber⁴; and Vladimir Yankov⁵

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(Presented By: E. David Crawford)

**Introduction:** Intermittent androgen deprivation (IAD) has been proposed as an alternative to continuous androgen deprivation (CAD) and offers potential for fewer side effects, better quality of life and cost savings. Studies have compared CAD with IAD using luteinizing hormone–releasing hormone agonists. We report the results of IAD with the gonadotrophin–releasing hormone (GnRH) antagonist degarelix.

**Methods:** Eligible patients (pts) had rising prostate−specific antigen (PSA) levels after prior definitive therapy and testosterone (T) >150 ng/dL. Men were randomized to intermittent degarelix (DI; n=177), continuous degarelix (DC; n=50) or continuous leuprolide (LC; n=182). Initial treatment was 7 months of degarelix or leuprolide; pts with PSA <2 ng/mL then discontinued therapy in the DI arm and entered a 7−month off−treatment period. Pts in the DC or LC arm continued on degarelix or leuprolide, respectively. Primary endpoint was the proportion of pts with PSA ≤4.0 ng/mL at 14 months. Non−inferiority required a lower 95% confidence interval (CI) bound of greater than −12.5%. Secondary endpoints included T recovery, time to PSA >2 ng/mL and quality of life.

**Results:** PSA ≤4.0 ng/mL at month 14 was achieved by 100%, 97.6% and 98.7% of pts in the DI, DC and LC arms, respectively. The lower CI limit for DI vs. CAD (DC and LC arms combined) was −0.19%; therefore non−inferiority was established. In the DI arm, median time to T >50 ng/dL was 112 days (beginning 28 days after the last degarelix dose) and occurred in 116 (85%) pts within 6 months of discontinuation. In the DI arm, T levels were >150 ng/dL 6 months after discontinuation in 94 (67%) pts vs. 0 (0%) and 1 (<1%) in the DC and LC arms, respectively. Men in the DI arm had significantly improved sexual drive at month 14 compared with CAD pts (p=0.0271). Hot flashes were reported by 87 (50%), 26 (52%) and 110 (62%) pts in the DI, DC and LC arms, respectively. Injection site reactions occurred in 102 (58%) and 33 (66%) pts in the DI and DC groups, respectively, and 21 (12%) in the LC arm. 37 pts discontinued due to adverse events; 14 (8%), 5 (10%) and 18 (10%) pts from the DI, DC and LC arms, respectively.

**Conclusions:** The intermittent use of degarelix is non−inferior to CAD in maintaining PSA suppression when administered in a regimen of 7 months of treatment and a 7−month off−treatment period. 50% of men in the DI arm recovered from castration by 112 days after treatment discontinuation.
Poster #189
PROLARIS CCP SCORE STRATIFIES RISK FOR PROSTATE CANCER PATIENTS AT BIOPSY: INITIAL COMMERCIAL RESULTS
E. David Crawford¹; Neal Shore²; Peter Scardino³; John W. Davis⁴; Jonathan Tward⁵; Lowndes Harrison⁶; Kelsey Moyes⁷; Lisa Fitzgerald⁸; Steve Stone⁸; and Michael Brawer⁷
¹University of Colorado at Denver, Aurora, CO; ²Carolina Urologic Research Center, Myrtle Beach, SC; ³Memorial Sloan-Kettering Cancer Center, New York, NY; ⁴The University of Texas MD Anderson Cancer Center, Houston, TX; ⁵Huntsman Cancer Hospital, University of Utah, Salt Lake City, UT; ⁶Gadsden Regional Cancer Center, Gadsden, AL; ⁷Myriad Genetic Laboratories, Inc., Salt Lake City, UT; ⁸Myriad Genetics, Inc., Salt Lake City, UT
(Presented By: E. David Crawford)

Introduction: New prognostic markers for prostate cancer play an important role in addressing the controversies of over diagnosis and treatment. The Prolaris cell cycle progression score (CCP) is a new RNA–based marker which improved the prediction of prostate cancer aggressiveness in eight separate cohorts. Each one–unit increase in CCP corresponds with approximately a doubling of the risk of the studied event (recurrence or death from prostate cancer). In this analysis, we characterized the CCP distribution from our initial Prolaris commercial testing.

Methods: Our current laboratory database was evaluated for patients whose biopsy was tested with Prolaris and whose clinicopathologic data was collected by the ordering physician. Formalin fixed, prostate biopsy tissue from 1648 patients diagnosed with adenocarcinoma ordered by more than 300 physicians were analyzed. The CCP score was calculated by measuring the RNA expression of 31 cell cycle progression genes normalized to 15 housekeeping genes.

Results: Of the 1648 samples that contained sufficient carcinoma (>0.5mm linear extent), 1604 (97.3%) provided quality RNA for analysis. This retrospective analysis showed a normal distribution for the CCP ranging from −2.9 to 3.1. Correlation with Gleason score was r=0.35. A relative classification of cancer aggressiveness based on CCP of ~1200 patients from multiple cohorts was developed to interpret how the patient’s CCP score compared to that of patients within the same AUA risk category. The thresholds between each of the five intervals are one unit of CCP score apart, with the ‘consistent’ interval centered at the median CCP score. The table demonstrates how CCP modifies AUA risk. Based on the CCP score, 27.9% of men had a less aggressive cancer compared to the clinicopathologic prediction and were assigned to a lower risk group while 27.6% of patients had a more aggressive cancer.

Conclusion: Prolaris is a novel assay that can improve risk stratification for men with prostate adenocarcinoma independent of the Gleason score and PSA level. Over 50% of men initially tested in the commercial assay were assigned to a different risk category than predicted by their clinicopathologic features alone.

<table>
<thead>
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<th>AUA Risk Classification</th>
<th>Considerably Less Aggressive</th>
<th>Less Aggressive</th>
<th>Consistent</th>
<th>More Aggressive</th>
<th>Considerably More Aggressive</th>
<th>Totals</th>
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<td>Low</td>
<td>12 (2.1%)</td>
<td>142 (24.4%)</td>
<td>277 (47.5%)</td>
<td>137 (23.5%)</td>
<td>15 (2.6%)</td>
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<td>Intermediate</td>
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<td>195 (26.4%)</td>
<td>330 (44.8%)</td>
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<td>31 (4.2%)</td>
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<tr>
<td>High</td>
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<td>71 (25.3%)</td>
<td>107 (38.1%)</td>
<td>67 (23.8%)</td>
<td>24 (8.5%)</td>
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<tr>
<td>Totals</td>
<td>40 (2.5%)</td>
<td>408 (25.4%)</td>
<td>714 (44.5%)</td>
<td>372 (23.2%)</td>
<td>70 (4.4%)</td>
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Poster #190
CLINICAL UTILITY OF CELL CYCLE PROGRESSION GENES (CCP) IN FACILITATING PROSTATE CANCER TREATMENT DECISIONS
Neal Shore¹; Raoul Concepcion²; Daniel Saltzstein³; M. Scott Lucia⁴; Arletta van Breda⁵; William Welbourn⁶; and Michael Brawer⁷
¹Carolina Urologic Research Center, Myrtle Beach, SC; ²Urology Associates, Nashville, TN; ³Urology San Antonio Research, San Antonio, TX; ⁴The University of Colorado, Aurora, CO; ⁵The CSSP Group, LLC, Annandale, VA; ⁶Myriad Genetics, Inc., Salt Lake City, UT; ⁷Myriad Genetic Laboratories, Inc., Salt Lake City, UT
(Presented By: Neal Shore)

Introduction: The management of early-stage prostate cancer is plagued by the inability to distinguish between men with indolent disease from those with more aggressive cancer. This leads to widespread overtreatment, increasing patient morbidity and increased payer costs. Prolaris (Myriad Genetic Laboratories, Inc.), a novel prognostic test that has been validated in eight studies, predicts cancer-specific disease progression and disease specific mortality risk using a gene expression-based Cell Cycle Progression (CCP) score. This study evaluated Prolaris’ potential clinical utility in the context of a clinical validation trial.

Methods: Fifteen physicians participated in a clinical validation study, representing 15 distinct community urology practices. Participating urologists were sent a retrospective questionnaire to assess the value of the CCP score and the test result. Questionnaires were completed for 294 evaluable patients. All patients had localized prostate cancer (T1–T3b, N0, M0). Questionnaires were returned within 1–2 weeks of physicians receiving the test result.

Results: Physicians indicated that a majority (55%) of tests generated a mortality risk that was either higher or lower than the physician expected. Physicians also indicated that nearly a third (32%) of test results would lead to a definite or possible change in treatment. Though the test was likely to lead to a change in treatment for patients with higher than expected mortality results and those with lower than expected results (39% and 42%, respectively), the data suggests that the test would have the net effect of shifting patients from more aggressive treatment to more conservative treatment. This was evidenced by the significant association between change in treatment and lower CCP scores (p<0.002). Also, in tests likely to lead to a definite or possible change in treatment, 62% had mortality risks lower than the physician expected versus only 10% with risks higher than expected.

Conclusions: The CCP score adds meaningful new information to risk assessment for localized prostate cancer patients. Real-world use of the test is likely to lead to a change in treatment in a significant portion of tested patients, particularly by shifting patients towards more conservative management. This could help reduce overtreatment of patients with less aggressive disease, which would reduce patient morbidity and save costs for payers and the healthcare system.
THE DECIPHER PROSTATE CANCER CLASSIFIER PREDICTS BIOCHEMICAL FAILURE IN PATIENTS FOLLOWING POST OPERATIVE RADIATION THERAPY

Robert Den¹; Felix Feng²; Timothy Showalter³; Mark Mishra⁴; Edouard Trabulsi¹; Costas Lallas¹; Leonard Gomella¹; Ruth Birbe¹; Peter McCue¹; Mercedeh Ghadessi⁵; Karen Knudsen¹; and Adam Dicker¹

¹Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA; ²University of Michigan, Ann Arbor, MI; ³University of Virginia, Charlottesville, VA; ⁴University of Maryland, Baltimore, MD; ⁵GenomeDx Biosciences Inc., Vancouver, BC

(Presented By: Robert Den)

Introduction: Radiation therapy (RT) is commonly offered in the post radical prostatectomy (RP) setting, however response varies. We hypothesized that the DecipherTM genomic classifier (GC) would predict biochemical failure (BF) and distant metastasis (DM) in men receiving post-RP RT.

Methods: Under an IRB approved protocol, 223 men who underwent post-RP RT at the Kimmel Cancer Center of Thomas Jefferson University for pT3 or margin positive disease from 1990–2009 were identified. RNA was extracted from 143 patients with paraffin-embedded specimens and expression quantified from the highest Gleason grade tumor focus using a high-density oligonucleotide microarray. GC score using 22 markers and a random forests algorithm previously developed to predict clinical metastasis was successfully generated. Excluding men who received neo-adjuvant therapy, 139 patients remained for analyses, of which 128 patients with complete clinicopathologic data were used for comparison with the Stephenson nomogram. Receiver operating characteristic (ROC), decision curves, cumulative incidence accounting for competing risks, and multivariable Cox regression analysis were performed to assess GC score for predicting BF and DM after RT.

Results: The ROC of the Stephenson model was 0.70 (95% CI 0.61–0.79) and 0.70 (95% CI 0.49–0.90) for BF and DM endpoints, respectively. Inclusion of GC improved the ROC to 0.78 (95% CI 0.69–0.86) and 0.80 (95% CI 0.68–0.93) for BF and DM, respectively. Cumulative incidence of BF at 8 years after RT was 21%, 48%, and 81% for low (<0.4), intermediate (0.4–0.6), and high (>0.6) GC score, respectively (p<0.00001). In multivariable analysis, patients who received RT early (pre-RT PSA <1 ng/mL) had a BF benefit with a significantly reduced hazard ratio (HR) of 0.26 (95% CI 0.10–0.68, p<0.005). In contrast, patients with high GC score had higher rates of BF with a HR of 1.55 (95% CI 1.27–1.89, p<0.00001). No other variables besides post-RP PSA level were significantly associated with BF or DM.

Conclusion: This is the first validation of the DecipherTM score in the post-RP RT setting. GC score improved risk stratification above clinical classifiers. Patients with a high GC score did not appear to benefit from early RT. Ongoing studies are focused on validating whether men with a high GC score that received post-RP RT and hormones versus RT had improved survival outcomes.
Poster #192
TARGETED MAGNETIC RESONANCE IMAGING/ULTRASOUND FUSION BIOPSY SIGNIFICANTLY OUTPERFORMS RANDOM 12-CORE BIOPSY FOR PREDICTION OF TOTAL PROSTATE CANCER TUMOR VOLUME
Chinonyerem Okoro¹; Soroush Rais-Bahrami¹; Arvin George¹; Annerleim Walton-Diaz¹; M. Minhaj Siddiqui¹; Nabeel A. Shakir¹; Jason T. Rothwax¹; Dima Raskolnikov¹; Lambros Stamatakis¹; Daniel Su¹; Baris Turkbey²; Peter L. Choyke³; Bradford J. Wood³; Maria Merino⁴; and Peter A. Pinto⁵
¹Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD; ²Molecular Imaging Program, National Cancer Institute, National Institutes of Health, Bethesda, MD; ³Center for Interventional Oncology, National Cancer Institute & Clinical Center, National Institutes of Health, Bethesda, MD; ⁴Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, MD
(Presented By: Chinonyerem Okoro)

Introduction and Objective: Tumor quantification with percent core and/or core length involvement is a parameter used to determine burden of disease for patients with prostate cancer (PCa). However, controversy exists regarding tumor quantification in random 12-core biopsies due to discrepancies in lesion targeting and overall needle core lengths obtained. Targeted magnetic resonance imaging/ultrasound (MRI/US) fusion biopsy allows for more optimal lesion targeting and interpretation of this parameter. We aim to correlate highest percentage core involvement and corresponding tumor length for both targeted fusion and random 12-core biopsies with total tumor volume.

Methods: Patients who underwent multiparametric MRI (MP−MRI) with targeted MRI/US fusion biopsy at our institution between 2007 and 2012 were reviewed. Those that met Johns Hopkins criteria for active surveillance (AS) based on outside 12-core biopsy were then identified. MRI tumor volumes were calculated in fusion biopsy positive lesions and correlated with the highest percentage core involvement and corresponding tumor length for both targeted fusion biopsy and 12-core biopsy. Bivariate analysis was used to determine the empirical relationship between these variables and the correlative R2 value.

Results: 696 patients had MP−MRI with MRI/US fusion biopsy, 109 of which met Johns Hopkins criteria for AS upon entry and 47 of these patients had fusion biopsy confirmed PCa. Mean age was 61 years and mean PSA was 5.6ng/ml. For highest percentage core involvement, targeted biopsy showed a positive correlation (R=0.57) whereas 12-core biopsy showed a poor correlation (R=0.016) with the total tumor volume (p<0.0001 and p=0.91 respectively). Similarly, for tumor length of the highest percentage core, targeted biopsy showed a positive correlation (R=0.6) whereas 12-core biopsy showed a poor correlation (R=0.01) with the total tumor volume (p<0.0001 and p=0.94 respectively). (Figure 1)

Conclusions: Highest percentage core involvement and corresponding tumor length on targeted MRI/US fusion biopsy positively correlate with total tumor volume. Targeted biopsy better predicts overall burden of disease and can aid in risk stratification of patients seeking AS.

![Bivariate Fit of Total Positive Lesion Volume by Tumor Length](image1)

![Bivariate Fit of Total Positive Lesion Volume by Core Highest % Involvement](image2)

![Bivariate Fit of Total Positive Lesion Volume by Target Highest % Involvement](image3)

![Bivariate Fit of Total Positive Lesion Volume by Random Highest % Involvement](image4)

Figure 1: Comparison of Highest Percent Core Involvement and Tumor Length for Fusion Biopsy vs. Random 12-Core Biopsy
Poster #193
INDEPENDENT VALIDATION OF A GENOMIC CLASSIFIER IN AN AT RISK POPULATION OF MEN CONSERVATIVELY MANAGED AFTER RADICAL PROSTATECTOMY
Cristina Magi-Galluzzi¹; Jianbo Li²; Andrew Stephenson³; Kasra Yousefi⁴; Michael Kattan⁵; and Eric Klein³
¹Anatomic Pathology, Cleveland Clinic, OH; ²Quantitative Health Sciences, Cleveland Clinic, OH; ³Glickman Urological And Kidney Institute, Cleveland Clinic, Cleveland, OH; ⁴GenomeDx Biosciences, Vancouver, BC
(Presented By: Eric Klein)

Introduction and Objectives: Prostate cancer patients with locally advanced disease after radical prostatectomy (RP) are at risk for clinical progression and by current guidelines are candidates for adjuvant radiation. While three clinical trials comparing adjuvant radiation to observation demonstrated benefits for many of these patients about 50% men on the control observation arm did not progress. This study evaluated whether a validated genomic classifier (GC, DecipherTM) for predicting metastasis can be used to identify high-risk patients that may be spared unnecessary secondary therapy. The objective of this study was to validate GC predictions in an at risk population conservatively managed after RP.

Methods: A case–cohort design was used to sample patients with either preop PSA>20 ng/mL, pT3 stage, positive surgical margin or Gleason score ≥8 disease, treated at Cleveland Clinic with RP between 1987–2008. Patients with lymph node metastasis or neo–adjuvant or adjuvant treatment for prostate cancer were excluded. Cases were defined as local recurrence confirmed by biopsy and/or regional/distant metastasis confirmed by positive CT/bone scan. Random sampling of the cohort, including all cases, yielded 220 study patients. Tissue blocks were available for 196 and GC scores were generated for 184 patients. Receiver operating characteristic area under the curve (AUC), multivariable Cox regression analysis and event incidence with Chi–square tests were used to assess GC performance for predicting biochemical failure (bF) and distant metastasis (DM) in comparison to the 2005 Stephenson nomogram.

Results: GC had AUC of 0.79 (95% CI 0.71−0.86) and 0.78 (95% CI 0.70−0.85) for predicting bF and DM, respectively. A combined GC–Stephenson nomogram model yielded an AUC of 0.86 (95% CI 0.80−0.91) and 0.83 (95% CI 0.76−0.89) for bF and DM endpoints. GC was the predominant predictor of both endpoints in multivariable Cox analysis (p<0.0001). Incidence of bF at 5 years post–RP was 4.9%, 7.1% and 10.9% for patients with low (58.7%), intermediate (19.6%), and high (21.7%) GC, respectively (p<0.0005). Incidence of DM at 5 years was 1.6%, 3.3% and 3.8% for patients with low, intermediate, and high GC, respectively (p<0.0001). GC−Stephenson nomogram model yielded an AUC of 0.86 (95% CI 0.80−0.91) and 0.83 (95% CI 0.76−0.89) for bF and DM endpoints.

Conclusions: We present results of a second, blinded independent validation study of GC performance in a conservatively managed RP cohort. In an at risk population use of the GC model may further allow identification of men that may be safely spared adjuvant radiation therapy.

Poster #194
AFRICAN AMERICAN MEN WITH VERY LOW-RISK PROSTATE CANCER: DO NOT EXHIBIT ADVERSE ONCOLOGIC OUTCOMES
Cesar E. Ercole; Maria Carmen Mir; Eric A. Klein; and Andrew J. Stephenson
Cleveland Clinic, Cleveland OH
(Presented By: Cesar E. Ercole)

Objective: The current recommendation by the National Comprehensive Cancer Network (NCCN) is for patients with very low-risk prostate cancer (PCa) to be managed with active surveillance or seek definitive treatment such as radical prostatectomy (RP) or radiotherapy. It has been established that African American (AA) ethnicity carries a significant higher risk of prostate cancer. We sought to validate the recent work by Sundi, et al. (JCO Aug 20, 2013) to evaluate how this risk translates in terms of pathologic outcomes within context of this select population who may not have opted for a RP upfront.

Methods: Of 6894 men who underwent RP from 1991–2009 at our institution, 1446 patients met the NCCN criteria for very low-risk prostate cancer. Within this group, we identified 114 AA males. We reviewed this series to determine if there is a correlation between race and poor oncologic outcomes, as well as if race is an independent risk factor for poor outcomes. Pathology reports were evaluated for upstaging and adverse pathologic features. Patients’ follow–up times were used to determine biochemical recurrence (BCR).

Results: Overall, 309 patient of all races had pathologic upstaging, 18% for AA and 22% for all other races (p=0.146). Evaluation of Gleason scores (GS), showed that 9% of AA compared to 4% of all others had a GS >= 7 (4+3), although no statistically significant difference. We also did not appreciate a difference for positive surgical margins (AA 24% v others 7%, p=0.138). Biochemical recurrence did show a difference when defined as PSA <0.2 and <0.4 with 12% and 11% (respectively) for AA and 5% and 3% for all others (p=0.002, and p=0.001). Overall 5 year biochemical free survival was 83.7% (C.I. 95%: 76 – 92%) for AA and for all others 94.4% (C.I. 95%: 93 – 96%, p=0.000). Multivariate analysis with race, age, presenting PSA, and prostate weight were not found to be an independent predictor for adverse pathologic features.

Conclusions: Our series did not reflect the reported findings by Sundi et al., with no increased risk for either upgrading or adverse pathology in the AA population. Therefore, we would consider active surveillance as an option for very low-risk prostate cancer in AA men. Further evaluation is necessary to determine how to best apply the NCCN recommendations with AA patients.
Poster Session II – Full Abstracts

Poster #195
A PHASE II, RANDOMIZED, DOUBLE-BLIND, PLACEBO CONTROLLED TRIAL OF METHYLPHENIDATE FOR REDUCTION OF FATIGUE IN PROSTATE CANCER PATIENTS RECEIVING LHRH-AGONIST THERAPY
Patrick Richard; Shabbir Alibhai; Antonio Finelli; Micheal Jewett; Alexandre Zlotta; Girish Kulkarni, Jaimin Bhatt; and Neil Fleshner
University of Toronto, Toronto, Canada
(Presented By: Patrick Richard)

Introduction: Fatigue is common among men with prostate cancer (PCa) especially those treated with LHRH (luteinizing hormone-releasing hormone) agonist. Methylphenidate has been studied in cancer-related fatigue with mix results and no studies have look at its benefit in men treated with LHRH agonist.

Methods: We performed a randomized, double-blind placebo-controlled trial to investigate whether a 10 mg daily of methylphenidate could alleviate fatigue levels, as measured Functional Assessment of Cancer Therapy: Fatigue subscale (FACT-F), in men with PCa treated with LHRH agonist for a period of at least 6 months. Secondary outcomes were changes in fatigue levels and quality of life (QoL) as measured by the Bruera Global Fatigue Severity Scale (BFS) and the Medical Outcomes Study 36-Item Short-Form Health Survey, respectively.

Results: Twenty-four men were randomized to methylphenidate or placebo (12 in each group). After a 10-week treatment course, improvement in fatigue score, as measurement by the FACT-F, was significantly greater in the methylphenidate arm (5 [3–17] vs. 1 [(−2)−5]; p=0.04). The within group analysis also demonstrated a significant improvement of fatigue in the methylphenidate arm (36 [24–38] vs. 40 [38–44]; p=0.008) but not in the placebo one (37 [23–43] vs. 38 [28–41]; p=0.82). Furthermore, there was significantly more men in the methylphenidate than in the placebo arm that had a clinically significant reduction of fatigue levels according to the FACT-F at week−10 (p=0.02). Similar results were obtaining using the BFS scale. The decrease in fatigue levels also resulted in a significantly greater improvement of QoL score in the methylphenidate group than in the placebo group (p=0.001).

Conclusion: Methylphenidate significantly reduces fatigue levels and improves QoL in men treated with LHRH agonist for their prostate cancer.

Poster #197
OUTCOMES OF SALVAGE PROSTATE CRYOABLATION AFTER PRIMARY EXTERNAL BEAM RADIATION OR BRACHYTHERAPY: IS THERE A DIFFERENCE?
Matthew Ingham¹; Erik Grossgold¹; Robert Given¹; and Stephen Jones²
¹Eastern Virginia Medical School, Norfolk, VA; ²Cleveland Clinic Foundation, Cleveland, OH
(Presented By: Matthew Ingham)

Introduction: Prostate cryoablation (CRYO) is a treatment option for biochemical recurrence (BCR) after primary external beam radiation therapy (EBRT) or brachytherapy (BT) for localized prostate cancer (CaP). It is unknown whether one modality is more amenable to salvage CRYO. We sought to evaluate outcome differences in salvage CRYO following primary EBRT vs. BT.

Methods: Using the Cryo Online Database (COLD), we collected data on men having received BT or EBRT for localized CaP with salvage CRYO for BCR. Biochemical disease-free survival (bDFS) was defined using Phoenix criteria, and compared at 5 years post-CRYO. Groups were also compared in terms of post-operative complications 1 year post-CRYO: incontinence, pad use, urinary retention, potency, and rectourethral fistulae. Subsequent prostate biopsy data were compared between groups during the first year post-CRYO.

Results: 101 and 566 men had undergone BT and EBRT, respectively, followed by salvage CRYO for BCR. No differences existed in age, Gleason score, stage, baseline PSA, or D’Amico risk. There were no significant differences in 1-year post-CRYO complications. During the first year post-CRYO, there was no difference in repeat biopsy rate, nor any difference in biopsy outcome. At 5 years, 32% receiving BT+CRYO and 43% receiving EBRT+CRYO remained free from biochemical failure (p=0.7481).

Conclusions: bDFS with salvage CRYO was slightly higher after EBRT as compared to BT, but did not reach statistical significance. No differences in 1-year post-CRYO complications existed between these two groups. Similarly, equal percentages in both groups underwent post-CRYO prostate biopsies during the first year, with no difference in outcome.
Poster #198
OUTCOMES AFTER POST-OPERATIVE RADIATION THERAPY
Hao Nguyen; Clint Cary K.; Appa Ayesha A.; Cowan Janet E.; Welty Christopher; Roach III Mack; Shinohara Katsuto; and Carroll Peter R.
UCSF Medical Center, San Francisco, CA
(Presented By: Hao Nguyen)

Introduction and Objective: Adjuvant radiotherapy following radical prostatectomy has been shown to improve PSA recurrence free survival for patients with high-risk pathologic features. However, an alternative strategy is careful follow-up after surgery and selective salvage radiation therapy. To investigate voiding, sexual function, and oncological outcomes of patients who underwent adjuvant radiotherapy (ARD) or salvage radiotherapy (SRT) after radical prostatectomy (RP).

Methods: We conducted a retrospective analysis of patients with localized prostate cancer treated with open or robotic assisted laparoscopic RP at UCSF from 2002 to 2013. Primary outcomes of interest were voiding function, sexual function, PSA recurrence-free survival (PRFS), combined bone metastasis free-survival/cancer-specific survival (BMFS/CSS), and overall survival (OS). Voiding and sexual function were measured using IPSS and SHIM score. Survival outcomes were estimated and compared using the Kaplan–Meier method and log rank test.

Results: Among 2,908 men in the study, mean age was 60 years (SD 6.9), median PSA was 5.9 ng/ml (IQR 4.6–8.6), and median PSA density was 0.19 (IQR 0.13–0.28) at diagnosis. Median follow-up was 28 months (IQR 8–61). Of those with high risk pathologic features, 1,086 patients did not undergo post-RP radiation (NRT), 109 had ART, and 156 had SRT. All patients had comparable pre-treatment sexual (SHIM: 18) and voiding function (IPSS: 8). However, patients treated with ART or SRT had worse SHIM scores at 4 years post-RP compared to patients without radiation (5.2 (ART/SRT) vs 11.1 (NRT), p=0.01). There were no differences in voiding function at 4 years between the three groups. PRFS at 4 years was 92% for NRT, 82% for ART, and 55% for SRT cohort, log-rank p<0.01. Four-year BMFS/CSS and OS both were 98% and were similar for all groups. In a sub-analysis of men with stage pT2/3a, positive margins, and negative lymph nodes, PRFS were 86% (NRT) and 90% (ART). The PRFS following SRT was 63%.

Conclusions: This study provides novel information on both oncological and functional outcomes for men managed with surgery and postoperative radiation therapy at UCSF. Such information allows for better pre- and post-operative counseling of men. Further analyses are required to better determine which men benefit from immediate adjuvant radiation as compared to a strategy of surveillance followed by selective salvage radiation.

Poster #199
FACTORS ASSOCIATED WITH BIOPSY PROGRESSION ON ACTIVE SURVEILLANCE
Christopher Welty; Janet Cowan; Hao Nguyen; Shinohara Katsuto; Nannette Perez; Kirsten Greene; Maxwell Meng; Matthew Cooperberg; and Peter Carroll
UCSF, San Francisco, CA
(Presented By: Christopher Welty)

Introduction: Active surveillance (AS) is a treatment strategy for prostate cancer (CaP) involving close monitoring of men diagnosed with low-risk CaP to reduce overtreatment. We report here factors associated with disease progression while on AS in a large, single institution cohort.

Methods: We retrospectively reviewed the data of men enrolled in the University of California at San Francisco (UCSF) AS cohort between 1990 and 2012. Strict eligibility criteria were prostate-specific antigen (PSA) <10ng/ml, Stage <cT3, Gleason grade ≤ 6, ≤33% of biopsy cores positive, and ≤ 50% of any single biopsy core positive. Men who did not meet these criteria but still elected AS were followed as well. Surveillance consisted of quarterly PSA testing, reimaging with TRUS at provider discretion, and annual prostate biopsy. Biopsy progression was defined as upgrade to at least Gleason 7 or increase in volume >33% cores. Factors associated with progression while on active surveillance were determined through multivariate Cox proportional hazards regression.

Results: Of 1,009 men enrolled in AS at UCSF, 758 men have consented to participate in research to date and have been followed on AS for a median of 57 months. Of these, 518 (68%) met strict criteria for AS while 240 (32%) did not. The median number of repeat biopsies was 3 (IQR 2–4). At 5 years after diagnosis, 53 % were progression-free and 40% of patients received local therapy. Overall survival was 94% among those not AS eligible and 100% among those AS eligible at 5 years. There were no CaP-related deaths. In multivariate analysis, only PSA density (PSAD) and later year of diagnosis were positively associated with the risk of both biopsy progression (HR 1.62, 95% CI 1.36–1.92, p<0.01 and HR 1.17, 95% CI 1.10–1.25, p<0.01, respectively) and receiving treatment (HR 1.39, 95% CI 1.20–1.60, p<0.01 and HR 1.18, 95% CI 1.14–1.23, p<0.01, respectively). Caucasian race was associated with receiving treatment (HR 1.92, 95% CI 1.35–2.74, p<0.01) but not with disease progression.

Conclusions: The majority of men who enrolled in this active surveillance cohort remained on AS after a median follow up of 57 months. While higher PSAD was associated with biopsy progression, additional predictive tools would improve selection and counseling of men for AS.
Poster #200
Evolving management paradigms for stage 1 testicular cancer: the impact of clinical trial evidence on institutional practice patterns

Gautum Agarwal; Oscar Valderrama; Sabine Nguyen; Adam Luchey; Julio Pow-Sang; Philippe Spiess; Michael Poch; and Wade Sexton
Moffitt Cancer Center, Tampa, FL
(Presented By: Gautum Agarwal)

Introduction: Contemporary management for patients with stage I testicular cancer (TC) continues to evolve. Survival rates are dependent upon accurate staging, careful surveillance and the treatment(s) rendered. We sought to determine whether treatment recommendations have been impacted by evidence gained from recent clinical trials and how sociodemographic factors might affect therapeutic decisions for patients with stage I pure seminoma (PS) and nonseminoma (NSGCT).

Methods: We performed a single institution, IRB approved, retrospective review of patients evaluated for TC from 1999–2013. Chi-square and logistic regression analyses were performed between multiple variables including: type of treatment, specialty of the provider seen, year of treatment, insurance status and distance traveled to our hospital.

Results: 440 patients were evaluated; of this group 121 patients had stage I TC and met inclusion criteria. Insurance status had no effect on the type of treatment received for both NSGCT (p=0.858) and PS (p=0.398). For NSGCT patients, living farther than 50 miles from our center was associated with treatment (p=0.041). If intervention was recommended, NSGCT patients evaluated prior to 2010 were more likely to undergo primary RPLND (p=0.01); after 2010 these patients were more likely to have primary chemotherapy (PC) (p=0.01). Rates of active surveillance remained the same before and after 2010. The percentage of PS patients receiving external beam radiation decreased from 40% to 5% after 2010, while the rate of surveillance increased from 47% to 79% (p=0.016). Throughout the study period, NSGCT patients primarily evaluated by urologic oncologists had higher RPLND rates while patients evaluated by medical oncologists more often received PC (p<0.001). For all Stage I patients the presence of lymphovascular invasion (LVI) was associated with treatment compared to surveillance (p=0.001).

Conclusions: The management of patients with Stage I TC has changed significantly over the past decade. Surveillance remains an attractive option for many patients with NSGCT but is increasingly recommended for patients with PS. LVI still drives recommendations for both PS and NSGCT patients and PC is increasingly recommended in this setting. In our study, management recommendations have been shown to be dependent upon the specialty of the provider and other social factors such as distance from the hospital, which suggests the possibility of bias during patient counseling.

Poster #201
Do seminoma germ cell elements affect perioperative outcomes following post-chemotherapy retroperitoneal lymph node dissection for metastatic testis cancer?

Gautum Agarwal¹; David Buethel¹; Christopher Russell¹; Patrick Espiritu¹; Adam Luchey¹; Phillipe Spiess¹; Julio Pow-Sang¹; Michael Poch¹; and Wade Sexton¹
¹Moffitt Cancer Center, Tampa, FL; ²University of South Florida, Tampa, FL
(Presented By: Gautum Agarwal)

Introduction: Post-chemotherapy retroperitoneal lymph node dissections (PC−RPLND) performed at high-volume centers is safe and comparable in risk to primary RPLNDs. However, the desmoplastic reaction encountered during PC−RPLND in patients with seminoma components has been reported to increase the complexity of surgical dissection. Our objective was to examine whether the presence of seminoma at diagnosis was associated with more adverse events in the perioperative setting.

Methods: An IRB approved retrospective review identified 108 patients undergoing PC−RPLND between 1992 and 2012 within a single institution. All patients had received at least 1st line cisplatin−based induction chemotherapy. Of these, 11 patients undergoing redo PC−RPLNDs were excluded from analysis. Patients were divided into 2 groups; those with any seminoma element in their orchiectomy or retroperitoneal specimens and those without seminoma elements. We performed independent t−tests and Chi−squared analysis of the data. A p−value <0.05 was considered significant.

Results: Of 97 patients undergoing PC−RPLND, 33 had seminoma components in their diagnostic specimens. Using the Clavien classification system to stratify post−operative complications, the presence of seminoma and the percentage of seminomatous elements (<50% compared to >50%) within the primary tumor did not correlate with a higher incidence of complications; even when examining only major complications (p=0.673). There was a trend towards higher nephrectomy rate for tumors with seminoma elements compared to those without (27% vs. 8.5%, p=.058). The nephrectomy rate did however show a dependence on the pathologic size of the residual mass regardless of histology (31% for >10 cm, 6.8% for 5−10 cm, 0% for 0−5 cm p = 0.021). There was also a trend towards blood loss greater than 1 liter for patients with seminoma elements compared to those without (63% vs. 43%, p = 0.078). However the transfusion rate was similar between the two groups (p=0.785). Post−operative length of stay was independent of a patient’s histology (p=0.94).

Conclusions: PC−RPLND remains a safe and necessary therapeutic procedure. The presence of seminoma germ cell elements in our patient cohort did not result in a more complicated perioperative course surrounding PC−RPLND.
THE INFLUENCE OF ACCESS TO CARE ON ADHERENCE TO CLINICAL PRACTICE GUIDELINES FOR TESTIS CANCER
Zachary Reardon¹; Harras Zaid¹; CJ Stimson¹; Sanjay Patel²; Samuel Kaffenberger¹; Daniel Barocas¹; Matthew Resnick¹; and Sam Chang¹
¹Vanderbilt University Medical Center, Department of Urology, Nashville, TN; ²University of Chicago Medical Center, Section of Urology, Chicago, IL
(Presented By: Zachary Reardon)

Introduction and Objective: Measurement of pre−orchiectomy serum tumor markers (pSTM) in patients with suspected testis cancer (TC) and use of radiation therapy (RT) for clinical Stage IS (cIS) seminoma are recommended processes of care in the National Comprehensive Cancer Network (NCCN) guidelines. We assessed whether factors that influence patient access to care resulted in decreased adherence to these guidelines.

Methods: We analyzed all patients with orchiectomy−proven non−seminomatous (NSGCT) and seminomatous (SGCT) germ cell tumors diagnosed between 2004−2011, from the National Cancer Database registry. Separate logistic regression models were fit to determine whether access−related factors predicted pSTM measurement among all TC patients, and use of RT among patients with cIS SGCT.

Results: A total of 6462 patients met our inclusion criteria, of which 4851/6462 (75%) had pSTM drawn. The cIS SCGT cohort included 527 patients, of which 270/527 (51.2%) received primary RT. While controlling for other clinical and demographic factors, multivariate analysis showed statistically significant increase in use of pSTM with younger age, geographic location in the South or Midwest, treatment at a comprehensive or academic cancer facility, and lower income (Table 1). With regards to utilization of RT for cIS SGCT, patients from the Midwest were significantly more likely to receive RT (referent Northeast, p<0.05).

Conclusion: Clear recommendations exist for the implementation of pSTM for patients with suspected TC as well us utilization of primary RT for cIS SGCT. Despite these recommendations, a considerable percentage of patients did not receive this management and it appears that factors influencing patient access to care are associated with decreased adherence to these guidelines.
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<td>Bishoff, Jay T.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 82</td>
</tr>
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<td>Bivalacqua, Trinity J.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 106</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 138</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 136</td>
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<td>Canter, Daniel J.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 59</td>
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<td>Cary, Clint K.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 101</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 35</td>
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<td>Chin, Arnold</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 155</td>
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<td>Chung, Paul H.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 156</td>
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<td>Correa, Andres F.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 188</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 189</td>
</tr>
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<td>Crook, Juanita</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 81</td>
</tr>
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<td>Daskivich, Timothy J.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 93</td>
</tr>
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<td>Daugherty, Michael</td>
<td>12/5/13</td>
<td>4:30 p.m.</td>
<td>Poster# 148</td>
</tr>
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<td></td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 150</td>
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<td>Den, Robert</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 191</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 111</td>
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<td>Donahue, Timothy F.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 176</td>
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<td>Donin, Nicholas</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 53</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 54</td>
</tr>
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</table>
Alphabetical Index of Authors

Downs, Tracy M.
12/6/13  4:30 p.m.  Poster# 125
12/6/13  4:30 p.m.  Poster# 126

Durso, Timothy
12/5/13  4:00 p.m.  Poster# 39

Eggener, Scott E.
12/6/13  4:30 p.m.  Poster# 170

Eisenberg, Manuel S.
12/4/13  7:05 p.m.  Podium #2
12/5/13  4:00 p.m.  Poster# 24

Ercole, Cesar E.
12/6/13  4:30 p.m.  Poster# 194

Espiritu, Patrick
12/6/13  4:30 p.m.  Poster# 119

Faia, Izak
12/6/13  4:30 p.m.  Poster# 103

Fairey, Adrian
12/6/13  4:30 p.m.  Poster# 120

Farrell, James S.
12/6/13  4:30 p.m.  Poster# 167

Ferry, Elizabeth K.
12/6/13  4:30 p.m.  Poster# 161

Feuerstein, Michael A.
12/4/13  7:10 p.m.  Podium #3

Filson, Christopher P.
12/5/13  4:00 p.m.  Poster# 66
12/5/13  4:00 p.m.  Poster# 73

Gandaglia, Giorgio
12/5/13  4:00 p.m.  Poster# 85
12/5/13  4:00 p.m.  Poster# 86

Getzenberg, Robert H.
12/5/13  4:00 p.m.  Poster# 196

Giannatempo, Patrizia
12/6/13  4:30 p.m.  Poster# 26
12/6/13  4:30 p.m.  Poster# 102

Gills, Jessie
12/6/13  4:30 p.m.  Poster# 116

Gin, Greg E.
12/5/13  4:00 p.m.  Poster# 69

Ginzburg, Serge M.
12/5/13  4:00 p.m.  Poster# 38

Gomella, Leonard G.
12/6/13  4:30 p.m.  Poster# 121

Gorin, Michael
12/5/13  4:00 p.m.  Poster# 51

Gorney Brown, Paulina
12/6/13  4:30 p.m.  Poster# 139

Hammerich, Kai H.
12/5/13  4:00 p.m.  Poster# 64

Hanna, Nawar
12/5/13  4:00 p.m.  Poster# 12
12/5/13  4:00 p.m.  Poster# 84

Harris, Kelly
12/6/13  4:30 p.m.  Poster# 137

Higano, Celestia S.
12/5/13  4:00 p.m.  Poster# 65

Hinds, Peter R.
12/6/13  4:30 p.m.  Poster# 179

Ho, Philip L.
12/6/13  4:30 p.m.  Poster# 105

Hong, Cheng W.
12/6/13  4:30 p.m.  Poster# 166

Hu, Brian R.
12/5/13  4:00 p.m.  Poster# 10

Hu, Jim
12/5/13  4:00 p.m.  Poster# 92

Ingham, Matthew
12/6/13  4:30 p.m.  Poster# 197

Jabaji, Ramzi
12/6/13  4:30 p.m.  Poster# 130

Jain, Rajat
12/6/13  4:30 p.m.  Poster# 193

Jayadevan, Rajiv
12/6/13  4:30 p.m.  Poster# 181

Jimenez, Juan A.
12/5/13  4:00 p.m.  Poster# 32
12/5/13  4:00 p.m.  Poster# 31
<table>
<thead>
<tr>
<th>Authors</th>
<th>Date</th>
<th>Time</th>
<th>Type</th>
</tr>
</thead>
<tbody>
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<td>Kaimakliotis, Hristos Z.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 1</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 72</td>
</tr>
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<td>Kardos, Steven V.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 30</td>
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<td>Kartha, Ganesh K.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 96</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 98</td>
</tr>
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<td>Kim, Timothy</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 34</td>
</tr>
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<td>12/6/13</td>
<td>1:30 p.m.</td>
<td>Podium #8</td>
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<td>Klaassen, Zachary</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 168</td>
</tr>
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<td>Klein, Eric A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 58</td>
</tr>
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<td>Knezevic, Dejan</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 74</td>
</tr>
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<td>Kopp, Ryan P.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 36</td>
</tr>
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<td>Krabbe, Laura-Marie</td>
<td>12/6/13</td>
<td>1:40 p.m.</td>
<td>Podium #9</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 162</td>
</tr>
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<td>Krasnow, Ross</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 115</td>
</tr>
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<td>Lane, Brian Robert</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 158</td>
</tr>
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<td>Lankford, Dawud</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 177</td>
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<td>Leapman, Michael</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 50</td>
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<td>Lee, Daniel</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 123</td>
</tr>
<tr>
<td>Lee, Hak J.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 135</td>
</tr>
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<td>Levy, David A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 70</td>
</tr>
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<td>Liss, Michael A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 13</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 134</td>
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<td></td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 175</td>
</tr>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 18</td>
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<td>Mano, Roy</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 131</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 142</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 149</td>
</tr>
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<td>Mata, Douglas A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 21</td>
</tr>
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<td>Mazzola, Clarisse R.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 154</td>
</tr>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 16</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 43</td>
</tr>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 182</td>
</tr>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 146</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 145</td>
</tr>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 57</td>
</tr>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 6</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 7</td>
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<td>12/6/13</td>
<td>1:20 p.m.</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 80</td>
</tr>
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<td>Moreira, Daniel</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 71</td>
</tr>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 22</td>
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<td>4:00 p.m.</td>
<td>Poster# 23</td>
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<td>4:00 p.m.</td>
<td>Poster# 25</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
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<td>12/6/13</td>
<td>4:30 p.m.</td>
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<td>Nguyen, Sabine</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 56</td>
</tr>
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<td>Noon, Aidan P.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 112</td>
</tr>
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<td>Odom, Brian</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 63</td>
</tr>
<tr>
<td>Okoro, Chinonyerem</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 192</td>
</tr>
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<td>Orr, Brian A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 89</td>
</tr>
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<td>Parsons, J. Kellogg</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 41</td>
</tr>
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<td>Patel, Devin</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 122</td>
</tr>
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<td>Patel, Neel</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 132</td>
</tr>
<tr>
<td>Pedrosa, Jose A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 17, 12, 100</td>
</tr>
<tr>
<td>Pietzak, III, Eugene J.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 79</td>
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<td>Pouliot, Frederic</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 169</td>
</tr>
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<td>Psutka, Sarah P.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 33</td>
</tr>
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<td>Ramaswamy, Krishna A.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 129</td>
</tr>
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<td>Reardon, Zachary D.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 108, 202</td>
</tr>
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<td>Richard, Patrick</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 195</td>
</tr>
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<td>Richards, Kyle A.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 3, 4, 27</td>
</tr>
<tr>
<td>Ristau, Benjamin T</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 114</td>
</tr>
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<td>Ritch, Chad R.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 118</td>
</tr>
<tr>
<td>Ritch, Chad R.</td>
<td>12/6/13</td>
<td>1:50 p.m.</td>
<td>Podium# 10</td>
</tr>
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<td>Rodriguez, Dayron</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 118</td>
</tr>
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<td>Rosoff, James S.</td>
<td>12/6/13</td>
<td>4:00 p.m.</td>
<td>Poster# 157</td>
</tr>
<tr>
<td>Ruhotina, Nedim</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 83, 107</td>
</tr>
<tr>
<td>Russell, Christopher</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 49</td>
</tr>
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<td>Salami, Simpa S.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 173</td>
</tr>
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<td>Sankin, Alexander</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 143</td>
</tr>
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<td>Schroek, Florian Rudolf</td>
<td>12/6/13</td>
<td>8:05 a.m.</td>
<td>Podium# 4</td>
</tr>
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<td>Semerjian, Alice</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 90</td>
</tr>
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<td>Sfakianos, John</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 61</td>
</tr>
<tr>
<td>Shakir, Nabeel A.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 186</td>
</tr>
<tr>
<td>Shore, Neal D.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 185, 190</td>
</tr>
<tr>
<td>Sidana, Abhinav</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 28</td>
</tr>
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<td>Siddiqui, Khurram</td>
<td>12/6/13</td>
<td>2:00 p.m.</td>
<td>Podium# 11</td>
</tr>
<tr>
<td>Siddiqui, M. Minhaj</td>
<td>12/6/13</td>
<td>8:13 a.m.</td>
<td>Podium# 5</td>
</tr>
<tr>
<td>Slawin, Kevin M.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 171</td>
</tr>
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<td>Author</td>
<td>Date</td>
<td>Time</td>
<td>Type</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 40</td>
</tr>
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<td>Soloway, Mark S.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 104</td>
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<td></td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 77</td>
</tr>
<tr>
<td>Spaliviero, Massimiliano</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 152</td>
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<td></td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 20</td>
</tr>
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<td>Sternberg, Itay A.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 174</td>
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<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 8</td>
</tr>
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<td>Stewart, Suzanne B.</td>
<td>12/6/13</td>
<td>4:30 p.m.</td>
<td>Poster# 127</td>
</tr>
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<td>Stratton, Kelly L.</td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
<td>Poster# 45</td>
</tr>
<tr>
<td></td>
<td>12/5/13</td>
<td>4:00 p.m.</td>
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<td>Su, Daniel</td>
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<td>Sullivan, John</td>
<td>12/6/13</td>
<td>8:21 a.m.</td>
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<td>Sundi, Debasbh</td>
<td>12/5/13</td>
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<td>Syan, Sumeet</td>
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<td>Tomaszewski, Jeffrey J.</td>
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<td>Welty, Christopher J.</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
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: Sia Daneshmand, MD
Director of Urologic Oncology
1441 Eastlake Avenue, MS 74, Suite 7416
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Email: daneshma@med.usc.edu

Fellowship Coordinator: Adriana Cassani
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Fax: (323) 865-0120
Email: cassani@med.usc.edu

**Mayo Clinic Cancer Center, Mayo School of Graduate Medical Education**
Program Director: Bradley C. Leibovich, MD
Professor of Urology
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Email: leibovich.brady@mayo.edu

Education Coordinator: Joan E. Simon
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Email: simon.joan@mayo.edu

**Massachusetts General Hospital**
Program Director: Aria F. Olumi, MD
Associate Professor, Department of Urology
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Fellowship Coordinator: Kimberly A. Williams
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http://www.massgeneral.org/urology/

**Moffitt Cancer Center**
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Jackie Campbell, Fellowship Coordinator
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Fax: (813) 745-4064
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**New York Presbyterian Hospital - Weill Cornell Medical Center**
Program Director: Shahrokh F. Shariat, MD
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SUO Fellowship Programs

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www.smithinstituteforurology.com

Northwestern University Feinberg School of Medicine
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Roswell Park Cancer Institute
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http://www.roswellpark.edu/education/clinical-fellowships/urology

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University of Pittsburgh Medical Center
Program Director: Benjamin Davies, MD
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daviesbj@upmc.edu

University of Toronto - Uro-Oncology Fellowship Program, Division of Urology
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Fax: (416) 586-8354
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http://www.surg.med.utoronto.ca/urooncology/

University of Western Ontario, Uro-Oncology Fellowship Program
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Associate Professor, Departments of Surgery & Oncology
Divisions of Surgical Oncology & Urology Schulich School of Medicine & Dentistry
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SUO Fellowship Programs

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SUO FELLOWSHIP PROGRAMS

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Fellowship Coordinator: Joanie O’Leary
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Fellowship Coordinator: Glenda Gardner
Email: glenda.garnnder@utsouthwestern.edu

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SUO Fellowship Programs

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Fax: (314) 361-2203
Email: grubbr@wudosis.wustl.edu

SUO Fellowship Coordinator - Sally Wahlbrink
Email: wahlbrinks@wustl.edu
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.
SUO-SBUR Joint Meeting at the 2014 AUA Annual Meeting
May 2014
Orlando, FL

SUO at the 2014 AUA Annual Meeting
May 2014
Orlando, FL

SUO 2014 Annual Meeting
December 2014
Bethesda North Marriott Hotel & Conference Center
Bethesda, Maryland