18th Annual Meeting of the Society of Urologic Oncology

Extraordinary Opportunities for Discovery

NOVEMBER 29 – DECEMBER 1, 2017

Renaissance Washington DC Downtown Hotel
Washington, DC
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**A list of 2017 SUO faculty bios can be found on the SUO website at:** suonet.org/docs/meetings/suo1711/biobook.pdf

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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 Hours
Location: Grand Registration Desk
Wednesday, November 29, 2017 10:00 a.m. - 6:00 p.m.
Thursday, November 30, 2017 7:00 a.m. - 6:20 p.m.
Friday, December 1, 2017 7:00 a.m. - 3:30 p.m.

Exhibit Hall Hours
Location: Grand Ballroom
Wednesday, November 29, 2017 2:00 p.m. - 6:00 p.m.
Thursday, November 30, 2017 7:30 a.m. - 7:50 p.m.
Friday, December 1, 2017 7:30 a.m. - 11:00 a.m.

SOCIAL EVENTS

Young Urologic Oncologists (Y.U.O.) Dinner*
*Y.U.O. Members only. Membership is limited to the first seven-and-a-half years after completion of fellowship.
Date: Wednesday, November 29, 2017
Time: 6:00 p.m. - 9:00 p.m.
Location: Congressional Ballroom
Cost: One ticket is included in the registration fee
Attire: Business Casual.

Membership in the Y.U.O. Section of the SUO 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-and-a-half years after completion of fellowship.

SUO Reception
Date: Thursday, November 30, 2017
Time: 6:20 p.m. - 7:50 p.m.
Location: Grand Ballroom
Cost: One ticket is included in the registration fee
Attire: Business casual

The SUO welcomes its members to the 18th Annual Meeting. Members can visit with exhibitors and connect with fellow members, all while enjoying delicious drinks and hors d’oeuvres.
EDUCATIONAL NEEDS

Advanced Imaging in Prostate Cancer
The ability to detect, stage, and monitor both local and metastatic prostate cancer has been hampered by a paucity of sensitive and specific imaging modalities and imaging tracers for generations. However, this situation has begun to change dramatically with the emergence of novel bone, metabolic, and prostate cancer specific tracers, as well as advances in anatomic and functional imaging such as MRI. Published results as well as ongoing clinical trials are accumulating for each of these modalities, but their availability is still somewhat limited and sporadic depending on the community in which one practices. Therefore, there is an urgent need for the SUO community to be educated on the different existing and developing modalities and tracers, their use, their sensitivity and specificity, and how they might alter management decisions throughout the course of the disease.

Immunotherapy of Genitourinary Cancer
The field of immunotherapy of genitourinary cancer has developed recently such that this is an important area of interest and clinical utility to the practicing urologist. Thoughtful critique, discussion, and debate are critical for dissemination and implementation in the clinical care of patients with various forms of these challenging diseases. Notably, an expanding armamentarium of immunologic and molecular therapeutics for treatment of advanced and metastatic genitourinary cancer has led to interest in the development of novel immunologic agents alone and in combination with recently approved targeted agents. Practicing urologists and medical oncologists need to be familiar with the immunologic and genomic drivers for various forms of genitourinary cancers, the approach toward personalized medicine in this field, the novel pathways, mechanisms, safety profile, and efficacy of available agents. Further, this understanding will support rational trial design and execution for the advancement of our patient care mission. Urologists and medical oncologists should understand the role of checkpoint inhibition in promoting tumor killing by the innate immune system and be familiar with results of promising combination trials.

The standards of interventional treatment are shifting in the management of localized disease, not only through advances in surgical techniques and technologies, but also through risk-stratified approaches to patient management. These approaches take into account features such as tumor aggressiveness, patient comorbidities, and life-expectancy as well as the risks of contemporary interventions. Developed guidelines based on these variables require dissemination and discussion. Important as well is to understand the limitations of surgical techniques and areas in which data-driven decisions regarding the appropriate application of surgical intervention warrant development and oversight.

Kidney Cancer
Recent changes in oncologic medical care have had a profound impact in urologic malignancies and particularly in field of kidney cancer management that are of critical clinical utility to the practicing urologist. Thoughtful critique, discussion, and debate on these topics go hand-in-hand with the process of dissemination and implementation in the clinical care of patients with various forms of this challenging disease. Notably, an expanding armamentarium of molecular therapeutics for treatment of advanced and metastatic disease has sparked interest in the development of an array of neoadjuvant and adjuvant applications being tested in clinical trials with recently reported results becoming available. The mixed results of such studies are open to careful interpretation and thoughtful discussion as additional studies develop. Practicing urologists and medical oncologists need to be familiar with the genomic drivers for various forms of kidney cancers, the approach toward personalized medicine in this field, the novel pathways, mechanisms, safety profile, and efficacy of available agents. Further, this understanding will support rational trial design and execution for the advancement of our patient care mission. Urologists and medical oncologists should understand the role of checkpoint inhibition in promoting tumor killing by the innate immune system and be familiar with results of promising combination trials.

Bladder Cancer
This year’s bladder cancer sessions will address identified knowledge gaps including understanding the molecular characterization of non-muscle invasive bladder cancer and trying to optimize evaluation and treatment of patients with variant histology identified in NMIBC. For patients with muscle-invasive disease, we focus on perioperative assessment and management to optimize outcomes, updating our current status of knowledge regarding molecular subtypes of muscle invasive cancer, and, finally, identifying which patients might benefit from surgical treatment of metastatic disease.
Prostate Cancer
For prostate cancer patients, especially those with low risk tumors, therapeutic decision making remains a challenging process with a risk of over or under treatment. As such, there is a need for robust biomarkers to better stratify indolent from aggressive prostate cancer both at time of diagnosis as well as after definitive therapy to better guide timing and type of adjuvant or salvage therapy.

Many studies have examined the clinical need for a predictor of recurrence or metastatic potential of primary prostate cancer including gene expression signatures, genomic alterations, and protein profiling. The purpose of the first session is to discuss the role of MRI imaging in determining which men with elevated PSA levels may or may not need a biopsy. The value of genomic signatures that promise to better stratify risk in men with early stage prostate cancer need to be better understood both in newly diagnosed men at the time of diagnosis from biopsy as well as in the post prostatectomy state. Additionally, more recent data is allowing clinicians to more precisely recommend and time the role of combined androgen deprivation therapy and radiation therapy in men with adverse risk factors after prostatectomy. Indeed, there are recent genomic predictions biomarkers that promise to more accurately select the ideal patient at greater risk of benefiting from combined hormone therapy, plus radiation in a precision oncology manner.

The management of metastatic prostatic cancer continues to evolve quickly with some disruptive new biomarkers and therapies emerging into the clinic that will change patterns of practice. Recent advances in genomics are now allowing less expensive ways to survey the adaptive mutation landscape in CRPC under the selective pressures of treatment. While this could only until recently be done with tissue biopsies, recent advances using liquid biopsies and plasma circulating tumor DNA are allowing a more feasible way to serially survey the emergence of treatment resistance while on ADT and AR pathway inhibitors. The role of plasma DNA assays as prognostic and predictive markers will be discussed to provide an up-to-date review on these advances.

Alongside these emerging promising biomarkers, the newer and more potent AR pathway inhibitors are now being combined with androgen deprivation therapy in metastatic castrate sensitive prostate cancer. Two recent trials combining androgen deprivation therapy plus abiraterone promises to alter patterns to practice and significantly prolong survival in patients with M1 castrate sensitive prostate cancer. These promising combination therapies will likely move upstream and to earlier stages in the disease both in neoadjuvant settings and will be important to urologists to be familiar with these opportunities. The neoadjuvant model provides an opportunity to use pathology and complete responses to assess contextually lethal novel combination regimens that promise to delay progression and possibly improve survival if used in appropriate candidates in the neoadjuvant setting. The neoadjuvant model in assessing androgen responsiveness will be reviewed, and how this, along with preclinical models, allows the study of resistance and the role of alterations, steroid metabolism, and AR responsiveness will also be reviewed.

Penile Cancer
Penile cancer is a rare disease in the United States. Most urologic oncologists evaluate patients with this condition infrequently. Knowledge of the most recent AJCC staging guidelines enables decision making and prognosticitation by urological oncologists. Many patients with penile cancer present at a late stage, and may be incompletely treated by conventional therapies. Understanding the latest treatments, including immunotherapy, is vital for urologic oncologists. The recently-opened worldwide INPACT trial is of significant interest in helping the entire community of physicians caring for patients to design the appropriate sequenced treatment strategies.

Educational Needs & Objectives
Educational Objectives
At the conclusion of the 2017 SUO Annual Meeting, attendees should be able to:

Advanced Imaging in Prostate Cancer
1. Identify all new imaging modalities and tracers for prostate cancer.
2. Explain up-to-date data on each of the new imaging modalities and tracers for prostate cancer.
3. Describe how to use the emerging tools in managing men with prostate cancer.

Immunotherapy of Genitourinary Cancer
1. Explain the importance of PD-1 in renal cancer and the clinical impact of combined checkpoint inhibition.
2. Identify the obstacles to trial accrual for patients with advanced genitourinary cancers.
3. Describe the impact of immunotherapy on disease progression and survival for patients with advanced genitourinary malignancies.
4. Explain the rationale for immunotherapy using novel targeted and immune modulating agents.
5. Explain risk-stratified strategies for entering patients into clinical trials involving immunotherapies.
6. Identify the key genomic drivers of genitourinary cancers and developing strategies to adjunctively manage these tumors following surgery.
7. Explain the significance of tumor staining for PD-1 and PDL-1.
8. Describe the current and potential future value of agents such as nivolumab, pembrolizumab, and/or ipilimumab in patients with advanced genitourinary malignancies.

Bladder Cancer
1. Describe the pros and cons of post-TUR intravesical chemotherapy and the possible use of gemcitabine in this role.
2. Describe the current understanding of the genomic profile of nonmuscle invasive bladder cancer and compare it to invasive cancer.
3. Interpret the prognostic impact of variant histology when identified on TUR specimens in the absence of muscle invasion.
4. Describe the scientific background supporting current clinical trials of checkpoint inhibitors in NMIBC.
5. Describe observed changes in genomics of metastatic bladder cancer and tumor heterogeneity.
6. Describe the advantage of new molecular imaging techniques for staging evaluation of patients with bladder cancer.
7. Learn methods to optimize outcomes of performing radical cystectomy and using new checkpoint inhibitors in elderly, frail patients with bladder cancer.

Kidney Cancer
1. Describe the impact of adjuvant systemic therapy on disease progression and survival following resection of localized renal cell carcinoma.
2. Explain the rationale for neoadjuvant vs. adjuvant therapy using novel target and immune modulating agents.
3. Identify the obstacles to trial accrual for localized renal cell carcinoma.
4. Explain the importance of PD-1 in renal cancer and the clinical impact of combined checkpoint inhibition.
5. Explain risk-stratified strategies for surveillance of incidental renal masses as well as the risks and the role of selective biopsy for renal tumors.
6. Identify the details of the new guidelines for management of small renal masses.
7. Identify the advantages and outcomes of interventional techniques for percutaneous treatment of renal tumors as well as limitations of new technologies in the field.
8. Discuss the controversies surrounding minimally invasive surgical technologies for advanced renal cancers, the limitations of these approaches including aspects of case selection, serious pitfalls, and how to avoid them.

Prostate Cancer
1. Define the role of MRI imaging in PSA detected prostate biopsies.
2. Review the role of genomic signatures in risk stratification in men with early stage prostate cancer and following radical prostatectomy.
3. Discuss advances in optimal management in adverse risk factors following a radical prostatectomy through integration of clinical pathologic features, serum biomarkers, and genomic signatures.
4. Review recent advances using plasma circulating tumor DNA as a prognostic and predictive biomarkers in metastatic CRPC.
5. Explain recent Phase III data on combination androgen deprivation therapies and discuss life prolonging therapies combining androgen deprivation therapy in men with metastatic castrate sensitive prostate cancer.
6. Utilize the neoadjuvant pre-surgery model to study emerging combination therapies in prostate cancer.
7. Review mechanism of action alterations in steroid metabolism that may affect responsiveness of AR pathway inhibitors in advanced prostate cancer.

Penile Cancer
1. Identify the 2017 staging system just introduced for penile cancer.
2. Describe the international INPACT trial now open in the USA as of 2017, and how this trial will be of pivotal importance in advancing penile cancer management, and also to highlight the role US urologic oncologists may play.
3. Describe the latest treatments and immunotherapy options when first line systemic therapy has failed.
4. Describe ‘real-world’ clinical cases with input from penile cancer thought leaders representing medical oncology, radiation oncology, and urologic oncology.
Nurses and other healthcare professionals will receive a Certificate of Attendance. For information on the applicability and acceptance of Certificates of Attendance for educational activities certified for AMA PRA Category 1 Credit™ from organizations accredited by the ACCME, please consult your professional licensing board.

General Disclaimer
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Disclosure Information
In compliance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. All reported conflicts are managed by a designated official to ensure a bias-free presentation.

Special Assistance
We encourage participation by all individuals. If you have a disability, advance notification of any special needs will help us better serve you. Call (847) 264-5901 or email info@suonet.org if you require special assistance to fully participate in the meeting.
WEDNESDAY, NOVEMBER 29, 2017

12:00 p.m. – 1:00 p.m. Industry Satellite Lunch Symposium
Sponsored by Pfizer
Location: Congressional B
“Advanced Kidney Cancer: Case-Based Discussion”
Philippe Spiess, MD, MS, FACS, FRCS(C)
Moffitt Cancer Center
Tampa, FL
E. Jason Abel, MD, FACS
University of Wisconsin School of Medicine
Madison, WI
Jose A. Karam, MD, FACS
University of Texas MD Anderson Cancer Center
Houston, TX

THURSDAY, NOVEMBER 29, 2017

7:00 a.m. - 8:00 a.m. Industry Satellite Breakfast Symposium
Sponsored by PRIME Education
Location: Congressional A
“Quality Improvement Interventions and Real-World Urologic Oncology Practices in Bladder Cancer Care”
Matthew Milowsky, MD
Chapel Hill, NC
Daniel Petrylak, MD
New Haven, CT
Sara Psutka, MD, MSc
Chicago, IL

11:55 a.m. - 1:10 p.m. Industry Satellite Lunch Symposium
Sponsored by KOL Consortium
Location: Congressional B
“Growing Evidence for Clinical Utility of Genetics, Genomics, and Biomarkers”
E. David Crawford, MD
University of Colorado
Ginger Haynes, MS, CGC, MBA
Ambry Genetics

11:55 a.m. - 1:10 p.m. Industry Satellite Lunch Symposium
Sponsored by AstraZeneca
Location: Congressional A
“Immuo-Oncology Therapy for Patients with Advanced Urothelial Carcinoma Previously Treated with Chemotherapy”
Russell K. Pachynski, MD
Washington University School of Medicine
St Louis, MO
## Industry Satellite Symposia

**FRIDAY, DECEMBER 1, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</table>
| 7:00 a.m. - 8:00 a.m. | Industry Satellite Breakfast Symposium  
*Sponsored by Genentech*  
*Location: Congressional A*  
*“TECENTRIQ®: The First FDA-Approved Anti-PDL1 Cancer Immunotherapy for Locally Advanced or Metastatic Urothelial Carcinoma (mUC)”*  
Nancy Dawson, MD  
Medstar Georgetown University Hospital  
Washington, DC |
| 11:50 a.m. - 1:00 p.m. | Industry Satellite Lunch Symposium  
*Sponsored by Astellas and Pfizer Oncology*  
*Location: Congressional A*  
*“Elevate Care in Advanced Prostate Cancer”*  
Neal Shore, MD  
Carolina Urologic Research Center  
Myrtle Beach, SC |
18th Annual Meeting of the Society of Urologic Oncology
Extraordinary Opportunities for Discovery
November 29 – December 1, 2017
Renaissance Washington DC Downtown Hotel
Washington, DC

General Scientific Program

Program Co-Chairs
Gerald L. Andriole Jr., MD
Christopher J. Kane, MD

Speakers and times are subject to change.
All sessions located in the Renaissance Ballroom unless otherwise noted.
WEDNESDAY, NOVEMBER 29, 2017

OVERVIEW

10:00 a.m. - 6:00 p.m.  Registration/Information Desk Open
   Location: Grand Registration Desk

10:00 a.m. - 6:00 p.m.  Speaker Ready Room
   Location: Carnegie

2:00 p.m. - 6:00 p.m.  Exhibit Hall Open
   Location: Grand Ballroom

6:00 p.m. - 9:00 p.m.  *Young Urologic Oncologists (Y.U.O.) Dinner
   Location: Congressional Ballroom

GENERAL SESSION

12:00 p.m. - 1:00 p.m.  Industry Satellite Symposium Lunch
   Location: Congressional B

1:00 p.m. - 2:30 p.m.  Advanced Imaging in Prostate Cancer
   Session Chair: Robert E. Reiter, MD

   1:00 p.m. - 1:10 p.m.  [18F] Sodium Fluoride
      Speaker: Hossein Jadvar, MD, PhD, MPH, MBA

   1:10 p.m. - 1:20 p.m.  [11C] Choline
      Speaker: R. Jeffrey Karnes, MD

   1:20 p.m. - 1:30 p.m.  [18F] FACBC
      Speaker: Peter T. Nieh, MD

   1:30 p.m. - 1:40 p.m.  [68Ga] PSMA
      Speaker: Robert E. Reiter, MD

   1:40 p.m. - 1:50 p.m.  PSMA-targeted PET Imaging of Prostate Cancer with Florinated Radiotracers
      Speaker: Michael A. Gorin, MD

   1:50 p.m. - 2:00 p.m.  PET/MR of Prostate Cancer Using Copper Radiopharmaceuticals
      Speaker: Joseph Ippolito, MD, PhD

   2:00 p.m. - 2:10 p.m.  VPAC1: A Novel Target for Imaging Prostate Cancer
      Speaker: Matthew (Madhukar) Thakur, PhD

   2:10 p.m. - 2:30 p.m.  Case Panel Discussion
      Moderator: Robert E. Reiter, MD
      Panelists: Michael A. Gorin, MD
                 Joseph Ippolito, MD, PhD
                 R. Jeffrey Karnes, MD
                 Peter T. Nieh, MD

   2:30 p.m. - 3:00 p.m.  Break/Visit Exhibits
      Location: Grand Ballroom

Speakers and times are subject to change.
All sessions located in the Renaissance Ballroom unless otherwise noted.
3:00 p.m. - 4:30 p.m.  **Immunotherapy of Genitourinary Cancer**

**Session Chairs:** W. Marston Linehan, MD
David F. McDermott, MD

3:00 p.m. - 3:15 p.m.  **Renal Cell Carcinoma: Emerging Data for Locally Advanced and Metastatic Disease**

**Speaker:** David F. McDermott, MD

3:15 p.m. - 3:30 p.m.  **Renal Cell Carcinoma: Predicting Response and Overcoming Resistance**

**Speaker:** Hans J. Hammers, MD

3:30 p.m. - 3:45 p.m.  **Bladder Cancer: Upcoming Immunotherapy Ongoing Trials and Early Data**

**Speaker:** Jonathan Rosenberg, MD

3:45 p.m. - 4:00 p.m.  **Bladder Cancer: Currently Approved Immunotherapy**

**Speaker:** Elizabeth R. Plimack, MD, MS

4:00 p.m. - 4:30 p.m.  **Panel Discussion**

**Moderator:** David F. McDermott, MD
**Panelists:** Hans J. Hammers, MD
Elizabeth R. Plimack, MD, MS
Jonathan Rosenberg, MD

4:30 p.m. - 6:00 p.m.  **Poster Session I and Reception**

*Location: Grand Ballroom*
*Not CME Accredited*

6:00 p.m. - 9:00 p.m.  **Young Urologic Oncologists (Y.U.O.) Dinner**

*Location: Congressional Ballroom*
*Not CME Accredited*

6:00 p.m. - 7:00 p.m.  **Cocktail Hour**

7:00 p.m. - 7:10 p.m.  **Welcome and Introduction**

**President:** Alexander Kutikov, MD, FACS

7:10 p.m. - 7:20 p.m.  **Annual Business Meeting**

7:20 p.m. - 7:30 p.m.  **AUA Office of Research Update**

**Speaker:** Carolyn J. Best, PhD

7:30 p.m. - 7:40 p.m.  **Paper of the Year Presentation**

7:40 p.m. - 9:00 p.m.  **Mentor/Mentee Relationships: A Rudder for One's Early Career**

**Speakers:** James E. Montie, MD
David C. Miller, MD, MPH
Angela B. Smith, MD, MS
Cheryl T. Lee, MD
## THURSDAY, NOVEMBER 30, 2017

### OVERVIEW

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>7:00 a.m. - 6:20 p.m.</td>
<td>Registration/Information Desk Open</td>
<td>Grand Registration Desk</td>
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<tr>
<td>7:00 a.m. - 6:20 p.m.</td>
<td>Speaker Ready Room</td>
<td>Carnegie</td>
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<td>7:30 a.m. - 7:50 p.m.</td>
<td>Exhibit Hall Open</td>
<td>Grand Ballroom</td>
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<tr>
<td>11:20 a.m. - 11:55 a.m.</td>
<td>SUO Annual Business Meeting</td>
<td>Renaissance Ballroom</td>
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<tr>
<td>6:20 p.m. - 7:50 p.m.</td>
<td>SUO Reception and Awards</td>
<td>Grand Ballroom</td>
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### GENERAL SESSION

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>7:00 a.m. - 8:00 a.m.</td>
<td>Industry Satellite Symposium Breakfast</td>
<td>Congressional A</td>
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<tr>
<td>8:00 a.m. - 9:15 a.m.</td>
<td>Prostate Cancer Session I: Stratifying Risk in Localized PCA</td>
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<tr>
<td>8:00 a.m. - 8:15 a.m.</td>
<td>Role of MRI in PSA-Detected Prostate Biopsy Promise Study (Is it Safe to Avoid Not bx in Men with Elevated PSA?)</td>
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<tr>
<td>8:15 a.m. - 8:30 a.m.</td>
<td>Genomic Signatures to Risk Stratify Men with PCA</td>
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<td>8:30 a.m. - 8:40 a.m.</td>
<td>Optimal Management of Adverse Risk Post RP</td>
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<tr>
<td>9:05 a.m. - 9:15 a.m.</td>
<td>State-of-the-Art Lecture I: Trials, Trends, and Models: Synthesizing the Evidence on Prostate Cancer Screening</td>
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<tr>
<td>9:40 a.m. - 9:55 a.m.</td>
<td>2017 Richard D. Williams, MD Prostate Cancer Research Excellence Award Lecture</td>
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<tr>
<td>9:55 a.m. - 10:25 a.m.</td>
<td>Break/Visit Exhibits</td>
<td>Grand Ballroom</td>
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</table>
10:25 a.m. - 11:10 a.m.  **Penile Cancer**  
**Session Chair:** Viraj A. Master, MD, PhD, FACS

10:25 a.m. - 10:30 a.m.  **Introduction/Discussion of New 2018 Staging**  
**Speaker:** Viraj A. Master, MD, PhD, FACS

10:30 a.m. - 10:50 a.m.  **Case Presentations: Trying to Salvage Problematic Initial Management**  
**Moderator:** Viraj A. Master, MD, PhD, FACS
**Panelists:** Juanita Crook, MD  
Guru Sonpavde, MD  
Philippe E. Spiess, MD, MS, FACS, FRCS(C)

10:50 a.m. - 11:00 a.m.  **What to Do with the Locally Advanced or Metastatic Penile Cancer Patient if First Line Chemotherapy Fails?**  
**Speaker:** Guru Sonpavde, MD

11:00 a.m. - 11:10 a.m.  **INPACT Trial - Answering the Unanswered Questions**  
**Speaker:** Curtis A. Pettaway, MD

11:10 a.m. - 11:20 a.m.  **In Memoriam: Donald S. Coffey, PhD**  
**Speaker:** Trinity J. Bivalacqua, MD, PhD  
*Not CME Accredited*

11:20 a.m. - 11:55 a.m.  **SUO Annual Business Meeting**

11:55 a.m. - 1:10 p.m.  **Industry Satellite Lunch Symposium**  
**Location:** Congressional B

11:55 a.m. - 1:10 p.m.  **Industry Satellite Lunch Symposium**  
**Location:** Congressional A

1:10 p.m. - 2:10 p.m.  **Bladder Cancer Session I: Update on Biology and Management of Non Muscle Invasive Bladder Cancer**  
**Session Chair:** Eila C. Skinner, MD

1:10 p.m. - 1:30 p.m.  **Post-TUR Mitomycin C Debate: Should it be Standard of Care?**

1:10 p.m. - 1:16 p.m.  **Pro**  
**Speaker:** Jennifer M. Taylor, MD, MPH

1:16 p.m. - 1:22 p.m.  **Con**  
**Speaker:** Eila C. Skinner, MD

1:22 p.m. - 1:30 p.m.  **Is Gemcitabine the Answer?**  
**Speaker:** Edward M. Messing, MD

1:30 p.m. - 1:37 p.m.  **Thermo Reversible Hydrogel Based Delivery of Mitomycin C (MitoGel) for Treatment of Upper Tract Urothelial Carcinoma**  
**Speaker:** Seth P. Lerner, MD

1:37 p.m. - 1:52 p.m.  **Molecular Profile of Non-Invasive Bladder Cancer**  
**Speaker:** Margaret Knowles, PhD

1:52 p.m. - 2:04 p.m.  **Aberrant Histology in NMIBC - What Do We Know and Not Know?**  
**Speaker:** Donna E. Hansel, MD, PhD

2:04 p.m. - 2:10 p.m.  **Promise of Checkpoint Inhibitors for BCG-Unresponsive NMIBC: How Excited Should We Be?**  
**Speaker:** Stephen A. Boorjian, MD
2:10 p.m. - 2:40 p.m. Huggins Lecture

2:10 p.m. - 2:20 p.m. *Huggins Medal Presentation
Speaker: Leonard G. Gomella, MD, FACS
*Not CME Accredited

2:20 p.m. - 2:40 p.m. Huggins Medal Lecture: The Urologist's Role in Advanced Renal Cancer: An Insight into Personal Development and Career Progression
Speaker: Robert C. Flanigan, MD, FACS

2:40 p.m. - 3:10 p.m. *SUO-CTC Session: Endpoints in Localized Prostate Cancer Clinical Trials: Moving Beyond Overall Survival
Session Chairs: Adam S. Kibel, MD
Daniel W. Lin, MD
*Not CME Accredited

2:40 p.m. - 2:50 p.m. Metastasis-Free Survival Endpoint
Speaker: Christopher Sweeney, MBBS

2:50 p.m. - 3:00 p.m. Progression-Free Survival (PSA) Endpoint
Speaker: James L. Mohler, MD

3:00 p.m. - 3:10 p.m. Discussion
Speakers: James L. Mohler, MD
Christopher Sweeney, MBBS

3:10 p.m. - 3:40 p.m. Break/Visit Exhibits
Location: Grand Ballroom

3:40 p.m. - 4:40 p.m. Kidney Cancer Session I: Neoadjuvant and Adjuvant Therapy
Session Chair: Jonathan A. Coleman, MD
Moderator: Jose A. Karam, MD, FACS

3:40 p.m. - 3:55 p.m. Rationale, Pitfalls and Actionable Results of Genomic Testing in Developing Neoadjuvant and Adjuvant Strategies
Speaker: Sumanta K. Pal, MD

3:55 p.m. - 4:10 p.m. Neoadjuvant Therapies in Kidney Cancer: Critique, Current Trials and Future Directions
Speaker: Martin Voss, MD

4:10 p.m. - 4:25 p.m. Adjuvant Therapies in Kidney Cancer: Critique, Current Trials and Future Directions
Speaker: Lauren C. Harshman, MD

4:25 p.m. - 4:40 p.m. Panel Discussion/Q&A
Moderator: Jose A. Karam, MD, FACS
Panelists: Lauren C. Harshman, MD
Adam R. Metwalli, MD
Sumanta K. Pal, MD
Martin Voss, MD

4:40 p.m. - 4:50 p.m. Efficacy and Safety of Flexible Blue Light Cystoscopy with Hexaminolevulinate (HAL) in the Surveillance of Bladder Cancer: A Phase 3, Comparative, Multi-Center Study
Speaker: Siamak Daneshmand, MD

4:50 p.m. - 6:20 p.m. *Poster Session II and Reception
Location: Grand Ballroom
*Not CME Accredited

6:20 p.m. - 7:50 p.m. SUO Reception and Awards
Location: Grand Ballroom
FRIDAY, DECEMBER 01, 2017

OVERVIEW

7:00 a.m. - 3:30 p.m. Registration/Information Desk Open
Location: Grand Registration Desk

7:00 a.m. - 3:30 p.m. Speaker Ready Room
Location: Carnegie

7:30 a.m. - 11:00 a.m. Exhibit Hall Open
Location: Grand Ballroom

GENERAL SESSION

7:00 a.m. - 8:00 a.m. Industry Satellite Breakfast Symposium
Location: Congressional A

8:00 a.m. - 8:30 a.m. Young Urologic Oncologists (Y.U.O.) Program

8:00 a.m.  #1 PROSTATE CANCER INCIDENCE, TREATMENT TRENDS, AND SURVIVAL AMONG AMERICAN INDIANS AND ALASKAN NATIVES IN THE UNITED STATES
Presented By: Carissa E. Chu, MD

8:08 a.m.  #2 PROSTATE CANCER TREATMENT VARIATION IN ACCOUNTABLE CARE ORGANIZATIONS
Presented By: Parth K. Modi, MD

8:16 a.m.  #3 CT SCAN HAS HIGH RATE OF INCIDENTAL FINDINGS AND LOW CLINICAL UTILITY IN A COHORT OF HIGH RISK PROSTATE CANCER PATIENTS STAGED WITH 99MTC BONE SCAN AND PELVIC MR
Presented By: Chad Reichard, MD

8:30 a.m. - 9:30 a.m. Bladder Cancer Session II: Biology and Management of MIBC and Oligometastatic Bladder Cancer
Session Chair: Eila C. Skinner, MD

8:30 a.m. - 8:42 a.m. Clonal Evolution in Metastatic Urothelial Cancer
Speaker: Bishoy M. Faltas, MD

8:42 a.m. - 8:50 a.m. Comprehensive Molecular Characterization of Muscle-Invasive Bladder Cancer – An Update from The Cancer Genome Atlas Project
Speaker: Seth P. Lerner, MD

8:50 a.m. - 9:00 a.m. Prehabilitation for Cystectomy Patients - The Impact of Bladder Boot Camp
Speaker: Jeffrey S. Montgomery, MD, MHSA

9:00 a.m. - 9:10 a.m. Toward Better Clinical Staging - Molecular Imaging in Muscle Invasive and Metastatic Bladder Cancer
Speaker: Michael V. Knopp, MD, PhD

9:10 a.m. - 9:20 a.m. Oligometastatic Disease in Bladder Cancer - What is the Role of Surgery?
Speaker: Bernard H. Bochner, MD

9:20 a.m. - 9:30 a.m. Management of Immune Related Toxicity with Checkpoint Inhibitors in Bladder Cancer Patients
Speaker: Andrea Apolo, MD
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<th>Time</th>
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<tr>
<td>9:30 a.m.</td>
<td>Kidney Cancer Session II: Controversies in Surgical Management of Kidney Cancer</td>
</tr>
</tbody>
</table>
| 9:30 a.m. - 9:40 a.m. | Small Renal Masses and New Guidelines in Management  
Speaker: Ithaar H. Derweesh, MD |
| 9:40 a.m. - 9:50 a.m. | Ablative Technologies for Kidney Masses: State-of-the-Art and Management Guidelines  
Speaker: Thomas D. Atwell, MD |
| 9:50 a.m. - 10:00 a.m. | Managing Recurrences in the Current Era: Change in Recurrence Pattern, Natural History, and Multi-Disciplinary Management  
Speaker: Paul Russo, MD |
| 10:00 a.m. - 10:20 a.m. | Point - Counterpoint: IVC Thrombectomy for Level 2 Tumor Thrombus is Best Approached: |
| 10:00 a.m. - 10:10 a.m. | Open  
Speaker: Bradley C. Leibovich, MD, FACS |
| 10:10 a.m. - 10:20 a.m. | Robotically  
Speaker: Inderbir S. Gill, MD |
| 10:20 a.m. - 10:30 a.m. | Panel Discussion/Q&A  
Moderator: Christopher G. Wood, MD, FACS  
Panelists: Thomas D. Atwell, MD  
Ithaar H. Derweesh, MD  
Inderbir S. Gill, MD  
Bradley C. Leibovich, MD, FACS  
Paul Russo, MD |
| 10:30 a.m. - 11:00 a.m. | Break/Visit Exhibits  
Location: Grand Ballroom |
| 11:00 a.m. - 11:05 a.m. | Introduction to the EAU Lecturer  
Speaker: Christopher P. Evans, MD, FACS |
| 11:05 a.m. - 11:25 a.m. | EAU Lecture: Clinically Relevant Questions in the Surgical Management of Prostate Cancer  
Speaker: Francesco Montorsi, MD |
| 11:25 a.m. - 11:50 a.m. | State-of-the-Art Lecture II: The Evolving Management of Advanced Renal Cell Carcinoma  
Speaker: Rana R. McKay, MD |
| 11:50 a.m. - 1:00 p.m. | Industry Satellite Lunch Symposium  
Location: Congressional A |
1:00 p.m. - 1:45 p.m.  Oral Abstract Session
Moderator: Badrinath R. Konety, MD, MBA

1:00 p.m.  #4 COMBINING CLINICAL RISK FEATURES AND INTRINSIC MOLECULAR SUBTYPES TO REFINE SELECTION CRITERIA FOR NEOADJUVANT CHEMOTHERAPY IN PATIENTS WITH MUSCLE INVASIVE BLADDER CANCER
Presented By: Jonathan Duplisea, MD

1:07 p.m.  #5 ACTIVE SURVEILLANCE FOR VON HIPPEL-LINDAU-RELATED RENAL TUMORS USING SIZE-BASED RISK STRATIFICATION: LONG-TERM RESULTS
Presented By: Mark W. Ball, MD

1:14 p.m.  #6 PHARMACODYNAMIC AND PHARMACOKINETIC NEOADJUVANT STUDY OF HEDGEHOG PATHWAY INHIBITOR SONIDEGIB (LDE-225) IN MEN WITH HIGH-RISK LOCALIZED PROSTATE CANCER UNDERGOING PROSTATECTOMY
Presented By: Robert M. Hughes, BS

1:21 p.m.  #7 IMPACT OF HOSPITAL CASE VOLUME ON TESTICULAR CANCER OUTCOMES AND PRACTICE PATTERNS
Presented By: Solomon L. Woldu, MD

1:28 p.m.  #8 EFFECT OF RADIATION FACILITY OWNERSHIP ON VARIATION IN PROSTATE CANCER TREATMENT AND SPENDING
Presented By: Tudor Borza, MD, MS

1:45 p.m. - 2:45 p.m.  Prostate Cancer Session II: Management of Metastatic Castrate Sensitive PCa
Session Chair: Martin E. Gleave, MD, FRCSC, FACS
Moderators: Vivek K. Arora, MD, PhD
Isla Garraway, MD, PhD

1:45 p.m. - 2:00 p.m.  Tumor DNA and Clinical Outcomes in Metastatic Prostate Cancer
Speaker: Alexander Wyatt, BSc, D.Phil

2:00 p.m. - 2:15 p.m.  Optimal Management of Metastatic Castration Sensitive Prostate Cancer
Speaker: Kim N. Chi, MD

2:15 p.m. - 2:30 p.m.  Novel Targeted Androgen Ablation Prior to Radical Prostatectomy
Speaker: Adam S. Kibel, MD

2:30 p.m. - 2:45 p.m.  Alterations in Steroid Metabolism and AR Responsiveness
Speaker: Nima Sharifi, MD

2:45 p.m. - 3:30 p.m.  Research Scholars Update

2:45 p.m. - 3:00 p.m.  Research Scholar Update I: Diagnosis of Prostate Cancer by Desorption Electrospray Ionization Mass Spectrometric Imaging of Small Metabolites and Lipids
Speaker: Geoffrey A. Sonn, MD

3:00 p.m. - 3:15 p.m.  Research Scholar Update II: Molecular Profiling of Serial Targeted Biopsy Tissue to Predict Progression of Low to High Grade Prostate Cancer
Speaker: Simpa S. Salami, MD, MPH

3:15 p.m. - 3:30 p.m.  Research Scholar Update III: Tumor Evolution and Drug Response in Patient-Derived Organoid Models of Bladder Cancer
Speaker: Suk Hyung Lee, PhD

Disclaimer Statement
Statements, opinions and results of studies contained in the program are those of the presenters/authors and do not reflect the policy or position of the SUO nor does the SUO provide any warranty as to their accuracy or reliability.

Every effort has been made to faithfully reproduce the abstracts as submitted. However, no responsibility is assumed by the SUO for any injury and/or damage to persons or property from any cause including negligence or otherwise, or from any use or operation of any methods, products, instruments or ideas contained in the material herein.
FACULTY DISCLOSURE REPORT

18th Annual Meeting of the Society of Urologic Oncology
November 29 - December 01, 2017
Washington, DC

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. Therefore, it is mandatory that both the program planning committee and speakers complete disclosure forms. Members of the program committee were required to disclose all financial relationships and speakers were required to disclose any financial relationship as it pertains to the content of the presentations. The ACCME defines a ‘commercial interest’ as “any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients”. It does not consider providers of clinical service directly to patients to be commercial interests. The ACCME considers “relevant” financial relationships as financial transactions (in any amount) that may create a conflict of interest and occur within the 12 months preceding the time that the individual is being asked to assume a role controlling content of the educational activity.

ACS is also required, through our joint providership partners, to manage any reported conflict and eliminate the potential for bias during the activity. All program committee members and speakers were contacted and the conflicts listed below have been managed to our satisfaction. However, if you perceive a bias during a session, please report the circumstances on the session evaluation form.

Please note we have advised the speakers that it is their responsibility to disclose at the start of their presentation if they will be describing the use of a device, product, or drug that is not FDA approved or the off-label use of an approved device, product, or drug or unapproved usage.

The requirement for disclosure is not intended to imply any impropriety of such relationships, but simply to identify such relationships through full disclosure and to allow the audience to form its own judgments regarding the presentation.

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<thead>
<tr>
<th>PLANNING COMMITTEE / CME ORGANIZERS</th>
<th>DISCLOSURE</th>
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<tr>
<td></td>
<td>Company</td>
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Podium #1
PROSTATE CANCER INCIDENCE, TREATMENT TRENDS, AND SURVIVAL AMONG AMERICAN INDIANS AND ALASKAN NATIVES IN THE UNITED STATES
Carissa Chu, MD¹; Michael Leapman, MD²; Shoujun Zhao, PhD¹; Janet Cowan, PhD¹ and Matthew Cooperberg, MD, MPH¹
¹Department of Urology, UCSF, San Francisco, CA; ²Department of Urology, Yale University, New Haven, CT
Presented By: Carissa E. Chu, MD

Introduction: Americans Indians and Alaska Natives (AI/AN) face significant disparities in cancer care with lower rates of screening, delayed diagnosis, decreased treatment access, and worse overall survival. Studies show that AI/AN men may have a lower incidence of prostate cancer (PCa) than white men, yet the highest mortality of any racial group. We sought to characterize incidence, treatment, and survival of PCa within this population using a national cancer database.

Methods: In this study, we utilized the Surveillance, Epidemiology, and End Results (SEER) database linked with Indian Health Service Contract Health Service Delivery Areas (CHSDA) data to study PCa incidence, treatment patterns, and predictors of mortality. Our variables included demographics, PSA, Gleason score, clinical T-stage at diagnosis, calculated Cancer of the Prostate Risk Assessment (CAPRA-9) score, primary treatment, county characteristics, and PCa-specific mortality. Survival analysis was performed using Cox proportional hazards model.

Results: 302,354 men were identified from 2000 to 2011. Our median follow-up time was 5.7 years. Compared to white men, AI/AN men were more likely to be diagnosed with higher stage (3.9 vs. 2.9% cT3-T4, p<0.0001), higher median PSA (6.9 vs 6.1, p<0.0001) and higher Gleason score (8.0 vs 6.0% GS 9-10 p<0.0001). They were also more likely to be diagnosed with metastasis at diagnosis than both African American and white men (2.4 vs. 1.6 vs. 2.0%, respectively, p<0.0001). In an adjusted multivariate analysis, AI/AN men were less likely than white men to undergo radical prostatectomy (36.6 vs 43.1%, p=0.0055) or any treatment at all (24.9 vs 17.0%, p<0.001). When stratified by CAPRA-9 stage, AI/AN men consistently had higher rates of mortality than all other groups (Figure 1). Adjusted 5-year PCa specific mortality was highest among AI/AN compared with white or African American men (3.1 vs 2.0 vs 2.5%, respectively).

Conclusion: AI/AN men present with higher risk PCa, are less likely to undergo definitive treatment, and are more likely to die from their disease. While these disparities may be explained by access to care, a role for tumor biology cannot be excluded.

Funding: None
Podium #2
PROSTATE CANCER TREATMENT VARIATION IN ACCOUNTABLE CARE ORGANIZATIONS
Parth Modi, MD¹; Samuel Kaufman, MS¹; Tudor Borza, MD, MS³; Phyllis Yan, MS¹; Vahakn Shahinian, MD, MS² and Brent Hollenbeck, MD, MS¹
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Presented By: Parth K. Modi, MD

Introduction: Accountable care organizations (ACOs) aim to improve outcomes and reduce costs of healthcare by improving care coordination and avoiding low-value care. Prostate cancer (PCa) care, with its potential for overtreatment, represents an area for improvement. However, ACOs are focused on primary care providers; specialists may not benefit from ACO incentives. In this context, we examined the impacts of Medicare Shared Savings Program (MSSP) ACOs on the use of curative treatment and treatment costs for PCa.

Methods: Primary care physicians were assigned to ACOs using the provider-level Research Identifiable File. Patients diagnosed with PCa in 2012-2013 were then assigned to primary care physicians using MSSP methodology to establish beneficiary ACO alignment. Rates of treatment, potential overtreatment (i.e., treatment in men with > 75% chance of 10-year mortality) and Medicare payments were measured at the ACO-level using logistic and negative binomial regression models. ACOs were characterized by the proportion of patients who were treated by an ACO-aligned urologist.

Results: 1437 beneficiaries were identified and assigned to one of 199 ACOs. The mean rate of curative treatment among all ACOs was 69.5% (IQR 65.4-74.8%). ACO rates of curative treatment ranged from 23.3% to 83.1% (Figure). When considering beneficiaries with >75% chance of 10-year non-cancer mortality, the mean curative treatment rate was 43.0% (IQR 28.0%-61.1%). Average Medicare payments among ACOs were $21,604.33 (IQR $12,534.61-$22,748.62). ACOs with the smallest proportion of men treated by ACO-aligned urologists had significantly higher rates of potential overtreatment than ACOs with the largest proportion (24.6% v 57.6%, P=0.036).

Conclusions: Considerable variation exists in the use of curative treatment for PCa among ACOs, especially for men with limited life expectancy. ACOs that include more men treated by urologists who are members of an ACO have lower rates of overtreatment, suggesting that ACOs that better engage urologists may have more of an impact on reducing low-value care.

Funding: NCI R01 CA168691 (VBS), NCI T32 CA180984 (PM, TB), NIA R01 AG048071 and ACS Research Scholar Grant RSGI-13-323-01-CPHPS (BKH).
Podium #3
CT SCAN HAS HIGH RATE OF INCIDENTAL FINDINGS AND LOW CLINICAL UTILITY IN A COHORT OF HIGH RISK PROSTATE CANCER PATIENTS STAGED WITH 99MTC BONE SCAN AND PELVIC MR
Chad Reichard, MD; Tharakeswara Bathala; Justin Gregg; Janet Kukreja; Mary Achim; John Davis and Brian Chapin, MD
Anderson Cancer Center Houston, TX
Presented By: Chad Reichard, MD

Introduction: Use of pelvic MR for staging and/or surgical planning is increasing, especially in NCCN high risk (HR) and very high risk (VHR) prostate cancer (PCa) patients. Most of these patients also undergo CT and technetium-99m bone scan (99mTc BS) for metastatic staging work up (often prior to tertiary center referral). We hypothesized that the omission of CT in the metastatic work up of HR PCa patients undergoing pelvic MR and 99mTc BS would not cause information loss regarding metastatic status and would reduce the burden of unwanted incidental findings. Thus we analyzed the incidence of pelvic and distant metastases (nodal and bone) identified on CT scan compared with that of MR and 99mTc BS.

Methods: 271 HR or VHR prostatectomy patients from 2006-2016 were identified. 160 patients had CT scan, 99mTc BS, and pelvic MR available for review. MR and CT were re-reviewed by a single radiologist (TKB). Descriptive statistics were used to codify the study sample (Table 1). ANOVA was used to test means among groups. Chi-square was used for categorical variables. Analyses were performed using SPSS v24 (IBM Corp).

Results: The clinical characteristics of patients with 99mTc BS only, CT only, or no imaging did not differ from those with all three imaging modalities (all p>0.05). The overall incidence of lymphadenopathy (LA) on imaging was low (3.1% for CT scan and 5% for MR). Only one patient had distant LA on CT which was biopsy negative. No patients with pelvic LA on MR had distant LA on CT. Furthermore, 50% of the patients with pelvic LA on CT had negative biopsies. MR specific findings: 18% of patients had SV involvement; 26% and 36% had evidence of NVB involvement and EPE respectively. 11.9% of CT scans had incidental findings, 84% of which were of minimal clinical significance.

Conclusion: In this cohort of HR and VHR PCa patients, the rate of incidental findings on CT scan is consistent with reported literature, with the majority being of minimal clinical significance. Additionally, in selected patients with pelvic MR and 99mTc BS, CT scan did not add any additional informative data regarding extra-pelvic disease status. These findings warrant further investigation into staging practices in patients with HR PCa.
Podium #4
COMBINING CLINICAL RISK FEATURES AND INTRINSIC MOLECULAR SUBTYPES TO REFINE SELECTION CRITERIA FOR NEOADJUVANT CHEMOTHERAPY IN PATIENTS WITH MUSCLE INVASIVE BLADDER CANCER
Jonathan Duplisea, MD¹; Michael Metcalfe, MD²; Debasish Sundi, MD²; Roger Li, MD²; James Ferguson, MD, PhD²; Shanna Pretzsch, PhD²; Jolanta Bondaruk, PhD²; Bogdan Czerniak, MD²; Ashish Kamat, MD²; Neema Nevai, MD²; Jay Shah, MD²; Woonyoung Choi, PhD²; David McConkey, PhD²; Peter Black, MD³ and Colin Dinney, MD²,
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Presented By: Jonathan Duplisea, MD

Introduction: Clinical and pathologic high-risk (HR) features have been identified to select patients with muscle-invasive bladder cancer (MIBC) for neoadjuvant chemotherapy (NAC) prior to radical cystectomy (RC). More recently, genomic studies identified intrinsic basal, p53-like, and luminal molecular subtypes of MIBC. The basal subtype is associated with a worse prognosis when treated by RC alone, but has a favorable response to NAC. We sought to study the value of NAC in patients with basal tumors, and to confirm that subtype predicted response to chemotherapy irrespective of clinical risk grouping.

Methods: We identified patients with MIBC who underwent RC with or without NAC at two institutions. Patients were considered HR based on the presence of hydroureteronephrosis, cT3b-T4a disease, and/or histological evidence of lymphovascular invasion, micropapillary or neuroendocrine features on transurethral resection (TURBT). Low-risk (LR) tumors did not possess these features. Whole-genome analysis was performed on TURBT specimens classifying them into basal, luminal or p53-like subtypes. Overall survival (OS) outcomes were compared for each subtype and clinical risk criteria.

Results: 165 patients were included in our analysis. 52 (32%) were LR and 113 (68%) HR; 99 (60%) patients received NAC and of these, 82 (83%) and 17 (17%) were HR and LR respectively. 49 (30%) of patients had basal tumors. A significant survival benefit with NAC was seen in patients with basal tumors in both HR and LR cohorts (p<0.0001) Figure 1. There was no statistically significant difference in benefit for NAC in patients with either luminal (p=0.2374), or p53-like subtype tumors (0.4134).

Conclusion: NAC chemotherapy seems to benefit patients with basal tumors regardless of whether they fall into the HR or LR group. Once validated, the risk criteria to identify HR tumors may include basal tumors, especially since their OS is prolonged after NAC.

Survival of Basal Tumors by Intrinsic Subtype and Clinical Risk Classification
ACTIVE SURVEILLANCE FOR VON HIPPEL-LINDAU-RELATED RENAL TUMORS USING SIZE-BASED RISK STRATIFICATION: LONG-TERM RESULTS

Mark Ball, MD; Julie An; James Peterson; Maria Merino, MD; Ramaprasad Srinivasan, MD; Adam Metwalli, MD and W. Marston Linehan, MD
Bethesda, MD
Presented By: Mark W. Ball, MD

Introduction: Renal cell carcinoma (RCC) develops in 25-60% of patients von Hippel-Lindau (VHL). Our institution practice has been to perform active surveillance for renal lesions less than 3 cm and surgical resection for lesions greater than 3 cm, based on early observations of low metastatic potential of small lesions. However, patients who are referred with larger tumors or who are lost to follow-up may not be managed exclusively by this guideline. We sought to evaluate the oncologic efficacy of the 3 cm size threshold in a large cohort with long-term follow-up.

Methods: From a prospective registry of 764 patients with VHL, a subset of patients with solid renal masses was identified. The diameter of the largest solid tumor, length of follow-up, and development of metastatic disease was assessed. Patients were further subdivided into those who were managed exclusively by the 3 cm threshold and those who were not. The proportion of patients who developed metastatic disease at size thresholds beyond 3 cm was assessed in 1 cm increments. Metastasis-free survival (MFS) was defined as the interval from initial screening to the development of distant metastatic disease.

Results: A total of 440 patients (57.5%) developed solid kidney tumors. Of these 417 (94.7%) had prior imaging reports available. Median follow-up was 103 months. Metastatic disease developed in 42 patients (10.1%). No patients developed metastatic disease when the size of their largest tumor was < 3 cm. Table 1 lists the proportion of patients who developed metastases by size of their largest tumor. MFS for patients managed with the 3 cm threshold was significantly longer compared to those who were not (p=0.007) (Figure 1). MFS for patients managed by the 3 cm threshold was 100% compared, while the 5, 10 and 20-year MFS for patients not managed by the 3 cm threshold was 95.7%, 91.1%, and 69.5%, respectively

Conclusion: In a large cohort of patients with VHL, adherence to the 3 cm guideline was associated with superior MFS compared to those who were not. We advocate the use of this guideline in conjunction with other patient characteristics and surgical judgement.
Podium #6
PHARMACODYNAMIC AND PHARMACOKINETIC NEOADJUVANT STUDY OF HEDGEHOG PATHWAY INHIBITOR SONIDEGIB (LDE-225) IN MEN WITH HIGH-RISK LOCALIZED PROSTATE CANCER UNDERGOING PROSTATECTOMY

Robert Hughes¹; Stephanie Glavaris¹; Kamyar Ghabili, MD¹; Ping He²; Nicole Anders²; Rana Harb²; Luigi Marchionni, MD, PhD²; Edward Schaeffer, MD, PhD²; Alan Partin, MD, PhD¹; Mohamad Allaf, MD²; Trinity Bivalacqua, MD, PhD¹; Carolyn Chapman¹; Tanya O'Neal¹; Angelo DeMarzo, MD, PhD¹; Paula Hurley, PhD¹; Michelle Rudek, PhD, PharmD³; Emmanuel Antonarakis, MD¹ and Ashley Ross, MD, PhD¹
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Presented By: Robert M. Hughes, BS

Introduction: To determine the pharmacodynamic effects of Sonidegib (LDE-225) in prostate tumor tissue from men with high-risk localized prostate cancer, by comparing pre-surgical core-biopsy specimens to tumor tissue harvested post-treatment at the time of prostatectomy.

Methods: We conducted a prospective randomized (Sonidegib vs. observation) open-label translational clinical trial in men with high-risk localized prostate cancer undergoing radical prostatectomy. The primary endpoint was the proportion of patients in each arm who achieved at least a two-fold reduction in GLI1 mRNA expression in post-treatment versus pre-treatment tumor tissue. We hypothesized that >70% of men in the Sonidegib arm would achieve this primary endpoint. Secondary endpoints included the effect of pre-surgical treatment with Sonidegib on disease progression following radical prostatectomy, and safety.

Results: Fourteen men were equally randomized (7 per arm) to either neoadjuvant Sonidegib or observation for 4 weeks prior to prostatectomy. Six of seven men (86%) in the Sonidegib arm (and none in the control group) achieved a GLI1 suppression of at least two-fold. In the Sonidegib arm, drug was detectable in plasma and in prostatic tissue; and median intra-patient GLI1 expression decreased by 63-fold, indicating potent suppression of Hedgehog signaling. Sonidegib was well tolerated, without any Grade 3-4 adverse events observed. Disease-free survival was comparable among the two arms (HR = 1.50, 95% CI 0.26–8.69, P = 0.65).

Conclusion: Hedgehog pathway activity (as measured by GLI1 expression) was detectable at baseline in men with localized high-risk prostate cancer. Sonidegib penetrated into prostatic tissue and induced a >60-fold median suppression of the Hedgehog pathway. The oncological benefit of Hedgehog pathway inhibition in prostate cancer remains unclear.
**Podium #7**

**IMPACT OF HOSPITAL CASE VOLUME ON TESTICULAR CANCER OUTCOMES AND PRACTICE PATTERNS**

Solomon Woldu, MD¹; Justin Matulay, MD²; Nirmish Singla, MD³; Timothy Clinton, MD³; Laura-Maria Krabbe, MD³; Ryan Hutchinson, MD³; Yuval Freifeld, MD³; Arthur Sagalowsky, MD³; Yair Lotan, MD³; Vitaly Margulis, MD³ and Aditya Bagrodia, MD³

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Presented By: Solomon L. Woldu, MD

**Introduction:** Given the rarity of testicular germ cell tumors (TGCTs) and the complex aspects of management, we evaluate the impact of hospital TGCT case volume on overall survival (OS) outcomes and practice patterns.

**Methods:** The National Cancer Database was queried for patients diagnosed with seminoma or non-seminomatous germ cell tumor (NSGCT). Hospitals were classified by case volume as high (99th percentile, > 26.1 cases annually, high-intermediate (95-99th percentile, 14.6-26.0 cases annually), intermediate (75-95th percentile, 6.1-14.5 cases annually), low-intermediate (25th-75th percentile, 1.8-6.0 cases annually), and low (25th percentile, <1.8 cases annually). The median (IQR) number of TGCT cases per institution per year was 3.4 (1.8-6.1).

**Results:** 33,417 patients with TGCT diagnosed from 1,239 institutions met inclusion criteria. Low, low-intermediate, intermediate, high-intermediate, and high volume hospitals accounted for 5.0%, 36.8%, 35.6%, 15.9%, and 6.8% of the cases, respectively. As such, the highest volume hospitals took care of a disproportionate number of patients with the top 5% of hospitals by case volume caring for 22.7% of all patients. Despite worse disease characteristics of patients treated at higher volume institutions, hospital volume was positively associated with survival outcomes in more advanced cases of TGCT. In the overall cohort, compared to the high volume hospitals, patients treated at high-intermediate, intermediate, low-intermediate, and low volume hospitals the hazard ratio for overall mortality was 1.28, 1.45, 1.48, and 1.83, respectively (p<0.05). A statistically significant association between survival and hospital volume was not apparent for seminoma or stage I NSGCT. Patients treated at higher volume hospitals were more likely to undergo surveillance for stage I seminoma, primary retroperitoneal lymph node dissection (RPLND) for stage I NSGCT, and post-chemotherapy RPLND for stage II/III NSGCT.

**Conclusion:** Our analysis of a nationwide cancer registry demonstrated that increased hospital TGCT case volume was associated with significant differences in management strategies and improved survival outcomes, in particular for more advanced disease.
Podium #8
EFFECT OF RADIATION FACILITY OWNERSHIP ON VARIATION IN PROSTATE CANCER TREATMENT AND SPENDING
Tudor Borza, MD, MS¹; Phylis Yan, MS¹; Samuel R Kaufman, MS¹; Lindsey A Herrel, MD, MS¹; Ted A Skolarus, MD, MPH²; Vahakn B Shahinian, MD, MS³ and Brent K Hollenbeck, MS, MS¹
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Presented By: Tudor Borza, MD, MS

Introduction: Differences in prostate cancer treatment arise from multiple patient and disease factors. Financial incentives from radiation facility ownership may serve as an additional source of variation. Our objective was to characterize the variation in prostate cancer treatment and spending and examine the effect of radiation facility ownership on this.

Methods: Using a 20% Medicare sample, we perform a retrospective cohort study of men with newly diagnosed prostate cancer between 2010 and 2013. Urologists were categorized by their practice affiliation (single specialty vs. multispecialty group) and ownership of a radiation facility. For single specialty groups, generalized estimating equations adjusting for patient variables were used to calculate rates of treatment within one year of diagnosis, potential overtreatment (i.e. treatment in patients with a 10-year risk of non-cancer mortality exceeding 75%) and annual price standardized per-beneficiary spending.

Results: We identified 19,063 men who were cared for by urologists affiliated with one of 561 single specialty groups, 88 of which were radiation facility owners. The mean rate of initial treatment was 70% with wide variation noted among groups (range 47%-87%, Figure). The mean rate of potential overtreatment was 44% (range 15%-80%) and mean annual spending was $20,668 (range $12,865-$34,964). Only 16% of radiation facility owning groups had initial treatment rates below the mean while 57% were in the highest quartile with similar trends noted in potential overtreatment. For annual spending, only 11% of radiation facilities owning groups were below the mean and 68% were in the highest quartile.

Conclusion: We observed wide variation in rates of treatment and spending among single specialty urology groups. The majority of groups with radiation facility ownership had rates of initial treatment, potential overtreatment and annual spending in the highest quartile. Radiation facility ownership appears to play a role in how patients with newly diagnosed prostate cancer are treated.
Poster Session I & Reception
Wednesday, November 29, 2017
4:30 p.m. – 6:00 p.m.
Poster Walks
Grand Ballroom
See page 61 for full abstracts

Poster #1
COST-EFFECTIVENESS ANALYSIS OF A BIOMARKER-BASED APPROACH TO SELECT PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER FOR NEOADJUVANT CHEMOTHERAPY
Solomon Woldu, MD¹; Oner Sanli, MD²; Peter Black, MD³; Matthew Milowsky, MD⁴ and Yair Lotan, MD¹
¹UT Southwestern Medical Center; ²Istanbul University (Istanbul, Turkey); ³The University of British Columbia (Vancouver, BC); ⁴University of North Carolina Lineberger Comprehensive Cancer Center (Chapel Hill, NC)
Presented By: Solomon L. Woldu, MD

Poster #2
WITHDRAWN

Poster #3
CONTEMPORARY COST-CONSEQUENCE ANALYSIS OF BLUE LIGHT CYSTOSCOPY WITH HEXAMINOLEVULINATE IN NON-MUSCLE-INVASIVE BLADDER CANCER
Zachary Klaassen, MD¹, Kathy Li, MPH¹; Wassim Kassouf, MD, CM, FRCSC²; Peter C. Black, MD³; Alice Dragomir, MSc, PhD² and Girish S. Kulkarni, MD, PhD, FRCSC³
¹Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; ²McGill University Health Centre, Montreal, QC, Canada; ³University of British Columbia, Vancouver, BC, Canada
Presented By: Zachary Klaassen, MD

Poster #4
DISCRIMINATIVE ABILITY OF COMMONLY USED INDICES TO PREDICT ADVERSE OUTCOMES AFTER RADICAL CYSTECTOMY: COMPARISON OF DEMOGRAPHICS, ASA, MODIFIED CHARLSON COMORBIDITY INDEX, AND MODIFIED FRAILTY INDEX
Xiaosong Meng, MD, PhD¹; Audrey Renson, BS²; James Wysock, MD¹; William C. Huang, MD¹; Samir S. Taneja, MD¹ and Marc Bjurlin, DO³
¹Department of Urology, NYU Langone Health; ²Department of Clinical Research, NYU Langone Hospital - Brooklyn; ³Department of Urology, NYU Langone Hospital – Brooklyn
Presented By: Xiaosong Meng, MD, PhD

Poster #5
CLINICAL DESTINY OF INDETERMINATE PULMONARY NODULES IN PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA OF THE BLADDER
David Cahn, DO, MBS¹; Brian McGreen, DO²; Albert Lee, DO²; Karen Ruth, MS¹; Elizabeth Plimack, MD¹; Daniel Geynisman, MD¹; Matthew Zibelman, MD¹; Benjamin Ristau, MD, MHA¹; Marc Smaldone, MD, MSHP¹; Richard Greenberg, MD¹; Rosalia Viterbo, MD¹; David Chen MD⁴, Robert Uzzo, MD⁴ and Alexander Kutikov, MD⁴
¹Fox Chase Cancer Center, Philadelphia, PA; ²Hahnemann University Hospital, Philadelphia, PA; ³Einstein Healthcare Network, Philadelphia, PA; ⁴Fox Chase Cancer Center
Presented By: David B. Cahn, DO, MBS
Poster #6
NOVEL USE OF PRE-OPERATIVE CT-MEASURED ADIPOSE TISSUE INDICES TO PREDICT POSTOPERATIVE AND SURVIVAL OUTCOMES AMONG PATIENTS UNDERGOING RADICAL CYSTECTOMY
Michael Kim, HBSc¹; Jaimin Bhatt, MBChB, MMed¹; Zachary Klaassen, MD¹; Bimal Bhindi, MD, MSc¹; Thomas Hermanns, MD¹; Patrick Richard, MD, MSc¹; John Kachura, MD²; Robert Hamilton, MD, MPH¹; Neil Fleshner, MD, MPH¹; Antonio Finelli, MD, MSc¹; Michael Jewett, MD¹; Alexandre Zlotta, MD, PhD¹ and Girish Kulkarni, MD, PhD¹
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Presented By: Michael S. Kim, HBSc

Poster #7
CANCER AND ALL-CAUSE MORTALITY IN BLADDER CANCER PATIENTS UNDERGOING RADICAL CYSTECTOMY: DEVELOPMENT AND VALIDATION OF A NOMOGRAM FOR TREATMENT DECISION-MAKING.
Tamer Dafashy, MD, MS¹; Jinhai Huo, PhD²; Yiji Chu, PhD²; Jacques Baillargeon, PhD³; Timothy Daskivich, MD, MS⁴; Yong-Fang Kuo, PhD⁵; Christopher Kosarek, MD⁶; Simon Kim, MD, MPH⁶; Eduardo Orihuela, MD⁶; Douglas Tyler, MD⁶; Stephen Freedland, MD⁶; Ashish Kamat, MD⁶ and Stephen Williams, MD⁶
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Presented By: Tamer Dafashy, MD, MS

Poster #8
COMPLICATIONS FOLLOWING RADICAL CYSTECTOMY AND URINARY DIVERSION SURGERY AMONG 1,063 BLADDER CANCER PATIENTS IN COMMUNITY-BASED SETTINGS
Kim Danforth, ScD, MPH¹; Scott Gilbert, MD²; Marilyn Kwan, PhD³; David Yi, MPH¹; Valerie Lee, MHS⁴; Maureen O’Keeffe Rosetti, MS⁵; Joanna Bulkley, PhD⁶; Michael Leo, PhD⁶; Sheila Weinmann, PhD⁶; Robert Krouse, MD, MS⁶; Stephen Williams, MD⁶ and Carmit McMullen, PhD⁶
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Presented By: Kim Danforth, ScD, MPH

Poster #9
MUSCLE-INVASIVE BLADDER CANCER PATIENTS WHO DID NOT RECEIVE RADICAL CYSTECTOMY: TREATMENT DECISIONS, ALTERNATIVE TREATMENTS, AND OPPORTUNITIES FOR CARE IMPROVEMENT
Philip Kim, MD, MPH¹; Tiffany Luong, MPH¹; Tulsi Shah, BS²,³; David Yi, MPH³; Margo Sidell, ScD, MSPH³; Ayae Yamamoto, SM³; Jeffrey Bassett, MD, MPH³; Ronald Loo, MD⁴; Stephen Williams, MD⁴ and Kim Danforth, ScD, MPH³
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Presented By: Kim Danforth, ScD, MPH
Poster #10
IMPACT OF POST-TREATMENT PSYCHIATRIC ILLNESS ON SURVIVAL OUTCOMES FOLLOWING TREATMENT OF PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER
Tamer Dafashy, MD, MS¹; Usama Jazzar, BS²; Christopher Kosarek, MD³; Shan Yong, PhD⁴; Zachary Klaassen, MD⁵; Jinhai Huo, PhD⁶; Byron Hughes, MD⁷; Edgar Esperza, PhD⁸; Hemalkumar Mehta, PhD⁹; Yong-Fang Kuo, PhD¹⁰; Simon Kim, MD¹¹; Douglas Tyler, MD¹²; Stephen Freedland, MD¹³; Ashish Kamat, MD¹⁴; Martha Terris, MD¹⁵; Dwight Wolf, MD¹⁶ and Stephen Williams, MD¹⁷
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Presented By: Tamer Dafashy, MD, MS

Poster #11
PROGNOSTIC SIGNIFICANCE OF EZH2 EXPRESSION IN UPPER TRACT UROTHELIAL CARCINOMA
Nirmish Singla, MD¹; Laura-Maria Krabbem, MD¹; Ahmet Aydin ²; Vandana Panwar, MD¹; Ryan Hutchinson, MD¹; Solomon Woldu, MD¹; Christopher Wood, MD²; Jose Karam, MD²; Alon Weizer, MD²; Jay Raman, MD²; Mesut Remzi, MD²; Nathalie Rioux-Leclercq, MD²; Andrea Haitel, MD²; Marco Roscigno, MD³; Christian Bolenz, MD³; Karim Bensalah, MD³; Arthur Sagalowsky, MD³; Shahrokh Shariat, MD³; Yair Lotan, MD³; Aditya Bagrodia, MD³; Payal Kapur, MD³ and Vitaly Margulis, MD³
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Presented By: Nirmish Singla, MD

Poster #12
PREOPERATIVE MULTIPLEX NOMOGRAM FOR PREDICTION OF HIGH-RISK NON-ORGAN CONFINED UPPER-TRACT UROTHELIAL CARCINOMA
Firas Petros, MD¹; Wei Qiao, PhD²; Nirmish Singla, MD³; Haley Robyak, MD⁴; Vitaly Margulis, MD³; Jay Raman, MD³ and Surena Matin, MD³
¹Department of Urology, The University of Texas MD Anderson Cancer Center, Houston, Texas; ²Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, Texas; ³Department of Urology, University of Texas Southwestern Medical Center, Dallas, Texas; ⁴Department of Surgery, Division of Urology, Penn State Health Milton S. Hershey Medical Center, Hershey, Pennsylvania.
Presented By: Firas G. Petros, MD

Poster #13
CHEMORADIATION VERSUS RADICAL CYSTECTOMY FOR MUSCLE INVASIVE BLADDER CANCER: COMPARATIVE ANALYSIS OF NATIONAL CANCER DATABASE WITH PROPENSITY SCORE WEIGHTING
Dharam Kaushik; Hanzhang Wang, MS; Wasim Chowdhury, MS; Qianqian Liu, MS; Joel Michalek, PhD and Ahmed M. Mansour, MD University of Texas Health, San Antonio, Texas, USA
Presented By: Dharam Kaushik, MD

Poster #14
GENOMIC ANALYSIS OF SAME-PATIENT METACHRONOUS UPPER-TRACT AND BLADDER UROTHELIAL CARCINOMA
Firas Petros, MD¹; Yuan Qi, PhD²; Woonyoung Choi, PhD²; Roger Li, MD¹; Xiaoping Su, PhD²; Charles Guo, MD²; Colin Dinney, MD²; David McConkey, PhD³ and Surena Matin, MD¹
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Presented By: Firas G. Petros, MD
### Poster Session I – Summary

| Poster #15 | APOBEC-MEDIATED MUTAGENESIS IN UROTHELIAL CARCINOMA IS ASSOCIATED WITH IMPROVED SURVIVAL, MUTATIONS IN DNA DAMAGE RESPONSE GENES, AND IMMUNE SIGNATURES  
Alexander Glaser, MD¹; Damiano Fantini, PhD¹; Yiduo Wang, MD¹; Yanni Yu¹; Kalen Rimar, MD¹; Joseph Podojil, PhD²; Stephen Miller, PhD² and Joshua Meeks, MD PhD¹  
¹Northwestern University, Department of Urology, Chicago, IL; ²Northwestern University, Interdepartmental Immunobiology Center, Department of Microbiology-Immunology, Northwestern University, Chicago, IL  
Presented By: Alexander Paul Glaser, MD |
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| Poster #16 | OBJECTIVE MEASURES OF FRAILTY AS PREDICTORS OF POSTOPERATIVE COMPLICATIONS AFTER RADICAL CYSTECTOMY  
Madeleine L. Burg; Thomas G. Clifford; Soroush T. Bazargani; Jie Cai; Anne K. Schuckman; Hooman Djaladat and Siamak Daneshmand  
USC Institute of Urology, USC/Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA  
Presented By: Madeleine Burg |
| Poster #17 | COMPARISON OF MUTATIONS AND GENE EXPRESSION DIFFERENCES BETWEEN AFRICAN AMERICANS AND NON-AFRICAN AMERICANS WITH UROTHELIAL CELL CARCINOMA  
Kalen Rimar, MD¹; Damiano Fantini, PhD²; Alexander Glaser, MD³; Sarah Psutka, MD, MSc² and Joshua Meeks, MD, PhD²  
¹Feinberg School of Medicine, Chicago, Illinois; ²Feinberg School of Medicine, Chicago, IL; ³John H. Stroger Hospital, Chicago, IL  
Presented By: Kalen Rimar |
| Poster #18 | NOVEL THREE-DIMENSIONAL ORGANOID CULTURE REVEALS INVOLVEMENT OF WNT/β-CATENIN PATHWAY IN PROLIFERATION OF BLADDER CANCER CELLS  
Takahiro Yoshida, MD, PhD¹; Max Katesm MD¹; Nikolai Sopko, MD, PhD¹; Gregory Joice, MD¹; Xiaopu Liu, BS¹; David McConkey, PhD² and Trinity Bivalacqua, MD, PhD¹  
¹The James Buchanan Brady Urological Institute, Johns Hopkins University School of Medicine, Baltimore, MD; ²Greenburg Bladder Cancer Institute, The Johns Hopkins University School of Medicine, Baltimore, MD  
Presented By: Takahiro Yoshida, MD, PhD |
| Poster #19 | IDENTIFYING PATIENTS WHO MAY BENEFIT FROM TRIMODAL THERAPY VERSUS EXTRIPATIVE SURGERY IN BLADDER CANCER  
Matthew Clements, MD, MS; Timothy Showalter, MD, MPH and Stephen Culp MD, PhD, MS  
University of Virginia, Charlottesville, VA  
Presented By: Matthew B. Clements, MD, MS |
| Poster #20 | VALIDATION OF THE BCG UNRESPONSIVE DEFINITION  
Roger Li, MD¹; Michael J. Metcalfe, MD²; Graciela Nogueras Gonzalez, MPH²; Neema Naval, MD³; H. Barton Grossman, MD³; Colin P. Dinney, MD² and Ashish M. Kamat, MD²  
¹UT MD Anderson Cancer Center; ²UT MD Anderson  
Presented By: Roger Li, MD |
| Poster #21 | THE IMPACT OF THE AFFORDABLE CARE ACT AND MEDICAID EXPANSION ON INSURANCE STATUS AND CANCER STAGING FOR BLADDER CANCER PATIENTS  
Kyle Plante, MS, MPH; Natasha Ginzburg, MD; Oleg Shapiro, MD; Joseph Jacob, MD; Gennady Bratslavsky, MD and Elizabeth Ferry, MD  
SUNY Upstate Medical University, Syracuse, NY  
Presented By: Kyle P. Plante, MS, MPH |
Poster #22

CLINICAL UTILITY OF NEXT GENERATION SEQUENCING IN UROTHELIAL BLADDER CANCER: MEMORIAL SLOAN KETTERING CANCER CENTER EXPERIENCE IN 454 PATIENTS
Sumit Isharwal, MD; Francois Audenet, MD; Esther Drill, PhD; Eugene Pietzak, MD; Irina Ostrovnya, PhD; Hikmat Al-Ahmadie, MD; Eugene Cha, MD; Timothy Donahue, MD; Min Yuen Teo, MD; Samuel Funt, MD; Maria Arcila, MD; Michael Berger, MD; Jonathan Rosenberg, MD; Dean Bajorin, MD; Jonathan Coleman, MD; Guido Dalbagni, MD; Bernard Bochner, MD; David Solit, MD and Gopa Iyer, MD

Memorial Sloan Kettering Cancer Center, New York, New York
Presented By: Sumit Isharwal, MD

Poster #23

ASSESSMENT OF BLUE LIGHT FLEXIBLE CYSTOSCOPY WITH CYSVIEW ON PATIENT REPORTED OUTCOMES: A PROSPECTIVE, MULTICENTER, WITHIN-PATIENT CONTROLLED STUDY IN DETECTION OF BLADDER CANCER DURING SURVEILLANCE
Angela Smith, MD¹; Siamak Daneshmand, MD²; Kamal Pohar, MD³; Michael Cookson, MD⁴; Michael Woods, MD⁵; Eduard Trabulsi, MD⁶; William Huang, MD⁷; Jeffrey Jones, MD⁸; Jennifer Taylor, MD⁹; Trinity Bivalacqua, MD⁵; Tracy Downs, MD⁷; Michael O’Donnell, MD⁸¹⁶; Gary Steinberg MD⁸¹; Joel DeCastro MD⁹; Ashish Kamat MD⁹; Badrinath Konety MD¹⁰; Matthew Resnick MD¹¹; Mark Schoenberg MD¹²; J. Stephen Jones, MD¹³ and Yair Lotan, MD¹⁴
¹Chapel Hill, NC; ²Los Angeles, CA; ³Columbus, OH; ⁴Oklahoma City, OK; ⁵New York, NY; ⁶Houston, TX; ⁷Baltimore, MD; ⁸Madison, WI; ⁹Iowa City, IA; ¹⁰Chicago, IL; ¹¹Rochester, MN; ¹²Nashville, TN; ¹³Boron, NY; ¹⁴Cleveland, OH; ¹⁵Dallas, TX
Presented By: Angela B. Smith, MD, MS

Poster #24

EFFECT OF BLUE-LIGHT CYSTOSCOPY (BLC) ON RECURRENCE/PROGRESSION RATES FOR VESIGENURTACEL-L (HS-410) WITH BCG IN PATIENTS WITH NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)
Andrew Zganjar, MD¹; William Parker, MD¹; Jeffery Holzbeierlein, MD¹; Gary Steinberg, MD²; Neal Shore, MD³; Lawrence Karsh, MD¹⁴; James Bailen, MD⁵; Karim Chamie, MD³; James Cochran, MD⁴; Richard David, MD⁴; Robert Grubb, MD¹⁰; Wael Harb, MD¹¹; Ashish Kamat, MD¹²; Vijay Kasturi, MD¹³; Edouard Trabulsi, MD¹⁴; William Walsh, MD¹⁵; Michael Williams, MD¹⁵; Frederick Wolk, MD⁹; Michael Woods, MD⁸¹⁶; Melissa Price, PhD¹⁷; Brandon Early, MS¹⁸ and Taylor Schreiber, MD, PhD¹⁸
¹University of Kansas Medical Center, Kansas City, KS; ²University of Chicago Medical Center, Chicago IL; ³Carolina Urologic Research Center, Myrtle Beach, SC; ⁴The Urology Center of Colorado, Denver, CO; ⁵First Urology, Jeffersonville, IN; ⁶Johns Hopkins University, Baltimore, MD; ⁷University of California Los Angeles, Los Angeles, CA; ⁸University of North Texas, Dallas, TX; ⁹Taris Biomedical LLC, Lexington, MA; ¹⁰Heat Biologics Inc., Durham, NC
Presented By: Andrew Zganjar, MD

Poster #25

AUTOMATED COMPUTER-ASSISTED ENDOSCOPIC DETECTION OF BLADDER TUMORS
Martin Gosnell, PhD¹; Dmitry Polikarpov, MD, MRes²; Ewa Goldys, PhD³; Andrei Zvyagin, PhD,DSc³ and David Gillatt, MBChB, MS, FRCS, FRCSEd⁴
¹Quantitative Pty Ltd, NSW, Australia; ²Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia; ³ARC Centre of Excellence for Nanoscale BioPhotonics, MQ Photonics, Macquarie University, NSW 2109, Australia; ⁴Faculty of Medicine and Health Sciences, Macquarie University, NSW, 2109, Australia
Presented By: Dmitry Polikarpov, MD, MRes

Poster #26

COSTS OF UROLOGIC CANCER CARE ACROSS THE DISEASE CONTINUUM
Deborah Kaye, MD, MS; Alice Min, MS; Lindsey Herrel, MD, MS; Zaojun Ye, MS; Jonathan Li, BA; James Dupree, MS, MPH; Chad Ellimoottil, MD, MS and David Miller, MD, MPH
University of Michigan, Ann Arbor, MI
Presented By: Deborah R. Kaye, MD
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**IMPACT OF INPATIENT PALLIATIVE CARE CONSULTATION ON ADMISSIONS FOR METASTATIC BLADDER CANCER**
Neil Mistry, MPH¹ and Sameer Siddiqui, MD²
¹School of Medicine, Oregon Health & Science University, Portland OR; ²St. Louis University Hospital, Division of Urology, St. Louis, MO
Presented By: Neil A. Mistry, MPH

Poster #28
**LEARN-INFORM-RECRUIT: INCREASING THE OFFER OF UROLOGIC CANCER TRIALS IN COMMUNITY PRACTICE**
Andrew Zganjar, MD; Christine Mackay, RN, CCRP; Laurie Petty; Mugur Geanam MD, PhD; Jessie Gills, MD; Tomas Griebling, MPH, MD; Brantley Thrasher, MD and Shellie Ellis, MA, PhD
University of Kansas Medical Center, Kansas City, KS
Presented By: Andrew Zganjar, MD

Poster #29
**PROSTATE CANCER ANXIETY IN MEN UNDERGOING ACTIVE SURVEILLANCE. FINDINGS FROM A LARGE PROSPECTIVE COHORT STUDY**
Karim Marzouk, MD, FRCSC¹; Behfar Eghdaie, MD, MPH²; Melissa Assel, MS³ and Andrew Vickers, PhD³
¹Memorial Sloan Kettering Cancer Center, Department of Surgery, Division of Urology, New York, NY; ²Memorial Sloan Kettering Cancer Center, Department of Surgery, Division of Urology; ³Memorial Sloan Kettering Cancer Center, Department of Epidemiology and Biostatistics
Presented By: Karim Marzouk, MD

Poster #30
**USE OF ADMINISTRATIVE DATA FOR COMPARATIVE EFFECTIVENESS RESEARCH IN THE TREATMENT OF NON-PROSTATE GENITOURINARY MALIGNANCIES**
Daniel Edwards, DO¹; David Cahn, DO, MBS²; Marc Smaldone, MD, MSHP² and Alexander Kutikov, MD²
¹Hahnemann University Hospital, Philadelphia, PA; ²Fox Chase Cancer Center, Philadelphia, PA
Presented By: David B. Cahn, DO, MBS

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Yunze Xu, PhD and Yiran Huang, PhD
Ren Ji Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, China
Presented By: Yunze Xu, PhD

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Soum D. Lokeshwar, BS¹; Zachary Klaassen, MD²; Asif Talukder, MD³; Travis Yates, PhD⁴; Martin J. P. Hennig, MD⁵; Michael Garcia-Roig, MD³; Sarrah S. Lahorewala, DDS⁵; Naureen N. Mullani, MS⁵; Bruce R. Kava, MD¹; Murugesan Manoharan, MD¹; Mark S. Soloway, MD³ and Vinata B. Lokeshwar, PhD³
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Presented By: Zachary Klaassen, MD

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**GERMLINE MUTATIONS OF RENAL TUMOR PREDISPOSITION GENES IN EARLY-ONSET PATIENTS**
Junlong Wu, MD¹; Hongkai Wang, MD¹; Christopher Ricketts, MD²; Youfeng Yang, MD²; Hailiang Zhang, MD¹; Guohai Shi, MD¹; Marston Linehan, MD²; Yao Zhu, MD¹ and Dingwei Ye, MD¹
¹Fudan University Shanghai Cancer Center, Shanghai, China; ²Urologic Oncology Branch, Center for Cancer Research, National Cancer Institute, National Institutes of Health, Bethesda, USA
Presented By: Junlong Wu, MD
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PATHOLOGIC DOWNSTAGING FOLLOWING NEOADJUVANT CHEMOTHERAPY IN PATIENTS WITH HIGH-RISK UPPER TRACT UROTHELIAL CARCINOMA
Ross Liao¹; Mohit Gupta, MD¹; Zeyad Schwen, MD¹; Hiten Patel, MD¹; Max Kates, MD¹; Michael Johnson, MD¹; Noah Hahn, MD²; David McConkey, PhD³; Trinity Bivalacqua, MD, PhD¹ and Phillip Pierorazio, MD¹
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Presented By: Ross Shane Liao

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Thenappan Chandrasekar, MD; Zachary Klaassen, MD; Hanan Goldberg, MD; Rashid K. Sayyid, MD; Girish S. Kulkarni, MD and Neil E. Flesher, MD
Division of Urologic Oncology, Department of Surgical Oncology, University of Toronto, Toronto, Ontario, Canada
Presented By: Thenappan Chandrasekar, MD

Poster #36
UTILITY OF LYMPH NODE DISSECTION FOR CLINICAL NODE NEGATIVE UPPER TRACT UROTHELIAL CELL CARCINOMA: A MULTICENTER STUDY
Zachary Hamilton, MD¹; Miki Haifler, MD²; Laura-Marie Krabbe, MD³; Timothy Clinton, MD³; Daniel Han, MD⁴; Stephen Ryan, MD⁴; Madhumitha Reddy MD⁴, Charles Field BS⁴, Aaron Bloch BS⁴, Fang Wan MS⁴, Robert Uzzo MD², Vitaly Margulis MD² and Ithaar Derweesh MD⁴
¹Saint Louis University, MO; ²San Raffaele Scientific Institute, Milan, Italy; ³University of Texas, San Antonio; ⁴University of California, San Diego
Presented By: Zachary A. Hamilton, MD

Poster #37
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Zachary Hamilton, MD¹; Umberto Capitanio, MD²; Deepak Pruthi, MD³; Ahmet Bindayi, MD⁴, Alessandro Larcher, MD²; Stephen Ryan , MD⁴; Madhumitha Reddy, MD⁴; Kendrick Yim, BS⁴, Aaron Bloch, BS⁴; Charles Field, BS⁴; Sean Berquist, BS⁴; Eric Ballon-Landa, MD⁴; Michael Liss, MD³; Francesco Montorsi, MD² and Ithaar Derweesh, MD⁴
¹Saint Louis University, MO; ²San Raffaele Scientific Institute, Milan, Italy; ³University of Texas Southwestern, Dallas, TX; ⁴University of California, San Diego
Presented By: Zachary A. Hamilton, MD

Poster #38
THE PROGNOSTIC VALUE OF NEUTROPHIL-LYMPHOCYTE RATIO FOR METASTATIC RENAL CELL CARCINOMA WITH VENOUS TUMOR THROMBUS PATIENTS UNDERGOING CYTOREDUCTIVE NEPHRECTOMY
Charles Peyton, MD¹; Jason Abel, MD²; Jose Karam, MD²; Vitaly Margulis, MD²; Viraj Master, MD²; Surena Matin, MD²; Christopher Wood, MD²; Kamran Zargar-Shoshtari, MD²; Wade Sexton, MD¹ and Philippe Spiess, MD²
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Presented By: Charles Peyton, MD

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CONDITIONAL SURVIVAL AND LANDMARK ANALYSIS FOR PATIENTS WITH SMALL RENAL CELL CARCINOMA UNDERGOING ACTIVE SURVEILLANCE AT A TERTIARY CARE CENTER
Firas Petros, MD¹; Aradhan Venkatesan, MD²; Diana Kaya, MD²; Chaan Ng, MD²; Bryan Fellman, MS³; Jose Karam, MD¹; Christopher Wood, MD¹ and Surena Matin, MD¹
¹Department of Urology, The University of Texas MD Anderson Cancer Center, Houston, Texas; ²Department of Diagnostic Radiology, The University of Texas MD Anderson Cancer Center, Houston, Texas; ³Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, Texas
Presented By: Firas G. Petros, MD
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Zachary Hamilton, MD¹; Miki Haifler, MD²; Laura-Marie Krabbe, MD³; Timothy Clinton, MD³; Stephen Ryan, MD⁴; Madhumitha Reddy, MD⁴; Sean Berquist, BS⁴; Aaron Bloch, BS⁴; Charles Field, BS⁴; Sunil Patel, MD⁴; Brittney Cotta, MD⁴; Vitaly Margulis, MD⁴; Robert Uzzo, MD⁴ and Ithaar Derweesh, MD⁴
¹Saint Louis University, MO; ²Fox Chase Cancer Center, Philadelphia, PA; ³University of Texas Southwest, Dallas, TX; ⁴University of California, San Diego
Presented By: Zachary A. Hamilton, MD

Poster #41
CYTOREDUCTIVE NEPHRECTOMY WITH OR WITHOUT METASTASECTOMY FOR METASTATIC RENAL CELL CARCINOMA IN THE TARGETED THERAPY ERA: A NATIONAL CANCER DATABASE STUDY
Leilei Xia, MD¹; Marshall Strother, MD¹; Phillip Mucksavage, MD¹; Benjamin Taylor, MD² and Thomas Guzzo, MD, MPH¹
¹Division of Urology, Department of Surgery University of Pennsylvania Perelman School of Medicine, Philadelphia, PA; ²Department of Urology, Weill Cornell Medical College, New York, NY
Presented By: Leilei Xia, MD

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LONG TERM OUTCOMES OF PATIENTS WITH CYSTIC CLEAR CELL RENAL CELL CARCINOMA
Mary E. Westerman, MD¹; Vidit Sharma, MD¹; Christine M. Lohse, MS²; Stephen A. Boorjian, MD¹; Bradley C. Leibovich, MD¹; John C. Cheville, MD² and R. Houston Thompson, MD¹
¹Mayo Clinic Department of Urology, Rochester Minnesota; ²Mayo Clinic Department of Health Sciences Research, Rochester Minnesota; ³Mayo Clinic Department of Pathology, Rochester Minnesota
Presented By: Mary Elizabeth Westerman, MD

Poster #43
HOSPITAL VOLUME AND OUTCOMES OF ROBOT-ASSISTED PARTIAL NEPHRECTOMY
Leilei Xia, MD¹; Jose Pulido, MD¹; Benjamin Taylor, MD² and Thomas Guzzo, MD, MPH¹
¹Division of Urology, Department of Surgery University of Pennsylvania Perelman School of Medicine, Philadelphia, PA; ²Department of Urology, Weill Cornell Medical College, New York, NY
Presented By: Leilei Xia, MD

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ANDROGEN RECEPTOR EXPRESSION IN RENAL CELL CARCINOMA: IMPLICATIONS FOR PROGNOSIS
Juan Chipollini, MD; Charles Peyton MD, Leah Cook, PhD; Jasreman Dillon, MD; Jeanette Rheinhardt; Zena Sayegh; Connor Lynch, PhD and Phillipe Spiess, MD
Moffitt Cancer Center, Tampa, FL
Presented By: Juan J. Chipollini, MD

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A DESCRIPTIVE ANALYSIS OF PD-1 AND PD-L1 EXPRESSION IN RARE KIDNEY CANCERS: IS IT TIME TO EXPAND TREATMENT PARADIGMS?
Juan Chipollini, MD; Charles Peyton, MD; Jasreman Dhillon, MD; Jeanette Rheinhardt; Zena Sayegh and Phillipe Spiess, MD
Moffitt Cancer Center, Tampa, FL
Presented By: Juan J. Chipollini, MD

Poster #46
TARGETED THERAPY PRIOR TO CYTOREDUCTIVE NEPHRECTOMY FOR IMDC INTERMEDIATE AND POOR RISK PATIENTS
Shivashankar Damodaran, MBMCh¹; Philippe Spiess, MD²; Jose Karam, MD²; Vitaly Margulis, MD⁴; Viraj Master, MD⁴; Wade Sexton, MD³; Datta Patil, MD⁴; Leonardo Borregales, MD⁴; Surena Matin, MD⁴; Christopher Wood, MD³ and E. Jason Abel, MD¹
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Presented By: Shivashankar Damodaran, MBMCh
Poster #47
ACCURACY OF CLINICAL NODAL STAGING IN PATIENTS UNDERGOING SURGERY FOR RENAL CELL CARCINOMA
Kushan D. Radadia, MD¹; Zorimar Rivera-Núñez, PhD²; Sinha Kim, PhD²; Nicholas J. Farber, MD³; Joshua Sterling, MD³; Marissa Falkiewicz, BS¹; Parth K. Modi, MD¹; Sharad Goyal, MD²; Rahul Parikh, MD²; Robert E. Weiss, MD¹; Isaac Y. Kim, MD¹; Sammy E. Elsamra, MD¹; Thomas L. Jang, MD¹ and Eric A. Singer, MD¹
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Presented By: Kushan D. Radadia, MD

Poster #48
RETROPERITONEAL VERSUS TRANSPERITONEAL ROBOTIC-ASSISTED LAPAROSCOPIC PARTIAL NEPHRECTOMY: A MATCHED-PAIR, BI-CENTER ANALYSIS WITH COST COMPARISON USING TIME-DRIVEN ACTIVITY-BASED COSTING
Aaron Laviana, MD¹; Hung-Jui Tan, MD²; Daniel Barocas, MD, MPH³; Sam Chang, MD, MBA³; Alon Weizer, MD, MS⁴ and Jim Hu, MD, MPH³
¹Vanderbilt University; ²University of North Carolina, Chapel Hill, NC; ³Vanderbilt University, Nashville, TN; ⁴University of Michigan, Ann Arbor, MI; ⁵Weill Cornell Medical Center, New York, New York
Presented By: Aaron A. Laviana, MD

Poster #49
LONG-TERM ACTIVE SURVEILLANCE OF CYSTIC RENAL MASSES & HETEROGENEITY OF BOSNIAK 3 LESIONS
Deepak Pruthi, MD, FRCSC¹; Qianqian Liu, PhD²; Iain Kirkpatrick, MD, FRCPC³; Jonathan Gefond, MD, PhD² and Darrel Drachenberg, MD, FRCSC⁴
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Presented By: Deepak Kumar Pruthi, MD, FRCSC

Poster #50
RADIOGENOMICS: A PROMISING TOOL FOR ASSESSING MALIGNANT POTENTIAL IN KIDNEY CANCER
Deepak Pruthi, MD, FRCSC¹; Rahul Rajendran, MSc²; Osamah Al-Bayati, MD³; Sos Agaiaiain, PhD² and Micheal Liss, MD, MAS³
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Presented By: Deepak Kumar Pruthi, MD, FRCSC

Poster #51
A PHASE 3 TRIAL TO COMPARE EFFICACY AND SAFETY OF LENVATINIB IN COMBINATION WITH EVEROLIMUS OR PEMBROLIZUMAB VS SUNITINIB ALONE IN FIRST-LINE TREATMENT OF PATIENTS WITH METASTATIC RENAL CELL CARCINOMA
Robert J. Motzer, MD¹; Viktor Grünwald, MD²; Thomas E. Hutson, DO³; Camillo Porta, MD⁴; Thomas Powles, MD⁵; Masatoshi Eto, MD⁶; Corina E. Dutucus, MD⁷; Mahadi A. Baig, MD⁷; Lea Dutta, PharmD⁷; Di Li, PhD⁷ and Toni K. Choueiri, MD⁸
¹Memorial Sloan Kettering Cancer Center, New York, NY, USA; ²Hannover Medical School, Niedersachsen, Germany; ³Baylor University Medical Center, Dallas, TX, USA; ⁴IRCCS San Matteo University Hospital Foundation, Pavia, Italy; ⁵Barts Cancer Institute, London, England, UK; ⁶Kyushu University, Fukuoka, Japan; ⁷Eisai Inc., Woodcliff Lake, NJ, USA; ⁸Dana Farber Cancer Institute, Boston, MA, USA
Presented By: Robert J. Motzer, MD

Poster #52
IMPACT OF DELAYED TARGETED THERAPY IN RENAL CELL CARCINOMA: A NATIONWIDE CANCER REGISTRY STUDY
Solomon Woldu, MD; Justin Matulay, MD; Timothy Clinton, MD; Yuval Freifeld, MD; Ryan Hutchison, MD; Yair Lotan, MD; James Brugarolas, MD; Hans Hammers, MD; Vitaly Margulis, MD and Aditya Bagrodia, MD
UT Southwestern Medical Center
Presented By: Solomon L. Woldu, MD
Poster #53

BIM EXPRESSION IN PERITUMORAL LYMPHOCYTES IS AN INDEPENDENT PREDICTOR OF SURVIVAL IN PATIENTS WITH METASTATIC CLEAR CELL RENAL CELL CARCINOMA

Bimal Bhindi, MD, CM, MSc FRCSC; John Cheville; Christine Lohse; Ross Mason; Susan Harrington; Haidong Dong; Stephen Boorjian, R. Houston Thompson and Bradley Leibovich

Mayo Clinic, Rochester, MN

Presented By: Bimal Bhindi, MD, CM, MSc, FRCSC

Poster #54

THE PROBABILITY OF INDOLENT VERSUS AGGRESSIVE HISTOLOGY BASED ON RENAL TUMOR SIZE: IMPLICATIONS FOR SURVEILLANCE AND TREATMENT

Bimal Bhindi MD, CM, FRCSC; R Houston Thompson; Christine Lohse; Ross Mason; Igor Frank; Stephen Boorjian; John Cheville and Bradley Leibovich

Mayo Clinic, Rochester, MN

Presented By: Bimal Bhindi, MD, CM, MSc

Poster #55

PRIMARY ADRENAL MALIGNANCY: INSIGHTS INTO THE EPIDEMIOLOGY OF A RARE HISTOLOGICAL SUBSET

Thenappan Chandrasekar, MD; Hanan Goldberg, MD; Zachary Klaassen, MD; Ardalun E. Ahmad, MD; Dixon T.S. Woon, MD; Jaime O. Herrera-Caceres, MD; Robert J. Hamilton, MD; Girish S. Kulkarni, MD and Neil E. Fleshner, MD

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Presented By: Thenappan Chandrasekar, MD

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PROGNOSTIC SIGNIFICANCE OF BAP1 EXPRESSION IN UPPER TRACT UROTHELIAL CARCINOMA

Laura-Maria Krabbe, MD¹; Nirmish Singlam, MD²; Ahmet Murat Aydin, MD²; Vandana Panwar, MD²; Ryan Hutchinson, MD²; Solomon Woldu, MD²; May Westerman, MD²; Christopher Wood, MD³; Jose Karam, MD³; Alon Weizer, MD³; Jay Raman, MD³; Mesut Remzi, MD³; Nathalie Rioux-Leclercq, MD³; Andrea Haitel, MD³; Marco Roscigno, MD³; Christian Bollen, MD³; Karim Bensalah, MD³; Arthur Sagalowsky, MD³; Shahrokh Shariat, MD³; Yair Lotan, MD³; Aditya Bagrodia, MD³; Payal Kapur, MD³ and Vitaly Margulis, MD²

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Presented By: Laura-Maria Krabbe, MD

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DIFFERENCES BETWEEN PATIENTS WITH DENOVO VS. SECONDARY UPPER TRACT UROTHELIAL CARCINOMA – THE PRINCESS MARGARET CANCER CENTER EXPERIENCE

Hanan Goldberg, MD¹; Douglas Cheung, MD¹; Zachary Klaassen, MD¹; Thenappan Chandrasekar, MD¹; Rashid Sayyid, MD¹; Girish Kulkarni, MD¹; Robert Hamilton, MD¹; Andrew Evans, MD¹; Bharati Bapat, PhD²; Theodorus van der Kwast, MD³ and Neil Fleshner, MD¹

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Presented By: Hanan Goldberg, MD

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ROBOT-ASSISTED VERSUS LAPAROSCOPIC NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL CARCINOMA: SHORT-TERM OUTCOMES FROM THE NATIONAL CANCER DATABASE

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Presented By: Leilei Xia, MD
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LONG TERM OUTCOMES FOR PATIENTS WITH VON HIPPEL LINDAU AND PHEOCHROMOCYTOMA: DEFINING THE BEST CANDIDATES FOR ACTIVE SURVEILLANCE
Thomas Sanford, MD; Rashid Siddiqui; Daniel Su; Julie An; W. Marston Linehan and Adam Metwalli
NCI, Bethesda, MD
Presented By: Thomas Sanford, MD

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Antonio Gorgen¹; Alice Semerjian²; CJ Stimson², Stephen A. Boorjian, MD³ and Christian Pavlovich⁴
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Presented By: Antonio Robello Horta Gorgen, MD

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Kyrollis Attalla, MD¹; David Paulucci², Kyle Blum, MD³; Harry Anastos, MD³; Kelvin Moses, MD³; Ketan Badani, MD²; Philippe Spiess, MD⁴ and John Sfakianos, MD²
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Presented By: Kyrollis G. Attalla, MD

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CRYOTHERAPY AND CYBERKNIFE EXHIBIT COMPARABLE PATIENT-REPORTED QUALITY OF LIFE TO ACTIVE SURVEILLANCE IN ORGAN-CONFINED PROSTATE CANCER
Glenn Werneburg, PhD¹; Michael Kongnyuy, MD²; Daniel Halpern, BS²; Jose Salcedo BBA²; Kaitlin Kosinski MS²; Jonathan Haas MD²; Jeffrey Schiff MD²; Anthony Corcoran MD² and Aaron Katz MD² ¹Stony Brook University, Stony Brook, NY; ²NYU-Winthrop Hospital, Mineola, NY
Presented By: Glenn Thomas Werneburg, PhD

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THE ASSOCIATION OF MALE PATTERN BALDNESS AND RISK OF CANCER AND HIGH-GRADE DISEASE AMONG MEN PRESENTING FOR PROSTATE BIOPSY
Ghazi Al Edwan, MD; Bhindi B, MD; Margel D, MD; Chadwick, K MD; Finelli A, MD; Zlotta A, MD; Trachtenberg J, MD and Neil Flesher, MD
Princess Margaret Hospital Toronto, Ontario CANADA. And the university of Jordan .Amman Jordan.
Presented By: Ghazi Al Edwan, MD

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Adam Bezinque, BS¹; Andrew Morarity, MD²; Crystal Farrell, MD²; Sabrina Noyes, BS² and Brian Lane, MD, PhD³ ¹Michigan State University College of Osteopathic Medicine, East Lansing, MI; ²Spectrum Health, Grand Rapids, MI and Advanced Radiology Services PC, Grand Rapids, MI; ³Spectrum Health, Grand Rapids, MI and Grand Rapids Medical Education Partners, Grand Rapids, MI; ⁴Spectrum Health, Grand Rapids, MI; ⁵Spectrum Health, Grand Rapids, MI; ⁶Michigan State University College of Human Medicine, Grand Rapids, MI
Presented By: Adam Bezinque, BS
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Stephen Freedland, MD¹; David I Quinn²; Elisabeth I Heath³; Ronald F Tutrone⁴; David G McLeod⁵; Nadeem A Sheikh⁶; Nancy N Chang⁷ and Oliver Sartor ⁷
¹Cedars Sinai Medical Center; ²Norris Comprehensive Cancer Center, University of Southern California, Los Angeles, CA; ³Karmanos Cancer Institute, Wayne State University School of Medicine, Detroit, MI; ⁴Chesapeake Urology, Towson, MD; ⁵Center for Prostate Disease Research at the Uniformed Services University of Health Sciences and the Walter Reed National Military Medical Center, Bethesda, MD; ⁶Dendreon Pharmaceuticals Inc, Seattle, WA; ⁷Tulane Medical School, New Orleans, LA
Presented By: Stephen J. Freedland, MD

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Christopher Martin, BS¹; Brock O’Neil, MD¹; Ashley Kapron, PhD²; Michael Flynn, MD²; Kensaku Kawamoto, MHS, MD, PhD²; William Lowrance, MPH, MD¹ and Kathleen Cooney²
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Presented By: Christopher Martin, BS

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IMPACT OF HIGH VOLUME CENTERS ON MANAGEMENT IN HIGH RISK PROSTATE CANCER
John Burns, MD¹; Mazen Alsinnawi, MD¹; Sydney Akapame, PhD²; Fernando Caumont, MD¹ and Chris Porter, MD¹
¹Virginia Mason Medical Center, Seattle, WA; ²Axio Research, Seattle, WA
Presented By: John F. Burns, MD

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PREDICTORS OF EARLY DISEASE SPECIFIC MORTALITY AMONG PATIENTS WITH PROSTATE ADENOCARCINOMA BONE METASTASIS AT DIAGNOSIS
Zachary Klaassen, MD¹; Thenappan Chandrasekar, MD¹; Hanan Goldberg, MD¹; Karan Arora, BSc², Rashid K. Sayyid, MD, MSc³; Robert J. Hamilton, MD, MPH, FRCS¹; Neil E. Fleshner, MD, MPH, FRSC¹ and Girish S. Kulkarni, MD, PhD, FRSC¹
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Presented By: Zachary Klaassen, MD

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Takahiro Osawa, MD¹; Stephen Robinson², Brendan Leung, PhD²; Jinlu Dai, PhD²; Shuichi Takayama, PhD²; Nobuo Shinhara, MD¹ and Evan Keller, DVM, PhD²³
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Presented By: Takahiro Osawa, MD

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THE INFLUENCE OF ETHNIC HETEROGENEITY ON PROSTATE CANCER MORTALITY AFTER RADICAL PROSTATECTOMY IN HISPANIC/LATINO MEN: A POPULATION-BASED ANALYSIS.
Maria C. Velasquez, MD¹; Felix Chinea, MD²; Deukwoo Kwon, PhD²; Nachiketh Soodana-Prakash, MD, MS³; Marcelo Barboza, MD³; Ronit Shah, Medical Student³; Mark Gonzalgo, MD, PhD³; Chad Ritch, MD, MBA³; Alan Pollack, MD, PhD³; Dipen Parekh, MD³ and Sanoj Punnen, MD, MS³
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Presented By: Maria Camila Velasquez Escobar, MD

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Nancy Wang, MD, MPH; John Leppert, MD; Richard Fan, PhD; Alan Thong, MD; James Brooks, MD; Pejman Ghannouni, MD; Andreas Loening, MD; Katherine To’o, MD and Geoff Sonn, MD
Stanford School of Medicine, Stanford, CA
Presented By: Nancy Wang, MPH, MD
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ASSOCIATION BETWEEN ANDROGEN-DEPRIVATION THERAPY AND NON-PROSTATE CANCER MORTALITY AMONG MEN WITH NON-METASTATIC PROSTATE CANCER
Christopher Wallis, MD, PhD¹; Raj Satkunasivam, MD, MS²; Sender Herschorn, MD³; Calvin Law, MD, MPH⁴; Arun Seth, PhD⁵; Ronald Kodama, MD⁶; Girish Kulkarni, MD, PhD⁷ and Robert Nam, MD, MSc²
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Christopher Wallis, MD, PhD¹; Raj Satkunasivam, MD, MS²; Sender Herschorn, MD³; Calvin Law, MD, MPH⁴; Arun Seth, PhD⁵; Ronald Kodama, MD⁶; Girish Kulkarni, MD, PhD⁷ and Robert Nam, MD, MSc²
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Presented By: Christopher Wallis, MD, PhD

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THE INSTITUTIONAL LEARNING CURVE FOR PROSTATE MRI AND MRI-US FUSION-TARGETED BIOPSY: IMPROVEMENTS IN CANCER DETECTION OVER TIME BASED ON 1400 PROSTATE BIOPSIES
Xiaosong Meng, MD, PhD¹; Andrew B. Rosenkrantz, MD²; Fang-Ming Deng, MD/PhD³; Richard Huang, BS¹; James Wysock, MD¹; Marc Bjurlin, DO⁴; William C. Huang; MD¹; Herbert Lepor, MD¹ and Samir S. Taneja, MD¹
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Presented By: Xiaosong Meng, MD, PhD

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Janette Kinsella, RN¹; Pär Stattin, MD, PhD²; Declan Cahill, MD³; Christian Brown, MD⁴; Anna Bill-Axelson, MD, PhD⁵; Ola Bratt, MD, PhD⁶; Mieke van Hemelrijck, PhD⁷ and Sigrid Carlsson, MD, PhD, MPH⁸
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Presented By: Sigrid Carlsson, MD, PhD, MPH

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Rashid Sayyid, MD, MSc¹; Shabbir Alibhai, MD, MSc²; Rinku Sutrading, PhD³; Maria Eberg, MSc³; Kinwah Fung, MSc³; Zachary Klaassen, MD⁴; Hanan Goldberg, MD⁴; Nathan Perlis, MD, MSc⁴; David Urbach, MD, MSc⁴ and Neil Fleshner, MD, MSc⁴
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Presented By: Rashid Sayyid, MD, MSc
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ARTIFICIAL INTELLIGENCE WITH MACHINE LEARNING TO PREDICT EARLY BIOCHEMICAL RECURRENCE FOLLOWING ROBOTIC PROSTATECTOMY
Nathan Wong, MD¹; Cameron Lam MD²; Lisa Patterson² and Bobby Shayegan, MD²
¹Hamilton; ²McMaster University, Hamilton, ON
Presented By: Nathan Wong, MD

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Michael Wang, BS¹; Christina Buzzy, PhD¹; Amr Mahran, MD¹; Michael Glover, BS¹; Rayan Abboud, MS²; Nafiseh Janaki, MD³; Andrew Turk, BS³ and Lee Ponsky, MD³
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Presented By: Michael Wang, BS

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Alireza Aminsharifi, MD, PhD¹; Ariel Schulman, MD¹; Kae Jack Tay, MBBS²; Ghalib Jibara, MB,ChB¹; Efrat Tsivian, MD¹; Ahmed Elshafiel, MD³; Thomas Polascik, MD¹ and Stephen Jones, MD³
¹Duke University Medical Center, Durham NC; ²SingHealth, Singapore General Hospital, Singapore; ³Glickman Urological & Kidney Institute, Cleveland Clinic, Cleveland, Ohio
Presented By: Alireza Aminsharifi, MD, PhD

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Daniel Moreira, MD MHS¹; Michael Abern, MD¹; Gerald Andriole, MD²; Ramiro Castro-Santamaría, MD³ and Stephen Freedland, MD⁴ ¹University of Illinois at Chicago; ²Washington University at Saint Louis; ³GlaxoSmithKline; ⁴Cedars-Sinai Health System
Presented By: Daniel M. Moreira, MD, MHS

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IMPACT OF USPSTF RECOMMENDATION ON RATES OF NON-DEFINITIVE MANAGEMENT IN LOW RISK PROSTATE CANCER UTILIZING THE NATIONAL CANCER DATABASE
John Burns, MD¹; Mazen Alsinnawi, MD¹; Sydney Akapame, PhD¹ and Chris Porter, MD¹
¹Virginia Mason Medical Center, Seattle, WA; ²Axio Research, Seattle, WA
Presented By: John F. Burns, MD

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John Burns, MD¹; Lauren Hurwitz, MHS¹; Katherine Levine, CCRP²; Mazen Alsinnawi, MD¹; John Massman, PhD¹; Timothy Brand, COL, MD²; Inger Rosner, COL, MD³; Sean Stroup, MD³; Joseph Sterbis, LTC, MD³; Jennifer Cullen, PhD, MPH² and Chris Porter, MD¹
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Presented By: John F. Burns, MD
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HEALTH RELATED QUALITY OF LIFE FOR PATIENTS UNDERGOING EXTERNAL BEAM RADIOTHERAPY WITH AND WITHOUT HORMONAL THERAPY
John Burns, MD¹; Lauren Hurwitz, MHS²; Katherine Levine, CCRP²; Mazen Alsinnawi, MD¹; John Massman, PhD¹; Timothy Brand, COL, MD; Inger Rosner, COL, MD⁴; Sean Stroup, MD⁴; Joseph Sterbis, LTC, MD⁴; Jennifer Cullen, PhD, MPH² and Chris Porter, MD¹ ¹Virginia Mason Medical Center, Seattle, WA; ²Center for Prostate Disease Research, Department of Defense, Rockville, MD; ³Madigan Army Medical Center, Tacoma, WA; ⁴Department of Surgery, Uniformed Services University of the Health Sciences, Bethesda, MD; ⁵Naval Medical Center, San Diego, CA; ⁶Tripler Army Medical Center, Honolulu, HI
Presented By: John F. Burns, MD

Poster #84
MULTI-INSTITUTIONAL DEVELOPMENT OF A PRETEST PROBABILITY CALCULATOR FOR HIGH RISK LESIONS ON MULTIPARAMETRIC PROSTATE MRI
Matthew Truong, MD¹; Janet Baack Kukreja, MPH, MD²; Soroush Rais-Bahrami, MD³; Nimrod Barashi, MD⁴; Bokai Wang, PhD⁵; Zachary Nuffer, MD⁶; Ji Hae Park, MD⁷; Khoa Lam, MD⁸; Thomas Frye, DO⁹; Jeffrey Nix, MD¹⁰; John Thomas, MD¹⁰; Changyong Feng, PhD¹¹; Brian Chapin, MD¹¹; John Davis, MD¹¹; Gary Hollenberg, MD¹¹; Aytekin Oto, MD¹¹; Scott Eggenger, MD¹¹; Jean Joseph, MD¹¹; Eric Weinberg, MD¹¹ and Edward Messing, MD¹¹ ¹Department of Urology, University of Rochester Medical Center, Rochester, NY; ²Department of Urology, University of Texas MD Anderson Cancer Center, Houston, TX; ³Department of Urology, University of Alabama at Birmingham, Birmingham, AL; ⁴Department of Urology, University of Chicago Medical Center, Chicago, IL; ⁵Department of Biostatistics and Computational Biology, University of Rochester School of Medicine and Dentistry, Rochester, NY; ⁶Department of Radiology and Imaging Sciences, University of Rochester Medical Center, Rochester, NY; ⁷Department of Radiology, Rochester General Hospital, Rochester, NY; ⁸Department of Radiology, University of Alabama at Birmingham, Birmingham, AL; ⁹Department of Radiology, University of Chicago Medical Center, Chicago, IL
Presented By: Matthew Truong, MD

Poster #85
FAVORABLE INTERMEDIATE-RISK PROSTATE CANCER LEADS TO WORSE SURVIVAL COMPARED TO LOW-RISK PATIENTS DUE TO ADVERSE PATHOLOGY
Hiten Patel, MD, MPH¹; Mohit Gupta, MD¹; Jeffrey Tosoian, MD, MPH¹; Ballentine Carter, MD¹; Bruce Trock, PhD¹; Alan Partin, MD, PhD¹ and Jonathan Epstein, MD² ¹Department of Urology, James Buchanan Brady Urological Institute, Johns Hopkins University School of Medicine, Baltimore, MD, USA; ²Department of Pathology, Johns Hopkins University School of Medicine, Baltimore, MD, USA
Presented By: Hiten D. Patel, MD, MPH

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Hiten Patel, MD, MPH; Mohit Gupta, MD; Bruce Trock, PhD and Alan Partin, MD, PhD Department of Urology, James Buchanan Brady Urological Institute, Johns Hopkins Medical Institutions, Baltimore, MD, USA
Presented By: Mohit Gupta, MD

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CAN PELVIC NODE DISSECTION AT RADICAL PROSTATECTOMY INFLUENCE THE NODAL RECURRENCE AT SALVAGE LYMPHADENECTOMY FOR PROSTATE CANCER?
Arjun Sivaraman, MD¹; Nicole Benfante¹; Karim Touijer, MD¹; Jonathan Coleman, MD¹; Peter Scardino, MD¹; Vincent Laudone, MD¹ and James Eastham, MD¹ ¹Urology service, Department of surgery, Memorial Sloan Kettering Cancer Center, New York, NY; ²Department of Biostatistics and Epidemiology, Memorial Sloan Kettering Cancer Center, New York, NY
Presented By: Arjun Sivaraman, MD

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CAN FREE PSA BE USED AS A BIOMARKER IN BIOCHEMICAL RECURRENCE AFTER SURGERY TO PREDICT CASTRATE RESISTANT PROSTATE CANCER?
Hanan Goldberg, MD; Ally Hoffman; Zachary Klaassen, MD; Thenappan Chandrasekar, MD; Douglas Cheung, MD; Alejandro Berlin, MD; Rashid Sayyid, MD and Neil Fleshner, MD Princess Margaret Cancer Center, UHN, Toronto, Ontario, Canada
Presented By: Hanan Goldberg, MD
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HEALTHCARE RESOURCE UTILIZATION, COSTS AND TREATMENTS IN A US POPULATION OF NON-METASTATIC AND METASTATIC CASTRATION RESISTANT PROSTATE CANCER
Adriana Valderrama, PhD, MBA¹; Krishna Tangirala, MPH²; Svetlana Babajanyan, MD³; Sreevalsa Appukuttan, MPH⁴; Lonnie Wen, RPh, PhD⁵ and Neal Shore, MD, FACSP⁶
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Presented By: Neal D. Shore, MD, FACS

Poster #90
THE VALIDITY OF REPEAT PROSTATE BIOPSY IN PRIOR BIOPSY NEGATIVE PATIENT: MRI-TRUS FUSION GUIDED BIOPSY
Jinho Hwang, MD; Youngeun Seo, MD; Young Dong Yu, MD; Jong Jin Oh, MD, PhD; Sangchul Lee, MD PhD; Sung Kyu Hong, MD PhD; Sang Eun Lee, MD, PhD and Seok-soo Byun, MD, PhD
Seoul National University Bundang Hospital, Dept. of Urology, Seongnam, South Korea
Presented By: Jinho Hwang, MD

Poster #91
THE NOVEL BIOPSY INSTRUMENT WITH A 25 MM SIDE-NOTCH IMPROVES THE DETECTION RATE OF PROSTATE CANCER IN TRANSRECTAL PROSTATE BIOPSY
Keishi Kajikawa, MD, PhD; Kent Kanao; Ikuo Kobayashi; Miho Sugie; Masanobu Saito; Shingo Morinaga; Hiroyuki Muramatsu; Genya Nishikawa; Yoshiharu Kato; Masahito Watanabe; Kogenta Nakamura and Makoto Sumitomo
Nagakute-city Aichi-ken
Presented By: Keishi Kajikawa, MD, PhD

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UTILIZATION OF MRI AND PCA3 REDUCES UNNECESSARY PROSTATE BIOPSIES
Courtney Berg, BS; Daniel Halpern; Melissa Fazzari, PhD; Jose Salcedo; Amanda LeSueur, PhD; Jeffrey Schiff, MD; Anthony Corcoran, MD and Aaron Katz, MD
NYU Winthrop Hospital Mineola NY
Presented By: Courtney Berg, BS

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Mary E. Westerman, MD¹; Vidit Sharma, MD¹; Adam T. Froemming, MD²; Robert H. McLaren, MD¹; Lance A. Mynderse, MD¹ and R. Jeffrey Karnes, MD¹
¹Mayo Clinic Department of Urology, Rochester Minnesota; ²Mayo Clinic Department of Radiology, Rochester Minnesota
Presented By: Mary Elizabeth Westerman, MD

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CONTEMPORARY NATIONAL TRENDS IN LOCALIZED PROSTATE CANCER RISK PROFILE AT DIAGNOSIS
Sean A. Fletcher, BS; Nicolas von Landenberg, MD; Alexander P. Cole, MD; Philipp Gild, MD; Quoc-Dien Trinh, MD and Adam S. Kibel, MD
Center for Surgery and Public Health, Division of Urologic Surgery, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA
Presented By: Sean A. Fletcher, BS

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AN INDEPENDENT, MULTI-INSTITUTIONAL, PROSPECTIVE STUDY IN THE VETERANS AFFAIRS HEALTH SYSTEM CONFIRMS THE 4KSCORE ACCURATELY PREDICTS AGGRESSIVE PROSTATE CANCER
Sanoj Punen; Stephen Freedland; Thomas Polascik; Stacy Loeb; Stephen Savage; Edward Uchio; Sharad Mathur; Michael Risk; Yan Dong and Jonathan Silberstein
University of Miami
Presented By: Sanoj Punnen, MD, MAS
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Daniel Canter, MD¹; Julia Reid MStat²; Maria Latsis, MS¹; Margaret Variano¹; Shams Halat, MD²; Kristen E. Gurtner, MD¹; Michael Brawer, MD²; Steven Stone, PHD² and Stephen Bardot, MD²
¹Ochsner Clinic, Department of Urology, New Orleans, LA; ²Myriad Genetics, Salt Lake City, UT
Presented By: Daniel J. Canter, MD

Poster #97
A BIOPSY-BASED 17-GENE GENOMIC PROSTATE SCORE TEST AS A PREDICTOR OF BIOCHEMICAL RECURRENCE IN PROSTATE CANCER PATIENTS WITH OR WITHOUT ADVERSE PATHOLOGY AT RADICAL PROSTATECTOMY
Jennifer Cullen, PhD, MPH¹; Ruixiao Lu, PhD²; Isabella Sesterhenn, MD³; Jeffrey Lawrence, MD²; Shiv Sirvastava, PhD³; Timothy Brand, MD³; Athanasios Tsiatis, MD³; Bela Denes, MD³; Phillip Febbo, MD² and Alan Shindel, MD²
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Presented By: Jennifer Cullen, PhD

Poster #98
A META-ANALYSIS OF PROSTATE CANCER CHARACTERISTICS IN THE U.S. PREVENTIVE SERVICES TASK FORCE GRADE D ERA
Matthew Clements, MD, MS; Basil Abdalla, BS; Stephen Culp, MD, PhD, MS; Tracey Krupski, MD, MPH and Raymond Costabile, MD University of Virginia, Charlottesville, VA
Presented By: Matthew B. Clements, MD, MS

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Harry Anastos, MD¹; Jared S. Winoker, MD²; Pratik A. Shukla, MD³; Cynthia J. Knauser²; John P. Sfakianos, MD²; Bachir A. Taouli, MD³; Sarah C. Lewis, MD³; Jon A. Schwartz, PhD⁴ and Ardeshir R. Rastinehad, DO²
¹Icahn School of Medicine at Mount Sinai; ²Department of Urology, Icahn School of Medicine at Mount Sinai, New York, NY; ³Department of Radiology, Icahn School of Medicine at Mount Sinai, New York, NY; ⁴Nanospectra Biosciences, Inc, Houston, TX
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Maria Ruden, BS, MS¹; Christopher Olivares, DO¹; Mathew Fakhoury, DO¹; Patricia Vidal, MD¹; Courtney Hollowell, MD¹ and Sarah P. Psutka, MD, MSc²
¹Division of Urology, Cook County Health and Hospitals System, Chicago, IL; ²Division of Urology, Cook County Health and Hospitals System, Department of Urology, Feinberg School of Medicine at Northwestern University, Chicago, IL
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Benjamin Taylor, MD¹; LeiLei Xia, MD²; Lamont Barlow, MD; Thomas Guzzo, MD, MPH and Douglas Scherr, MD¹
¹Weill Cornell Medical College, New York, NY; ²University of Pennsylvania, Philadelphia, PA
Presented By: Benjamin L. Taylor, MD

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Medical College of Georgia, Augusta University, Augusta, GA
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Timothy Clinton, MD; Yi Yin, MD, PhD and Ganesh Raj, MD, PhD
UT Southwestern Medical Center in Dallas, TX
Presented By: Timothy Clinton, MD, MPH

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Timothy Clinton, MD; Yi Yin, MD, PhD; Ming Zhao, MD, PhD and Ganesh Raj, MD, PhD
UT Southwestern Medical Center in Dallas, TX
Presented By: Timothy Clinton, MD, MPH

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Kevin Ginsburg, MD¹; Gregory Auffenberg, MD²; Ji Qi, MS²; David Miller, MD² and Michael Cher, MD¹
¹Wayne State University Department of Urology, Detroit, MI; ²University of Michigan Department of Urology, Ann Arbor, MI
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Courtney Berg; Amanda Lesueur, PhD; Jeffrey Schiff MD; Anthony Corcoran, MD and Aaron Katz, MD
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Chad Reichard, MD¹; Yaw Nyame²; Debasish Sundi¹; Jeffrey Tosoian³ Lamont Wilkins⁴; Ridwan Alam⁵; Andrew Stephenson⁶; Eric Klein⁷; Ashley Ross⁸; John Davis¹ and Brian Chapin¹
¹MD Anderson Cancer Center Houston, TX; ²Cleveland Clinic Glickman Urological & Kidney Institute, Cleveland, OH; ³Johns Hopkins Brady Urological Institute, Baltimore, MD; ⁴Cleveland Clinic Lerner College of Medicine, Cleveland, OH; ⁵Johns Hopkins University School of Medicine, Baltimore, MD
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Adam Gadzinski, MD, MS; Ian Metzler, MD; Renu Eapen, MBBS; Hao Nguyen, MD, PhD and Peter Carroll, MD, MPH
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Masakatsu Oishi¹; Toshitaka Shin¹; Carlos Fay¹; Daniel Freitas¹; Chisato Ohe¹; Suzanne Palmer²; Manju Aron³; Frank Chen²; Matthew Winter¹; Akbar Ashrafi¹; Giovanni Cacciamani¹; Luis Medina¹; Tigran Margaryan¹; Osamu Ukimura¹; Inderbir Gill¹ and Andre Abreu¹
¹USC Institute of Urology, Los Angeles, CA; ²USC Department of Radiology, Los Angeles, CA; ³USC Department of Pathology, Los Angeles, CA
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Indiana University, Indianapolis, Indiana
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Division of Urologic Oncology, Department of Surgical Oncology, University of Toronto, Toronto, Ontario, Canada
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Lucia Nappi, MD, PhD¹; Brock O’Neil, MD²; Marisa Thai¹; Ladan Fazli¹; Kim Chi¹; Bernhard Eigl¹; Craig Nichols, MD³; Martin Gleave¹ and Christian Kollmannsberger¹
¹University of British Columbia, Vancouver, British Columbia, Canada; ²University of Utah/Huntsman Cancer Hospital; ³Intermountain Medical Center, Salt Lake City, Utah
Presented By: Brock B. O’Neil, MD
Poster #1
COST-EFFECTIVENESS ANALYSIS OF A BIOMARKER-BASED APPROACH TO SELECT PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER FOR NEOADJUVANT CHEMOTHERAPY
Solomon Woldu, MD¹; Oner Sanli, MD²; Peter Black, MD³; Matthew Milowsky, MD⁴ and Yair Lotan, MD¹
¹UT Southwestern Medical Center; ²Istanbul University (Istanbul, Turkey); ³The University of British Columbia (Vancouver, BC); ⁴University of North Carolina Lineberger Comprehensive Cancer Center (Chapel Hill, NC)
Presented By: Solomon L. Woldu, MD

Introduction: Neoadjuvant chemotherapy (NAC) is a standard of care for muscle-invasive bladder cancer (MIBC), however utilization is low due to suboptimal response rates, potential delay in radical cystectomy (RC), and toxicity. Recent studies have demonstrated the ability of biomarkers to predict response to NAC.

Methods: Our aim was to evaluate the cost-effectiveness (CE) of a biomarker-based approach to select patients for NAC prior to RC. Data in locally-advanced bladder cancer treated by RC regarding stage distributions, overall survival (OS), cost, overall and biomarker-based response to NAC was abstracted from most recently available clinical studies. A decision analysis model was developed to evaluate the CE of biomarker-based approaches to select patients with MIBC (T2-T4aN0M0) for NAC. Comparison of CE included RC alone, RC + NAC in all-comers (unselected), and RC + NAC based on 3 biomarkers (mutations in DNA repair genes (ATM, RB1, FANCC), mutations in the excision repair cross-complementation group 2 (ERCC2) gene, and RNA subtypes [basal, luminal, p53-like]). Modeling was performed via TreeAge Pro 2016. The baseline assumptions in the model were varied by ±10% to generate confidence intervals. Several one-way and two-way sensitivity analyses were used to evaluate the impact of different assumptions on outcomes of the model.

Results: The least effective strategy is RC alone with an average 5-year OS of 54.2% and mean survival of 2.71 years. For strategies of NAC prior to RC without a biomarker, 5-year OS is 60.2% if all get NAC and 55.4% if only 20% of the population accept NAC. In the biomarker-based approaches, the arms driven by subtyping and mutations in the DNA repair genes had 5-year OS of 63.8% and 63.4%, respectively. Two of the biomarker-based approaches using a DNA repair gene panel (mean OS of 3.17 years, $30,992 / life year) and RNA subtyping (mean OS of 3.19 years, $31,487 / life year) were CE compared with unselected NAC (mean OS of 3.01 years, $32,129 / life year) and RC alone (mean OS of 2.71 years, $35,259 / life year).

Conclusion: A biomarker-based strategy to identify MIBC patients who should undergo NAC was more CE than unselected use of NAC or RC alone.

<table>
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<tr>
<th>Cost-Effectiveness According to Treatment Strategy</th>
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<td>5-year OS (%)</td>
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<tr>
<td>Traditional Approaches</td>
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<tr>
<td>Cystectomy Alone</td>
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<td>Cystectomy + NAC</td>
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<td>Cystectomy + NAC**</td>
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<tr>
<td>Biomarker-Based Approaches</td>
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<tr>
<td>DNA Repair Genes (ATM, RB1, FANCC)</td>
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<tr>
<td>ERCC2</td>
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<tr>
<td>RNA Subtyping (basal and luminal genes)</td>
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*Model was analyzed with all costs and benefits of adjuvant and salvage +/- 10% 
**Assuming 100% of eligible patients receive NAC
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Poster #3
CONTEMPORARY COST-CONSEQUENCE ANALYSIS OF BLUE LIGHT CYSTOSCOPY WITH HEXAMINOLEVULINATE IN NON-MUSCLE-INVASIVE BLADDER CANCER
Zachary Klaassen, MD¹, Kathy Li, MPH¹; Wassim Kassouf, MD, CM, FRCSC²; Peter C. Black, MD³; Alice Dragomir, MSc, PhD² and Girish S. Kulkarni, MD, PhD, FRCSC¹
¹Princess Margaret Cancer Centre, University Health Network, Toronto, ON, Canada; ²McGill University Health Centre, Montreal, QC, Canada; ³University of British Columbia, Vancouver, BC, Canada
Presented By: Zachary Klaassen, MD

Introduction: Previous studies have suggested cost-savings using blue light cystoscopy (BLC) with hexaminolevulinate (HAL) compared to white light cystoscopy (WLC) during transurethral resection of bladder tumour (TURBT) for non-muscle-invasive bladder cancer (NMIBC), secondary to improvements in recurrence and progression rates; however, these studies have used 'best case scenario' recurrence rate probabilities, thus decreasing generalizability of the findings. The objective of this study was to perform a contemporary cost-effectiveness assessment of BLC compared to WLC at the time of TURBT.

Methods: A decision and cost-effectiveness model with a five-year time horizon following initial TURBT was used. The model was created from the healthcare payer perspective. Comprehensive literature review was performed to obtain contemporary recurrence and progression rates. These values were meta-analyzed for inclusion into the model. Cost variables included in the model were from three large Canadian bladder cancer centres. Model outputs were number of recurrences prevented, bed days saved, and overall costs. One-way sensitivity and scenario analyses were performed to assess model robustness.

Results: The five-year amortized cost of using BLC with HAL on all incident NMIBC compared to WLC assistance was $4,832,908 for Ontario (n=4696; $1372/patient); $1,168,968 for British Columbia (n=1204; $1295/patient); and $2,484,872 (n=2680; $1236/patient) for Quebec. Use of BLC with HAL would result in 87,338 fewer recurrences annually. On sensitivity/scenario analyses for Ontario data, if BLC with HAL equipment were provided to the province at no cost, five-year costs would be $4,158,814 and $1,181 cost per patient. If BLC with HAL were only used for cystoscopically appearing aggressive tumours, the five-year amortized cost would be $3,874,098, with a cost per patient of $1,222. If there was a 20% or 50% improvement in progression rates with BLC plus HAL, the five-year amortized cost would be $2,660,529 and -$598,039 (cost-saving), respectively.

Conclusion: TURBT using BLC with HAL for patients with NMIBC is associated with a five-year cost of approximately $1-5 million for jurisdictions of 4-13 million people. Although this translates to a cost of $1200-1400 per patient for their initial TURBT, BLC with HAL improves patients care, reduces recurrences, and decreases the need for hospital beds after TURBT.
Poster #4
DISCRIMINATIVE ABILITY OF COMMONLY USED INDICES TO PREDICT ADVERSE OUTCOMES AFTER RADICAL CYSTECTOMY: COMPARISON OF DEMOGRAPHICS, ASA, MODIFIED CHARLSON COMORBIDITY INDEX, AND MODIFIED FRAILTY INDEX

Xiaosong Meng, MD, PhD¹; Audrey Renson, BS²; James Wysock, MD¹; William C. Huang, MD¹; Samir S. Taneja, MD¹ and Marc Bjurlin, DO³
¹Department of Urology, NYU Langone Health; ²Department of Clinical Research, NYU Langone Hospital - Brooklyn; ³Department of Urology, NYU Langone Hospital – Brooklyn
Presented By: Xiaosong Meng, MD, PhD

Introduction: The American Society of Anesthesiologists (ASA) physical status classification system, the modified Charlson Comorbidity Index (mCCI), and the modified Frailty Index (mFI) have been associated with complications following urologic surgery. No study has compared the predictive performance of these indices for postoperative complications following radical cystectomy (RC) for bladder cancer. Our study objective was to compare the discriminative ability of ASA, mCCI, and mFI, as well as demographic factors including age, body mass index, and gender for perioperative adverse outcomes following RC.

Methods: A retrospective review of patients undergoing elective RC for bladder cancer were extracted from the 2005–2015 American College of Surgeons National Surgical Quality Improvement Program (NSQIP). Perioperative adverse outcome variables assessed included the occurrence of minor adverse events, severe adverse events, infectious adverse events, any adverse event, extended length of hospital stay, and discharge to higher-level care. Patient comorbidity indices and characteristics were delineated and assessed for discriminative ability in predicting perioperative adverse outcomes using an area under the curve analysis from the receiver operating characteristics curves.

Results: A total of 5,166 patients were identified who met the inclusion criteria. The most predictive comorbidity index was ASA (AUC 0.54) and demographic factor was BMI (AUC 0.53). However, all predictive indices performance was poor for any adverse event (AUC 0.53-0.54) (Figure 1). ASA demonstrated the highest AUC of the indices for predicting serious (0.55), minor (0.53), infectious events (0.54), and discharge to higher level care (0.58). A combination of the most predictive demographic factor (BMI) and comorbidity index (ASA) resulted in incremental improvements in discriminative ability over the individual components for all outcome variables.

Conclusion: For RC, easily obtained patient ASA and BMI have overall similar or better discriminative abilities for perioperative adverse outcomes than numerically tabulated indices that have multiple inputs and are harder to implement in clinical practice.
Poster #5

CLINICAL DESTINY OF INDETERMINATE PULMONARY NODULES IN PATIENTS UNDERGOING RADICAL CYSTECTOMY FOR UROTHELIAL CARCINOMA OF THE BLADDER

David Cahn, DO, MBS¹; Brian McGreen, DO²; Albert Lee, DO³; Karen Ruth, MS¹; Elizabeth Plimack, MD¹; Daniel Geynisman, MD¹; Matthew Zibelman, MD¹; Benjamin Ristau, MD, MHA¹; Marc Smaldone, MD, MSHP¹; Richard Greenberg, MD¹; Rosalia Viterbo, MD¹; David Chen MD⁴, Robert Uzzo, MD⁴ and Alexander Kutikov, MD⁴

¹Fox Chase Cancer Center, Philadelphia, PA; ²Hahnemann University Hospital, Philadelphia, PA; ³Einstein Healthcare Network, Philadelphia, PA; ⁴Fox Chase Cancer Center

Presented By: David B. Cahn, DO, MBS

Introduction: Perioperative risks and significant quality of life concerns following radical cystectomy (RC) render accurate preoperative staging paramount. Incidental indeterminate pulmonary nodules (IPNs) are a common pre-operative finding in clinical practice, representing a management challenge since metastatic patients are unlikely to benefit from extirpation. We evaluate the natural history of IPNs in a large institutional cohort that underwent RC.

Methods: We reviewed our institutional database for patients who underwent RC from 2000-2014 for urothelial carcinoma (UCC) of the bladder & had ≥1 identifiable pulmonary lesion on preoperative staging imaging measuring <2cm in any axis. Patients who were M1 at surgery or had non urothelial histology were excluded. Cumulative incidence of any lung metastasis and overall survival were estimated. We sought to determine the natural history of these pulmonary lesions and evaluated predictors of metastatic etiology.

Results: During the study period, 681 RC were performed at our institution. Of which, 73 patients with an identifiable preoperative IPN met inclusion criteria & underwent RC. In this subset, 23% were female, 22% were active smokers & 55% former smokers. The median age at surgery was 70 yrs (range 43-88). 51% received neoadjuvant chemotherapy & 62% of RC were performed using the traditional open approach (vs 38% robotically). Final pathologic staging included 16% pT0N0Mx, 19% pTa/Tis/T1N0Mx, 43% pT2-4N0Mx, & 22% pTanyN+Mx. Median IPN size was 0.7±0.3cm. At median follow up of 23.5 months, the IPNs in 92% (67/73) of patients were clinically benign, with metastatic urothelial cancer confirmed in only 5 patients, & a primary lung malignancy diagnosed in 1 patient. In the IPN cohort, lung metastasis at non-IPN sites were detected in 2 additional patients. Cumulative incidence of any lung metastasis at 12, 24 & 36 months was 5.9% (95%CI 1.9-13.3%), 7.6% (95%CI 2.8-15.7%), & 13.0% (95%CI 5.4-24.1%), respectively. OS at 12, 24 & 36 months was 75.3% (95%CI 62.3-83.9%), 65.8% (95%CI 53.1-75.9%), & 54.0% (95%CI 39.7-66.2%), respectively.

Conclusion: The majority of IPNs in patients who proceeded to RC for UCC of the bladder were stable upon follow-up & rarely represented malignancy. Patients with IPNs have OS consistent with previously published literature. As such, in appropriately screened UCC patients, IPNs should not be a barrier to proceeding with extirpative surgical therapy.
NOVEL USE OF PRE-OPERATIVE CT-MEASURED ADIPOSE TISSUE INDICES TO PREDICT POSTOPERATIVE AND SURVIVAL OUTCOMES AMONG PATIENTS UNDERGOING RADICAL CYSTECTOMY

Michael Kim, HBSc¹; Jaimin Bhatt, MBChB, MMed¹; Zachary Klaassen, MD¹; Bimal Bhindi, MD, MSc¹; Thomas Hermanns, MD¹; Patrick Richard, MD, MSc¹; John Kachura, MD²; Robert Hamilton, MD, MPH¹; Neil Fleshner, MD, MPH¹; Antonio Finelli, MD, MSc¹; Michael Jewett, MD¹; Alexandre Zlotta, MD, PhD¹ and Girish Kulkarni, MD, PhD¹

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Presented By: Michael S. Kim, HBSc

Introduction: Obesity is a global epidemic, however the link between obesity and bladder cancer outcomes remains controversial. Recent studies have suggested that body mass index (BMI) may not be the most accurate measure of obesity. In this study, visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) levels were measured using CT scans prior to radical cystectomy (RC). The hypothesis was that patients with higher adipose tissue levels would have poorer perioperative and survival outcomes.

Methods: There were 202 patients undergoing a RC at a single institution that were included in this retrospective study (2000-2012). Multivariable logistic regression analysis was used to generate odds ratios (OR) for predictors of 30-day grade III-V Clavien-Dindo (CD) complications, and linear regression analysis was used to assess predictors of increasing length of stay (LOS). Multivariable competing risks and Cox proportional hazards models were used to assess disease-specific (DSS) and overall survival (OS), respectively.

Results: The median age was 70 (IQR 78-60) years, VAT 165 (IQR 223-114) cm², SAT 233 (IQR 316-182) cm², LOS 9 (IQR 12-7) days, and age-adjusted Charlson Comorbidity Index (CCI) score was 6 (IQR 8-5). 76% of patients were male, 59% were ever smokers, there were 32 (16%) 30-day CD grade III-V complications, 71% had ≥pT2-4 disease, and 40% of patients received chemotherapy. Over a median follow-up of 37 (IQR 54-27) months for alive patients, there were 43 (21%) bladder cancer specific deaths and 65 (32%) all-cause deaths. Adjusting for CCI score and smoking status, VAT was not predictive of grade III-V 30-day CD complications (OR 1.004, 95%CI 0.999-1.008), whereas SAT (OR 1.004, 95%CI 1.001-1.008) was predictive, with similar adjustments. VAT was predictive of increasing LOS (ß-coeff 0.0233, 95%CI 0.0002-0.0463) when adjusted for CCI score and gender, whereas SAT was not (ß-coeff 0.0159, 95%CI -0.0024-0.0342). Neither VAT nor SAT were predictive of DSS or OS on multiple scenario survival analyses.

Conclusion: We demonstrated that higher VAT was predictive of longer post-operative LOS and SAT was predictive of worse complications (CD III-V) 30 days after RC. There was no difference in cancer-specific or overall survival between groups. VAT and SAT measurements may be useful in conjunction with existing modalities to improve pre-operative risk assessment for predicting immediate post-operative outcomes.

Funding: None
CANCER AND ALL-CAUSE MORTALITY IN BLADDER CANCER PATIENTS UNDERGOING RADICAL CYSTECTOMY: DEVELOPMENT AND VALIDATION OF A NOMOGRAM FOR TREATMENT DECISION-MAKING.

Tamer Dafashy, MD, MS¹; Jinhai Huo, PhD²; Yiyi Chu, PhD²; Jacques Baillargeon, PhD³; Timothy Daskivich, MD, MS⁴; Yong-Fang Kuo, PhD⁴; Christopher Kosarek, MD¹; Simon Kim, MD, MPH⁵; Eduardo Orihuela, MD¹; Douglas Tyler, MD¹; Stephen Freedland, MD⁴; Ashish Kamat, MD⁶ and Stephen Williams, MD¹

¹Division of Urology, The University of Texas Medical Branch at Galveston, Galveston, TX; ²Department of Health Services Research, The University of Texas MD Anderson Cancer Center, Houston, TX; ³Department of Medicine, Division of Epidemiology, Sealy Center on Aging, The University of Texas Medical Branch at Galveston, Galveston, TX; ⁴Department of Urology, Cedars Sinai Medical Center, Los Angeles, CA; ⁵Department of Medicine, Division of Biostatistics, Sealy Center on Aging, Sealy Center on Aging, The University of Texas Medical Branch at Galveston, Galveston, TX; ⁶Urology Institute, Center for Health Care Quality and Outcomes, University Hospitals Case Western Medical Center, Case Western Reserve University, Cleveland, OH & Cancer Outcomes and Public Policy Effectiveness Research Center, Yale University, New Haven, CT; ⁷Department of Surgery, The University of Texas Medical Branch at Galveston, Galveston, TX; ⁸Department of Urology, The University of Texas MD Anderson Cancer Center, Houston, TX

Presented By: Tamer Dafashy, MD, MS

Introduction: To develop and validate a nomogram assessing cancer and all-cause mortality following radical cystectomy. Given concerns regarding the morbidity associated with surgery, there is a need for incorporation of cancer-specific and competing risks into patient counseling and recommendations.

Methods: A total of 5,325 and 1,257 diagnosed with clinical stage T2-T4a muscle-invasive bladder cancer from January 1, 2006 to December 31, 2011 from Surveillance, Epidemiology, and End Results (SEER)-Medicare and Texas Cancer Registry (TCR)-Medicare linked-data, respectively. Cox proportional hazards models were used and a nomogram was developed to predict 3- and 5-year overall and cancer-specific survival with external validation.

Results: Patients who underwent radical cystectomy were more likely to have been younger, male, married, non-Hispanic white and to have had fewer comorbidities than those who did not undergo radical cystectomy (p<0.001). Married patients, in comparison to their unmarried counterparts, had both improved overall (Hazard Ratio (HR) 0.76= 95% CI 0.70 to 0.83, p<0.001) and cancer-specific (HR 0.76= 95% CI 0.68 to 0.85, p<0.001) survival. A nomogram developed using SEER-Medicare data, predicted 3- and 5-year overall and cancer-specific survival rates with concordance indices of 0.65 and 0.66 in the validated TCR-Medicare cohort, respectively.

Conclusion: Older, unmarried patients with increased comorbidities are less likely to undergo radical cystectomy. We developed and validated a generalizable instrument which has been converted into an on-line tool (Radical Cystectomy Survival Calculator© (RCSC)), to provide a benefit-risk assessment for patients considering radical cystectomy.

Funding: This study was conducted with the support of the Institute for Translational Sciences at UTMB, supported in part by a by a Clinical and Translational Science Award Mentored Career Development (KL2) Award (KL2TR001441) from the National Center for Advancing Translational Sciences, National Institutes of Health (NIH). This study was funded, in part, by the NIH Bladder SPORE (5P50CA091846-03) (AMK).
Poster #8

COMPLICATIONS FOLLOWING RADICAL CYSTECTOMY AND URINARY DIVERSION SURGERY AMONG 1,063 BLADDER CANCER PATIENTS IN COMMUNITY-BASED SETTINGS

Kim Danforth, ScD, MPH¹; Scott Gilbert, MD²; Marilyn Kwan, PhD³; David Yi, MPH⁴; Valerie Lee, MHS⁵; Maureen O’Keeffe Rosetti, MS⁶; Joanna Bulkley, PhD⁷; Michael Leo, PhD⁸; Sheila Weinmann, PhD⁹; Robert Krouse, MD, MS¹⁰; Stephen Williams, MD¹¹ and Carmit McMullen, PhD¹²

¹Department of Research & Evaluation, Kaiser Permanente Southern California, Pasadena, CA; ²H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL; ³Division of Research, Kaiser Permanente Northern California, Oakland, CA; ⁴Center for Health Research, Kaiser Permanente Northwest, Portland, OR; ⁵University of Pennsylvania School of Medicine, Philadelphia, PA; ⁶Department of Urology, Southern California Permanente Medical Group, Riverside, CA

Presented By: Kim Danforth, ScD, MPH

Introduction: Most research on radical cystectomy (RC) and urinary diversion (UD) surgeries has focused on short-term complications (30-90 days post-surgery), with limited data on longer-term complications. Data have also been limited for complications in outpatient care or among patients with neobladders. Studies generally have been conducted in academic or high-volume tertiary care settings, although about 40% of surgeries are performed in community-based settings. We conducted a study within 3 community-based integrated healthcare systems to describe complications in the 2 years post-RC/UD surgery.

Methods: A retrospective cohort was created of all patients age >=21 years who had RC/UD surgery for bladder cancer between 1/2010 and 6/2015. UD type was abstracted from the operative report. Complications were identified via diagnosis and procedure codes extracted from the electronic health record and grouped into categories: acidosis/electrolyte imbalance, fistula, gastrointestinal, hernia, infection, renal impairment/failure, stoma, urinary obstruction, urolithiasis, or wound. A subset of patients were prospectively recruited and surveyed (n=269) at approximately 6 months post-surgery.

Results: Most of the 1,063 study patients were white (83%) and male (78%) with a mean age at surgery of 70 years. Ileal conduit (80%) was more common than neobladder or pouch diversions. Almost 70% of patients had a comorbidity pre-surgery. Complications during the 2 years post-RC/UD surgery were common; 76% had >=1 (see Figure 1 for incidence rates by category). Complication rates were similar by sex, but slightly higher among Asians and continent UD patients. In open-ended survey responses, patients noted the substantial impact of complications, particularly infections, on recovery; they commented on frequent UTIs, severe infections, and sequelae that kept them from working months after surgery.

Conclusion: Complications in the two years post-RC/UD were common among a large, community-based cohort. While attention has focused on the immediate post-surgical time period, these data suggest that new or ongoing complications from RC necessitate continued monitoring and support for bladder cancer survivors.

Funding: NCI R01 CA164128

Figure 1. Incidence of complications during the 2 years post-radical cystectomy/urinary diversion surgery among 1,063 bladder cancer patients
Poster #9
MUSCLE-INVASIVE BLADDER CANCER PATIENTS WHO DID NOT RECEIVE RADICAL CYSTECTOMY: TREATMENT DECISIONS, ALTERNATIVE TREATMENTS, AND OPPORTUNITIES FOR CARE IMPROVEMENT
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Presented By: Kim Danforth, ScD, MPH

Introduction: Radical cystectomy (RC), along with neoadjuvant chemotherapy, is the gold standard for treatment of muscle-invasive bladder cancer (MIBC). A substantial number of MIBC patients do not receive RC, but the reasons are unclear. Our aim was to determine why MIBC patients do not receive RC and identify alternative treatments used within a large, integrated delivery system.

Methods: We performed a retrospective study of all patients diagnosed with MIBC, without distant metastases, between 2007-2015 within Kaiser Permanente Southern California (KPSC). We compared baseline characteristics between those who did and did not undergo RC. For patients who did not have RC within a year of diagnosis, chart review was conducted to determine reasons RC was not performed and what treatments were used instead.

Results: Of 910 MIBC patients potentially eligible for RC, 402 did not have a RC within a year of diagnosis. Patients who did not undergo RC were similar to those who had RC with respect to race (p=0.35) and sex (p=0.27), but were older (p<0.0001) and had more comorbidities (p<0.0001). Chart review of these patients found that in most cases (81%), RC was at least considered as part of the initial treatment decision. Patient refusal (40%) and poor surgical candidacy (35%) were the two most common reasons for ultimately not undergoing RC. Patient refusal was based on factors that included quality of life and, in some cases, requests for hospice care. In about 25% of cases in which RC was initially considered, it was unclear why RC was not performed: it was not due to documented patient refusal, poor surgical candidacy, or entry into hospice. Alternative treatments to RC included chemotherapy (36%), radiation therapy (26%), and/or repeat endoscopic resections (30%).

Conclusion: Over 40% of KPSC patients in this MIBC cohort did not receive RC despite its established curative role. Patient refusal and poor surgical candidacy were the two major reasons identified by chart review. Providers may also have played a role, as RC was not considered an initial treatment option in 19% of cases. This study highlights opportunities to improve potential care gaps in the treatment of MIBC. Further study of the reason(s) for patient refusal and provider treatment recommendations is merited.

Funding: NCI R21 CA185931 and Southern California Permanente Medical Group.
**Poster #10**

**IMPACT OF POST-TREATMENT PSYCHIATRIC ILLNESS ON SURVIVAL OUTCOMES FOLLOWING TREATMENT OF PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER**

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Presented By: Tamer Dafashy, MD, MS

**Introduction:** Treatments for muscle-invasive bladder cancer are multimodal, complex and often carry significant physical and psychological morbidity risks. We sought to define the incidence and types of psychiatric illnesses diagnosed following treatment and determine the impact on survival outcomes.

**Methods:** A total of 3,709 patients diagnosed with clinical stage T2-T4a bladder cancer from January 1, 2001 to December 31, 2011 from the Surveillance, Epidemiology, and End Results (SEER)-Medicare were analyzed. We determined the incidence of psychiatric diagnosis for each treatment and used multivariable analysis to determine predictors associated with psychiatric diagnoses. Cox proportional hazards models were used to determine the impact of post-treatment psychiatric diagnosis on survival outcomes.

**Result:** Of the 3,709 patients, 1,870 (50.4%) were diagnosed with post-treatment psychiatric disorders with the most common diagnoses being mental and behavioral disorder due to psychoactive substance use and depressive disorders, respectively. Patients who underwent radical cystectomy (RC) were found to be at a significantly greater risk of having a post-treatment psychiatric illness in comparison to patients who underwent radiotherapy and/or chemotherapy (RTX and/or CTX) (Hazard Ratio (HR) 1.19, 95% CI = 1.08 - 1.32, P < 0.001). In adjusted analyses, patients with a post-treatment psychiatric diagnosis were found to have significantly worse overall and cancer-specific survival than patients without a post-treatment psychiatric diagnosis across all treatments.

**Conclusion:** Half of muscle-invasive bladder cancer patients who underwent treatment were diagnosed with a psychiatric disorder which resulted in worse survival outcomes as compared to patients without a post-treatment psychiatric diagnosis. In order to optimize the benefit of these treatments, addressing the non-oncologic needs of patients (i.e. depression screening, treatment, and survivorship clinics) are needed to improve survival outcomes.

**Funding:** A Clinical and Translational Science Award and Mentored Career Development Award through the Institute for Translational Sciences at UTMB. The National Center for Advancing Translational Sciences, National Institutes of Health. National Institute of Diabetes And Digestive And Kidney Diseases of the National Institutes of Health, and NIH Bladder SPORE.
Introduction: Enhancer of zeste homolog 2 is a methyltransferase encoded by the EZH2 gene. The role of EZH2 upregulation has been studied in several malignancies, including bladder cancer, though its role in upper tract urothelial carcinoma (UTUC) is poorly understood. We sought to evaluate the prognostic value of EZH2 expression in UTUC.

Methods: We reviewed a multi-institutional cohort of patients who underwent radical nephroureterectomy (RNU) for high-grade UTUC from 1990-2008. Immunohistochemistry for EZH2 was performed on tissue microarrays (TMA) from RNU specimens. Exclusion criteria were low tumor grade, receipt of neoadjuvant chemotherapy, previous muscle-invasive bladder cancer, and no tumor on TMA. The percentage of staining was evaluated, with EZH2 positivity defined as >20% staining present. Clinicopathologic characteristics and oncologic outcomes including recurrence-free (RFS), cancer-specific (CSS), and overall survival (OS) were compared between patients stratified by EZH2 positivity. Prognostic role of EZH2 was assessed using Kaplan-Meier (KM) analysis. Predictors of oncologic outcomes were identified using univariate (UVA) and multivariate (MVA) Cox regression analysis. Significance was defined for p<0.05.

Results: 376 patients were included for this updated, final analysis, with median follow-up 36 months. 298 (79.3%) patients were EZH2-negative and 78 (20.7%) were EZH2-positive. While gender, pT stage, pN stage, and prior bladder cancer were similar between groups, EZH2 expression was more often associated with ureteral location, sessile architecture, necrosis, and CIS. On UVA, EZH2 was a significant predictor for worse RFS (HR 1.63, p=0.033), CSS (HR 2.03, p=0.003), and OS (HR 2.11, p<0.001). On MVA adjusted for age, pT, pN, and LVI, EZH2 remained a significant predictor for worse OS (HR 1.65, p=0.005), while significance was lost for RFS and CSS. KM curves are shown (Figure).

Conclusion: EZH2 expression appears to be associated with adverse pathologic features and may predict worse oncologic outcomes in patients with high-grade UTUC. The role of EZH2 pathways in UTUC pathogenesis remains to be further elucidated.

Figure: Recurrence-free (a), cancer-specific (b) and overall (c) survival probability stratified by EZH2 expression.
Poster #12
PREOPERATIVE MULTIPLEX NOMOGRAM FOR PREDICTION OF HIGH-RISK NON-ORGAN CONFINED UPPER-TRACT UROTHELIAL CARCINOMA
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Presented By: Firas G. Petros, MD

Introduction: Radical nephroureterectomy (RNU) is the gold standard for management of upper-tract urothelial carcinoma (UTUC). We generate a preoperative tool to optimize predictive accuracy for high-risk non-organ confined (NOC)-UTUC.

Methods: Retrospective evaluation of 652 patients undergoing surgical excision of UTUC at 3 academic centers. Multiplex preoperative patient, imaging, endoscopic, and laboratory values were evaluated. Patients who had prior neoadjuvant chemotherapy were excluded. Multivariate logistic regression addressed the prediction of NOC disease (pT3/pT4 and/or pN+). A backward stepdown selection process achieved the most informative nomogram. Internal validation was conducted using 500 bootstrap resampling. A decision tree analysis identified a cut-off point predicting high-risk disease.

Results: A total of 528 patients were included for analysis with mean age of 70 years, over 80% Caucasian, 63% male, 49.4% high grade, and equal distribution of renal pelvis and ureter UTUC. NOC-UTUC was found in 169 (32%) patients on final pathology with 125 (24%) pT3, 44 (8%) pT4/pN+, 81 (48%) having tumors in the renal pelvis/calyces, 74 (44%) ureteral tumors, and 14 (8%) had tumors in both locations. Biopsy tumor grade (OR 5.14, p<0.01), tumor architecture (OR 3.66, p=0.01), Hgb (OR 0.81, p=0.02), and eGFR (OR 0.98, p=0.01) levels were independently associated with NOC disease. A preoperative nomogram incorporating these 4 variables achieved 78% accuracy in predicting NOC-UTUC, Figure 1. The cut-off point for predicting high-risk disease was ≥ 0.435.

Conclusion: We established an accurate tool for the prediction of locally advanced NOC-UTUC. This preoperative nomogram can be used to more optimally select patients for preoperative systemic chemotherapy, facilitate clinical trial enrollment, and determine need for lymph node dissection during surgery.

![Figure 1](image-url)
Poster #13
CHEMORADIATION VERSUS RADICAL CYSTECTOMY FOR MUSCLE INVASIVE BLADDER CANCER: COMPARATIVE ANALYSIS OF NATIONAL CANCER DATABASE WITH PROPENSITY SCORE WEIGHTING
Dharam Kaushik; Hanzhang Wang, MS; Wasim Chowdhury, MS; Qianqian Liu, MS; Joel Michalek, PhD and Ahmed M. Mansour, MD University of Texas Health, San Antonio, Texas, USA
Presented By: Dharam Kaushik, MD

Introduction: There is growing interest in the bladder preservation approach (Chemoradiation therapy: CMT) for muscle invasive bladder cancer (MIBC). The current overarching question is whether CMT offers similar overall survival (OS) when compared with radical cystectomy (RC) which is currently the gold standard treatment for MIBC.

Method: We reviewed the National Cancer Database (NCDB) for patients diagnosed with MIBC between 2004 and 2014 who subsequently underwent either RC with or without perioperative chemotherapy or primary CMT. RC and CMT patients were propensity score weighted based on clinical and pathologic variables. Subsequently, a weighted unadjusted proportional hazards model was used to contrast CMT and RC with OS. Weighted Kaplan-Meier curves were used to describe the two survival distributions.

Results: We identified 16,180 (RC: 14,282; CMT: 1,898) patients who met the inclusion criteria and had non-missing data. After performing propensity score weighting, we determined that RC and CMT differed significantly with regard OS, with CMT experiencing decreased OS relative to RC [Figure 1, Hazard Ratio 1.57 (CI: 1.52-1.62); p<0.0001]. The median 5- year OS was higher for RC (40.51 months) compared to CMT (20.24 months); 95% confidence bands are shaded.

Conclusion: In the NCDB dataset, RC was associated with 57% improved OS compared to CMT. Further studies are required to identify optimal treatment for specific patients.
Poster #14
GENOMIC ANALYSIS OF SAME-PATIENT METACHRONOUS UPPER-TRACT AND BLADDER UROTHELIAL CARCINOMA
Firas Petros, MD¹; Yuan Qi, PhD²; Woonyoung Choi, PhD³; Roger Li, MD⁴; Xiaoping Su, PhD⁵; Charles Guo, MD⁶; Colin Dinney, MD⁷; David McConkey, PhD⁸ and Surena Matin, MD⁹
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Presented By: Firas G. Petros, MD

Introduction: Despite similarities between upper-tract (UTUC) and bladder urothelial carcinoma (BUC), distinctive clinicopathologic and genomic differences are being described. We further investigate the genomic landscape of these two interrelated malignancies in same-patient metachronous (m) UTUC and BUC using next generation sequencing (NGS).

Methods: Following institutional board approval, UTUC and BUC samples were obtained from patients via surgical resection or endoscopic biopsy. Tumors were macrodissected from unstained formalin-fixed, paraffin-embedded slides. Study inclusion was untreated patient samples of UTUC and/or BUC divided into 4 groups: 1) UTUC with mBUC, 2) BUC with mUTUC, 3) Synchronous BUC and UTUC, 4) UTUC with no bladder history. Exclusions were for inadequate clinical data or histological tumor purity <30%. Whole transcriptome RNA sequencing was performed and analyzed using BASE47 panel (includes basal, luminal, p53-like and cell cycle genes).

Results: A total of 95 (UTUC=61, BUC=34) samples from 40 patients were analyzed. UTUC samples were 33 primary ureter and 28 renal pelvis cancer. Median age was 72 years, 68% male, 76% Caucasian, 60% former smokers. Groups samples were: 1) UTUC (n=19), mBUC (n=12); 2) BUC (n=12), mUT UC (n=9); 3) Synchronous UTUC/BUC (n=10); and 4) UTUC (n=23). Unsupervised hierarchical clustering (figure) segregated tumors into basal-like and luminal subtypes, with 87.5% of metachronous tumors displaying conserved subtype membership. For the groups with UTUC and BUC, only 3/24 (12.5%) clusters (2 patients in Group 2, and 1 patient in Group 3) had unmatched basal/luminal subtypes.

Conclusion: NGS analysis of same-patient metachronous UTUC and BUC shows that the majority stay within the same molecular subtype regardless of chronologic development or anatomic origin. Additional studies are necessary to explore differences that may occur within the subtypes, the role of methylation, and clinical correlates.
Poster #15
APOBEC-MEDIATED MUTAGENESIS IN UROTHELIAL CARCINOMA IS ASSOCIATED WITH IMPROVED SURVIVAL, MUTATIONS IN DNA DAMAGE RESPONSE GENES, AND IMMUNE SIGNATURES
Alexander Glaser, MD¹; Damiano Fantini, PhD¹; Yiduo Wang, MD²; Yanni Yu ¹; Kalen Rimar, MD³; Joseph Podojil, PhD³; Stephen Miller, PhD³ and Joshua Meeks, MD PhD¹
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Presented By: Alexander Paul Glaser, MD

Introduction: APOBEC enzymes are responsible for a mutation signature characterized by a TCW>T/G mutation implicated in a wide variety of tumors, including bladder cancer. We explore the APOBEC mutational signature in bladder cancer and the relationship with specific mutations, molecular subtype, gene expression, immune signature, and survival.

Methods: Sequencing data from the Cancer Genome Atlas (TCGA) bladder urothelial carcinoma dataset (n=395) was utilized for analysis, with validation using the Beijing Genomics Institute dataset (n=99) and the Cancer Cell Line Encyclopedia. Tumors were split into “APOBEC-high” and “APOBEC-low” based on APOBEC enrichment. TCGA expression data was used to compare bladder tumor molecular subtype, APOBEC enrichment score, and immune signatures. APOBEC-high and APOBEC-low cell lines were exposed to interferon-gamma, and qPCR was used to measure changes in APOBEC3B expression.

Results: Patients with APOBEC-high tumors have better overall survival compared to those with APOBEC-low tumors (38.2 vs 18.5 months, p=0.005). Tumors enriched for APOBEC mutagenesis are more likely to have mutations in DNA damage response genes (TP53, ATR, BRCA2), and chromatin regulatory genes (ARID1A, MLL, MLL3), while APOBEC-low tumors are more likely to have mutations in FGFR3 and RAS. APOBEC3A and APOBEC3B expression correlates with total mutation burden, regardless of bladder tumor molecular subtype. APOBEC enrichment score significantly correlates with B-cell, T-cell, Th1 T-cell, T-regulatory cell, gamma-delta T-cell, cytotoxic T-cell, dendritic cell, MHC-II, interferon, and immune checkpoint immune signatures. Furthermore, expression of APOBEC3B is increased after stimulation of APOBEC-high bladder cancer cell lines with interferon-gamma.

Conclusion: Tumors enriched for APOBEC mutagenesis are more likely to have mutations in DNA damage response and chromatin regulatory genes, potentially providing more single-strand DNA substrate for APOBEC enzymes, leading to a hypermutational phenotype and the subsequent enhanced immune response.
Poster #16

OBJECTIVE MEASURES OF FRAILTY AS PREDICTORS OF POSTOPERATIVE COMPLICATIONS AFTER RADICAL CYSTECTOMY

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Presented By: Madeleine Burg

Introduction: Frailty has been defined as a syndrome of physiological decline causing vulnerability to adverse outcomes. As bladder cancer is diagnosed at an average age of 70 years, these patients are more likely to be frail. Prospective studies on frailty and postoperative outcomes in urological patients are lacking. We aimed to determine whether established measures of frailty can identify high-risk patients undergoing radical cystectomy and predict their surgical outcomes.

Methods: Patients included those 65 years and older undergoing radical cystectomy. Under IRB approval, we prospectively recorded preoperative grip strength, gait speed, weight loss of ≥10 pounds in the past year, exhaustion, and low physical activity. Patients were also prospectively scored using the Clinical Epidemiological Survey for Depression (CES-D), Charlson Comorbidity Index (CCI), Katz Index of Independence in Activities of Daily Living (Katz ADL), Karnofsky Performance Scale (KPS), and Eastern Cooperative Oncology Group (ECOG) performance status. 90-day postoperative complications were recorded. Chi-square, Kruskal-Wallis, and multivariable logistic regression analysis were performed.

Results: A total of 91 patients were identified between 2/2014 and 2/2016 with an average age of 74.7 years. 68 (74.7%) patients had at least one postoperative complication within 90-days with no difference in age (p=0.8). 67.0% of patients underwent open radical cystectomy, with no difference in complication rates between open and robotic (p=0.08). On univariate analysis, gait speed (p<0.001), CCI (p<0.02), physical activity (p<0.02), and weight loss (p<0.03) were significantly associated with 90-day complications. On multivariable analysis, physical activity level (OR 0.73, CI 0.53-0.94, p<0.04) and CCI (OR 3.36, CI 1.14-10.56, p<0.04) were associated with increased risk of 90-day complications after controlling for pathologic stage, urinary diversion, blood transfusions, and age. Grip strength and subjective assessment tools (CES-D, Katz ADL, KPS, ECOG) were not associated with 90-day postoperative complications (p>0.05).

Conclusion: Objective measures of frailty, such as preoperative physical activity level or CCI, may be better predictors of postoperative complications than subjective assessments. These measures may be useful for identifying older patients at increased risk for complications after radical cystectomy who may need higher acuity care in the perioperative period.
Poster #17
COMPARISON OF MUTATIONS AND GENE EXPRESSION DIFFERENCES BETWEEN AFRICAN AMERICANS AND NON-AFRICAN AMERICANS WITH UROTHELIAL CELL CARCINOMA
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Presented By: Kalen Rimar

Introduction: African American’s with bladder cancer have been shown to have worse disease specific and overall survival. Though several factors such as socioeconomic status, access to care, and stage at presentation have been proposed, it remains unclear why this difference exists. Our objective was to identify whether there were mutation or gene expression differences in bladder cancer samples from African Americans compared to samples from non-African Americans and if so, whether these differences could potentially explain differences in disease specific and overall survival.

Methods: The Cancer Genome Atlas (TCGA), Bladder Urothelial Carcinoma (TCGA, Provisional) was utilized to obtain and compare mutation type, frequency, signature, and gene expression between African Americans and non-African Americans. We also compared differentially expressed genes according to race across all TCGA provisional cancer datasets.

Results: We identified 23 African-American and 323 Caucasian patients with whole genome sequencing and RNA-Seq available. We found no significant difference in the total mutation load between Caucasians and African-americans (range, median = 240.5 vs. range, median=225.5, p=0.228). There majority of DNA substitution mutations in both Caucasians and African-Americans were C>T, and there was no significant difference in frequency (p=0.33). There were no significant differences in signature frequency between the 2 groups (p=0.3). There was no significant difference in mutation frequency of known bladder cancer driver mutations based on race (p=0.41). We identified 14 genes with significant differential expression according to race within bladder tissue. Of these genes HIST1H2BD, L1TD1, and LRRC37A2 were associated with worse overall survival (p<0.005, p=0.03, p=0.02). The pattern of differential gene expression seen in bladder cancer by race also remained relatively consistent for several genes across all cancers in the TCGA.

Conclusion: African Americans with urothelial cell carcinoma have similar mutation type, frequency, and signature when compared to non-African Americans. However urothelial cell carcinoma from African Americans has several differentially expressed genes when compared to non-African Americans and these differences remain consistent across many cancer types within the TCGA. Further study of the effects of this differential exploration on tumor biology, cancer specific survival, and overall survival is warranted.
Poster #18
NOVEL THREE-DIMENSIONAL ORGANOID CULTURE REVEALS INVOLVEMENT OF WNT/ß-CATENIN PATHWAY IN PROLIFERATION OF BLADDER CANCER CELLS
Takahiro Yoshida, MD, PhD¹; Max Katesm MD¹; Nikolai Sopko, MD, PhD¹; Gregory Joice, MD¹; Xiaopu Liu, BS¹; David McConkey, PhD² and Trinity Bivalacqua, MD, PhD¹
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Presented By: Takahiro Yoshida, MD, PhD

Introduction: Understanding a molecular mechanism involved in cancer growth is an essential part of cancer research. Cancer cells often hijack physiological signaling pathways in normal counterpart cells to promote tumor progression. Wnt/ß-catenin pathway is reported to be involved in regeneration process of normal urothelium after injury. We tested involvement of Wnt/ß-catenin pathway in proliferation of bladder cancer cells using novel methods generating 3D organoids from immortalized cell lines and patient specimens.

Methods: Organoids from bladder cancer cell lines RT4 (luminal phenotype) and 5637 (basal phenotype) were generated by an aggregation method. A partial-digestion method was applied to prepare organoids directly from human bladder cancer specimens. Wnt/ß-catenin pathway was activated by using a small molecule CHIR99021 (GSK3 inhibitor, Wnt activator) and inhibited by siRNA against ß-catenin. Activation of Wnt/ß-catenin pathway was confirmed by upregulated AXIN2 mRNA expression and translocation of ß-catenin into nucleus. Proliferation of cancer cells were evaluated by growth assay under microscope and ATP viability assay. Differentiation status of organoids over growth was characterized by qRT-PCR and western blot.

Results: CHIR99021 promoted proliferation of cancer cell lines cultured as organoids with activation of Wnt/ß-catenin pathway but not in conventional monolayer culture. Enhanced proliferation of cancer cells with activation of Wnt/ß-catenin pathway by CHIR99021 was also confirmed in ex-vivo organoids from patient samples. When ß-catenin was knockdowned in cell lines, growth of organoids was significantly suppressed. Cytokeratin 20, a terminal differentiation marker, was less expressed over CHIR99021-enhanced cell proliferation.

Conclusion: Involvement of Wnt/ß-catenin pathway in proliferation of bladder cancer cells was revealed by using novel 3D organoid culture methods. Those organoid methods can dissect new aspects of cancer cell biology, such as drug response, which cannot be found in conventional monolayer cell culture.
Poster Session I – Full Abstracts

Poster #19
IDENTIFYING PATIENTS WHO MAY BENEFIT FROM TRIMODAL THERAPY VERSUS EXTRIPATIVE SURGERY IN BLADDER CANCER
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University of Virginia, Charlottesville, VA
Presented By: Matthew B. Clements, MD, MS

Introduction: The gold standard treatment for invasive bladder cancer remains radical cystectomy with pelvic lymph node dissection (RC). However, trimodal therapy (TMT), including endoscopic management and chemoradiation, may offer a less morbid, viable option for select groups of patients unable to undergo extirpative surgery. We sought to identify clinical and demographic factors associated with improved survival in patients undergoing TMT versus RC.

Methods: We identified patients diagnosed with non-metastatic urothelial carcinoma of the bladder (65-90 years of age) after transurethral resection (TUR) using Medicare-linked Surveillance, Epidemiology, and End Results data (2004-13). We categorized patients based on treatment following endoscopic debulking (RC vs. TMT, including radiation and systemic chemotherapy). Using oncologic staging at the time of TUR, we performed adjusted competing risk regression to identify independent predictors of bladder cancer-specific mortality (BCM) using death from other causes as the competing variable. Using a Cox proportional hazards model for overall survival (OS), we compared predicted OS in the TMT cohort with OS in subgroups of the RC cohort to define populations benefiting from TMT.

Results: We identified 6470 patients undergoing TUR followed by either TMT (n=306) or RC (n=5684). On multivariable analysis, TMT was associated with an increased risk of BCM (hazard ratio 1.63, p<0.001). We identified 4 patient populations that exhibited superior survival with TMT. These included patients with pelvic lymphadenopathy (cN+) (>65 years for female, >79 years for male), females with ≥T3 disease and Charlson Index >2, and males >65 years who had both cN+ and ≥T3 disease (Figure).

Conclusion: Although BCM is higher in patients undergoing TMT vs. RC, we identified 4 subsets of patients with superior overall survival with TMT as compared to RC. Interestingly, all subgroups included patients who were cN+ or had high risk of occult lymphadenopathy (≥T3), suggesting that radiation therapy and/or chemotherapy may be of benefit for such patients. These findings may inform decisions regarding multidisciplinary management of patients with invasive bladder cancer.
Poster #20
VALIDATION OF THE BCG UNRESPONSIVE DEFINITION
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Presented By: Roger Li, MD

Introduction: “BCG unresponsive disease” is a recent consensus term borne out of the need to better define patients who are unlikely to benefit from further intravesical BCG. This group combines two subcategories: BCG refractory (HG cancer at 6 months) and BCG relapsing (relapsing HG cancer after achieving disease-free state at 6 months), after adequate BCG treatment (induction and at least one maintenance). In practice, two reasons commonly disqualifying patients from satisfying the criteria are A) not receiving adequate BCG prior to recurrence and B) relapse beyond 9 months after the last BCG instillation. We studied the outcomes of patients classified as having BCG unresponsive disease and those with recurrence but did not satisfy the definition.

Methods: We identified 125 patients with HG recurrence after intravesical BCG from our bladder cancer database. Of these, 92 satisfied the BCG unresponsive definition (60 BCG refractory and 32 BCG relapsing) while 33 did not (26 due to reason A or 6 patients due to reason B). Recurrence free survival (RFS), progression free survival (PFS), time to cystectomy (TTC), and cancer specific survival (CSS) were compared between patients satisfying and not satisfying the BCG unresponsive definition. The same comparisons were made between the BCG refractory unresponsive and the BCG relapse unresponsive patients to validate their oncologic equivalence.

Results: Patients with BCG unresponsive disease were found to have shorter RFS (11mo vs NR, p<0.001) and TTC (38mo vs NR, p=0.009) compared to those with recurrence but outside the definition criteria (Fig 1a, b). A trend towards inferior PFS was observed for the BCG unresponsive patients (150mo vs. NR, p=0.06) (Fig 1c), while no difference was found in CSS (Fig 1d). All endpoints were similar for patients within the subgroups of BCG unresponsive disease (refractory vs relapsing) (p values RFS = 0.973, PFS = 0.953, CSS = 0.733).

Conclusion: Patients who meet the criteria for BCG unresponsive disease as currently defined have worse RFS and TTC than those who are classified as having BCG failure but fall outside the criteria of the definition. This study validates the definition of BCG unresponsive disease.
Poster #21
THE IMPACT OF THE AFFORDABLE CARE ACT AND MEDICAID EXPANSION ON INSURANCE STATUS AND CANCER STAGING FOR BLADDER CANCER PATIENTS
Kyle Plante, MS, MPH; Natasha Ginzburg, MD; Oleg Shapiro, MD; Joseph Jacob, MD; Gennady Bratslavsky, MD and Elizabeth Ferry, MD
SUNY Upstate Medical University, Syracuse, NY
Presented By: Kyle P. Plante, MS, MPH

Introduction: To examine the impact of the Affordable Care Act (ACA) and associated Medicaid expansion on the insurance status and staging of bladder cancer (BCa) patients in the United States.

Methods: Cases were identified from the National Cancer Database (NCDB) Participant User File (PUF) from 2004-2014. Patients were selected by year of diagnosis: prior to the passing of the ACA (2004-2009) and after the Medicaid expansion provision (2014). National data was analyzed, as well as the Pacific (PR) (AK, CA, HI, OR, WA) and West South Central (WSC) (AR, LA, OK, TX) regions, to sample regions of early and non-Medicaid expanding states, respectively. Chi-squared test was used to compare patient and disease characteristics. Multivariable logistic regression was used to estimate odds ratios for a stage IV BCa diagnosis within regions, controlling for age, distance, gender, race, Hispanic ethnicity, Charlson-Deyo score, and population-level income and education.

Results: The study included 239,479 people diagnosed with BCa in the U.S., 26,439 located in the PR, and 13,752 in the WSC. Prior to the Medicaid expansion, patients without insurance were at significantly higher risk to present with stage IV BCa, and at even higher risk if they had Medicaid, in all three study groups (OR uninsured: Nationally 1.9 (p<0.001 (CI 1.7-2.1)), PR 1.6 (p=0.012 (CI 1.1-2.2)), WSC 1.8 (p<0.001 CI 1.3-2.5); Medicaid: Nationally 2.3 (p<0.001 (2.1-2.5), PR 2.2 (p<0.001 CI 1.7-2.7), WSC 2.6 (p<0.001 CI 1.8-3.7)). Following expansion, the risk remained elevated for these groups Nationally, but did decrease (OR uninsured 1.6 (p<0.001 CI 1.3-2.1), Medicaid 1.6 (p<0.001 1.4-1.9)). Patients in the PR without insurance had no significantly different risk compared to their privately insured peers post-expansion, but those with Medicaid had a persistent elevated risk (OR 2.2 (p=0.001 CI 1.4-3.4)). In the WSC, those without insurance had an increased risk of stage IV disease (OR 2.2 (p=0.007 CI 1.2-3.9)), but those with Medicaid had no significantly different risk than their privately insured peers post-expansion.

Conclusion: Prior to the ACA, patients without insurance and those on Medicaid were more likely to present with stage IV BCa than their privately insured peers. In the first year following expansion, these odds improved Nationally for those without insurance and Medicaid, however, expanded states did not see this improvement in their Medicaid population, while non-expanded states did.
Introduction: Genomic characterization of urothelial bladder cancer (UBC) may help to identify alterations associated with tumor stage, novel therapeutic targets and biomarkers to predict outcomes.

Methods: 454 UBC patients were sequenced using a capture-based next generation sequencing (NGS) assay (MSK-IMPACT) at our center. 317 patients (123 NMIBC, 161 MIBC and 33 metastatic) had no prior h/o UC (i.e. index tumors) at time of NGS. Index tumor genomic alterations were analyzed to identify alterations associated with tumor stage, predictors of neoadjuvant chemotherapy response and prognostic biomarkers.

Results: Index tumors that harbored TP53 and/or RB1 alterations more frequently presented with advanced disease whereas tumors containing FGFR3 alterations presented with NMIBC (all p value <0.001). TP53/MDM2, DNA Damage Repair (DDR) and cell cycle pathway alterations were more common in index advanced stage tumors where as index NMIBC had more frequent RTK/RAS/RAF pathway alterations (all p value <0.05). FGFR3, PBRM1 and TP53 were significant to predict both overall and metastasis free survivals in multivariate models. MIBC with DDR gene alterations had significantly higher pathological downstaging as well as better overall survival compared to MIBC without DDR alterations with platinum-based neoadjuvant chemotherapy (both p value =0.04). Specifically, MIBC without DDR alterations, DDR alterations of unknown significance and DDR deleterious alterations had pathologic downstaging rate of 37.1%, 48% and 81.3%, respectively, with platinum-based neoadjuvant chemotherapy. MIBC with ERCC2 mutations exhibited a pathologic downstaging rate of 83.3% with platinum-based neoadjuvant chemotherapy.

Conclusion: TP53, RB1 and FGFR3 alterations as well as TP53/MDM2, DDR, cell cycle and RTK/RAS/RAF pathways alterations showed an association with index tumor stage. FGFR3, PBRM1 and TP53 were significant to predict both overall and metastasis free survivals in multivariate models. MIBC with DDR alterations had significantly higher pathological downstaging as well as better overall survival compared to MIBC without DDR alterations with platinum-based neoadjuvant chemotherapy.

Risk stratification based upon FGFR3, PBRM1 and TP53 status for overall survival (N=317, 90 events) and metastasis free survival (N=282, 96 events)
Poster #23
ASSSESSMENT OF BLUE LIGHT FLEXIBLE CYSTOSCOPY WITH CYSVIEW ON PATIENT REPORTED OUTCOMES: A PROSPECTIVE, MULTICENTER, WITHIN-PATIENT CONTROLLED STUDY IN DETECTION OF BLADDER CANCER DURING SURVEILLANCE

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Presented By: Angela B. Smith, MD, MS

Introduction: A phase 3 study evaluated utility of blue light flexible cystoscopy with Cysview (BLFCC) surveillance. We evaluated the impact of BLFCC on patient-reported outcomes, including anxiety and whether BLFCC was considered worthwhile.

Methods: A prospective, multicenter, within-patient controlled study was conducted in patients with non-muscle invasive bladder cancer at high risk of recurrence. Patients with suspicious lesions went to the OR where WL and BLCC were repeated and all lesions biopsied. The PROMIS Anxiety and “Was It Worthwhile” questionnaires were administered at baseline, after surveillance, and after OR resection (if performed). Comparisons of scores were performed between groups at different time points.

Results: A total of 304 patients were enrolled of whom 103 patients were referred for OR examination. Of 103 patients, 56 had histologically confirmed malignancy in the OR. When comparing anxiety levels from baseline to post-procedure, overall anxiety decreased after BLFCC (-2.6) with greater decrease among those with negative BLFCC compared to positive (p=0.051). For those who went to the OR, overall anxiety decreased marginally from post-surveillance (-2.6) but this was due exclusively to less anxiety among those with negative biopsies (“false positive”) as compared with true positives (p=0.054). When patients were asked about their experience with BLFCC, most found it worthwhile with no differences noted between those with false or true positive (86% vs 88%; p=1.0), whether they would undergo the procedure again (91% vs 92%; p=1.0) or recommend to others (93% vs 88%; p=0.49). Similarly, no differences were noted among those with positive or negative BLFCC regarding whether they felt the procedure was worthwhile (91% vs 97%; p=0.07), would do it again (92% vs 96%; p=0.23) or would recommend to others (90% vs 92%; p=0.63).

Conclusion: Anxiety decreased following BLFCC, with a more pronounced decrease among those with negative BLFCC or false positive results. The majority of patients undergoing BLFCC found it worthwhile to undergo the procedure and would recommend it to others, irrespective of whether they had a positive BLFCC or false positive in the operating room.

<table>
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<th>Statistic</th>
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<th>Post-OR</th>
<th>Post-Surveillance change from Baseline</th>
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<td>Mean 49.7</td>
<td>46.6</td>
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* Change from baseline to post-surveillance p=0.051
^ Change from post-surveillance to post-OR p=0.054
**Poster #24**  
**EFFECT OF BLUE-LIGHT CYSTOSCOPY (BLC) ON RECURRENCE/PROGRESSION RATES FOR VESIGENURTACEL-L (HS-410) WITH BCG IN PATIENTS WITH NON-MUSCLE INVASIVE BLADDER CANCER (NMIBC)**

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Presented By: Andrew Zganjar, MD

**Introduction:** Vesigenurtacel-L (HS-410) is an allogenic cell line vaccine that induces the expression of heat shock protein gp96-Ig, promoting activation of highly selective CD8+ cytotoxic T cells. Primary endpoint data (1-year Recurrence-Free Survival (RFS)) from a randomized Phase 2 trial of HS-410 and BCG in NMIBC has been reported - without a statistically significant reduction in RFS. However, response rates were superior to historic rates with BCG alone. We sought to evaluate the influence of BLC on the reported RFS.

**Methods:** 78 patients with intermediate or high-risk (n=73) NMIBC - who were either BCG-naïve or recurrent - were randomized to either 6 weeks of low-dose HS-410, high-dose HS-410, or placebo therapy during their 6-week induction BCG. Maintenance therapy consisted of 3-weekly treatments (combination therapy) at the 3, 6, and 12-month mark. A fourth group (16 patients) consisted of monotherapy HS-410 for patients who did not receive BCG, and were not included in the present analysis. The primary endpoint was 1-year RFS, which was analyzed with respect to use of BLC on initial TURBT.

**Results:** Of the 78 patients, 26.9% (21) underwent BLC at initial TURBT. Median follow-up was 14 (IQR 13-16) months, during which 21 patients recurred. The estimated 1-year RFS was 95% (95%CI 86-100%) in patients with BLC compared to 70% (95%CI 59-83%) in patients without BLC (p=0.047). On univariable logistic regression, the use of BLC was associated with a significant reduction in the odds of recurrence at 1 year (OR 0.12; 95%CI 0.01-0.95; p=0.04).

**Conclusion:** Similar to previous studies, BLC seems to significantly reduce RFS at one year. Patients in all combination arms performed better than historical data on BCG – which may have contributed to the lack of statistically significant difference between the HS-410 and placebo arms. Even patients without BLC showed RFS in excess of reported rates – possibly due to initial TURBT being performed at tertiary centers.

**Funding:** Heat Biologics Inc.
Poster #25

AUTOMATED COMPUTER-ASSISTED ENDOSCOPIC DETECTION OF BLADDER TUMORS

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¹Quantitative Pty Ltd, NSW, Australia; ²Faculty of Medicine and Health Sciences, Macquarie University, Sydney, Australia; ³ARC Centre of Excellence for Nanoscale BioPhotonics, MQ Photonics, Macquarie University, NSW 2109, Australia; ⁴Faculty of Medicine and Health Sciences, Macquarie University, NSW, 2109, Australia

Presented By: Dmitry Polikarpov, MD, MRes

Introduction: The most reliable method of bladder tumors detection is cystoscopy. This procedure would be often combined with a biopsy, or resection and histological analysis of any suspicious lesions. In this work, we attempted to develop an automated classifier of cystoscopy findings and explored whether it can identify low-risk patients. By reducing the subjectivity of the procedure and indicating when the risk of a lesion being malignant is minimal, such system would have a potential to reduce the number of referrals and biopsies, as well as associated complications and costs.

Methods: Cystoscopy images taken during routine clinical patient evaluation were interpreted by an expert clinician and supported by biopsy findings. They were further subjected to an automated image analysis developed to best capture cancer characteristics. The images were divided into biologically meaningful segments by using a specialized color segmentation system. After the selection of a set of highly informative features and training of the system, the segments were separated into four classes: healthy, blood vessels, inflammation and malignancy. Depending on the presence of malignant segments, the images were then classified as healthy or diseased, by using a linear discriminant, the naïve Bayes and the quadratic linear classifiers. Performance of the classifiers was measured by using receiver operation characteristic curves.

Results: The linear classifier had higher sensitivity and accuracy compared to the other systems. Its accuracy, however, was associated with higher false positive rate, unacceptable for our application. The quadratic classifier appeared overall to score better in our tests, yielded fifty percent false positive rate and zero false negative rate, which means, that no malignant lesions were missed by this classifier. Relatively high false positive rate was caused by many images containing scarring or highly inflamed tissue, which was considered suspicious by the classifier.

Conclusion: Based on criteria used for assessment of cystoscopy images by urologist and features that human visual system is less sensitive to, we developed a computer program that carries out an automated segmentation and analysis of cystoscopy images. This system has a potential to be used as a triage to identify patients who do not require further testing or referral to more experienced specialists.
Poster #26  
COSTS OF UROLOGIC CANCER CARE ACROSS THE DISEASE CONTINUUM  
Deborah Kaye, MD, MS; Alice Min, MS; Lindsey Herrel, MD, MS; Zaojun Ye, MS; Jonathan Li, BA; James Dupree, MS, MPH; Chad Ellimoottil, MD, MS and David Miller, MD, MPH  
University of Michigan, Ann Arbor, MI  
Presented By: Deborah R. Kaye, MD  

Introduction: To estimate the costs of Urologic cancer care during the initial, continuing, and end-of-life phases of care, and to examine variation in expenditures according to varying patient characteristics, geography, and year of diagnosis.  

Methods: We used linked SEER-Medicare data to identify patients aged 66-99 years who were diagnosed with one of the following 3 cancers: prostate, bladder, or kidney, from July 2007 through 2011. We attributed each patient to a phase of care. Patients surviving < 12 months from diagnosis were attributed to end-of-life, those surviving > 12 months but < 24 months were attributed to both the initial and end-of-life phase, and those surviving > 24 months were attributed to all 3 phases of care. For each patient-phase dyad, we calculated expenditures for all claims attributable to the primary cancer diagnosis. We then evaluated costs across patient demographics, geography, and year of diagnosis.  

Results: We identified 258,517 patients diagnosed with one of 3 Urologic malignancies. Annual costs for prostate cancer were highest during the initial phase, whilst costs for bladder and kidney cancer were highest at the end-of-life (Figure 1). Average expenditures across the 3 cancers by phase were: $8,593 in the initial, $1,299 for continuing, and $9,449 at end-of-life. Females had higher expenditures for bladder cancer than males ($10,936 vs $10,259, p<0.001), but lower costs for kidney cancer ($10,481 vs. $10,992, p=0.048). The costs of cancer care decreased with increasing age. For instance, across all cancers and phases, costs for patients >=80 years old were 13% lower than for those in the 65-70 age group. Across all phases, Blacks had higher expenditures for prostate and bladder cancer compared to Whites (Prostate: $10,765 vs. $10,224, p=0.015; Bladder: $13,126 vs. $10,356, p=<0.001). Overall costs remained fairly stable across both geographic regions and year of diagnosis.  

Conclusion: Considerable differences exist in expenditures across cancer type and phase. By understanding the drivers of such cost differentials across patient demographics and cancer characteristics, we can inform efforts to decrease costs and increase quality, thereby reducing the burden of cancer care.
Poster #27
IMPACT OF INPATIENT PALLIATIVE CARE CONSULTATION ON ADMISSIONS FOR METASTATIC BLADDER CANCER
Neil Mistry, MPH¹ and Sameer Siddiqui, MD²
¹School of Medicine, Oregon Health & Science University, Portland OR; ²St. Louis University Hospital, Division of Urology, St. Louis, MO
Presented By: Neil A. Mistry, MPH

Introduction: As the nation grapples to control the cost of end-of-life care, palliative consultation services have gained traction as a potential solution for patient-centered, cost-effective care backed by a growing body of evidence demonstrating improvements in quality of life and reductions in costs, lengths of stay, and in-hospital mortality. Our objectives are to identify the characteristics associated with palliative care consultation for patients admitted with metastatic bladder cancer and to report on outcomes including costs, hospital course, and discharge.

Methods: Using the National Inpatient Sample database from 2012-2013, we identified 32,515 patients with metastatic bladder cancer and analyzed data from their hospital admissions using descriptive statistics, chi-squared analysis, and regression modeling.

Results: Palliative care services were consulted in 14.6% (4,735) of metastatic bladder cancer admissions. These admissions were generally non-elective in origin and had lower use of surgical procedures and chemotherapy. The use of palliative care did not differ significantly based on hospital size, teaching status, or location, but patients at private investor-owned hospitals were least likely to receive consultation (OR: 0.421, p<0.001). With consultation, the average cost and charge for admission were 15.8% and 19.5% lower, respectively, but length-of-stay did not differ and in-house mortality was significantly increased. Controlling for factors including demographic and hospital characteristics, inpatient palliative care was more closely associated with acute complications such as stroke (OR: 1.73, p<0.001), patients having DNR (do-not-resuscitate) orders (OR: 5.11, p<0.001), lacking insurance (OR: 2.16, p<0.001), and being discharged to home (OR: 18.85, p<0.001), facilities like hospice care centers (OR: 4.74, p<0.001), or home health (OR: 3.23, p<0.001).

Conclusion: Inpatient consultation with palliative care specialists could positively influence the care of patients with metastatic bladder cancer. In addition to reduced costs, the higher rates of DNRs and discharges to home-health/hospice combined with lower rates of interventions suggest that end-of-life planning is taking place. Through our description of the incidence, patient factors, and settings where palliative care consultations occur, we conclude that palliative consultation should be expanded to further improve the treatment of patients admitted with metastatic bladder cancer.
Poster #28
LEARN-INFORM-RECRUIT: INCREASING THE OFFER OF UROLOGIC CANCER TRIALS IN COMMUNITY PRACTICE
Andrew Zganja, MD; Christine Mackay, RN, MSA, CCRP; Laurie Petty; Mugur Geana MD, PhD; Jessie Gills, MD; Tomas Griebling, MPH, MD; Brantley Thrasher, MD and Shellie Ellis, MA, PhD
University of Kansas Medical Center, Kansas City, KS
Presented By: Andrew Zganjar, MD

Introduction: Enrollment in cancer clinical trials has remained low for decades, largely because few physicians offer their patients the opportunity to participate. Although most interventions target oncologists to increase the offer of clinical trials, urologists diagnose and treat up to 20% of cancers before an oncologist is consulted. Thus, interventions are needed to help urology practices implement clinical trial offers.

Methods: We conducted a qualitative study to identify factors relevant to the offer of clinical trials in urology practices, and assessed barriers to communication. We recruited and interviewed both solo and group practice urologists and their staff in Kansas communities with open urological cancer trials.

Results: We interviewed 7 urologists and 11 staff members. We found that urology practices were receptive to offering clinical trials, however they had limited experience and awareness of available trials. Urologists prefer face-to-face interactions to learn about trials, and cited the influence of state/regional professional societies. Lack of knowledge, educational materials, and understanding of patients’ motivations were identified as barriers. Community cancer centers have the potential to support clinical trials; however, urologists had strong referral relationships with fellowship-trained urologic oncologists at tertiary centers and weaker relationships with local oncologists. Both surgeons and staff considered trials to be appropriate for patients with few treatment options, and were pleased to learn that some trials are designed for earlier treatment stages.

Conclusion: Community urologists are willing to participate in steps to increase clinical trial participation. Targeted communication strategies may increase awareness of available trials, but should address barriers we identified. Urologists are receptive to learning about clinical trials through programs endorsed by state/regional professional societies. Tools regarding available trials could support urologists’ need for patient education/capitalize on the value community urologists perceive in offering trials. Standardized information from trial sponsors may dispel misperceptions and facilitate care following enrollment. Strategies to strengthen community urology-oncology interaction are needed to increase/sustain the offer of clinical trials, and should enlist academic urologists to promote local interaction.

Funding: Brown Performance Group
Poster #29
PROSTATE CANCER ANXIETY IN MEN UNDERGOING ACTIVE SURVEILLANCE. FINDINGS FROM A LARGE PROSPECTIVE COHORT STUDY
Karim Marzouk, MD, FRCSC¹; Behfar Ehdai, MD, MPH²; Melissa Assel, MS³ and Andrew Vickers, PhD³
¹Memorial Sloan Kettering Cancer Center, Department of Surgery, Division of Urology, New York, NY; ²Memorial Sloan Kettering Cancer Center, Department of Surgery, Division of Urology; ³Memorial Sloan Kettering Cancer Center, Department of Epidemiology and Biostatistics
Presented By: Karim Marzouk, MD

Introduction: Active surveillance (AS) is a widely established management strategy for low risk prostate cancer (Pca). An estimated 5-13% of patients terminate AS and undergo treatment due to cancer related anxiety. Despite the growing acceptance of AS, there is limited information on anxiety in this patient population. We present our findings from a large prospective study that routinely inquired about cancer specific anxiety in a cohort of men on AS.

Methods: 463 patients enrolled in AS from March 2000 through January 2016. Of these, 413 had completed a Pca quality of life survey as part of routine clinical care. Men were asked if Pca impaired their ability to plan for the future, if Pca resulted in distressing worries or thoughts, and if these thought have affected their mood. A liberal definition of anxiety was used; responses indicating agreement or strong agreement with any of the statements resulted in a label of Pca anxiety. Men were also asked to rank their overall state of health on a 10-point Likert scale. Generalized estimating equations were used to test the association between the risk of anxiety and age, martial status, PSA, Gleason score, number of positive cores, family history of Pca, or overall state of health, and length of time on AS.

Results: The median age of men on AS was 61 years with a median PSA at diagnosis 4.4 ng/ml; 95% of patients had Gleason 6 disease, 29% had a family history, and 81% were married. The median time from AS initiation to last survey was 3.7 years. The risk of anxiety decreased with time on AS (Figure 1; OR=0.87; 95% CI: 0.79, 0.95; p=0.003). Patients reporting higher overall health scores had lower anxiety levels which lasted throughout the duration on AS (OR=0.83; 95% CI: 0.74, 0.93; p=0.001). None of the other covariates of interest were significantly associated with the change in the risk of high anxiety after adjusting for time.

Conclusion: Although moderate levels of anxiety exist in men undergoing AS, it significantly decreases over time. This should be taken into consideration when counseling men on AS.
Introduction: Comparative effectiveness research (CER) is imperative for objective and balanced assessment of treatment outcomes. CER that utilizes administrative databases (AD-CER) affords unique opportunities for large scale data analyses that potentially transcend limitations of small institutional datasets. Prostate cancer has received much attention from the AD-CER research community, while non-prostate genitourinary malignancies (NPGUM) are less well-studied. The objective of this study is to review the currently available AD-CER that has been published in the NPGUM space.

Methods: A systematic review of the literature was completed to identify English language articles pertaining to CER for NPGUM utilizing Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) standards. All abstracts were screened for relevance. Included studies answered a clearly defined comparative effectiveness question and utilized an administrative database. Included articles were read in their entirety.

Results: The initial search returned 3896 abstracts across all GU malignancies, and 95 studies met inclusion criteria. In summary, renal and bladder malignancies were the most commonly investigated at 49% (n=46) and 25% (n=24), respectively, with all other malignancies comprising the other 26% (n=25) of articles. Overall, SEER and SEER-Medicare (SEER-M) represented 38% (n=36) and 22% (n=20) of the studies included, respectively. All included articles were published after 2005, with substantial temporal increases in the number of CER reports utilizing administrative data. Selection biases, confounding factors, concern regarding generalizability, and a significant deficiency in data granularity all exist. As such, these studies need to be interpreted with caution, as positive findings often suggest association, not causation and are fraught with Type 1 errors.

Conclusion: The role of administrative databases in comparative effectiveness research has been established, but is poised for future refinement. Administrative databases remain a vital resource that is able to provide rapid and high-fidelity retrospective analyses to examine unanswered questions in urologic oncology. Nevertheless, given limitations of retrospective assessments, these studies will remain hypothesis-generating and will require continued caution during interpretation.
SPHINGOSINE KINASES 1 IS A NOVEL MOLECULAR THERAPEUTIC TARGET FOR RENAL CELL CARCINOMA

Yunze Xu, PhD and Yiran Huang, PhD
Ren Ji Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, China
Presented By: Yunze Xu, II, PhD

Introduction: Sphingosine kinase 1 (SphK1) has multiple functions in tumorigenesis. The present study was conducted to investigate the expression of SphK1 and its prognostic significance in renal cell carcinoma (RCC). Meanwhile, we set out to SphK1 as a novel molecular target in RCC and examine its role in tumor cell growth and sunitinib resistance in vitro and in vivo.

Methods: In this study, SphK1 expression levels as well as clinicopathological significance were evaluated in RCC cell lines and primary RCC clinical specimens by immunohistochemistry, immunofluorescence assay, qRT-PCR and western blot. We assessed the levels of S1P and Sph in tumor tissues by HPLC analysis and in the plasma of RCC patients by LC-MS/MS analysis. In vitro and in vivo knockdown or overexpression of SphK1 in RCC cell lines was used to determine its effect on tumor growth, cellular proliferation, colony formation, migration, invasion, and apoptosis. We conducted a phosphoprotein antibody array to identify ectopic phosphorylated proteins induced in 786-O cells with/without SphK1 expression vector. In addition, we further evaluated the effect of SphK1 antagonist fingolimod (FTY720) in RCC in vitro and in vivo, as a single agent or in combination with sunitinib, and attempted to explore its anticancerogenic mechanisms.

Results: We identify upregulation of SphK1 significantly associated with poor prognosis of RCC patients, which contributing to renal cell proliferation, migration and survival. Suppression of SphK1 activity suppresses cell growth in vitro and in vivo. A comprehensive phosphoprotein antibody array reveals that SphK1 overexpression promoted RCC progression by regulating the Akt/mTOR pathway. SphK1 could act as a canonical regulator of hypoxia-inducible HIF-1α and HIF-2α in RCC cells. Moreover, stem-like phenotype due to sunitinib administration via oncogenic activation of SphK1 could be ameliorated by SphK1 shRNA and FTY720. FTY720 administration enhanced tumor growth inhibition effect of sunitinib treatment on RCC cells in vitro and in vivo.

Conclusion: Our results unraveled that increased SphK1 defines an important mechanism for maintaining stemlike phenotype and sunitinib resistance, therefore contributes to tumour development and represents therapeutic targets for RCC.
Poster #32
MOLECULAR CHARACTERIZATION OF RENAL CELL CARCINOMA: A POTENTIAL THREE MICRORNA PROGNOSTIC SIGNATURE
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Presented By: Zachary Klaassen, MD

Introduction: Aberrantly expressed microRNAs (miR) promote renal cell carcinoma (RCC) growth and metastasis and are potentially useful biomarkers for metastatic disease. However, a consensus clinically significant miR signature has not been identified. The objective of this study was to identify a miR signature for predicting clinical outcome in RCC patients using a four-pronged interconnected approach with validation steps.

Methods: miR discovery phase involved analysis of 113 specimens (normal kidney: 59; tumor: 54). miR profiling performed in matched normal and tumor specimens from the same patients was validated by profiling unmatched normal and RCC specimens. The top 20 aberrantly expressed miRs were analyzed by PCR assays and the expression was correlated with RCC subtypes, and clinical outcome. The miR signature was further confirmed in a TCGA dataset (n=311 RCC patients).

Results: Discovery phase identified miR-21, miR-142-3p, miR-301a-3p, miR-155 and miR-192 as upregulated (2-30-fold) and miR-194 as downregulated (14-50-fold) in RCC; miR-155 distinguished small tumors (< 4 cm) from benign oncocytomas. 142-5p and combined biomarkers (miR-21+194, miR-21+142-5p+194) were significant and independent predictors of metastasis and disease-specific mortality; miR-21+142-5p+194 marker: P=0.0005; RR: 2.76; 92.8% sensitivity; 85% specificity. In the TCGA dataset, the combined biomarkers were associated with metastasis and were independent predictor of overall survival (miR-21+194: P=0.0057; RR: 2.54). The main limitation of our study was retrospective specimen cohort, nevertheless, the signature was validated in the TCGA dataset.

Conclusion: This study used multiple validation approaches to identify aberrantly expressed miRs in RCC. Based on miR profiling, PCR confirmation and TCGA dataset validation, our study identified a signature of three miRs that show consistent aberrant expression in RCC and is potentially clinically significant in predicting disease outcome.
**Poster Session I – Full Abstracts**

**Poster #33**

**GERMLINE MUTATIONS OF RENAL TUMOR PREDISPOSITION GENES IN EARLY-ONSET PATIENTS**

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Presented By: Junlong Wu, MD

**Introduction:** Inherited susceptibility to renal tumors has been associated with an array of RCC predisposing genes, but most screening has been limited patients with a strong family history of RCC. Next generation sequencing (NGS) - based multi-gene panel analysis provides an economic, efficient, and adaptable tool for investigating the frequency of germline pathogenic mutation on a wider scale. This study investigated the frequency of germline pathogenic mutations of renal tumor predisposition genes in sporadic, early-onset RCC.

**Methods:** An NGS-based array for 23 known and potential RCC predisposition genes was used to perform germline mutation analysis on 190 unrelated Chinese patients who presented with renal tumors at under 45 years old. Variants detected were filtered for pathogenicity and frequencies were calculated and correlated with clinical features.

**Results:** Eighteen of 190 patients (9.5%) had germline pathogenic mutations in 10 out of 23 selected RCC predisposition genes. Twelve patients had alterations in known RCC predisposition genes (6.3%), including 3 germline BAP1 mutations. While, 6 patients had mutations in potential RCC predisposition genes, such as BRCA1/2. Carrier status was significantly associated with second-degree relative tumor history (p< 0.001) only. Several germline variants of unknown clinical significance in FH and BAP1 demonstrated evidence of additional somatic loss in tumors consistent with pathogenic mutations.

**Conclusion:** In early-onset patients, multi-gene panel testing identified pathogenic germline mutations in known and potential RCC predisposition genes. This emphasizes the importance of screening these early-onset patients, irrelevant of family history, and provides valuable epidemiological information. Germline mutation screening for RCC susceptibility represents an achievable aspect of personalized medicine that can improve patient outcomes.
Poster #34
PATHOLOGIC DOWNSTAGING FOLLOWING NEOADJUVANT CHEMOTHERAPY IN PATIENTS WITH HIGH-RISK UPPER TRACT UROTHELIAL CARCINOMA
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Presented By: Ross Shane Liao

Introduction: High-risk upper tract urothelial carcinoma (UTUC) has been associated with poor survival outcomes. Limited retrospective data supports the use of neoadjuvant chemotherapy prior to radical nephroureterectomy. In this study, we evaluated the incidence of pathologic downstaging in patients with high-risk UTUC who underwent neoadjuvant chemotherapy followed by extirpative surgery to validate prior findings.

Methods: We performed a retrospective analysis of 240 patients at The Johns Hopkins Hospital with biopsy-proven, high-risk UTUC. The study group was comprised of patients who underwent neoadjuvant chemotherapy prior to RNU from 2003 to 2017. The control group was comprised of a time-matched cohort of patients who underwent initial surgery without neoadjuvant chemotherapy. Chi square and Fisher exact tests were used to evaluate clinical and pathologic variables between the two cohorts.

Results: There were 32 patients in the study group and 208 patients in the control group. Baseline demographic data was similar between both cohorts. There was significant pathologic downstaging in the study group compared to the control group (P<0.001). The incidence of patients with pT2 disease or higher was significantly reduced in patients treated with neoadjuvant chemotherapy (59.6% vs. 37.5%; P=0.022). There was also a 54.5% reduction in the incidence of pT3 disease or higher in patients without clinically-node positive or low-volume metastatic disease (p=0.01). A 9.4% complete remission rate was observed in all patients undergoing neoadjuvant chemotherapy.

Conclusion: Neoadjuvant chemotherapy was associated with a significant rate of downstaging in a contemporary cohort of patients. While longer follow-up is needed for survival data to mature, this data suggests improved outcomes in patients with high-risk UTUC who undergo neoadjuvant chemotherapy followed by radical nephroureterectomy.
Poster #35
HIGH COMPETING RISKS MINIMIZE REAL-WORLD UTILITY OF ADJUVANT TARGETED THERAPY IN RENAL CELL CARCINOMA: A POPULATION-BASED ANALYSIS
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Presented By: Thenappan Chandrasekar, MD

Introduction: Targeted therapy (TT) for renal cell carcinoma (RCC) is well established in the setting of metastatic RCC. Randomized controlled trials (RCTs) evaluating its role in the adjuvant setting for locoregional RCC have been inconclusive. Herein, we utilize a population-based approach to address the role of adjuvant TT in the management of RCC.

Methods: All patients with RCC from 2006 to 2013 in the SEER database were stratified by metastatic disease at the time of diagnosis (cM0 / cM1). cM0 patients following surgical excision were stratified into low and high-risk (ASSURE and S-TRAC criteria). Multivariable analyses were performed to identify predictors of TT receipt; Fine and Gray competing risks analyses were used to identify predictors of cancer-specific mortality (CSM). Subset analyses included patients with clear cell histology and high-risk cM0. Survival analyses were used to evaluate overall survival (OS) and cancer-specific survival (CSS) for all cohorts, stratified on TT receipt.

Results: Based on above criteria, 79,926 patients included (71,682 cM0, 8,244 cM1); median follow-up for the entire cohort was 40.1 months. Of 31,453 patients with histologic grade data, 18,328 and 13,125 were low- and high-risk cM0, respectively. TT utilization in cM1 patients peaked at 50.6% and was associated with reduced CSM (HR 0.73, p<0.01). In contrast, TT utilization (presumed salvage therapy) never exceeded 2.2% in the entire cM0 cohort and 3.5% in the high-risk cM0 cohort. On competing risks analysis, TT receipt was associated with increased CSM in all cohorts, including subset analyses. Kaplan-Meier survival analyses demonstrate that other-cause mortality exceeds cancer-specific mortality in the cM0 population.

Conclusion: When compared to the cM1 patients, TT receipt in cM0 patients does not provide any cancer-specific survival benefit, even in the small percentage of patients that eventually progress to metastatic disease. Competing risks mortality further limit any potential benefit in this population. Based on current evidence, adjuvant TT cannot be recommended for patients with RCC.
Poster #36
UTILITY OF LYMPH NODE DISSECTION FOR CLINICAL NODE NEGATIVE UPPER TRACT UROTHELIAL CELL CARCINOMA: A MULTICENTER STUDY
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Presented By: Zachary A. Hamilton, MD

Introduction: Upper tract urothelial cell carcinoma (UTUC) is an uncommon malignancy with disparate outcomes. Although use of lymph node dissection (LND) for urothelial cell carcinoma of the bladder has survival benefit even in setting of negative nodal status, therapeutic benefit of LND in the setting of clinical node negative disease for UTUC is unclear. We evaluated survival outcomes for UTUC after LND.

Methods: Multicenter retrospective analysis of UTUC patients undergoing nephroureterectomy (NU) for clinical node negative, non-metastatic disease from 2001-2016 (cTis/1-T3N0M0). The cohort was divided based on pathologic lymph node status (pNx, pN0, and pN+). Primary outcome was overall survival (OS). Secondary outcome was recurrence free survival (RFS). Cox regression (CR), logistic regression (LR) and Kaplan−Meier (KMA) analyses were utilized.

Results: 191 patients were analyzed (mean age 71.1 years, mean follow up 30.4 months, 27% ureteral location). LND was performed in 40.8% (78) and pN+ was noted in 11.0% (21). Mean number of nodes removed for pN0=6.6 and pN+= 3.9 (p=0.22). On CR for worsened all-cause mortality, significance was noted for ≥pT2 (OR 1.9, p=0.031), recurrence (OR 2.3, p=0.003), and pN+ (OR 2.8, p=0.004). On KMA, 5 year OS stratified by pathologic node status and nuclear grade (grade 1-2=LG; grade 3-4=HG) noted negative survival effect associated with pN+ and HG disease (pN0 LG 85.7%, pN0 HG 41.2%, pNx LG 58.1%, pNx HG 51.1%, pN+ HG 10.7%, log-rank p<0.001). No patient with pN+ had LG disease. On LR HG disease was predicted only by increasing clinical tumor size (OR 1.3, p=0.032). No significant difference in complications was noted between the groups (p=0.1)

Conclusion: In clinical node negative disease, LND for UTUC did not have survival benefit; however, LND for UTUC provided prognostic information without significantly increasing risk of complications. Finding of pN+ disease was associated with worsened prognosis. LND may be omitted in LG disease yet considered in patients with clinical HG disease and increasing tumor size. Further investigation is requisite.
Poster #37
DIVIDING PATHOLOGICALLY UPSTAGED T3A RENAL CELL CARCINOMA IS ASSOCIATED WITH IMPROVED ALIGNMENT OF OUTCOMES: A CALL FOR TMN REVISION
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Presented By: Zachary A. Hamilton, MD

Introduction: Incidental pathological upstaging to pT3a disease can occur after surgical treatment of clinical T1 and T2 Renal Cell Carcinoma (RCC), and upstaged pT3a disease is associated with worsened outcomes. Oncologic and survival outcomes within the pT3a category are heterogeneous. We investigated recurrence and survival outcomes in pT3a disease, and aimed to better categorize this cohort for improvement on current TMN staging.

Methods: Multi-center retrospective analysis of patients with renal cell carcinoma (cT1-cT3aN0M0) from 1987-2016. After initial comparison of outcomes between pT1, pT2 and pT3a, patients were sub-stratified within the pT3a category based on presenting clinical stage. Comparison was drawn between pT1, pT2 and the subdivided pT3a group (cT1 -> pT3a, cT2 -> pT3a, and cT3a -> pT3a). Primary outcome was recurrence free survival (RFS). Secondary outcome was overall survival (OS). Kaplan-Meier (KM) analysis was utilized.

Results: 2640 patients were analyzed (2125 cT1, 448 cT2, 67 cT3a, mean follow up 67.8 months). Rate of incidental T3a upstaging from cT1-2 was 14.7%. Compared to pT1-2 disease, patients with incidental pT3a upstaging had higher rate of recurrence (7.5% vs. 29.6%, p<0.001) and all-cause mortality at last follow up (15.9% vs. 25.4%, p<0.001). With regards to RFS, when pT3a was subdivided based on presenting clinical stage, significant differences in RFS emerged which aligned differently. Compared to 5 year RFS of pT1 (94.4%), cT1 -> pT3a aligned with pT2 (76.6% and 81.2%, p=0.346) while cT2 -> pT3a aligned with cT3a -> pT3a 47.4% and 44.0%, p=0.815). With regards to OS, a similar alignment was noted for 5 year OS after subdivision, where pT1 was 89.9%, while cT1 -> pT3a correlated with pT2 (79.8% and 83.1%, p=0.640) and cT2 -> pT3a correlated with cT3a -> pT3a 67.0% and 64.2%; p=0.893). (figure)

Conclusion: Patients with cT1 -> pT3a have outcomes more similar to pT2, than patients with cT2 -> pT3a which align more closely to cT3a -> pT3a. Future refinements of the TNM staging system for RCC should consider re-grouping cT1 -> pT3a into the pT2 group. Further confirmation is requisite.
Poster #38
THE PROGNOSTIC VALUE OF NEUTROPHIL-LYMPHOCYTE RATIO FOR METASTATIC RENAL CELL CARCINOMA WITH VENOUS TUMOR THROMBUS PATIENTS UNDERGOING CYTOREDUCTIVE NEPHRECTOMY
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Presented By: Charles Peyton, MD

Introduction: The neutrophil-lymphocyte ratio (NLR) is an established biologic signature of inflammation and poor oncologic outcomes. However, the limits of this marker for advanced pathology are infrequently examined. We sought to evaluate the utility of NLR in patients undergoing cytoreductive nephrectomy (CN) for metastatic renal cell carcinoma with venous tumor thrombus (mRCCt).

Methods: Perioperative prognostic data was collected for mRCCt patients undergoing cytoreductive nephrectomy between 2000 – 2014 from four different institutions. Patients were stratified for NLR ≤ 4. The association of NLR, perioperative variables, and mRCC risk models were assessed with standard contingency tables. Cox proportional hazard models and Kaplan-Meier curves were used to compare total and subset overall survival based on MSKCC mRCC risk groups.

Results: A total of 293 mRCCt patients who underwent CN were identified, of which 230 patients had preoperative NLR measurements. Patients with NLR ≤ 4 had longer median survival vs those with NLR > 4 (24 vs. 14 months, p= 0.018) and HR = 1.36 (95% CI 1.01 – 1.83, p = 0.041), Figure 1A. Contingency table analysis revealed NLR > 4 was associated with preoperative albumin ≤ 4.0 g/dL (p = 0.02), the presence of local symptoms (p = 0.02), higher thrombus level (p = 0.003) and higher Fuhrman nuclear grade (p = 0.04). Subgroup analysis of MSKCC intermediate risk mRCCt patients (n = 115) revealed an improved median survival for patients with NLR ≤ 4 vs. NLR > 4 (24 months vs. 12 months, p = 0.044), Figure 1B. This held true for Cox regression analysis (HR = 1.55, 95% CI 1.01 – 2.39, p = 0.046). MSKCC favorable risk (n = 45) and poor risk (n = 70) groups had similar survival for NLR ≤ 4 and NLR > 4 sub-stratification (median survival, favorable: 25 vs. 19 months, HR 1.16, 95% CI 0.58 – 2.31, p = 0.67 and poor: 15 vs. 8 months, HR 1.41, 95% CI 0.84 – 2.41, p = 0.21).

Conclusion: Preoperative elevated NLR can be used to distinguish overall survival patterns for patients with mRCC and tumor thrombus. MSKCC intermediate risk mRCCt patients can be further risk stratified using NLR, which can be considered when selecting patients for cytoreductive nephrectomy.

Figure 1: Overall survival stratified by NLR ≤ 4 (A) and MSKCC intermediate risk group sub-stratification by NLR ≤ 4 (B).
Poster #39
CONDITIONAL SURVIVAL AND LANDMARK ANALYSIS FOR PATIENTS WITH SMALL RENAL CELL CARCINOMA UNDERGOING ACTIVE SURVEILLANCE AT A TERTIARY CARE CENTER
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Presented By: Firas G. Petros, MD

Introduction: Conditional survival can provide guidance for patients once they have survived a period of time after diagnosis of their disease. We determine conditional survival for patients with small renal cell carcinoma (RCC) undergoing active surveillance (AS).

Methods: Patients were enrolled in a prospective AS registry at our institution between May 2005 and January 2016. Patients with localized biopsy-proven small RCC ≤4cm were included, with serial radiologic imaging available in-house for re-review. Overall survival (OS) was estimated using the Kaplan-Meier method and modeled via Cox proportional hazards models. The primary end points analyzed were the conditional probability of survival and tumor growth over time. Landmark analysis was used to evaluate survival outcomes beyond the 2-year mark after the initial scan.

Results: A total of 272 patients were included in this analysis. Mean initial tumor size was 1.74 ± 0.77 cm and mean tumor size closest to the 2-year mark was 1.97 ± 0.83 cm. The likelihood of continued survival to 5 years improved after the 2-year landmark was reached. Patients with tumors <3cm who survived the first 2-years on AS had a 0.84-0.85 chance of surviving to 5 years, and if they survived 3 years, the probability of surviving to 5 years improved to 0.91. Multivariable Cox proportional hazards analysis of survival revealed eGFR, Charlson comorbidity index (CCI), and tumor size of 3-4cm were significantly predictive of OS both at baseline and at 2-year mark (all p < 0.05). For both of these analyses, patients with a tumor size 3-4 cm were at a greater risk of non-RCC death (HR >3.5; p ≤ 0.001). A linear mixed effects model revealed slow tumor growth (beta: 0.12; p < 0.001) for tumors <3cm. Adjusted tumor size predictions disclosed parallel growth rates for small RCC of <2cm and 2-2.99cm with insignificant difference in growth rates (p = 0.969).

Conclusion: Our study provides insight into the survival of patients with small RCC on AS who have already survived a certain period of time. The conditional survival probability of patients with small RCC <3cm on AS improved after the initial 2 years, suggesting a role for re-counseling for those who survive to the 2-year landmark. Patient factors (renal function and CCI) were significantly associated with survival at baseline and at the 2-year landmark.
Poster #40
SIZE FOCALITY INVASION IN UPPER TRACT UROTHELIAL CARCINOMA (SFI-UTUC), A NOVEL IMAGING-BASED MORPHOMETRIC SCORING SYSTEM TO PREDICT SURVIVAL OUTCOMES IN UTUC

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Presented By: Zachary A. Hamilton, MD

Introduction: Upper tract urothelial cell carcinoma (UTUC) is an uncommon urologic malignancy with disparate outcomes. We sought to develop a novel morphometric scoring system for prediction of oncologic and survival outcomes before nephroureterectomy (NU).

Methods: Retrospective, multicenter analysis of patients with UTUC who underwent NU after negative metastatic workup. Preoperative CT was used to evaluate a novel image-based morphometric score for outcomes. We termed our system SFI-UTUC, based on 3 factors (tumor Size, Focality, Invasion of architecture) with a score of 1-3 based on degree of each factor (total score 3-9), and was applied to renal and ureteral tumors (Table). Primary outcome was overall survival (OS). Secondary outcomes were recurrence free survival (RFS). Multivariable (MVA) and Kaplan-Meier (KMA) analyses were utilized.

Results: We analyzed 244 patients (mean age 70.9, mean follow up 29.5 months). 61% of patients had SFI-UTUC score 3-6 and 39% were score 7-9, and the cohort was split into these groups for analysis. No difference in age, gender, BMI, or comorbidities was noted between groups. No difference in surgical approach, estimated blood loss, or complications was noted. SFI-UTUC score 7-9 had a higher rate of lymph node dissection (55.8% vs. 37.6%, p=0.006) and pN+ disease (24.2% vs. 8.1%, p=0.002) No difference in rate of high grade disease was noted (75.8% vs. 84.2%, p=0.41). All-cause mortality was higher for SFI-UTUC 7-9 (47.4% vs. 28.9%, p=0.004). On MVA for recurrence, significance was noted for high nuclear grade (OR 3.7, p=0.043) and pT2+ (OR 3.6, p=0.001). On MVA for all-cause mortality, age (OR 1.1, p=0.001), recurrence (OR 4.4, p<0.001) and SFI-UTUC 7-9 (OR 2.0, p=0.022) were significant. KMA for OS demonstrated 5 year OS of 57.0% for SFI-UTUC 3-6 and 34.1% for SFI-UTUC 7-9 (p=0.001, figure). KMA for RFS was significant for renal UTUC location with 5 year RFS of 72.3% for SFI-UTUC 3-6 and 54.2% for SFI-UTUC 7-9, p=0.006, figure).

Conclusion: A novel morphometric scoring system for UTUC preoperative imaging may predict OS, as well as RFS for renal UTUC locations.
Introduction: Limited data exists on the role of metastasectomy in the cytoreductive nephrectomy (CN) setting for primary metastatic renal cell carcinoma (mRCC), especially in the targeted therapy era. We sought to evaluate if there is a survival benefit of metastasectomy in patients treated with CN.

Methods: We used the National Cancer Database (2010-2013) to identify patients with RCC who had metastasis (lung, liver, brain, and bone) at diagnosis. Patients with multiple organ involvements were excluded. Interventions of interest were CN with metastasectomy and CN without metastasectomy. Multivariable Cox regression adjusted for patient (age, sex, race, comorbidity, insurance, education, income, and residence location), tumor (grade, pathology, pT, pN, and metastasis location), facility (type and location), and treatment (surgical approach for CN, targeted therapy, and radiation) characteristics were used to compare overall survival (OS) between the two groups.

Results: Among the 2,395 included patients who underwent CN, 352 (14.7%) had metastasectomy. Patients were younger in the metastasectomy group (60.5 y vs. 61.0 y, P=0.018). There was no significant difference in Charlson/Deyo comorbidity score between the two groups. Kaplan-Meier curve is shown in the Figure. The median OS of metastasectomy versus non-metastasectomy patients was 37.5 months (95%CI=30.9-44.2 months) versus 20.8 months (95%CI=18.9-22.8 months; log-rank P<0.001). Multivariable Cox regression showed that metastasectomy was associated with improved OS (HR=0.65, 95%CI=0.55-0.76, P<0.001) in the overall cohort (n=2,395). Fewer patients in the metastasectomy group received targeted therapy (44.0% vs. 56.1%, P<0.001). Subgroup analyses showed consistently improved OS of metastasectomy in patients who received targeted therapy (n=1,302, HR=0.71, 95%CI=0.56-0.91, P=0.006) and those who did not (n=1,093, HR=0.60, 95%CI=0.47-0.76, P<0.001).

Conclusion: When feasible, metastasectomy may offer an OS benefit when combined with CN. However, current study should be interpreted with potential selection bias and future prospective studies are needed to validate our findings.
Poster #42
LONG TERM OUTCOMES OF PATIENTS WITH CYSTIC CLEAR CELL RENAL CELL CARCINOMA
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Presented By: Mary Elizabeth Westerman, MD

Introduction: Cystic clear cell renal cell carcinoma (ccRCC), defined as multilocular cystic renal neoplasms of low malignant potential or ccRCC with cystic change, comprises less than 5% of renal cortical neoplasms and has been associated with a favorable prognosis in small retrospective studies. Because studies are limited due to the rarity of this variant, we reviewed our experience with ccRCC and report on long term oncologic outcomes of cystic ccRCC.

Methods: We identified 3,865 patients treated with radical or partial nephrectomy for unilateral, sporadic ccRCC between 1970 and 2010. One urologic pathologist re-reviewed all pathologic slides, blinded to patient outcome. Cancer-specific survival (CSS) was estimated using the Kaplan-Meier method and compared between those with and without cystic ccRCC using log-rank tests.

Results: Overall, 158 of 3,865 (4%) patients had cystic ccRCC. Compared to patients with non-cystic ccRCC, patients with cystic ccRCC were younger (median 58 vs. 63 years, p<0.001), were more likely to have radiographic evidence of cystic structures (60% vs. 17%, p<0.001), were less likely to have distant metastases at surgery (0% vs. 14%, p<0.001), and had smaller tumors (median 3.0 vs. 6.0cm, p<0.001) that were less likely to contain coagulative tumor necrosis (1% vs. 29%, p<0.001) or sarcomatoid differentiation (0% vs. 5%, p=0.006). With a median follow-up for survivors of 10.5 years (IQR 7.3-14.9), 63 patients with cystic ccRCC died at a median of 7.7 years after surgery (IQR 3.8-11.9). However, only one patient died from RCC after developing metastases 22 years after the initial surgery. CSS rates at 25 years following surgery were significantly better for cystic ccRCC compared to non-cystic ccRCC (88% vs. 52%, p<0.001) (Figure 1), even among the subset of pT1, pNX/0, M0 patients (100% vs. 83%, p=0.001).

Conclusion: In a large cohort of ccRCC patients with pathologic re-review and long-term follow-up, our results suggest that cystic ccRCC is both uncommon and associated with a very favorable prognosis.

Funding: None
Introduction: Robot-assisted partial nephrectomy (RAPN) has been increasingly utilized for the management of renal cell carcinomas. There is still limited data on the impact of hospital volume on outcomes of RAPN in the literature.

Methods: Patients who underwent RAPN between 2010 and 2013 were identified in the National Cancer Database. Hospital volume (cases/year) was defined as the number of RAPNs captured in each individual year. Five categories of hospital volume were defined by most closely sorting patients into five groups of equal size: very low, low, medium, high, and very high. Outcomes included 30-day mortality, 90-day mortality, (open) conversion, prolonged length of stay (PLOS, ≥4 days), 30-day readmission, and positive surgical margin (PSM). Unadjusted analyses and multivariable logistic regressions adjusted for patient/tumor characteristics and diagnosis year were used to compare the outcomes. We performed sensitivity analyses with hospital volume considered as a continuous variable.

Results: A total of 18,724 RAPNs were included. Hospital volume cut-offs and unadjusted outcome distributions by hospital volume are shown in the Figure. There was no significant difference in 30-day or 90-day mortality between the five groups. Multivariable logistic regressions (references: very low volume) showed that higher hospital volume was associated with lower odds of conversion (medium [OR=0.60, P=0.001]; high [OR=0.57, P<0.001]; very high [OR=0.47, P<0.001]), PLOS (medium [OR=0.75, P<0.001]; high [OR=0.62, P<0.001]; very high [OR=0.45, P<0.001]), and PSM (low [OR=0.76, P<0.001]; medium [OR=0.76, P<0.001]; high [OR=0.59, P<0.001]; very high [OR=0.34, P<0.001]). Sensitivity analyses confirmed that increasing hospital volume (per case) was associated with lower odds of conversion (OR=0.986, P<0.001), PLOS (OR=0.989, P<0.001), and PSM (OR=0.984, P<0.001). Difference in 30-day readmission was found on unadjusted analysis but not adjusted analyses.

Conclusion: Undergoing RAPN at higher volume hospitals may have better perioperative outcomes (conversion and LOS) and lower PSM rate. Future studies are needed to explore the detailed components that lead to the superior outcomes in higher volume hospitals.
Poster #44
ANDROGEN RECEPTOR EXPRESSION IN RENAL CELL CARCINOMA: IMPLICATIONS FOR PROGNOSIS
Juan Chipollini, MD; Charles Peyton MD, Leah Cook, PhD; Jasreman Dillon, MD; Jeanette Rheinhardt; Zena Sayegh; Connor Lynch, PhD and Phillippe Spiess, MD
Moffitt Cancer Center, Tampa, FL
Presented By: Juan J. Chipollini, MD

Introduction: Androgen receptor (AR) is known to be present in the proximal and distal tubules of the kidney. However, its role in Renal Cell Carcinoma (RCC) remains unclear. In this study, we evaluate the presence of AR expression in archival clear-cell and non-clear cell RCCs specimens and assess its prognostic role in overall (OS) and cancer specific survival (CSS).

Methods: Formalin-fixed paraffin-embedded tumors from 66 patients treated with extirpative surgery at our institution were stained with anti-AR rabbit monoclonal primary antibody (Ventana SP107). Histologies included 21 clear cell, 9 sarcomatoid, 6 rhabdoid, 2 medullary, 2 translocation Xp11.2, 1 collecting duct, and 25 papillary RCCs. Staining of ≥ 1% was considered positive. Survival outcomes were evaluated using the Kaplan Meier method. Logistic regression and Cox proportional hazard was used to assess prognostic associations.

Results: Median age was 60 years old and median follow-up was 40 months. In total, 56.1% of tumors expressed AR: 66.7% in clear cell and 44.2% in non-clear histologies. Five-year CSS was 89.5 and 70.6% for AR positive and negative tumors (log-rank p=0.072), while 5-year OS was 86.3 and 70.6%, respectively (log-rank p=0.040) (Figure 1). AR expression was significantly associated with lower stage on univariate and multivariate analysis (OR=0.10, 0.03-0.38; p<0.001), while trending for improved OS (HR=0.35, 0.12-0.99; p=0.050) and CSS (HR=0.35, 0.11-1.15; p=0.084) on univariate analysis.

Conclusion: AR appears to be a marker of indolent disease in RCC. Inhibition of hormonal signaling may be putative in treatment therapies against this cancer type. Larger, prospective studies are needed to validate these results.
Poster #45
A DESCRIPTIVE ANALYSIS OF PD-1 AND PD-L1 EXPRESSION IN RARE KIDNEY CANCERS: IS IT TIME TO EXPAND TREATMENT PARADIGMS?
Juan Chipollini, MD; Charles Peyton, MD; Jasreman Dhillon, MD; Jeanette Rheinhardt; Zena Sayegh and Phillipe Spiess, MD
Moffitt Cancer Center, Tampa, FL
Presented By: Juan J. Chipollini, MD

Introduction: Immune checkpoint inhibitors have substantially changed treatment of advanced clear cell renal cell carcinoma (RCC). Unfortunately, patients with non-clear cell histologies are often excluded from clinical trials, thus limiting evidence-based recommendations. This study evaluates program death-1 (PD-1) and PD-1 ligand (PD-L1) expression in a cohort of patients with papillary and rare, aggressive RCC variants.

Methods: Formalin-fixed paraffin-embedded specimens from 45 non-clear cell RCCs were microarrayed and immunostained for PD-1 and PD-L1 using monoclonal mouse (NAT105) and rabbit (E1L3N) antibodies, respectively. These were compared to 21 pure clear cell RCCs. Staining of ≥ 1% for tumor-infiltrating lymphocytes or tumor cells was considered positive. Primary outcome was cancer-specific survival (CSS) and evaluated using the Kaplan-Meier method.

Results: Median age was 60 years old and median follow-up was 40 months. Non-clear histologies included 9 sarcomatoid, 6 rhabdoid, 2 medullary, 2 translocation Xp11.2, 1 collecting duct, 11 papillary type I and 14 papillary type II RCCs. PD-1 and PD-L1 expression was seen in 20% of non-clear cell tumors vs. 14.3 and 4.8% in clear cell, respectively. In the non-clear cell group, PD-1 and PD-L1 positive patients had 5-year CSS of 100 and 57%, respectively versus those with no expression (73.2 and 83%, respectively).

Conclusion: PD-L1 and PD-1 expression is regularly expressed in non-clear cell and aggressive variant RCCs. PD-1 positivity of tumor-infiltrating lymphocytes was associated with better survival while PD-L1 positivity of tumor cells was associated with unfavorable survival for these patients.
**INTRODUCTION:** Surgery for metastatic renal cell carcinoma (mRCC) with tumor thrombus is complex and pre-surgical targeted therapy may be used in patients who appear to have a limited life expectancy. The purpose of this study was to compare survival of patients with mRCC and thrombus treated with pre-surgical therapy prior to CN with those treated with upfront nephrectomy.

**METHODS:** Comprehensive data was reviewed for 486 mRCC patients with tumor thrombus treated surgically from 2000 to 2015 at five centers. Patients were divided into two groups: pre-surgical therapy and upfront nephrectomy. Differences in clinicopathological parameters and thrombus levels were compared using Fisher exact and multicontingency chi square tests. Patients were stratified using IMDC criteria into risk groups and overall survival (OS) compared using the Kaplan Meier method.

**RESULTS:** There were 39 patients in the presurgical therapy group (pre-surgical +CN; N=39; 8.0%); and 447 patients in the upfront cytoreductive nephrectomy group (upfront CN; n=447; 92%). Thrombus level (Neves) was 0, 1, 2, 3, and 4 in 131(29.3%), 59(13.1%), 154(34.4%), 61(13.6%) and 42 (9.4%) in upfront nephrectomy group and 13 (13.3%), 10 (25.6%), 9 (23.1%), 5 (12.8%) and 2 (5.1%) in pre-surgical therapy group. After risk stratification, 26/39 (66.6%) pre-surgical therapy and 209/387 (54.0%) upfront nephrectomy patients were IMDC intermediate risk. Median OS (IQR) was not different for pre-surgical therapy; 26.2(13.1-na) months vs upfront nephrectomy; 24.6(9.9-50.1) months for IMDC intermediate risk patients, (p=0.36). A total of 13/39 (33%) pre-surgical therapy and 178/387(45%) upfront nephrectomy patients were IMDC poor risk. Median OS (IQR) was not different for pre-surgical therapy group; 38.1 months (10.1-49.4) vs. upfront nephrectomy group; 13.4 months (5.1-33.8) for IMDC poor risk patients, (p=0.28).

**CONCLUSION:** No difference was identified in OS for patients who received pre-surgical targeted therapy prior to CN compared to upfront CN. Future studies should evaluate the optimal patient selection for pre-surgical therapy in mRCC patients with thrombus.

**Funding:** None
**Poster #47**

**ACCURACY OF CLINICAL NODAL STAGING IN PATIENTS UNDERGOING SURGERY FOR RENAL CELL CARCINOMA**

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Presented By: Kushan D. Radadia, MD

**Introduction:** The value of lymph node dissection (LND) in renal cell carcinoma (RCC) remains undefined. Despite this uncertainty, the American Urological Association (AUA) guideline on localized renal cancer recommends that LND be performed for staging purposes when there is suspicion of regional lymphadenopathy on imaging. Using the National Cancer Database (NCDB), a hospital registry database, we sought to examine the relationship between clinical lymph node (cLN) and pathologic lymph node (pLN) status.

**Methods:** The NCDB was queried for non-metastatic patients who underwent partial nephrectomy or nephrectomy for RCC from 2010 to 2014. Patient demographic and hospital characteristics were extracted. Frequency distributions were calculated for patients with cLN and pLN status information available. Positive predictive value (PPV) and negative predictive value (NPV) of cLN for pLN positivity were calculated.

**Results:** We identified 110,963 patients who underwent surgery for RCC, of whom 9,199 had LND coded at the time of surgery. cLN and pLN information were available in 8,723 patients, of which 1,311 were preoperatively staged as having positive cLN. A total of 1,485 patients were ultimately found to have positive pLN after LND. The sensitivity and specificity of preoperative imaging to detect positive pLN was 66% and 95%, respectively. Among all cLN negative patients, the NPV of LND was 96%. Among all cLN positive patients, the PPV of LND for was 75%. All cLN positive patients were then analyzed by T stage and PPV was calculated for tumor stages 1-4 as shown in Table 1.

**Conclusion:** In our study sample, preoperative imaging is more specific for determining negative pLN status. Patients who are cLN negative are highly likely to be pLN negative (96%), while patients who are cLN positive have a 75% likelihood of being pLN positive. Although multiple factors influence node positivity rates, these findings from the NCDB offer a useful point of reference for future prospective studies investigating the utility of clinical staging for LND in RCC.

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**Table 1: PPV of LND in cLN Positive Patients by Clinical T Stage**

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<tr>
<th>T Stage</th>
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<th>PPV (%)</th>
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<tr>
<td>1</td>
<td>268</td>
<td>75</td>
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<tr>
<td>2</td>
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Poster #48
RETROPERITONEAL VERSUS TRANSPERITONEAL ROBOTIC-ASSISTED LAPAROSCOPIC PARTIAL NEPHRECTOMY: A MATCHED-PAIR, BI-CENTER ANALYSIS WITH COST COMPARISON USING TIME-DRIVEN ACTIVITY-BASED COSTING
Aaron Laviana, MD¹; Hung-Jui Tan, MD²; Daniel Barocas, MD, MPH³; Sam Chang, MD, MBA³; Alon Weizer, MD, MS⁴ and Jim Hu, MD, MPH⁵
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Presented By: Aaron A. Laviana, MD

Introduction: To perform a bi-center, retrospective study of perioperative outcomes of retroperitoneal versus transperitoneal robotic-assisted laparoscopic partial nephrectomy (RALPN) and assess costs using time-driven activity-based costing (TDABC).

Methods: We identified 355 consecutive patients who underwent RALPN at UCLA and the University of Michigan during 2009-16. We matched according to RENAL nephrometry score, date, and institution for 78 retroperitoneal versus 78 transperitoneal RALPN. Unadjusted analyses were performed using McNemar’s chi-squared or paired-t test, and adjusted analyses were performed using multivariable repeated measures regression analysis. From multivariable models, predicted probabilities were derived according to approach. Cost analysis was performed using TDABC.

Results: Subjects treated with retroperitoneal versus transperitoneal RALPN were similar in age (p=0.490), gender (p=0.715), BMI (p=0.273), and comorbidity (p=0.393). Most tumors were posterior or lateral in both the retroperitoneal (92.3%) and transperitoneal (85.9%) groups. Retroperitoneal RALPN was associated with shorter operative times (167.0 versus 191.1 minutes, p=0.001) and length of stay (LOS) [1.8 versus 2.7 days, p<0.001]. There were no differences in renal function preservation or cancer control. In adjusted analyses, retroperitoneal RALPN was 17.6-minutes shorter (p<0.001) and had a 76% lower probability of LOS ≥ 2 days (p<0.001). Utilizing TDABC, transperitoneal RALPN added $2337 in cost when factoring in disposable equipment, operative time, LOS, and personnel.

Conclusion: In two high-volume, tertiary centers, retroperitoneal RALPN is associated with reduced operative times and shortened LOS in posterior and lateral tumors, while sharing similar clinicopathologic outcomes, which may translate into lower healthcare costs. Further investigation into anterior tumors is needed.
Poster #49
LONG-TERM ACTIVE SURVEILLANCE OF CYSTIC RENAL MASSES & HETEROGENEITY OF BOSNIAK 3 LESIONS
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Presented By: Deepak Kumar Pruthi, MD, FRCSC

Introduction: To better characterize the frequency of Bosniak cyst class changes and identify predictors. To determine the average growth rate of cysts and validate the safety of active surveillance.

Methods: Consecutive patients referred for management of complex cysts (≥ Bosniak 2f) at a single institution between January 1, 2003 – Aug 31, 2014 were included. Patients required at least 6 months of diagnostic imaging follow-up until the patient was discharged, deceased, underwent surgery, or was lost to follow-up. Patients were excluded if they had greater than 2 complex cysts, immediately underwent surgery, or had pre-existing renal disorders. All imaging studies (CT, MRI, ultrasound) were re-evaluated and any stage change was reviewed with a blinded radiologist. Bosniak class and cyst size were only obtained from the CT or MRI. The Bosniak classification was sub-refined by separating septated enhancing Bosniak cysts (3s) and Bosniak 3 cysts with cyst wall only nodularity (3n). Multivariate (MV) logistic regression was performed to identify predictors Bosniak classification change. Kaplan-Meier (KM) curves were used to analyze Bosniak cyst progression or regression.

Results: A total 1640 images were reviewed in the 140 patients. After exclusion there were 140 lesions identified in 106 patients. Of the remaining 1011 images there were 464 CT scans and 408 MRIs. Median follow-up for all patients was 46 months [IQR 23, 65.5] and patients underwent median number of 7 [IQR 4,9] diagnostic scans. On MV analysis progression was determined by cysts that were nodular (HR 6.16 [2.58,14.72], p<0.00004). Cysts that were entirely endophytic were less likely to progress HR 0.21 [0.05,0.85], p=0.028). On KM analysis Bosniak 3s cysts were more likely to regress (p=0.0178) while Bosniak 3n cysts were more likely to progress than 3s cysts (p=0.0002). The growth rate of 3n was 0.19cm/year (p=0.0493) and 2f cysts was 0.11cm/year (p=0.0327). There was no significant difference in growth rate between Bosniak 4 and non-Bosniak 4 lesions. No patients developed metastatic disease.

Conclusion: Classification of Bosniak 3 cysts into 3n and 3s better characterizes their clinical behavior. Diagnostic change among Bosniak 3s and 2f cysts is common; Bosniak 3n cysts behave more like Bosniak 4s. Most complex kidney cysts can be safely monitored without intervention, diagnostic change is frequent, and interval imaging between studies should be increased.
Poster #50
RADIOGENOMICS: A PROMISING TOOL FOR ASSESSING MALIGNANT POTENTIAL IN KIDNEY CANCER
Deepak Pruthi, MD, FRCSC¹; Rahul Rajendran, MSc²; Osamah Al-Bayati, MD³; Sos Agaian, PhD² and Micheal Liss, MD, MAS³
¹Department of Urology, University of Texas Health San Antonio, San Antonio, Texas, USA; ²University of Texas San Antonio, Department of Electrical and Computer Engineering;³University of Texas Health Science Center, Department of Urology

Presented By: Deepak Kumar Pruthi, MD, FRCSC

Introduction: Patients with small kidney masses are faced with the dilemma of pursuing biopsy, repeat surveillance imaging, or treatment. The development of software to assess the potential aggressiveness of a mass would be a useful aid in shared decision-making. We test the role of our "roughness score" on patients identified from the Cancer Genome Atlas (TCGA) in correlating with adverse micro-RNAs.

Methods: After obtaining IRB approval, we randomly selected thirty patients who underwent nephrectomy (10 clear cell, 10 papillary, and 10 chromophobe tumors). The images were reviewed independently by blinded engineers and with software (Domain Transform, Shape-adaptive edge enhancement, and Adaptive histogram equalization). Using our previously-developed algorithm, the “roughness” was based on the tumoral topographic features visualized on basic contrast-enhanced computed-tomography (CT) scans. The ten most common miRNAs were included for each tumor based on reads per million miRNA mapped. Pearson-correlation coefficients were used to assess relationships between reads per million miRNA mapped and voxel box counts. The R2 statistic was used to measure variance.

Results: After the exclusion of poor image-rendered images 19 patients remained. Among these 5 were clear cell renal cell carcinomas (RCC), 7 were papillary RCCs, and 7 were chromophobe RCCs. The mean age was 51, 74% were male, and 21% were African American. At a median follow-up of 3.9 years (interquartile range [IQR] 2.2, 5.4 years) there were 3 patient deaths. The mean roughness score for clear cell, papillary, and chromophobe RCCs were 1.12, 1.13, 1.15 units, respectively. Expression of microRNAs miR 10a (Pearson coefficient -0.619, p=0.005), miR 10b (Pearson coefficient -0.465, p=0.045), miR 100 (Pearson correlation -0.501, p=0.029) were inversely related to image roughness. Conversely, miR21 to miR 10b r, previously implicated as a poor prognostic biomarker, noted a positive correlation with image roughness (Pearson coefficient 0.547, p=0.015) and was able to discern RCC subtype (ANOVA F=13.5, p<0.001).

Conclusion: Using basic CT imaging software the tumoral topography can be quantified and correlated with histology and biological aggressiveness in small renal masses. Larger studies are necessary validate these findings.
Poster #51
A PHASE 3 TRIAL TO COMPARE EFFICACY AND SAFETY OF LENVATINIB IN COMBINATION WITH EVEROLIMUS OR PEMBROLIZUMAB VS SUNITINIB ALONE IN FIRST-LINE TREATMENT OF PATIENTS WITH METASTATIC RENAL CELL CARCINOMA

Robert J. Motzer, MD¹; Viktor Grünwald, MD²; Thomas E. Hutson, DO³; Camillo Porta, MD⁴; Thomas Powles, MD⁵; Masatoshi Eto, MD⁶; Corina E. Dutcus, MD⁷; Mahadi A. Baig, MD⁷; Lea Dutta, PharmD⁷; Di Li, PhD⁷ and Toni K. Choueiri, MD⁸

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Presented By: Robert J. Motzer, MD

Introduction: Lenvatinib (LEN) is a multikinase inhibitor of vascular endothelial growth factor (VEGF) receptor 1–3, fibroblast growth factor receptor 1–4, platelet-derived growth factor receptor alpha, and RET and KIT. Based on a phase 2 study (Motzer et al. Lancet Oncol. 2015), LEN was approved in combination with everolimus (EVE) for the treatment of metastatic renal cell carcinoma (RCC) following 1 prior VEGF-targeted therapy. A phase 1b/2 study of LEN in combination with pembrolizumab (PEM) in patients (pts) with RCC LEN is also underway. We report the design of a multicenter, open-label, phase 3 trial of LEN plus EVE or PEM vs sunitinib (SUN; a standard therapy for RCC) as first-line treatment for advanced RCC.

Methods: Pts aged ≥ 18 years with confirmed advanced RCC diagnosis, ≥ 1 measurable lesion per Response Evaluation Criteria in Solid Tumors (RECIST) v1.1, Karnofsky Performance Status ≥ 70, controlled blood pressure, and adequate blood coagulation, renal, hepatic, and bone marrow function are eligible. Pts will be randomized 1:1:1 to receive LEN 18 mg/d + EVE 5 mg/d, LEN 20 mg/d + PEM 200 mg every 3 weeks, or SUN 50 mg/d (on a schedule of 4 weeks on treatment followed by 2 weeks off) until disease progression, unacceptable toxicity, withdrawal of consent, or study end. The primary endpoint is to show superiority of LEN+EVE or LEN+PEM over single-agent SUN as first-line treatment for advanced RCC in improving progression-free survival (PFS). Secondary endpoints include comparison of objective response rate, overall survival, PFS on next-line therapy, health-related quality of life, and safety and tolerability in pts receiving LEN+EVE or LEN+PEM vs SUN. Exploratory endpoints include PFS in the LEN+PEM arm using immune-related RECIST, comparison of duration of response, disease control rate, and clinical benefit rate in pts treated with LEN+EVE or LEN+PEM vs SUN, and analysis of the relationship between blood biomarkers and outcome. No interim analysis is planned for efficacy or futility. Enrollment of 735 pts is planned to achieve 90% power at 2-sided α = 0.05 to detect a difference in ≥ 1 of the primary comparisons.

Funding: Eisai
Poster #52
IMPACT OF DELAYED TARGETED THERAPY IN RENAL CELL CARCINOMA: A NATIONWIDE CANCER REGISTRY STUDY
Solomon Woldu, MD; Justin Matulay, MD; Timothy Clinton, MD; Yuval Freifeld, MD; Ryan Hutchison, MD; Yair Lotan, MD; James Brugarolas, MD; Hans Hammers, MD; Vitaly Margulis, MD and Aditya Bagrodia, MD
UT Southwestern Medical Center
Presented By: Solomon L. Woldu, MD

Introduction: Targeted therapy (TT) is the first-line option for metastatic clear cell renal cell carcinoma (mc-RCC). Although this form of systemic therapy is associated with improved progression free survival and overall survival (OS), it is not curative and most patients will eventually die. Additionally, TT is associated with a high-cost and significant adverse event profile. We sought to evaluate the survival implications of delaying the initiation of TT.

Methods: The National Cancer Database (NCDB) was queried from 2006-2012 for patients with mc-RCC at diagnosis who were treated with cytoreductive nephrectomy and TT. Time to initiation of TT was defined as ‘early’ (within 2 months), ‘moderately delayed’ (2-3 months), and ‘delayed’ (3-6 months), and ‘late’ (>6 months). Multivariable logistic regression was performed to determine factors predictive of delayed TT. The impact time to initiation of TT on OS was estimated by Kaplan-Meier and Cox multivariable survival analysis. The relationship between time to initiation of TT and time from initiation of TT to patient death was analyzed by bivariate and partial Pearson correlation testing.

Results: 2,716 patients were included in the final analysis. The median (interquartile range [IQR]) follow-up was 18.8 (9.1-32.9) months, and 71.8% of patients had died at last follow-up. The median (IQR) time from diagnosis to initiation of TT was 2.1 (1.3-3.23) months, with the longest delay being 20.1 months. 1,255 patients (46.2%) had early TT, 671 patients (24.7%) had moderately delayed TT, and 685 patients (25.2%) had delayed TT, and 105 patients (3.9%) had late TT. Delay in TT was not found to be a statistically significant predictor of OS in multivariable analysis. Time from diagnosis to initiation of TT and time from initiation of TT to patient death were not correlated after control for covariates (r=0.04, p=0.08).

Conclusion: Delay in initiation of TT for mc-RCC was not an independent predictor of worse OS. Although this study is subject to limitations of observation study design and selection bias, the results do suggest that in carefully selected patients, outcomes might not be compromised with initial observation. Prospective, randomized evaluation is warranted.
Poster #53
BIM EXPRESSION IN PERITUMORAL LYMPHOCYTES IS AN INDEPENDENT PREDICTOR OF SURVIVAL IN PATIENTS WITH METASTATIC CLEAR CELL RENAL CELL CARCINOMA
Bimal Bhindi, MD, CM, MSc FRCSC; John Cheville; Christine Lohse; Ross Mason; Susan Harrington; Haidong Dong; Stephen Boorjian, R. Houston Thompson and Bradley Leibovich
Mayo Clinic, Rochester, MN
Presented By: Bimal Bhindi, MD, CM, MSc, FRCSC

Introduction: Clinical and pathologic factors alone have limited prognostic ability in patients with metastatic clear cell renal cell carcinoma (ccRCC). Bim (BCL-2-interacting mediator of cell death) is a downstream pro-apoptotic signaling molecule activated by the PD-1 pathway in tumor reactive T-lymphocytes. We sought to determine if Bim expression in peritumoral lymphocytes (PTLs) is independently associated with survival in patients with metastatic ccRCC.

Methods: Patients who underwent nephrectomy for ccRCC between 1990-2004 who either had metastases at diagnosis or developed metastases during follow-up were identified using the Mayo Clinic Nephrectomy Registry. Sections (5?m) were taken from paraffin-embedded tumor tissue blocks and immunohistochemistry staining for Bim (Rabbit IgG monoclonal antibody) was performed. A genitourinary pathologist quantified Bim expression as high versus low (>20 versus <=20 PTLs expressing Bim per high power field (hpf)). Cancer-specific survival (CSS) and overall survival (OS) were measured from the first date of detection of distant metastasis. The association between Bim expression in PTLs and survival outcomes was evaluated using univariable and multivariable Cox regression analyses, adjusting for age, sex, and our previously reported metastases-score.

Results: The cohort included 525 patients with metastatic ccRCC, of whom 169 (32%) had metastases at time of nephrectomy. A median of 20 (range 0-350) PTLs per hpf expressing Bim were present at nephrectomy. On univariable analysis, high Bim expression was associated with worse CSS (HR 1.57; 95%CI 1.30-1.90; p<0.001) and OS (HR=1.56; 95%CI 1.29-1.87; p<0.001). Furthermore, upon multivariable adjustment, high Bim expression remained associated with worse CSS (HR=1.29; 95%CI 1.06-1.57; p=0.01) and OS (HR=1.27; 95%CI 1.05-1.53; p=0.01).

Conclusion: High Bim expression in PTLs at nephrectomy is prognostic of worse CSS and OS in patients with metastatic ccRCC. As such, these patients may warrant more aggressive systemic therapy and earlier consideration for novel PD-1/PD-L1 directed agents.
Poster #54
THE PROBABILITY OF INDOLENT VERSUS AGGRESSIVE HISTOLOGY BASED ON RENAL TUMOR SIZE: IMPLICATIONS FOR SURVEILLANCE AND TREATMENT
Bimal Bhindi MD, CM, FRCSC; R Houston Thompson; Christine Lohse; Ross Mason; Igor Frank; Stephen Boorjian; John Cheville and Bradley Leibovich
Mayo Clinic, Rochester, MN
Presented By: Bimal Bhindi, MD, CM, MSc

Introduction: The probability of benign versus malignant histology based on renal tumor size has been well-described. However, this alone does not sufficiently inform decision-making in the modern era, since indolent malignant tumors can often be surveilled. Thus, we sought to characterize the probability of indolent versus aggressive histology based on radiographic tumor size.

Methods: We evaluated patients who underwent radical or partial nephrectomy at Mayo Clinic for a unilateral, sporadic, pT1-2, pNx/0, M0 solid renal tumor between 1990-2010. Pathology was reviewed by a single genitourinary pathologist. Along with benign tumors, malignant tumors considered as indolent included the following: low grade (1-2) clear cell renal cell carcinoma (RCC), papillary RCC, and translocation-associated RCC, and any chromophobe RCC, clear cell papillary RCC, mucinous tubular and spindle cell RCC, SDH-B deficient RCC, and tubulocystic RCC. Malignant tumors with necrosis or sarcomatoid differentiation were considered aggressive. All other histologies were considered aggressive. The validity of the classification was confirmed by comparing Kaplan-Meier cancer-specific survival (CSS) estimates. Logistic regression models were used to characterize the predicted probability of malignant and aggressive histology based on tumor size. Sex-stratified analyses were also performed.

Results: Of the 2650 patients included, there were 1774 patients with indolent tumors (303 benign; 1471 malignant) and 876 with aggressive tumors. Ten-year CSS was 96% for indolent malignant tumors and 82% for aggressive tumors. The probabilities of any malignant histology and aggressive malignant histology increased with tumor size (Figure). For example, the estimated probability of malignant histology for a 2.5cm renal tumor is 86%, while the estimated probability of aggressive histology is only 23%. For any given tumor size, males had a greater probability of aggressive histology than females. Sex-specific predicted probabilities were estimated (data not shown).

Conclusion: Estimates of the probability of aggressive histology based on tumor size can be informative for treatment decision-making and patient counseling for newly diagnosed renal tumors.
**Poster Session I — Full Abstracts**

**Poster #55**  
**PRIMARY ADRENAL MALIGNANCY: INSIGHTS INTO THE EPIDEMIOLOGY OF A RARE HISTOLOGICAL SUBSET**  
Thenappan Chandrasekar, MD; Hanan Goldberg, MD; Zachary Klaassen, MD; Ardalan E. Ahmad, MD; Dixon T.S. Woon, MD; Jaime O. Herrera-Caceres, MD; Robert J. Hamilton, MD; Girish S. Kulkarni, MD and Neil E. Fleshner, MD  
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Presented By: Thenappan Chandrasekar, MD

**Introduction:** Primary malignancies of the adrenal glands remain quite rare, with institutional descriptions limited to case reports and case series. Epidemiologic assessment of the constellation of primary adrenal malignancies is lacking. We aim to utilize population-level data to provide a better understanding of the incidence, distribution and prognostic factors associated with these rare malignancies.

**Methods:** The SEER database was queried for all patients with primary adrenal malignancy, limited to patients with 11 specific histology codes, grouped into 5 groups: adrenocortical carcinoma (ACC), pheochromocytoma and paraganglioma (PH), neuroblastoma (NE), Non-Hodgkin’s lymphoma (NHL), and sarcoma (SA). Incidence, distribution trends, and cancer-specific survival (CSS) for each group was computed using descriptive statistics. All statistical tests were performed using R statistical package (2012).

**Results:** 5,586 patients with primary adrenal malignancy were identified, of which 4,695 had one of the 11 predominant histology codes. ACC (N=2057) and NE (N=1863) comprise the majority of the cohort. There is a clear age distribution of presentation, demonstrated in Figure 1. NE is the most prevalent during the first decade of life, ACC predominates after age 30, but both are common during the second decade of life. NHL begins to outnumber PH after age 70. NHL is more common in women (64.4%) and often presents with bilateral disease (33.2%); there was no difference in incidence based on sex and laterality for all the other groups. Except for NHL (chemotherapy), surgery was the primary mode of treatment, though multimodality therapy was not uncommon. NE predominantly presented with distant disease (67.1%), while ACC, PH, and SA more often presented with localized or regional disease. 5-year CSS for ACC, PH, NE, NHL and SA were 38%, 69%, 64%, 38%, and 42%, respectively.

**Conclusion:** As the first population-level analysis of all primary adrenal malignancies, we provide important initial data regarding presentation and outcomes of this rare condition. Due to their rarity, epidemiologic knowledge is lacking. Further evaluation of changing treatment paradigms and predictors of survival can help guide future research.
**Poster #56**

**PROGNOSTIC SIGNIFICANCE OF BAP1 EXPRESSION IN UPPER TRACT UROTHELIAL CARCINOMA**

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Presented By: Laura-Maria Krabbe, MD

**Introduction:** BRCA1-associated protein-1 is a deubiquitinase encoded by the BAP1 tumor suppressor gene. BAP1 mutations have been associated with prognostic implications in renal cell carcinoma, uveal melanoma and mesothelioma. Its role in urothelial carcinoma remains poorly elucidated. We sought to evaluate the prognostic value of BAP1 expression in upper tract urothelial carcinoma (UTUC).

**Methods:** Review of a multi-institutional cohort of patients who underwent radical nephroureterectomy (RNU) for high-grade UTUC from 1990-2008. Immunohistochemistry for BAP1 was performed on tissue microarrays from RNU specimens. Exclusion criteria were low tumor grade, receipt of NAC, previous MIBC and no tumor on TMA. BAP1 staining intensity was graded from 0-3, with positivity defined as average intensity >1. Clinicopathologic characteristics and oncologic outcomes including recurrence-free (RFS), cancer-specific (CSS), and overall survival (OS) were stratified by BAP1 positivity. Prognostic role of BAP1 was assessed using Kaplan-Meier (KM) and Cox regression analysis. Significance was defined as p<0.05. No funding was received.

**Results:** 348 patients were included for this updated, final analysis, with median follow-up of 36 months. 173 (49.7%) patients were BAP1-negative and 175 (50.3%) were BAP1-positive. While pT stage, lymphovascular invasion (LVI), and pN stage were similar between groups, BAP1 expression was more often associated with sessile architecture, necrosis, and CIS. On univariate analysis, BAP1 expression was associated with worse RFS and CSS (Figure). On multivariable analysis adjusted for pT, pN, focality, LVI, architecture, necrosis and concomitant CIS, positive BAP1 expression did not show prognostic significance.

**Conclusions:** BAP1 expression appears to be associated with adverse pathologic features and worse oncologic outcomes in patients with high-grade UTUC in UVA. Prognostic significance was lost in MVA in this updated analysis. Although loss of BAP1 is frequently associated with worse outcomes in other malignancies, our findings seem to parallel those of mesothelioma, in which BAP1 loss confers a better prognosis. The role of BAP1 pathways in UTUC pathogenesis remains to be further elucidated.
Poster #57
DIFFERENCES BETWEEN PATIENTS WITH DENOVO VS. SECONDARY UPPER TRACT UROTHELIAL CARCINOMA – THE PRINCESS MARGARET CANCER CENTER EXPERIENCE
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Presented By: Hanan Goldberg, MD

Introduction: Upper tract urothelial carcinoma (UTUC) accounts for <5% of all urothelial cancers (UC). It is usually considered a part of the spectrum of UC, manifesting as bladder cancer (BC) primarily. Our objective was to find whether there are clinical differences between UTUC tumors that present de novo (DnUTUC) and those that present secondarily (SUTUC)(i.e.: having had a prior history of BC).

Methods: The Princess Margaret Cancer Center institutional database was queried for all UTUC patients between 2002-2016. Data collected included clinical, pathological and follow-up parameters. Patients were stratified according to whether their disease was DnUTUC or SUTUC. Survival outcomes were compared and multivariate logistic regression analysis was performed to predict covariates associated with recurrence.

Results: A total of 128 UTUC patients were found, 98 with DnUTUC (76.5%) and 30 with SUTUC (23.5%). Mean age and the number of males were similar (70.5 vs 69.1, p=0.548, and 83.3% vs 70.4%, p=0.161, for DnUTUC vs. SUTUC, respectively). However, DnUTUC patients had a lower age adjusted Charlson score (6.4 vs 7.5, p=0.039). In both groups 70% of patients had high grade (HG) disease, more than 43% had Ta disease and more than 37% had T2 and above disease. Interestingly, CIS and recurrence rates were much higher in SUTUC than in DnUTUC (56.7% vs. 25.5%, p=0.001, and 70.4% vs. 39.8%, p=0.005, respectively). Treatment strategy was similar with more than 80% undergoing nephroureterectomy in both groups. Cancer specific survival (CSS) was significantly better in DnUTUC with 11.5% vs. 32.1% dying of their disease, p =0.058. Multivariable logistic regression analysis demonstrated that male gender and SUTUC disease significantly predicted recurrence.

Conclusion: In this single center experience spanning more than a decade, DnUTUC disease has been shown to be the more common UTUC variant with the majority of patients having HG disease. In this specific entity CIS and recurrence rates are significantly lower and survival rates are considerably better when compared to SUTUC. These findings raise the question whether follow-up strategies for recurrence should differ between DnUTUC and SUTUC.
Poster #58
ROBOT-ASSISTED VERSUS LAPAROSCOPIC NEPHROURETERECTOMY FOR UPPER TRACT UROTHELIAL CARCINOMA: SHORT-TERM OUTCOMES FROM THE NATIONAL CANCER DATABASE
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Presented By: Leilei Xia, MD

Introduction: Minimally invasive nephroureterectomy (MINU), including laparoscopic nephroureterectomy (LNU) and robot-assisted nephroureterectomy (RANU), has been increasingly used for the management of upper tract urothelial carcinoma (UTUC). Limited data exist on whether RANU has advantages over LNU in perioperative safety profiles and short-term outcomes.

Methods: We identified patients with non-metastatic UTUC who underwent RANU or LNU from 2010 to 2013 in the National Cancer Database (NCDB). Unadjusted analyses and multivariable logistic regressions adjusted for patient (age, sex, race, comorbidity, and insurance), tumor (location, grade, size, cT, and cN), and facility (type and MIRN volume) characteristics were used to compare 30-day mortality, 90-day mortality, conversion (to open surgery), prolonged length of stay (PLOS, ≥6 days), and 30-day readmission rates between RANU and LNU.

Results: A total of 5,197 patients (RANU, n=1,777; LNU, n= 3,420) were included. From 2010 to 2013, there was a trend of increasing RANU usage and decreasing LNU usage among all the MINU cases (Figure A). Unadjusted comparisons showed significantly lower 90-day mortality rate (2.19% vs. 3.45%) and fewer patients had conversion (5.29% vs. 10.73%) and PLOS (21.38% vs. 29.53%) in the RANU group versus LNU group (Figure B). Multivariable logistic regressions in the overall cohort showed that RANU was associated with lower odds of 90-day mortality (OR=0.67, 95%CI=0.46-0.97, P=0.035), conversion (OR=0.46, 95%CI=0.46-0.58, P<0.001), and PLOS (OR=0.67, 95%CI=0.58-0.77, P<0.001). Secondary multivariable logistic regressions in the cohort of patients without open conversion (n= 4,736) still showed that RANU was associated with lower odds of 90-day mortality (OR=0.66, 95%CI=0.43-0.99, P= 0.047) and PLOS (OR=0.69, 95%CI=0.59-0.79, P<0.001). 30-day mortality and readmission rates were similar between the two groups in both unadjusted analyses and multivariable logistic regressions.

Conclusion: Compared with LNU, RANU may provide better perioperative safety profiles and short-term outcomes. Future prospective studies are needed to validate our findings.

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A

Percentage of MINU (%)

2010 2011 2012 2013

RANU LNU

B

Percentage of patients (%)

30-day mortality 90-day mortality Conversion PLOS 30-day readmission

RANU LNU

1.01 1.61 2.19 3.45 5.29 21.38 29.53 4 3.77

*P<0.05
Poster #59
LONG TERM OUTCOMES FOR PATIENTS WITH VON HIPPEL LINDAU AND PHEOCHROMOCYTOMA: DEFINING THE BEST CANDIDATES FOR ACTIVE SURVEILLANCE
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Presented By: Thomas Sanford, MD

Introduction: Patients with a germline mutation in the Von Hippel-Lindau (VHL) gene have a 7-18% lifetime risk of developing pheochromocytoma. The purpose of this study is to evaluate the oncologic and functional outcomes of patients with VHL associated pheochromocytoma who underwent a period of active surveillance.

Methods: Patients were included in the study if they met the following criteria: 1) Confirmed mutation in the Von Hippel Lindau tumor suppressor gene, 2) History of surgery for either pheochromocytoma or paraganglioma, 3) At least 10 years of follow-up at the NIH. The active surveillance cohort consisted of any patients who underwent repeat imaging at the NIH. The surveillance cohort was split into three subsets based on mass size: less than 1 cm, 1-2 cm, and greater than 2 cm and the growth rate per year was calculated using the following formula: (size [end of surveillance period]- size [beginning of surveillance period])/ time( years).

Results: There were 72 patients who met all inclusion criteria from 54 families with median length of follow up of 17 years. There were 38 masses that underwent a period of surveillance in 26 patients. The median age at which surveillance was began was 30 (range 7-61). The median time on surveillance was 4.3 years (range 0.3-20.1). The median size of mass when starting surveillance was 1.0 cm (range 0.3-2.5 cm) and the median size when the mass was resected was 2.0 (range 0.3-4.5). The median growth rate for all masses was 1mm per year (range 0.23-1.06). The median growth rate for masses under 1.0 cm was 0.3 mm per year. The median growth rate for masses between 1.0 and 2.0 cm was 1.2 mm per year. The median growth rate for masses larger than 2.0 cm was 3.2 mm per year (p=0.018). No patients on surveillance developed metastatic disease.

Conclusion: Active surveillance is a safe strategy for the management of pheochromocytoma in patients with germline Von Hippel Lindau alterations. Growth rates appear to increase dramatically with increasing size of the tumors. It appears that patients with masses smaller than 2 cm are the optimal candidates for active surveillance.
Poster #60
IDENTIFYING CURRENT TRENDS IN THE UROLOGIC ONCOLOGY WORKFORCE: DOES COMPLETION OF FELLOWSHIP SIGNIFICANTLY CHANGE FUTURE PRACTICE?
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Presented By: Antonio Robello Horta Gorgen, MD

Introduction: ACGME-imposed duty-hour limits and focus on surgeon-specific outcomes have led to the perception that urologists-in-training receive less autonomy. Trainees increasingly seek adjunct subspecialty fellowships to further their education. We studied urologic oncology training, hypothesizing that fellowship-trained urologists (OF) perform more major oncology cases than their non-fellowship-trained peers (NF).

Methods: We identified all urologists with initial board certifications and re-certifications from the American Board of Urology between 2004 and 2016 using a de-identified data set. The outcome variable was major urologic oncology case volume. Exposure variables included fellowship status, city population and practice type. Data was analyzed using 2-sample t-test with significance defined at p<0.05.

Results: 8,123 urologic surgeons met criteria for inclusion, of whom 338 were OF’s. There were significant positive associations between OF and large practice area population of greater than 500k (66.8% OF vs. 45.7%, p<0.0001) and academic practice (38.2% vs. 8.6%, p<0.0001) and negative associations with smaller population and private practice (p<0.0001 for both). Furthermore, in more recent years, increasing OF’s practiced in academics and/or larger cities. OF’s performed more major cases in kidney, bladder, and prostate cancer across all certification time points compared to NF’s, and continued to perform these cases with high frequency across all certification times. (Figure 1).

Conclusion: OF’s perform significantly more major urologic oncology cases in all organ systems compared to NF’s, maintained over the course of their careers, and are significantly more likely to practice in an academic center and/or in a more populated area. This information is useful to urology residents considering a career in urologic oncology.

Figure 1: Mean cases per surgeon per year between groups OF and NF for each cycle of certification (1, 2, and 3) of major oncologic procedures by organ system. A) Total Major Urologic Oncology Cases B) Kidney Cancer Cases C) Prostate Cancer Cases D) Bladder Cancer Cases E) RCNU40 for Transitional Cancer

* Denotes p<0.05, NF vs. OF
DEMCGOGRAPHIC AND SOCIOECONOMIC PREDICTORS OF TREATMENT DELAYS, PATHOLOGIC STAGE AND SURVIVAL AMONG PATIENTS WITH PENILE CANCER: A REPORT FROM THE NATIONAL CANCER DATABASE

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Presented By: Kyrollis G. Attalla, MD

Introduction: To evaluate whether socioeconomic factors affect pathologic stage, treatment delays, pathologic upstaging and overall survival (OS) in patients with penile cancer (PC).

Methods: A total of 13,283 eligible patients diagnosed with PC from 1998-2012 were identified from the National Cancer Database. Socioeconomic, demographic and pathologic variables were used in multivariable regression models to identify predictors of pathologic T stage ≥ 2, pathologic lymph node positivity, cT to pT upstaging, treatment delays and OS.

Results: 5-year overall survival was 61.5% with a median follow-up of 41.7 months. Pathologic T stage ≥ 2 was identified in 3521 patients (27.2%), 1173 (9.2%) had ≥ pN1 and 388 (7.9%) experienced cT to pT upstaging. Variables associated with a higher likelihood of pathologic T stage ≥ 2 included no insurance (OR=1.79, p<0.001), lower higher education based on zip code (OR=1.13, p=0.027), black race (OR=1.17; p=0.046) and Hispanic ethnicity (OR=1.66; p<0.001). Patients with Hispanic ethnicity (OR=1.46; p<0.001) or living in non-metropolitan areas were more likely to have ≥ pN1 (p=0.001). Lack of insurance was associated with cT to pT upstaging (OR=2.05; p=0.001) as was living in an urban vs. metropolitan area (OR=1.35; p=0.031). In addition to TNM stage, black vs. white race (HR=1.56, p<0.001), living in an urban vs. metropolitan area (HR=1.18; p=0.022), age (HR=1.04, p<0.001) and Charlson score (HR=1.49; p<0.001) were associated with lower OS.

Conclusion: Socioeconomic variables including no insurance, lower education, race, Hispanic ethnicity and non-metropolitan residence were found to be poor prognostic factors. Increased educational awareness of this rare disease may help reduce delays in diagnosis, improve prognosis and ultimately prevent deaths among socioeconomically disadvantaged men with PC.

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Introduction: Technological developments have led to the emergence of minimally invasive modalities such as CyberKnife and Cryotherapy for the treatment of prostate cancer. Here, we investigated patient-reported quality of life (QoL) domains of urinary function, bowel habits, and sexual function in patients following CyberKnife (CK) or Cryotherapy treatment, in comparison to active surveillance (AS) patients.

Methods: An IRB-approved institutional database was retrospectively reviewed for patients who underwent CK, Cryotherapy, or AS. QoL questionnaire (EPIC, IIEF, IPSS) responses were collected from consented patients. Using descriptive univariate analysis (analysis of variance, t-test) the questionnaire domain scores were analyzed in yearly intervals over a 4-year period following treatment.

Results: 279 patients (767 questionnaire sets) were included in the study. There was no significant difference among groups in urinary function scores. The CyberKnife group had significantly lower bowel habit scores in the early years following treatment (year two mean difference: -5.4, p<0.01) but returned to AS level scores by year four. Cryotherapy patients exhibited an initial, but non-significant, decrease in bowel function, which then improved and approached that of AS. Both CK (year 1 mean difference: -26.7, p<0.001) and Cryotherapy groups (-35.4, p<0.001) had an early decline in sexual function scores relative to AS, which gradually improved and were not significantly different from AS by the third year post-treatment. A history of hormonal therapy was associated with a decrease in sexual function relative to patients who did not receive hormones in both CK (-18.45, p<0.01) and Cryotherapy groups (-14.6, p<0.05). Graphical representation of our results is shown in Figure 1 (*p<0.05; **p<0.01; ***p<0.001).

Conclusion: After an initial decline in bowel habits and urinary function scores, CyberKnife or Cryotherapy-treated patients exhibited significant improvement and had no significant difference in QoL scores relative to AS patients by the fourth year post-treatment. These results highlight the benefit of CK and Cryotherapy in the management of organ-confined prostate cancer.
THE 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, MD

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

Methods: We prospectively enrolled 394 eligible patients presenting for prostate biopsy and independently determined their MPB pattern using the validated modified Norwood classification system (0: no balding; 1: frontal balding; 2: mild vertex balding; 3: moderate vertex balding; 4: sever vertex balding). Univariate and multivariable models, including Norwood score, age, prostate-specific antigen, and digital rectal examination 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: Norwood patterns were increasingly associated with cancer and high-grade disease with a dose-effect (p for trend <0.001 on univariate and multivariable analyses for cancer and p=0.001 and p=0.0036 for high-grade disease on univariate and multivariable analyses, respectively). On multivariable analyses, trends still held, with all patients exhibiting Norwood scale 3 and 4 at increased risk for cancer. In predicting risk of high-grade disease, only patients with Norwood pattern 4 exhibited an increased risk.

Conclusion: MPB appears to be a strong and independent risk factor for both cancer and high-grade disease for men presenting for prostate biopsy. Ours could be superior to marketed costly genetic tests. Further research is needed to understand the biology behind this observation and to incorporate these findings into clinical decision-making.
**Poster #64**  
**DETERMINATION OF PROSTATE VOLUME - A COMPARISON OF CONTEMPORARY METHODS**

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Presented By: Adam Bezinque, BS

**Introduction:** The optimal method of prostate volume (PV) estimation remains unclear. We evaluated PV determined by digital rectal exam (DRE), transrectal ultrasound (TRUS), magnetic resonance imaging (MRI) with/without 3D segmentation software, and surgical prostatectomy weight (SPW) and volume (SPV).

**Methods:** Our institutional multiparametric MRI registry was evaluated for patients that underwent radical prostatectomy ≤1 year after MRI. Clinical data were collected on each patient and MRI-determined PV calculations were recorded based on radiologist-performed measurements using bullet and ellipse formulas and according to automated software (MRI-A3D), 3D software modeling by a radiologist (MRI-R3D), and a 3rd year medical student (MRI-S3D). SPW and SPV calculations were based on recorded measurements. Interclass correlation coefficients (ICC) compared the relative accuracy of each volume measurement.

**Results:** Median PVs are as follows: MRI-A3D 38mL, MRI-R3D 37mL, MRI-S3D 38 mL, MRI-ellipse 40mL, MRI-bullet 50mL, DRE 35mL, TRUS 38mL, SPW 55mL, SPV ellipse 39mL, and SPV-bullet 49mL. SPW and bullet formulas consistently overestimated PV, and formula-based PV had a wider spread than PV based on segmentation. Compared with MRI-R3D, the ICC was 0.93 for MRI-S3D, 0.90 for MRI-ellipse, 0.87 for TRUS, 0.85 for SPV-ellipse, 0.73 for SPV-bullet, 0.71 for SPW and MRI-bullet, 0.53 for DRE, and 0.36 for MRI-A3D.

**Conclusion:** With MRI-R3D measurement as our reference, the most reliable were MRI-S3D, MRI-ellipse formula, and TRUS. Urologists performing office TRUS biopsies can be assured that contemporary volume estimates are relatively accurate.

**Funding:** Spectrum Health Foundation.
Poster #65  
SURVIVAL OUTCOMES FOR AFRICAN-AMERICAN (AA) VERSUS MATCHED CAUCASIAN (CAU) PATIENTS WITH METASTATIC CASTRATE-RESISTANT PROSTATE CANCER (mCRPC) TREATED WITH SIPULEUCEL-T.  
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Presented By: Stephen J. Freedland, MD  

Introduction: Prostate cancer risk and mortality is higher in AA versus CAU men. In an analysis of three phase 3 mCRPC trials, AA patients appear to derive greater survival benefit with sipuleucel-T, an autologous cellular immunotherapy for asymptomatic/minimally symptomatic mCRPC. AA patients on sipuleucel-T had a 30.7-month median overall survival (OS) benefit versus control (AUA 2012 P953), in contrast to a 4.1-month OS benefit with sipuleucel-T versus control for all pts in IMPACT (NEJM 2010;363:411). As the prior analysis did not adjust for baseline differences between races, we matched AA to CAU pts on sipuleucel-T to better assess racial differences in sipuleucel-T benefit and cumulative antigen presenting cell (APC) activation, which correlates with OS (CII 2013;62:137).  

Methods: Data were from phase 3 mCRPC trials that randomized patients 2:1 to sipuleucel-T or control (D9901 [NCT00005947]; D9902A [NCT01133704]; IMPACT [NCT00065442]). Thirty-three AA sipuleucel-T patients were matched with 66 CAU sipuleucel-T patients based on predicted Halabi survival. Data were evaluated by the Kaplan-Meier method (event rates) and ANOVA (APC activation).  

Results: Median follow-up was 36 (CAU) and 33.7 (AA) months. AA patients on sipuleucel-T had a 20.6-month longer median OS (45.3 months; 95% CI 23.4–NE) versus CAU patients (24.7 months; 95% CI 18.1–29.4) (HR=0.49; 95% CI 0.26–0.91; p=0.02). Median event-free survival (time to death or anticancer intervention [ACI]) was 17.7 months for AA patients (95% CI 8.5–21.5) versus 8.7 months for CAU patients (95% CI 6.6–11.5) (HR=0.74; 95% CI 0.47–1.18; p=0.20). Median time to next ACI was 23.5 months in AA patients (95% CI 9.4–NE) versus 16.3 months in CAU patients (95% CI 9.7–25.6) (HR=0.78; 95% CI 0.42–1.43; p=0.42). In AA patients, median APC activation was higher with sipuleucel-T infusion 1 versus CAU patients (7.0 versus 5.5, p=0.004). Median (range) cumulative APC activation over the three infusions was 27.7 (2.9–60.4, AA) versus 25.7 (4.3–46.4, CAU) (p=0.083).  

Conclusion: Prior studies found sipuleucel-T provides OS benefit to both AA and CAU mCRPC patients. Herein, for men treated with sipuleucel-T, AA had longer survival, suggesting sipuleucel-T may provide greater OS benefit in AA. The basis for this may be biologic (greater APC activation). Further studies with larger sample sizes are needed to confirm if AA patients derive greater OS benefit from sipuleucel-T.
Introduction: The USPSTF has proposed changing their prostate screening recommendation to C for men aged 55–69. This change may result in renewed interest by providers to offer this test. In order to understand important areas of emphasis for improvements in PSA screening quality, we sought to characterize the age distribution, impact of family history and comorbid illness, and between-screening intervals of patients undergoing PSA testing in an academic center prior to these new recommendations.

Methods: PSA tests completed in the University of Utah Health System from January 1, 2011 through July 30, 2017 were identified. Data from the electronic medical record (EMR) were used to determine age, family history of PCa, and comorbidities at time of PSA test. Tests related to a current diagnosis of prostate cancer, transplant, or hypogonadism were excluded. Ages 55–69 were considered to be guideline-concordant following American Urologic Association and USPSTF recommendations. The interval between tests was evaluated for patients with a PSA result <4 ng/mL.

Results: 27,349 PSA tests completed in 14,817 individuals met study criteria. 43.9% of the PSA tests were conducted outside of the age-based guidelines (26.0% completed in patients <55 years and 17.9% in patients ≥ 70 years, Figure 1). The proportion of patients with a positive family history of PCa recorded in the EMR was higher in those <55 years compared to the guideline-concordant group (13.9% vs. 10.8%, p<0.001). Comorbidities were common in those tested (Table 1), with the proportion of patients with at least one comorbidity greater in those > 70 years compared to the guideline-concordant group (65.1% vs. 48.1%, p<0.001). The median time for repeat testing was 13.8 months with 21.5% of repeat tests ordered within 12 months and 78.8% within 24 months of the previous test.

Conclusion: A significant portion of testing is outside of the age recommendations. The proportion of young men with a positive family history, which could motivate early screening, is statistically significantly higher than the guideline-concordant group, but the difference (2.1%) is not clinically significant. The comorbidities of older patients suggest an individual patient’s life-expectancy is not being properly considered. Lastly the between test interval is overly aggressive. Intervention based on these metrics is necessary to improve the value of our PSA testing.

Funding: None
Poster #67
IMPACT OF HIGH VOLUME CENTERS ON MANAGEMENT IN HIGH RISK PROSTATE CANCER
John Burns, MD¹; Mazen Alsinnawi, MD¹; Sydney Akapame, PhD²; Fernando Caumont, MD¹ and Chris Porter, MD¹
¹Virginia Mason Medical Center, Seattle, WA; ²Axio Research, Seattle, WA
Presented By: John F. Burns, MD

Introduction: Hormonal ablative therapy (HT) is often omitted in high risk patients receiving external beam radiotherapy (EBRT). Additionally, the primary modality of treatment used in these patients is not uniform across centers. We attempted to identify the impact of facility volume (FV) stratification on management strategies in high risk PCa.

Methods: We utilized the National Cancer Database (NCDB) and 344,107 patients diagnosed with localized PCa from 2010-2013 who had data available for review. We analyzed 60,255 patients with High Risk PCa defined as Gleason 8-10 PCa. Hospitals were classified by average annual FV to determine if higher volume centers influenced choice of management for high risk patients. We performed logistic regression analysis which controlled for age, race, clinical stage, FV, facility type, insurance, Charlson comorbidity index, PSA, year of diagnosis, geographic location, and neighborhood income.

Results: As shown in Figure 1, radical prostatectomy (RP) utilization correlated with higher FV centers with rates of RP at Top 5% FV being (49.7%; OR = 5.54) versus the Lowest frequency FV (13.9%) p < 0.001. EBRT utilization was inversely correlated with higher FV centers. HT was given in addition to EBRT on average (84.1%). HT use was omitted more often when a patient was receiving EBRT at the lowest and low volume center p <0.001.

Conclusion: Our study found that RP was more likely utilized as a primary modality at high FV centers versus EBRT. It was encouraging to discover that the utilization of HT when EBRT was given was surprisingly higher than previous reports. Lower volume centers were less likely to utilize HT with EBRT when given to high risk patients.

Figure 1. RP vs EBRT by Facility Volume
Poster #68
PREDICTORS OF EARLY DISEASE SPECIFIC MORTALITY AMONG PATIENTS WITH PROSTATE ADENOCARCINOMA BONE METASTASIS AT DIAGNOSIS
Zachary Klaassen, MD¹; Thenappan Chandrasekar, MD¹; Hanan Goldberg, MD¹; Karan Arora, BSc²; Rashid K. Sayyid, MD, MSc³; Robert J. Hamilton, MD, MPH, FRCSC⁴; Neil E. Fleshner, MD, MPH, FRCSC¹ and Girish S. Kulkarni, MD, PhD, FRCSC¹
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Presented By: Zachary Klaassen, MD

Introduction: Two randomized trials have suggested a survival benefit for patients with high volume metastatic prostate cancer (PCa) who initially receive chemotherapy. The purpose of this study was to assess the demographic and clinicopathologic factors among patients with PCa bone metastasis (mets) at diagnosis and identify predictors of early PCa-specific mortality (PCSM).

Methods: 8,040 men presenting with bone mets between 2010-2013 from the SEER database formed the study cohort. Descriptive statistics were used to compare demographic and clinicopathologic variables between patients experiencing PCSM and those that were alive/died of other causes. A Fine and Gray’s competing risks model was used to generate hazards ratios (HR) to identify predictors of PCSM. Kaplan-Meier analysis using log-rank test was used to assess PCSM stratified by extent of mets.

Results: There were 2,497 men (31.1%) experiencing PCSM and 5,543 men (68.9%) without PCSM (n=643 dead of other causes; n=4,900 alive) over a median follow-up of 35mo (IQR: 34-37). Patients with PCSM were older, unmarried, more likely to live in Southeast US, have biopsy Gleason Group (bGG) 5 disease or have no prostate biopsy, and have concomitant PCa brain, liver, and lung mets at diagnosis compared to patients without PCSM. Competing risks modeling identified older age (HR 1.023, 95%CI 1.019-1.027), non-black/white race (HR 0.77, 95%CI 0.62-0.95), unmarried status (HR 1.10, 95%CI 1.01-1.20), living in Southeast US (vs Northeast HR 1.24, 95%CI 1.07-1.44), PSA (HR 1.005, 95%CI 1.003-1.008), bGG 4 (vs 1 HR 1.53, 95%CI 1.04-2.26), bGG 5 (vs 1 HR 2.18, 95%CI 1.50-3.19), no prostate biopsy (vs 1 HR 2.97, 95%CI 2.02-4.37), and brain (HR 1.48, 95%CI 1.05-2.10), liver (HR 2.18, 95%CI 1.79-2.65) and lung mets at diagnosis (HR 1.33, 95%CI 1.13-1.56) as predictive of PCSM. Increasing volume of visceral mets with bone mets lead to worse survival vs bone mets only, with median time to PCSM of 27 mo for bone+lung (HR 1.35, 95%CI 1.13-1.62), 15 mo for bone+liver (HR 2.28, 95%CI 1.81-2.86), and 11 mo for bone+lung+liver (HR 3.04, 95%CI 2.14-4.33).

Conclusion: Men presenting with PCa-bone metastatic disease may have aggressive tumor biology and are at risk of PCSM in <3 years. Patients with aggressive prostate bGG disease presenting with bone and concomitant visceral mets should be considered for early, aggressive systemic therapy and/or clinical trials.
Poster #69
MICRO- AND MACRO-FLUIDIC MODELS OF PROSTATE CANCER METASTASIS
Takahiro Osawa, MD¹; Stephen Robinson², Brendan Leung, PhD²; Jirul Dai, PhD²; Shuichi Takayama, PhD²; Nobuo Shinohara, MD¹ and Evan Keller, DVM, PhD³
¹Department of Urology, Hokkaido University, Sapporo, Japan; ²Department of Biomedical Engineering; ³Department of Urology
Presented By: Takahiro Osawa, MD

Introduction: Metastasis is a complex cascade that involves both intravasation of tumor cells into systemic circulation and extravasation into the target metastatic site. Although visualizing tumor cell motility in vivo has been established, the underlying mechanisms of tumor cell metastasis remain largely unknown. In this study, we developed an in vitro model for recapitulating an in vivo microenvironment to observe prostate carcinoma cell metastasis.

Methods: To allow for high resolution and real-time imaging of tumor intravasation, we developed a micro-metastatic model by constructing a microfluidic polydimethylsiloxane (PDMS) device to mimic a primary tumor site and a metastatic site with an interconnecting vascular-type loop in three-dimensions. We also developed a macromodel device for creating a primary tumor site and metastatic sites. The primary tumor and metastatic sites were connected with vessel-mimicking tubing which was coated with type I collagen. Cell culture media was circulated between the primary and metastatic sites using a peristaltic pump. Prostate carcinoma cells (PC3/luc) were labeled with Cell Tracker® and seeded into primary tumor site containing biomimetic collagen extracellular matrix within a microfluidic device or 6-well tissue culture plate. Bone stromal cells (HS-5) were seeded into metastatic microenvironment site.

Results: We observed in both devices intravasation and circulation of the tumor cells using fluorescent microscope and plate reader. In addition, we found tumor cells at the metastatic site in the macromodel. In summary, we have developed several model systems that mimic key steps of the metastatic cascade including intravasation and the accompanying presence of circulating tumor cells, followed by extravasation and the accompanying presence of disseminated tumor cells.

Conclusion: Such systems will allow both exploration of mechanisms of metastasis and development of novel biologic assays for discovery of new therapeutics.

Funding: P50CA69568, P01CA093900; R01CA190554
**Poster Session I – Full Abstracts**

**Poster #70**

**THE INFLUENCE OF ETHNIC HETEROGENEITY ON PROSTATE CANCER MORTALITY AFTER RADICAL PROSTATECTOMY IN HISPANIC/LATINO MEN: A POPULATION-BASED ANALYSIS.**

Maria C. Velasquez, MD¹; Felix Chinea, MD²; Deukwoo Kwon, PhD³; Nachiketh Soodana-Prakash, MD, MS⁴; Marcelo Barboza, MD⁵; Ronit Shah, Medical Student⁶; Mark Gonzalgo, MD, PhD⁷; Chad Ritch, MD, MBA⁸; Alan Pollack, MD, PhD⁹; Dipen Parekh, MD ¹ and Sanoj Punnen, MD, MS³

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Presented By: Maria Camila Velasquez Escobar, MD

**Introduction:** Recent studies have shown that significant disparities in prostate cancer-specific mortality (PCSM) exist in Mexican American and Puerto Rican men. Our aim was to determine if these findings remained true in patients undergoing surgery, where the true grade and extent of cancer is known and can be accounted for.

**Methods:** Men diagnosed with localized-regional prostate cancer who had undergone radical prostatectomy as primary treatment were identified (n= 180,794). Patients were divided into the following racial and ethnic groups: Non-Hispanic White (n= 135,358), Non-Hispanic Black (n= 21,882), Hispanic/Latino (n= 15,559) and Asian American/Pacific Islander (n= 7,995). Hispanic/Latino men were further categorized into the following subgroups: Mexican (n= 3,323), South or Central American excluding Brazil (n= 1,296), Puerto Rican (n= 409), and Cuban (n= 218). A multivariable analysis was conducted using competing risks regression in prediction for PCSM.

**Results:** This analysis revealed hidden disparities in surgical outcomes for prostate cancer. In the multivariable analysis, Hispanic/Latino men (HR= 0.88, p= 0.207) did not show a significant difference in PCSM compared to Non-Hispanic White men. When breaking Hispanic/Latino men into their country of origin or ancestry, Puerto Rican men were found to have significantly worse PCSM compared to Non-Hispanic White men (HR= 2.55, p= 0.004), and Non-Hispanic Black men (HR= 2.33, p= 0.016).

**Conclusion:** Our findings confirm that ethnic heterogeneity within Hispanic/Latino men is an influential factor for PCSM risk after radical prostatectomy; with higher rates of PCSM for Puerto Rican men compared to both Non-Hispanic White and Non-Hispanic Black men. At minimum, these findings need further validation and should be considered in the screening and management of these patients.
Poster #71
PROSTATE MRI INTERPRETATION VARIATES SUBSTANTIALLY ACROSS RADIOLOGISTS
Nancy Wang, MD, MPH; John Leppert, MD; Richard Fan, PhD; Alan Thong, MD; James Brooks, MD; Pejman Ghannouni, MD; Andreas Loening, MD; Katherine To'o, MD and Geoff Sonn, MD
Stanford School of Medicine, Stanford, CA
Presented By: Nancy Wang, MPH, MD

Introduction: Multiparametric MRI is a powerful tool for prostate cancer diagnosis when interpreted by experienced radiologists. The objective of this study was to assess for variability in mpMRI reporting and diagnostic accuracy across radiologists of varying experience in routine clinical care.

Methods: Participants were a consecutive cohort of men at Stanford who underwent mpMRI and MR-US fusion biopsy between 2014 and 2016. Subjects were either biopsy-naïve or had undergone prior biopsy. All MRIs were read by 1 of 9 different radiologists using PIRADS. MRIs were not re-read prior to biopsy by another radiologist. Biopsy histopathology served as the standard for evaluating presence of cancer. Primary outcomes were the PIRADS score distribution and diagnostic accuracy across 9 radiologists. Clinically significant cancer was defined as Gleason ≥7. We used multivariable logistic regression to evaluate the association between age, PSA, PIRADS score, and radiologist in predicting significant cancer. Sensitivity analysis included radiologist prostate mpMRI case volume and changes in accuracy over time.

Results: 409 subjects with 509 MRI lesions were analyzed. While the mean number of lesions assigned per patient (1.2) did not differ across radiologists, substantial variation existed in PIRADS distribution and cancer yield. Significant cancer detection ranged from 0-23% for PIRADS 3, 23-65% for PIRADS 4 and 40-80% for PIRADS 5 across radiologists. The proportion of men with PIRADS < 3 found to have clinically significant cancer varied from 7-50%. AUC was 0.70 (range of 0.63-0.80) for all prostate cancers and 0.72 (range of 0.62-0.82) for clinically significant cancer. Multivariable analysis showed that PIRADS score (p<0.001) and radiologist (p=0.03) were independent predictors of cancer. Neither individual radiologist case volume, nor study period impacted results.

Conclusion: Considerable variability in PIRADS score assignment and diagnostic accuracy exists across radiologists in prostate MRI. We advise internal validation of MRI scan interpretations with biopsy findings before using MRI to make important clinical decisions.

Funding: We have no financial disclosures to declare.
ASSOCIATION BETWEEN ANDROGEN-DEPRIVATION THERAPY AND NON-PROSTATE CANCER MORTALITY AMONG MEN WITH NON-METASTATIC PROSTATE CANCER

Christopher Wallis, MD, PhD¹; Raj Satkunasivam, MD, MS²; Sender Herschorn, MD²; Calvin Law, MD, MPH³; Arun Seth, PhD⁴; Ronald Kodama, MD²; Girish Kulkarni, MD, PhD⁵ and Robert Nam, MD, MSc²

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Presented By: Christopher Wallis, MD, PhD

Introduction: Androgen deprivation therapy (ADT) has been associated with cardiovascular risk factors and the development of cardiovascular disease in men with metastatic prostate cancer. The effect of ADT on non-prostate cancer mortality is unknown among patients with non-metastatic prostate cancer.

Methods: We performed a population-based, retrospective cohort study of men treated with surgery or radiotherapy for non-metastatic prostate cancer in Ontario, Canada from 2002-2009. ADT exposure was operationalized as a time-varying binary and cumulative dose exposure. Primary and secondary outcomes were non-prostate cancer mortality and cardiovascular mortality, respectively. The Fine & Gray sub-distribution method with generalized estimating equations was used to calculate sub-distribution hazard ratios (sdHR), while accounting for competing risks.

Results: We examined 20,651 men treated for non-metastatic prostate cancer. Median follow-up was 7.4 years. Androgen deprivation therapy was not significantly associated with non-prostate cancer mortality (sdHR 0.75, 95% CI 0.37-1.50) or cardiovascular mortality (sdHR 1.16, 95% CI 0.37-3.63) when operationalized as a binary time-varying exposure. Similar results were obtained when we examined ADT cumulative dose exposure.

Conclusion: Androgen deprivation therapy is not associated with non-prostate cancer mortality or cardiovascular mortality in a large, population-based cohort of men with localized prostate cancer treated by surgery or radiation therapy.

Funding: C.J.D.W. is supported by the Canadian Institute of Health Research Banting and Best Doctoral Award. R.K.N. is supported by the Ajmera Family Chair in Urologic Oncology.
A QUANTITATIVE ASSESSMENT OF RESIDUAL CONFOUNDING IN THE COMPARISON BETWEEN SURGERY AND RADIOTHERAPY IN THE TREATMENT OF NON-METASTATIC PROSTATE CANCER

Christopher Wallis, MD, PhD¹; Raj Satkunasivam, MD, MS²; Sender Herschorn, MD²; Calvin Law, MD, MPH³; Arun Seth, PhD⁴; Ronald Kodama, MD²; Girish Kulkarni, MD, PhD⁵ and Robert Nam, MD, MSc²

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Presented By: Christopher Wallis, MD, PhD

Introduction: Observational comparisons of surgery and radiotherapy as prostate cancer treatments may be affected by residual confounding. We sought to quantify the degree of this bias in men treated for non-metastatic prostate cancer, both between treatment modalities and compared to men without prostate cancer.

Methods: We performed a population-based, retrospective cohort study of men treated for non-metastatic prostate cancer in Ontario, Canada from 2002-2009. Patients treated with surgery and radiotherapy were matched on demographics, comorbidity, and cardiovascular risk factors. The primary outcome was non-prostate cancer mortality. The Fine & Gray sub-distribution method with generalized estimating equations was used to compare outcomes. Additionally, we compared these patients with prostate cancer to the general population. We used a previously published technique to quantify the prevalence and strength of residual confounding necessary to account for observed results.

Results: Of 20,651 eligible men, 10,786 (5393 pairs) were matched. The 10-year cumulative incidence of non-prostate cancer mortality was higher among patients who underwent radiotherapy (12%) than surgery (8%; adjusted sub-distribution hazard ratio 1.57, 95% CI 1.35-1.83). Both groups had significantly lower rates of non-prostate cancer mortality than matched men without prostate cancer (18%, p<0.001). Hypothetical residual confounders would have to be both strongly associated with non-prostate cancer mortality (HRs in excess of 2.5) and have highly differential prevalence in order to nullify the observed effect.

Conclusion: Patients treated for non-metastatic prostate cancer have significantly lower non-prostate cancer mortality than men in the general population. We identified the magnitude of potential residual confounders to account for differences in treatment effects for prostate cancer.

Funding: C.J.D.W. is supported by the Canadian Institute of Health Research Banting and Best Doctoral Award. R.K.N. is supported by the Ajmera Family Chair in Urologic Oncology.
Poster #74
THE INSTITUTIONAL LEARNING CURVE FOR PROSTATE MRI AND MRI-US FUSION-TARGETED BIOPSY: IMPROVEMENTS IN CANCER DETECTION OVER TIME BASED ON 1400 PROSTATE BIOPSIES
Xiaosong Meng, MD, PhD¹; Andrew B. Rosenkrantz, MD²; Fang-Ming Deng, MD/PhD³; Richard Huang, BS¹; James Wysock, MD²; Marc Bjurlin, DO⁴; William C. Huang, MD⁵; Herbert Lepor, MD¹; and Samir S. Taneja, MD⁶
¹Department of Urology, NYU Langone Health; ²Department of Radiology, NYU Langone Health; ³Department of Pathology, NYU Langone Health; ⁴Department of Urology, NYU Langone Hospital - Brooklyn
Presented By: Xiaosong Meng, MD, PhD

Introduction: While MRI-US Fusion-targeted biopsy (MRF-TB) allows for improved targeting and detection of clinically significant prostate cancer (PCa), a concerning number of clinically significant disease is still missed on MRF-TB. We evaluate the impact of the learning curve associated with MRF-TB in detection of PCa on cancer detection rates (CDR) over time as well as the outcomes of repeat MRF-TB in men with continued suspicion for cancer.

Methods: Secondary analysis of 1400 prostate biopsies in a prospectively acquired cohort of men presenting for prostate biopsy over a 4-year period was performed. All men underwent pre-biopsy MRI and were assigned a maximum MRI suspicion score (mSS). Men with an MRI abnormality underwent combined MRF-TB and systematic biopsy (SB). The Cochran-Armitage Trend Test was used to calculate the relationship between operator experience and CDR. Biopsy outcomes between initial and repeat biopsy are evaluated for Gleason upgrade rates and newly detected cancer.

Results: Cancer detection rate increased 27% over time with increased institutional experience in men with mSS 4 and 5 lesions (Figure 1). Increased operator experience significantly correlated with detection of Gleason ≥ 3+4 PCa over time. Out of 108 men who underwent repeat MRF-TB, 35% were upgraded, with 47% due to increase in Gleason score and 53% due to newly detected PCa. 53% of men with mSS 4 and 5 lesions were upgraded compared to only 23% of men with mSS 1 and 2 lesions on repeat biopsy. Limitations include retrospective design and potential for selection bias given a referral population.

Conclusion: Increasing cancer detection rate over time and high upgrade rates on repeat MRF-TB demonstrate the significant learning curve associated with MRF-TB. This finding suggests that men with low risk or negative biopsy results with persistent concerning lesions on MRI should be promptly re-biopsied. However, improved targeting accuracy with operator experience can help decrease the number of missed clinically significant PCa.

Cancer detection rate over time

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Poster #75
SYSTEMATIC REVIEW OF FACTORS AFFECTING MEN’S CHOICE OF ACTIVE SURVEILLANCE FOR LOW RISK PROSTATE CANCER
Janette Kinsella, RN¹; Pär Stattin, MD, PhD²; Declan Cahill, MD³; Christian Brown, MD⁴; Anna Bill-Axelson, MD, PhD⁵; Ola Bratt, MD, PhD⁶; Mieke van Hemelrijck, PhD⁷ and Sigrid Carlsson, MD, PhD, MPH⁸
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Presented By: Sigrid Carlsson, MD, PhD, MPH

Introduction: To systematically review the evidence regarding barriers and facilitators to selecting active surveillance (AS) as a management strategy for low risk prostate cancer (PC).

Methods: We searched major databases (PsychINFO, PubMed, Medline 2000-now, Embase, CINAHL and Cochrane Central databases) from 2002 to March 2017 using the search terms “prostate cancer”, “active surveillance”, “treatment selection”, “treatment decision”, “treatment choice”, “preferences”, “facilitators” and “barriers” and their relevant synonyms. Qualitative and quantitative studies were included. Key themes were synthesized.

Results: Eighteen studies examining factors influencing choice of AS were identified: 4 qualitative, 12 quantitative and 2 mixed-methodology studies. The following themes emerged as factors influencing men’s choice of AS, on multiple levels: (1) patient level factors: patient and tumor characteristics (age, co-morbidities, knowledge, education, socioeconomic status, family history, race/ethnicity, grade, stage and tumor volume) and psychological factors (anxiety, distress, fear of progression, fear of side-effects); (2) family and social support; (3) provider recommendation (specialty, communication style, attitudes); (4) healthcare system and clinical management (guidelines, geography, type of practice) and (5) health policy level (guidelines, year, awareness).

Conclusion: A large number of factors have been reported to influence men’s choice of AS on multiple levels. More research is needed to better understand patients’ preferences and concerns and to study interventions that address these factors at various levels in increasing the uptake of AS when medically appropriate. It is important to learn from the experience of institutions/collaboratives/countries that are making significant headway in appropriately recruiting men to AS protocols, through standardized patient information, clinician education and uniform guidelines, to decrease the heterogeneity in AS practice.

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Poster #76

POPULATION-BASED OUTCOMES OF MEN WITH A SINGLE NEGATIVE PROSTATE BIOPSY: IMPORTANCE OF CONTINUED FOLLOW UP AMONG OLDER PATIENTS

Rashid Sayyid, MD, MSc¹; Shabbir Alibhai, MD, MSc²; Rinku Sutradhar, PhD³; Maria Eberg, MSc³; Kinwah Fung, MSc³; Zachary Klaassen, MD⁴; Hanan Goldberg, MD⁴; Nathan Perlis, MD, MSc⁴; David Urbach, MD, MSc⁵ and Neil Fleshner, MD, MSc⁴

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Presented By: Rashid Sayyid, MD, MSc

Introduction: Prostate biopsies have false-negative rates of 20-30%. Men with negative biopsies may thus undergo repeat biopsies, get diagnosed with prostate cancer, receive treatment for prostate cancer, and potentially die of prostate cancer. Our objective was to determine the long-term health outcomes of North American men with a negative first transrectal ultrasound-directed prostate biopsy.

Methods: This was a population-based study, using data from linked health administrative databases, of all Ontario-based men with a negative first biopsy between January 1994 and October 2014. Patients were followed from time of first biopsy till death, administrative censoring, or end of study period. Cumulative incidence functions were used to calculate the study outcomes’ cumulative incidences.

Results: Our study cohort included 95,675 men with a median age of 63.0 years. Median follow-up was 8.1 years. The 20-year cumulative rates of prostate cancer-specific mortality and diagnosis were 1.8% and 23.7%, respectively. Men ages 70-79 and 80-84 at initial biopsy had 20-year prostate cancer-specific mortality cumulative rates of 3.2% and 6.4% respectively. Among patients subsequently diagnosed with prostate cancer, 71.3%, 19.4%, and 8.3% were diagnosed after one, two, and three or more repeat biopsies. Higher socioeconomic status and urban residence were associated with higher diagnosis risks yet lower prostate cancer-specific mortality risks.

Conclusion: Following a negative first biopsy, 23.7% of men are subsequently diagnosed with and 1.8% die of prostate cancer within 20 years. Cancer-specific mortality rates were considerably worse in older men, suggesting the need for more aggressive treatment approaches in medically fit older individuals.
INTRODUCTION: Machine learning allows for the analysis and interpretation of “big data” in a semi-automated and adaptive fashion. Predictive algorithms can arm clinicians with knowledge that can provide personalized medicine to patient care. Herein, we trained and compared machine learning algorithms to traditional regression analysis for the prediction of early biochemical recurrence following robotic prostatectomy.

METHODS: A prospectively collected dataset of 338 patients who underwent robotic prostatectomy for localized prostate cancer was examined. We employed three supervised machine learning algorithms and used 19 different training variables (demographic, clinical, imaging, and operative data) in a hypothesis-free manner to build models that could predict patients with biochemical recurrence at 1 year. We also performed traditional cox regression analysis for comparison.

RESULTS: K-nearest neighbor, logistic regression, and random forest classifier were used as machine learning models. Classical cox regression analysis had an area under the curve (AUC) of 0.865 for the prediction of biochemical recurrence. All three of our machine learning models (K-nearest neighbor [AUC 0.903], random forest tree [AUC 0.924] and logistic regression [AUC 0.940]) outperformed the conventional statistical regression model. Accuracy prediction scores for K-nearest neighbor, random forest tree and logistic regression were 0.976, 0.953 and 0.976 respectively.

CONCLUSION: Machine learning techniques can produce accurate disease predictability better than traditional statistical regression. These tools may prove clinically useful for the automated prediction of patients who develop early biochemical recurrence following robotic prostatectomy. For these patients, appropriate individualized treatment options can improve outcomes and quality of life.

Funding: None
Poster #78
USING HISTOPATHOLOGIC LESION CHARACTERISTICS FROM LOW-GRADE RADICAL PROSTATECTOMIES TO PREDICT MRI PI-RADS IMPRESSIONS
Michael Wang, BS¹; Christina Buzzy, PhD⁴; Amr Mahran, MD⁴; Michael Glover, BS¹; Rayan Abboud, MS²; Nafiseh Janaki, MD³; Andrew Turk, BS⁴ and Lee Ponsky, MD⁵
¹Case Western Reserve University, Cleveland OH; ²University Hospitals Urology Institute, Cleveland OH; ³Department of Pathology University Hospitals Cleveland Medical Center, Cleveland OH; ⁴North East Ohio Medical University, Cleveland OH; ⁵Case Western Reserve University, University Hospitals Urology Institute, Cleveland OH
Presented By: Michael Wang, BS

Introduction: Previous studies have shown that multiparametric MRI (mpMRI) detects prostate lesions with a Gleason score (GS) of 4+3 and higher while missing lower grade lesions (GS 3+3 or 3+4). Prostate Imaging Reporting and Data System (PI-RADS) is a scoring system used to grade the risk of clinically significant prostate cancer on mpMRI. However, it is unclear why high PI-RADS scores are sometimes assigned to low-grade lesions. We examine this conundrum in this study by comparing histologic characteristics (lesion size and the lesion distance to the prostate capsule) of low-grade prostate cancers from radical prostatectomy (RP) to the visibility of these lesions on the mpMRI.

Methods: Patients with a mpMRI, RP, and final GS of 3+3 and 3+4 were included in the study. 210 low-grade lesions on whole-mount slides were annotated by a pathology fellow. After digitizing these slides, lesion size and distance from the capsule of the lesions were measured using Adobe Acrobat. The impressions of each lesion on the MRI from the radiologists were co-localized to the lesions outlined by the pathologist.

Results: Both lesion size (p=0.010) and distance from capsule (p=0.014) were significant when predicting for MRI impressions. Stratifying based on mean lesion size (11.32mm) demonstrated that lesion capsular distance was not predictive of MRI impression when lesion sizes were less than 11.32mm (p=0.714), while lesion capsular distance was predictive when lesion sizes were greater than 11.32mm (p=0.016). Stratifying based on mean distance of lesion from capsule (1.88mm) demonstrated that distance less than 1.88mm showed lesion size to be predictive of MRI impression (p=0.014), whereas distances greater than 1.88mm were not (p=0.714).

Conclusion: Low-grade neoplasms that were assigned a positive impression were larger and twice as close to the capsule as those of negative impressions. Stratifying the cohort showed that both conditions of larger lesion sizes and close proximity to capsule were necessary for low-grade diseases to be visible on the MRI. It is important to be aware of this fact as high PI-RADS does not necessarily indicate the presence of a high-grade lesion.

Funding: Case Comprehensive Cancer Center

Figure 1: Co-localization of prostate cancer lesion detected on MRI to radical prostatectomy pathological specimen for a patient with a final GS of 3+4. A) T2-W weighted hypointense corresponding to a suspicious lesion in the right mid transition zone – PI-RADS 5 (blue arrow) B) Radical prostatectomy pathological slide of the mid gland with annotated lesions showing an index tumor (blue arrow) in the right mid anterior gland abutting the prostate capsule. Three additional smaller lesions were detected on pathology.
Poster #79
PREDICTORS OF RECTOURETHRAL FISTULA FORMATION AFTER PRIMARY WHOLE GLAND CRYOABLATION FOR PROSTATE CANCER: RESULTS FROM THE CRYO ON-LINE DATABASE (COLD) REGISTRY
Alireza Aminsharifi, MD, PhD¹; Ariel Schulman, MD¹; Kae Jack Tay, MBBS²; Ghalib Jibara, MB,ChB¹; Efrat Tsivian, MD¹; Ahmed Elshafei, MD³; Thomas Polascik, MD¹ and Stephen Jones, MD³
¹Duke University Medical Center, Durham NC; ²SingHealth, Singapore General Hospital, Singapore; ³Glickman Urological & Kidney Institute, Cleveland Clinic, Cleveland, Ohio
Presented By: Alireza Aminsharifi, MD, PhD

Introduction: To defined the incidence and risk factors associated with rectourethral fistula (RUF) formation following primary whole gland cryosurgery using a multicenter, centralized registry.

Methods: The Cryo On-Line Data (COLD) registry was queried for men undergoing primary whole gland cryotherapy between 1990 and 2014 who developed a RUF. Patient factors and disease parameters were correlated with RUF using Chi-square test and the t-test. Variables with P<0.25 were entered into a binary logistic regression with stepwise backward elimination to determine the factors associated with RUF formation.

Results: There were a total of 4,102 men, who underwent primary whole gland cryotherapy, in the COLD registry at the time of analysis. Of these, 3,843 have the presence or absence of RUF recorded. Therefore, all analyses were done on this population. Postoperative RUF was documented in 50 out of 3843 cases (1.30%). Patients with RUF had similar demographic data, prostate volume, preoperative PSA level and clinical stage in comparison with those without fistula. On both univariate and multivariate analyses, postoperative urinary retention (OR: 7.26; 95% CI 4.06-13.03, P<0.001), preoperative Gleason score of ≥7 (OR: 1.92; 95% CI 1.08-3.43, P=0.027) and preoperative incontinence (OR: 2.95, 95% CI 1.12-7.76, P=0.028) were the most significant predictors of RUF formation. The accuracy, specificity and negative predictive value of these predictive variables ranged from 57.7% to 99.2%.

Conclusion: Primary whole gland cryotherapy for prostate cancer may be associated with a low rate (1.30%) of postoperative RUF formation. Postoperative urinary retention, Gleason score > 7 and preoperative urinary incontinence were the most significant predictors of RUF formation.

Funding: None
Poster #80

PREVIOUS PROSTATE BIOPSY-RELATED COMPLICATIONS AND THE TYPE OF COMPLICATION ARE ASSOCIATED WITH LOWER PATIENT COMPLIANCE WITH RE-BIOPSY SCHEME

Daniel Moreira, MD MHS¹; Michael Abern, MD¹; Gerald Andriole, MD²; Ramiro Castro-Santamaria, MD³ and Stephen Freedland, MD⁴ ¹University of Illinois at Chicago; ²Washington University at Saint Louis; ³GlaxoSmithKline; ⁴Cedars-Sinai Health System

Presented By: Daniel M. Moreira, MD, MHS

Introduction: Prostate biopsy-related complications such as hematuria, urinary tract infection (UTI) and acute urinary retention (AUR) have important health-related and financial consequences. Moreover, they may affect patient compliance with re-biopsy; however, this has not been studied in earnest. Thus, we evaluated whether previous prostate biopsy-related complications and the type of complication were associated with repeat prostate biopsy compliance in a clinical trial with systematic biopsies.

Methods: Retrospective analysis of 5,087 men 50-75 years-old who underwent a 2-year study-mandated prostate biopsy and were recommended to undergo the 4-year study-mandated prostate re-biopsy in the Reduction by Dutasteride of prostate cancer (PC) Events (REDUCE) study. The analyzed biopsy-related complications at the 2-year prostate biopsy were: hematuria, UTI, AUR and hematospermia, or any of the former. The association of 2-year biopsy complication with 4-year re-biopsy compliance was evaluated with chi-squared and logistic regression controlling for clinical variables.

Results: A total of 265 (5.2%) men had a 2-year prostate biopsy-related complication, including 182 (3.6%) who had hematuria, 39 (0.8%) UTI, 26 (0.5%) AUR, and 104 (2.0%) hematospermia. Biopsy-related complications were associated with lower PSA levels and placebo arm (both P<0.05). A total of 493 (9.7%) men were noncompliant with the 4-year biopsy. In univariable analysis, any previous complication (OR=1.50, P=0.029), UTI (OR=2.43, P=0.026), AUR (OR=4.19, P=0.001), and hematospermia (OR=1.72, P=0.050) were associated with higher risk of re-biopsy noncompliance. Hematuria was not associated with repeat biopsy compliance (OR=1.16, P=0.55). Results were unchanged in multivariable analysis (any complication: OR=1.53, P=0.024; UTI: OR=2.56, P=0.021; AUR: OR=4.09, P=0.001; hematospermia: OR=1.80, P=0.035; hematuria: OR=1.18, P=0.51, Table).

Conclusion: Among men undergoing repeat prostate biopsy, a previous prostate biopsy-related complication and the type of complication were associated with lower compliance with re-biopsy scheme. These patients should receive counseling regarding the importance and safety of prostate re-biopsy to prevent noncompliance.

<table>
<thead>
<tr>
<th>Complication</th>
<th>Re-biopsy compliance</th>
<th>Univariable</th>
<th>Multivariable*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No N (%)</td>
<td>Yes N (%)</td>
<td>OR</td>
</tr>
<tr>
<td>None</td>
<td>457 (9.5)</td>
<td>4,365 (90.5)</td>
<td>ref.</td>
</tr>
<tr>
<td>Any</td>
<td>36 (13.6)</td>
<td>229 (86.4)</td>
<td>1.50</td>
</tr>
<tr>
<td>Hematuria</td>
<td>20 (11.0)</td>
<td>162 (89.0)</td>
<td>1.16</td>
</tr>
<tr>
<td>UTI</td>
<td>8 (20.5)</td>
<td>31 (79.5)</td>
<td>2.43</td>
</tr>
<tr>
<td>AUR</td>
<td>8 (30.8)</td>
<td>18 (69.2)</td>
<td>4.19</td>
</tr>
<tr>
<td>Hematospermia</td>
<td>16 (15.4)</td>
<td>88 (84.6)</td>
<td>1.72</td>
</tr>
</tbody>
</table>

AUR: acute urinary retention, CI: confidence interval, OR: odds ratio, UTI: urinary tract infection

*Adjusted for age, race, family history of prostate cancer, body-mass index, digital rectal exam, prostate volume, prostate-specific antigen and treatment arm (dutasteride or placebo)
Poster #81
IMPACT OF USPSTF RECOMMENDATION ON RATES OF NON-DEFINITIVE MANAGEMENT IN LOW RISK PROSTATE CANCER UTILIZING THE NATIONAL CANCER DATABASE
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Presented By: John F. Burns, MD

Introduction: Since the 2011 U.S. Preventative Services Task Force (USPSTF) recommendation against prostate cancer (PCa) screening, there have been various modifications observed in the practice of urology. We hypothesized that low risk PCa is managed more conservatively secondary to the USPSTF recommendation and sought to evaluate the rates of non-definitive management (NDM) during this era.

Methods: We performed a retrospective cohort study of 105,295 patients in the National Cancer Database diagnosed with NCCN low risk PCa from 2010-2013. Our primary endpoint was to identify rates of NDM {active surveillance (AS) + watchful waiting (WW)} before and after the USPSTF recommendation against PSA screening in 2011. We performed multivariate logistic regression analysis to evaluate patient specific factors contributing to this form of management. These included age, race, clinical stage, facility volume, facility type, insurance, Charlson comorbidity index, PSA, year of diagnosis, geographic location, and neighborhood income.

Results: Of the 105,295 patients with low risk disease, 15,423 (15%) elected NDM versus 89,872 (85%) who elected active treatment. Of the 15,423 patients who elected NDM, 75% were on AS and 25% on WW. Median age of patients electing NDM versus treatment was 65 and 62 years old, respectively. As shown in Figure 1, the rate of NDM in years prior to the USPSTF recommendation was 10.1% and 12.9% in 2010 and 2011, respectively p<0.001. NDM increased in the years following the USPSTF recommendation of 2011 with the rate of NDM of 17.04% in 2012 (OR 1.92, p<0.001), and increasing to 21.6% in 2013 (OR 2.56, p<0.001). At the current rate of change of 3.85% per year, NDM utilization would reach 50% by the year 2021.

Conclusion: Since the USPSTF recommendation, NDM utilization has significantly increased in patients with low risk PCa. However, this data highlights the continued underutilization of surveillance in this patient population.
Poster #82
IMPACT OF SUBSEQUENT PROSTATE BIOPSIES ON HEALTH RELATED QUALITY OF LIFE
John Burns, MD¹; Lauren Hurwitz, MHS²; Katherine Levine, CCRP³; Mazen Alsinnawi, MD⁴; John Massman, PhD¹; Timothy Brand, COL, MD³; Inger Rosner, COL, MD⁴; Sean Stroup, MD⁵; Joseph Sterbis, LTC, MD⁶; Jennifer Cullen, PhD, MPH² and Chris Porter, MD¹
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Presented By: John F. Burns, MD

Introduction: Active surveillance (AS) allows patients to delay curative treatment and maintain better quality of life compared to patients who are treated. Many men will undergo subsequent prostate needle biopsy (PNB) which may have a cumulative effect on health related quality-of-life (HRQoL). The aim of this study was to identify the effect of subsequent PNB on HRQoL in patients on AS for prostate cancer (PCa) and in a comparable group of men without cancer.

Methods: Since 2007, the Center for Prostate Disease Research (CPDR) multi-center national database has enrolled patients undergoing PNB for suspicion of PCa into a prospective study of HRQoL. For this study, patients diagnosed with low and favorable-intermediate risk PCa choosing AS, and patients without cancer and a history of negative PNB were included for analysis. All patients complete the Expanded PCa Index Composite (EPIC) and the RAND 36-Item Short Form Health Survey (SF-36) surveys at baseline and at regular follow-up intervals. Mean HRQoL was compared over time between patients who did and did not undergo subsequent PNB following baseline.

Results: Of the 725 patients with history of PNB included for analysis, 145 (20%) had PCa on AS, and 580 (80%) did not have a diagnosis of cancer. Mean follow up was 38.8 (SD ± 17.2) and 37.0 (SD ± 17.3) months for patients with a history of PCa and those without cancer, respectively. Of the patients with subsequent PNB, 99 (48.6%) were in the non-cancer group, while 105 (51.4%) had PCa on AS. We compared the impact of subsequent PNB in the PCa and non-cancer group individually. We did not identify a significant impact on HRQoL in men undergoing subsequent PNB in either group over a five year period.

Conclusion: Alternatives to subsequent PNB include imaging modalities such as multiparametric MRI as well as other biomarkers to predict presence of cancer. However, subsequent PNB is required in most AS protocols as well as in those with persistent suspicion of PCa. Our analysis shows that subsequent PNB does not significantly impact HRQoL in this subset of men.
HEALTH RELATED QUALITY OF LIFE FOR PATIENTS UNDERGOING EXTERNAL BEAM RADIOTHERAPY WITH AND WITHOUT HORMONAL THERAPY

John Burns, MD¹; Lauren Hurwitz, MHS²; Katherine Levie, CCRP³; Mazen Alsinnawi, MD¹; John Massman, PhD¹; Timothy Brand, COL, MD; Inger Rosner, COL, MD⁴; Sean Stroup, MD⁵; Joseph Sterbis, LTC, MD⁶; Jennifer Cullen, PhD, MPH² and Chris Porter, MD¹ ¹Virginia Mason Medical Center, Seattle, WA; ²Center for Prostate Disease Research, Department of Defense, Rockville, MD; ³Madigan Army Medical Center, Tacoma, WA; ⁴Department of Surgery, Uniformed Services University of the Health Sciences, Bethesda, MD; ⁵Naval Medical Center, San Diego, CA; ⁶Tripler Army Medical Center, Honolulu, HI

Presented By: John F. Burns, MD

Introduction: Hormonal therapy (HT) may negatively impact health-related quality of life (HRQoL) in men treated for prostate cancer (PCa). We attempted to identify the impact of HT on HRQoL in patients receiving external beam radiotherapy (EBRT) for PCa versus those who receive EBRT alone.

Methods: We reviewed prospectively collected data from the Center for Prostate Disease Research (CPDR) multi-center national database for patients with intermediate and high risk PCa undergoing EBRT with or without HT between 2007 and 2015. Patients completed the Expanded Prostate Cancer Index Composite (EPIC) and the RAND 36-Item Short Form Health Survey Version 2 (SF-36v2) at the time of diagnosis and prospectively at regular follow-up intervals. Mean HRQoL scores over time were compared between patients who received EBRT alone and EBRT in combination with HT.

Results: 143 patients were included for analysis. 64 (44.8%) patients had EBRT + HT and 79 (55.2%) had EBRT alone. Mean follow up was 36.5 (SD ± 16.1) months and 41.2 (SD ± 17.1) months for patients with a history of EBRT versus EBRT + HT, respectively. Mean duration of HT was 21.7 months. Our analysis shows that patients who receive EBRT + HT have worse urinary, sexual, bowel-related, and hormonal-related HRQoL. Importantly, longitudinal analysis shows that in these domains over 5 years of follow up, HRQoL did return to baseline. No significant impact in mental and physical HRQoL as measured by SF-36v2 was seen by addition of HT.

Conclusion: Patients receiving EBRT + HT suffer in the domains of urinary, sexual, bowel-related, and hormonal-related HRQoL but these appear to improve overtime. SF-36v2 scores are not significantly impacted by the addition of HT with EBRT.
Poster #84
MULTI-INSTITUTIONAL DEVELOPMENT OF A PRETEST PROBABILITY CALCULATOR FOR HIGH RISK LESIONS ON MULTIPARAMETRIC PROSTATE MRI
Matthew Truong, MD¹; Janet Baack Kukreja, MPH, MD²; Soroush Rais-Bahrami, MD³; Nimrod Barashi, MD⁴; Bokai Wang, PhD⁵; Zachary Nuffer, MD⁶; Ji Hae Park, MD⁷; Khoa Lam, MD⁷; Thomas Frye, DO⁸; Jeffrey Nix, MD⁹; John Thomas, MD⁹; Changyong Feng, PhD⁵; Brian Chapin, MD⁴; John Davis, MD⁴; Gary Hollenberg, MD⁴; Aytekin Oto, MD⁹; Scott Eggener, MD⁹; Jean Joseph, MD⁹; Eric Weinberg, MD⁵ and Edward Messing, MD¹
¹Department of Urology, University of Rochester Medical Center, Rochester, NY; ²Department of Urology, University of Texas MD Anderson Cancer Center, Houston, TX; ³Department of Urology, University of Alabama at Birmingham, Birmingham, AL; ⁴Department of Urology, University of Chicago Medical Center, Chicago, IL; ⁵Department of Biostatistics and Computational Biology, University of Rochester School of Medicine and Dentistry, Rochester, NY; ⁶Department of Radiology and Imaging Sciences, University of Rochester Medical Center, Rochester, NY; ⁷Department of Radiology, Rochester General Hospital, Rochester, NY; ⁸Department of Radiology, University of Alabama at Birmingham, Birmingham, AL; ⁹Department of Radiology, University of Chicago Medical Center, Chicago, IL
Presented By: Matthew Truong, MD

Introduction: There are no existing tools to determine the pre-test probability of detecting high risk prostate multiparametric MRI (mpMRI) lesions. The objective of this study was to develop and validate a machine learning model for predicting the presence of high risk lesions on mpMRI.

Methods: Four tertiary care centers with mpMRI expertise were included in this retrospective study (BiRCH Study Collaborative: Birmingham, Rochester, Chicago, and Houston). Prediction models were developed using 1269 patients who met mpMRI inclusion criteria: mpMRI performed in a biopsy naïve patient; mpMRI performed after at least one prior negative 12-core transrectal ultrasound-guided biopsy; mpMRI performed during active surveillance for low risk PCa. Using age, PSA, and prostate volume, a support vector machine (SVM) model was developed for predicting the probability of harboring Prostate Imaging – Reporting and Data System (PIRADS) 4 or 5 lesions. Receiver operating characteristic (ROC) curves, calibration curves, and decision curves were generated to assess performance. Bias correction was performed using 10-fold cross validation.

Results: For biopsy naïve patients and patients with at least one prior negative 12-core transrectal ultrasound-guided biopsy, the machine learning tool discriminated with an AUC of 0.730. Moreover, excellent calibration and high net clinical benefit were observed. A web-based application was developed for clinical use (http://birch.azurewebsites.net/).

Conclusion: In this multi-institutional collaborative study, we developed the BiRCH SVM model that determines the pre-test probability of harboring high risk lesions on prostate mpMRI, which can help guide patient selection before prostate mpMRI.

Funding: None
Introduction: Intermediate-risk (IR) prostate cancer is a heterogeneous classification. While potential favorable criteria have been proposed to guide treatment decisions, recent evidence suggests rates of adverse pathology are not comparable to low-risk (LR) patients. Preoperative clinical stage and Grade Group (GG) on needle biopsy are often upgraded on surgical pathology. Therefore, we aimed to quantify the rate of adverse surgical pathology and implications for survival for patients with favorable IR versus LR prostate cancer.

Methods: The National Cancer Database was queried to identify patients undergoing radical prostatectomy (RP) with biopsy and surgical pathology data from 2009-2013. Baseline and pathologic outcomes were compared for patients meeting clinically LR (GG1, ≤cT2a, PSA<10) or GG2 IR (GG2, ≤cT2b, PSA<20) disease. Adverse pathology was defined as ≥GG3, pT3b, or pN1 disease. Various strata and definitions from the literature were explored including the Memorial Sloan Kettering definition (MSK; ≤GG2 with only one IR factor including GG2, cT2b, or PSA 10-20). Log-binomial regression compared rates of adverse pathologic findings while logistic regression assessed predictors. Kaplan-Meier survival curves and adjusted Cox proportional hazards regression models compared overall survival (OS) between GG2 IR and LR groups and the impact of adverse pathology for GG2 IR patients.

Results: A total of 3,519 (6.8%) of 51,688 LR and 8,888 (20.8%) of 42,720 GG2 IR patients included were found to have adverse pathologic findings (RR 3.06 (95%CI 2.95-3.17; p<0.001)), largely given by GG3 disease on surgical pathology. PSA and number of positive cores were significant predictors of adverse pathology but stratification minimally impacted the absolute rate. Results were similar for the MSK definition while restriction to GG1 IR patients led to a reduced increase in adverse pathology (RR 2.00 (1.86-2.16); p<0.001). GG2 IR patients had worse OS compared to LR patients in adjusted models (HR 1.25 (1.10-1.43; p=0.001)). Additionally, the presence of adverse pathology led to worse OS in the GG2 IR group (HR 1.26 (95% CI 1.03-1.54; p=0.023)).

Conclusion: Adverse pathology is observed at a three-fold higher rate for patients classified as favorable IR compared to LR. The presence of adverse pathologic findings led to worse survival for men in the favorable IR risk group; favorable IR men as a whole experienced worse survival relative to LR men.
Poster #86
ADJUVANT RADIATION WITH ANDROGEN DEPRIVATION THERAPY IMPROVES SURVIVAL IN PATIENTS WITH LYMPH NODE METASTASES FOLLOWING RADICAL PROSTATECTOMY
Hiten Patel, MD, MPH; Mohit Gupta, MD; Bruce Trock, PhD and Alan Partin, MD, PhD
Department of Urology, James Buchanan Brady Urological Institute, Johns Hopkins Medical Institutions, Baltimore, MD, USA
Presented By: Mohit Gupta, MD

Introduction: Although the incidence of lymph node metastasis (LNM) has decreased in the era of prostate specific antigen screening, its presence following radical prostatectomy (RP) is a poor prognostic indicator. The ideal treatment paradigm for patients with LNM is not clearly defined; current options include observation, androgen deprivation therapy (ADT), and external beam radiation therapy (XRT) + ADT. In this study, we performed a comparative analysis of these management strategies.

Methods: Patients with LNM following RP between 2004-2013 were identified from the National Cancer Database. Exclusion criteria included the use radiation therapy or ADT prior to RP, cM1 disease, or lack of follow-up data. The primary outcome was overall survival (OS). Kaplan-Meier curves and adjusted Cox proportional hazards regression models were constructed to account for baseline differences in demographic, comorbidity, and disease characteristics affecting treatment decisions. Subanalyses further evaluated time to receipt of adjuvant therapy and patient risk stratification.

Results: A total of 8,074 patients with LNM following RP met inclusion criteria. Postoperatively, 4,489 (55.6%) received observation, 2,065 (25.6%) ADT, and 1,520 (18.8%) XRT+ADT. Mean follow-up time was 52.3 months (median 48.0, IQR 28.5-73.5). Patients receiving ADT or XRT+ADT had higher pathologic Gleason scores, T stage, positive surgical margin rates, and greater nodal burden. Adjusted multivariable Cox models showed improved OS for XRT+ADT vs. observation (HR 0.77 (95% CI 0.64-0.94; p = 0.008)) and vs. ADT (HR 0.76 (95% CI 0.63-0.93; p = 0.007)). There was no difference in OS for ADT vs. observation (HR 1.01 (95% CI 0.87-1.18; p = 0.88)). Findings were similar when restricting the ADT and XRT+ADT cohorts for timing of adjuvant therapy. There was no difference in OS between groups when the analysis was limited to the 2509 (31.1%) patients lacking any of the following adverse features: CCI ≥2, pT4, Gleason ≥9, ≥3 positive nodes, or positive surgical margin. Conclusion: In patients with LNM following RP, use of XRT+ADT was associated with improved OS compared to observation or ADT alone. Up to 70% of patients with LNM after RP may benefit from XRT+ADT.
Poster #87
CAN PELVIC NODE DISSECTION AT RADICAL PROSTATECTOMY INFLUENCE THE NODAL RECURRENCE AT SALVAGE LYMPHADENECTOMY FOR PROSTATE CANCER?
Arjun Sivaraman, MD¹; Nicole Benfante²; Karim Touijer, MD¹; Jonathan Coleman, MD¹; Peter Scardino, MD¹; Vincent Laudone, MD¹ and James Eastham, MD¹
¹Urology service, Department of surgery, Memorial Sloan Kettering Cancer Center, New York, NY; ²Department of Biostatistics and Epidemiology, Memorial Sloan Kettering Cancer Center, New York, NY
Presented By: Arjun Sivaraman, MD

Introduction: In prostate cancer (PCa), lymph node only recurrence can be a cause of biochemical recurrence following radical prostatectomy (RP). We examined the quality of pelvic lymph node dissection (PLND) performed at RP to verify its influence on nodal recurrence in patients undergoing salvage lymph node dissection (sLND).

Methods: We performed a retrospective review of 48 patients who underwent sLND for presumed lymph nodal recurrence following RP to describe the PLND characteristics at RP and correlate the anatomical sites and the number of the suspicious nodes reported in the radiological imaging and the final pathology of sLND.

Results: Overall, at RP, 8 (17%) did not undergo PLND, 32 (67%) and 8 (17%) received a “limited” (between external iliac vein and obturator nerve) and an “extended” (external iliac, hypogastric, and obturator) dissection, respectively. Median nodes removed during limited and extended dissection were 2 and 24, respectively. At sLND, the mean age was 61.3 years and median PSA was 1.07 ng/ml. Median nodes removed at sLND were 17 with a median of 2 positive nodes. Recurrent nodes were identified within the template of an extended PLND in 62.5%, 50% and 12.5% patients, respectively, following prior no, limited and extended dissection at RP. Recurrence outside the expected lymphatic drainage pathway was noted in 37.5% patients with prior extended dissection at RP. There was a correlation between imaging and pathology specimen in 83% for node location and 58% for number of anatomical sites involved.

Conclusion: In prostate cancer patients undergoing sLND, most had an inadequate PLND at the original RP. Pattern of nodal recurrence may be influenced by the prior dissection and pre sLND imaging appears to underestimate the nodal recurrence.
Poster #88
CAN FREE PSA BE USED AS A BIOMARKER IN BIOCHEMICAL RECURRENCE AFTER SURGERY TO PREDICT CASTRATE RESISTANT PROSTATE CANCER?
Hanan Goldberg, MD; Ally Hoffman; Zachary Klaassen, MD; Thenappan Chandrasekar, MD; Douglas Cheung, MD; Alejandro Berlin, MD; Rashid Sayyid, MD and Neil Fleshner, MD
Princess Margaret Cancer Center, UHN, Toronto, Ontario, Canada
Presented By: Hanan Goldberg

Introduction: Most serum PSA is complexed to proteases, but 5%-45% of PSA exists as enzymatically inactive free PSA (fPSA). PSA produced from prostate cancer (PC) cells appears to escape proteolytic processing, resulting in a greater fraction of complexed PSA and a lower %fPSA. This led to the development of fPSA as an adjunct marker to improve PSA accuracy in screening. %fpsa cut points range from 15%-25% with higher values correlated with lower PC risk, within the PSA range 4-10 ng/mL. However, the role of fPSA in biochemical recurrence (BCR) after radical prostatectomy (RP) is not known.

Methods: A local institutional PC database was queried for all patients in the last decade who had BCR after RP and had at least one fPSA blood test. Patients were stratified according the %fPSA cut-off of 0.15. Multivariable logistic regression analysis was performed to predict covariates associated with a higher %fPSA.

Results: A total of 81 men with BCR were found. 41 patients (50.6%) had %fPSA<0.15 (group 1) and 40 patients (49.4%) had >0.15 (group 2). Median age and age adjusted Charlson score were similar between group 1 (61.4 [7.1], 3.8 [0.75]) and group 2 (63.2 [7.6], 4.1 [0.88]), p=0.285 and p=0.143, respectively. Mean PSA and %fPSA at diagnosis was 10.7 and 8.6, p=0.234, and 0.121 and 0.156, p=0.042, respectively for group 1 and 2. Mean prostate volume at RP was lower in group 1, 45.8 ml vs. 57.7 ml, p=0.012. Median follow-up time was 104 and 95.6 months for group 1 and 2, respectively, p=0.44. Interestingly, 20% (group 1) vs. 60% (groups 2) become castrate resistant (CRPC), p<0.0001 and the time to reach CRPC state was much shorter in group 2 (33.5 months) vs. group 1 (57.9 months), p=0.05. Additionally, 60% of group 2 patients vs. 32.5% of group 1 patients developed metastasis, p=0.014. Lastly, Kaplan Meier curve demonstrated median survival of 193 months for group 2 patients with no median survival for group 1, Log Rank test p=0.023 (Figure 1). Multivariable logistic regression analysis demonstrated that secondary Gleason score of 5 (compared to 3) and %fPSA>0.15 predicted CRPC status (OR 11.63, CI 95% 1.38-97.4, p=0.024, OR 7.99, CI 95% 2-31.95, p=0.003, respectively).

Conclusion: %fPSA>0.15 in the setting of BCR after RP confers a more aggressive disease. This manifests in a faster development of CRPC, metastasis and death. Our findings suggest a reversal in the significance of % fPSA values in BCR patients, and should be validated in larger cohorts.
HEALTHCARE RESOURCE UTILIZATION, COSTS AND TREATMENTS IN A US POPULATION OF NON-METASTATIC AND METASTATIC CASTRATION RESISTANT PROSTATE CANCER

Adriana Valderrama, PhD, MBA¹; Krishna Tangirala, MPH¹; Svetlana Babajanyan, MD¹; Sreevalsa Appukkuttan, MPH¹; Lonnie Wen, RPh, PhD¹ and Neal Shore, MD, FACSP²

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Presented By: Neal D. Shore, MD, FACS

Introduction: Health care resource use (HCRU) and costs among non-metastatic castration resistant prostate cancer (nmCRPC) patients who develop metastases (mets) have not been quantified among the insured US population. Previous studies have followed prostate cancer (PC) patients before and after mets diagnosis but have not focused on CRPC patients. This study follows nmCRPC patients through their continuum of care and describes the treatments, costs, and total HCRU during the year before and after mets diagnosis.

Methods: A retrospective cohort of metastatic CRPC (mCRPC) patients was identified from the MarketScan database from January 2009 to March 2015 with metastasis diagnosis as the index date. mCRPC algorithm was based on ICD-9 codes for both PC and secondary mets disease (including lymph, viscera and bone mets), and a subsequent claim for an FDA approved treatment for mCRPC. Patients were also required to have evidence of surgical or medical castration with no evidence of bone antineoplastic treatments at baseline. Costs and HCRU were compared in the 1 year pre- and post-index time periods.

Results: Among the 261 patients identified (mean age=72.1, 71% were ≥65 years), 79.3% had bone metastases. Most common treatments in the nmCRPC stage were bicalutamide (90%), leuprolide (82%), abiraterone (22.2%) docetaxel (20.7%), and ketoconazole (18%). Mean per patient per year (PPPP) inpatient visits (0.2 vs. 1.4), office visits (11.7 vs. 21.1) and ER visits (0.6 vs 2.4) were higher post mets compared to the nmCRPC period. Total costs were also higher during the mets stage compared to nmCRPC (mean PPPY $ 35,102.5 vs. 156,499.9). The below figure illustrates that total medical costs begin to rise steadily in the month before mets, peaked during the month of diagnosis and remained substantially higher than the nmCRPC stage. Oral drug costs however progressively increased after the metastatic stage.

Conclusion: Average yearly HCRU and costs more than doubled following the mCRPC diagnosis which indicates the need for appropriate management strategies for nmCRPC patients in order to optimize the potential delay of disease progression.

Funding: This study was funded by Bayer.U.S
Poster #90
THE VALIDITY OF REPEAT PROSTATE BIOPSY IN PRIOR BIOPSY NEGATIVE PATIENT: MRI-TRUS FUSION GUIDED BIOPSY

Jinho Hwang, MD; Youngeun Seo, MD; Young Dong Yu, MD; Jong Jin Oh, MD, PhD; Sangchul Lee, MD PhD; Sung Kyu Hong, MD PhD; Sang Eun Lee, MD, PhD and Seok-soo Byun, MD, PhD
Seoul National University Bundang Hospital, Dept. of Urology, Seongnam, South Korea
Presented By: Jinho Hwang

Introduction: To investigate validity of magnetic resonance imaging-transrectal ultrasound fusion target biopsy (Fusion-Bx) compared with transrectal ultrasound-guided biopsy (TRUS-Bx) by evaluating detection rate of prostate cancer (PCa).

Methods: Medical records of 376 patients with prior negative TRUS-Bx who underwent repeat biopsy from Aug. 2015 to Apr. 2017 were retrospectively reviewed. The cohort was stratified into two groups (TRUS-Bx and Fusion-Bx) and assessed target / non-target cores in each group to analyze clinical and biopsy characteristics pattern.

Results: There were total 195 and 181 patients in TRUS-Bx and Fusion-Bx group, respectively. The overall cancer detection rate was slightly higher in Fusion-Bx group, but no statistical significance was observed (24.6% vs 28.7%, p=0.367). Fusion-Bx group showed significantly greater detection rate in target core analysis (5.0% vs 17.7%, p=0.044). In confirmed positive biopsy patients, Fusion-Bx group had higher rate of clinically significant prostate cancer cases, but no statistical significance was seen (85.4% vs 92.3%, p=0.271). In the patients with highly or very highly suspicious MRI (maximum image grade 4–5) findings, malignancy was positive in 38 out of 100 men (38.0%). A strong relationship existed between target image grade and biopsy yield.

Conclusion: Fusion-Bx showed better clinical significance including detection rate in repeat biopsy applied to prior negative patients. A further study with larger patient pool and prospective design is needed to confirm the validity of Fusion-Bx.

Table 1. Clinical and biopsy characteristics of prior negative 376 men who underwent repeat prostate biopsy

<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>TRUS Bx only (n=187)</th>
<th>TRUS MR Fusion Bx (n=200)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>67.7 ± 8.9</td>
<td>64.6 ± 8.0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mean BMI</td>
<td>24.3 ± 7.7</td>
<td>24.5 ± 2.6</td>
<td>0.820</td>
</tr>
<tr>
<td>Mean sPSA</td>
<td>20.3 ± 129.5</td>
<td>9.7 ± 5.7</td>
<td>0.257</td>
</tr>
<tr>
<td>Mean volume of prostate</td>
<td>49.5 ± 21.9</td>
<td>48.3 ± 22.1</td>
<td>0.209</td>
</tr>
<tr>
<td>Mean No. of prior Bx</td>
<td>1.15 ± 1.4</td>
<td>1.43 ± 0.7</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Biopsy characteristics</th>
<th>TRUS Bx only (n=187)</th>
<th>TRUS MR Fusion Bx (n=200)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive pts. of Pca</td>
<td>48 / 195 (24.6%)</td>
<td>52 / 181 (28.7%)</td>
<td>0.367</td>
</tr>
<tr>
<td>Targeted</td>
<td>2 / 40 (5.0%)</td>
<td>32 / 181 (17.7%)</td>
<td>0.044</td>
</tr>
<tr>
<td>Non-targeted</td>
<td>47 / 195 (24.1%)</td>
<td>50 / 181 (27.6%)</td>
<td>0.435</td>
</tr>
<tr>
<td>Total Bx cores (mean)</td>
<td>2423 (12 ± 1.1)</td>
<td>2592 (14.3 ± 0.9)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Targeted cores, total (mean)</td>
<td>83 (0.4 ± 1.1)</td>
<td>422 (2.3 ± 0.8)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Non-targeted, total (mean)</td>
<td>2222 (12.9 ± 0)</td>
<td>2160 (11.9 ± 0.9)</td>
<td>0.319</td>
</tr>
<tr>
<td>Positive cores</td>
<td>113 / 2228 (14.5%)</td>
<td>115 / 2160 (5.3%)</td>
<td>0.707</td>
</tr>
<tr>
<td>cPSA vs Pca</td>
<td>41 / 48 (85.4%)</td>
<td>48 / 52 (92.3%)</td>
<td>0.271</td>
</tr>
<tr>
<td>cPca vs Pca</td>
<td>7 / 48 (14.6%)</td>
<td>4 / 52 (7.7)</td>
<td></td>
</tr>
<tr>
<td>Biopsy GS sum ≥ 6</td>
<td>25 / 52 (51.2%)</td>
<td>20 / 52 (38.5%)</td>
<td>0.171</td>
</tr>
<tr>
<td>Pathologic GS sum ≥ 7</td>
<td>23 / 48 (47.9%)</td>
<td>22 / 52 (41.6%)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: BMI=body mass index, sPSA=serum prostate specific antigen, Bx=biopsy, Pca=prostate cancer, cPca=clinically significant prostate cancer, cPca=clinically insignificant prostate cancer, GS=Gleason score.
Poster #91
THE NOVEL BIOPSY INSTRUMENT WITH A 25 MM SIDE-NOTCH IMPROVES THE DETECTION RATE OF PROSTATE CANCER IN TRANSRECTAL PROSTATE BIOPSY
Keishi Kajikawa, MD, PhD; Kent Kanao; Ikuo Kobayashi; Miho Sugie; Masanobu Saito; Shingo Morinaga; Hiroyuki Muramatsu; Genya Nishikawa; Yoshiharu Kato; Masahito Watanabe; Kogenta Nakamura and Makoto Sumitomo
Nagakute-city Aichi-ken
Presented By: Keishi Kajikawa, MD, PhD

Introduction: To evaluate the impact of a novel biopsy instrument that extends the length of the side-notch on the detection of prostate cancer in transrectal needle biopsy.
Methods: We collaborated with a biopsy needle manufacturer and developed a novel biopsy instrument (PRIMECUT® II long-notch type) with a 25 mm side-notch length and 28 mm stroke length to take longer tissue cores. The sampled core length, cancer detection rate, pain, and complications of 276 patients who underwent transrectal biopsy using the long-notch needle were compared with those of 469 patients who underwent biopsy using a normal instrument with a 19 mm side-notch length and 22 mm stroke length.
Results: The mean length of tissue taken by the long-notch needle was significantly longer than that of tissue taken by the normal-notch needle (16.3 vs. 22.4mm, p<0.001). Overall cancer detection rate was 42.0% for the normal-notch needle and 48.9% for the long-notch needle (p = 0.067). In patients with a prostate volume of 20–40 ml, the cancer detection rate for the long-notch needle was significantly higher than that for the normal-notch needle (63.6% vs. 47.5%, p = 0.003). Multivariate analysis showed that the long-notch needle improved cancer detection significantly (odds ratio 1.526, p = 0.013). There were no differences of pain during biopsy and complication between two groups.
Conclusion: The novel biopsy instrument with a 25 mm side-notch can take longer tissue samples safely and has a higher rate of prostate cancer detection in transrectal biopsy.
Poster #92

UTILITY OF MRI AND PCA3 REDUCES UNNECESSARY PROSTATE BIOPSIES
Courtney Berg, BS; Daniel Halpern; Melissa Fazzari, PhD; Jose Salcedo; Amanda LeSueur, PhD; Jeffrey Schiff, MD; Anthony Corcoran, MD and Aaron Katz, MD
NYU Winthrop Hospital Mineola NY
Presented By: Courtney Berg, BS

Introduction: Both Magnetic Resonance Imaging (MRI) and Prostate Cancer Antigen 3 (PCA3) are useful adjuncts in screening patients for prostate cancer (PCa). The purpose of this study is to analyze the clinical effectiveness of using both MRI findings and PCA3 results to predict adverse pathology on prostate biopsy.

Methods: We retrospectively reviewed patients at our institution that had an MRI, PCA3 and prostate biopsy. An abnormal MRI was defined as any suspicion of PCa inside or surrounding the prostate. A positive PCA3 was defined as a score ≥ 25 and a positive biopsy was defined as Gleason ≥ 6. Analyses were performed to determine if there was a significant association between an abnormal MRI, positive PCA3 and Gleason scores.

Results: 149 patients were included in this analysis. The average time between MRI, PCA3 and biopsy was 1.5 months. Higher Gleason scores were associated with a higher likelihood of an abnormal MRI (p for trend=0.01) and positive PCA3 (p for trend=0.03). MRI correctly predicted a positive biopsy 60% of the time, with a sensitivity of 82% and specificity of 29%. Similarly, PCA3 status correctly predicted a positive biopsy results 62% of the time with a sensitivity of 81% and specificity of 37%. When we considered positive MRI and PCA3 results jointly, specificity increased to 60% and sensitivity decreased to 64%.

Conclusion: Individually, MRI and PCA3 have comparable accuracy for predicting positive biopsy and both are useful for identifying high risk PCa. Using both tests does not increase the likelihood of identifying men with prostate cancer. However, the combined use of MRI and PCA3 does help to identify men without PCA. Therefore, implementing both tests into clinical practice may decrease the number of unnecessary biopsies performed.

Funding: Department of Urology, NYU Winthrop Hospital
Introduction: High Grade Prostatic Intraepithelial Neoplasia (HGPIN) and atypical small acinar proliferation (ASAP) are identified in 5-10% of prostate biopsies, and the optimal management of this unknown. We aimed to assess the clinical utility of mpMRI among patients who have HGPIN or ASAP on prostate biopsy.

Methods: We identified 27,233 prostate biopsies performed between 1994-2016 at our institution, of which 4,748 contained HGPIN or ASAP. Patients with concurrent or prior PCa were excluded, leaving 586 patients. A final cohort of 30 men who underwent mpMRI following a HGPIN/ASAP diagnosis was identified. Descriptive statistics were performed to determine associations between mpMRI findings and subsequent PCa diagnosis.

Results: Median age at diagnosis was 59 years and median PSA was 5.8. Median follow up from initial diagnosis was 43.2 months (IQR 24.5, 55.4) and 23.6 months (IQR 4, 32.6) from mpMRI. Overall, 13/30 (43%) were PI-RADS ≤2, 8/30 (27%) were PI-RADS 3, and 9/30 (30%) were PI-RADS ≥4. Following mpMRI, 15 (50%) underwent targeted biopsy while 6 (20%) underwent targeted biopsy. 13 patients (43%) were diagnosed with PCa at a median of 1.73 months (IQR 0.37, 29.6) following mpMRI. 92% of all PCa and 100% of clinically significant PCa was diagnosed by targeted biopsy. Patients with a PI-RADS lesion ≥4 were significantly more likely to be diagnosed with PCa (89% vs. 24%, p=0.002) compared to those with a PI-RADS lesion ≤3. Two-thirds (6/9) of patients with a PI-RADS lesion ≥4 were diagnosed with intermediate or high risk cancer, while no patient with PI-RADS ≤ 2 was diagnosed with clinically significant disease. On univariate analysis, mpMRI was more predictive of prostate cancer diagnosis than patient age, PSA, PSA kinetics, and Prostate Cancer Prevention Trial Risk Score.

Conclusion: Multiparametric MRI demonstrated utility in stratifying patients with HGPIN/ASAP in terms of the risk of developing any PCa as well as intermediate/high risk disease. In fact, 30% of HGPIN/ASAP patients will have a PI-RADS ≥4 lesion and a significant chance (~67%) of harboring intermediate to high risk PCa; while 43% of patients have a PI-RADS ≤2 mpMRI, which was associated with a low chance of harboring clinically significant PCa. Thus, if verified in other pure HGPIN/ASAP cohorts, mpMRI with targeted biopsies may provide valuable clinical risk stratification to 73% of patients with HGPIN/ASAP.

Funding: None
Poster #94
CONTEMPORARY NATIONAL TRENDS IN LOCALIZED PROSTATE CANCER RISK PROFILE AT DIAGNOSIS
Sean A. Fletcher, BS; Nicolas von Landenberg, MD; Alexander P. Cole, MD; Philipp Gild, MD; Quoc-Dien Trinh, MD and Adam S. Kibel, MD
Center for Surgery and Public Health, Division of Urologic Surgery, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA, USA
Presented By: Sean A. Fletcher, BS

Introduction: In the years following the introduction of prostate specific antigen (PSA) screening in the early 1990s, there was a documented “stage migration” toward lower risk prostate cancer (PCa) that persisted through the 2000s. National policy guidelines such as the US Preventive Services Task Force’s (USPSTF) recommendation against PSA screening for men over age 75 in 2008, and for all men in 2012, has led to a decline in both screening for and incidence of PCa. The extent to which these policy changes may have impacted contemporary trends in PCa risk stratification at diagnosis is not well known.

Methods: We used the National Cancer Database (NCDB), a nationwide hospital-based registry that captures 70% of cancer diagnoses, to identify men diagnosed with localized PCa (cT1-4N0M0) from 2010 through 2014. The Cancer of the Prostate Risk Assessment (CAPRA) score was used to define PCa risk stratification into low, intermediate, and high-risk categories. This risk score incorporates age and PSA at diagnosis, Gleason score of biopsy, clinical T-stage, and percent of biopsy cores positive for cancer; we excluded individuals missing any of this information. Temporal trend analysis was evaluated using the estimated annual percent change (EAPC) mixed linear regression methodology.

Results: From 2010 to 2014 the proportion of patients presenting with low-risk PCa decreased from 43.7% to 33.9%; EAPC: -6.29 (95% CI: -3.95, -8.75), p=0.004. Conversely, the proportion of high-risk PCa diagnoses increased from 16.5% to 22.0%; EAPC: 8.02 (5.09, 11.03), p=0.003. The proportion of intermediate-risk PCa diagnoses also increased, from 39.8% to 44.1%; EAPC: 2.49 (1.99, 3.90), p=0.002.

Conclusion: From 2010 to 2014 the proportion of men presenting with low-risk PCa decreased significantly, and there was a concomitant increase in the proportion of men presenting with intermediate and high-risk PCa. Nationwide changes in PSA screening practices may be contributing to these findings.

Funding: Prostate Cancer Foundation Young Investigator Award, American Society of Clinical Oncology Conquer Cancer Foundation (QDT)
Poster #95
AN INDEPENDENT, MULTI-INSTITUTIONAL, PROSPECTIVE STUDY IN THE VETERANS AFFAIRS HEALTH SYSTEM CONFIRMS THE 4KSCORE ACCURATELY PREDICTS AGGRESSIVE PROSTATE CANCER
Sanoj Punen; Stephen Freedland; Thomas Polascik; Stacy Loeb; Stephen Savage; Edward Uchio; Sharad Mathur; Michael Risk; Yan Dong and Jonathan Silberstein
University of Miami
Presented By: Sanoj Punen, MD, MAS

Introduction: The 4Kscore test was previously validated in a large, prospective trial to predict aggressive prostate cancer, however, the study population had a limited number of African American (AA) men. We conducted an independent multi-institutional, prospective trial to validate the 4Kscore test within the Veterans Affairs (VA) Health System, where a large proportion of the men getting care are AA.

Methods: We prospectively enrolled men who were referred for biopsy of their prostate at 8 diverse VA sites throughout the nation. All men underwent phlebotomy for 4Kscore ascertainment prior to prostate biopsy. We assessed the discrimination, calibration, and clinical utility of the 4Kscore test for predicting Grade Group 2 or higher (GG2+) prostate cancer, and compared it to a base model consisting of age, digital rectal exam findings, and PSA. Additionally, we compared the performance of the 4Kscore test in AA and non-AA men.

Results: Among 403 men who were enrolled in the trial, we had 366 men with a 4Kscore and complete data available for analysis. Among these men, 208 (56%) were AA, and 134 (36%) had GG2+ prostate cancer. The 4Kscore exhibited better discrimination (AUC: 0.81 vs. 0.74, p=0.011) and higher clinical utility on decision analysis than the base model for deciding on the need for biopsy. Calibration plots of the 4Kscore for the entire cohort afforded predictions that closely matched the observed risk of GG2+ prostate cancer in the population (Figure 1). There was no difference in the performance of the 4Kscore test in AA and non-AA men (0.80 vs. 0.84; p=0.32), and the 4Kscore outperformed the base model in both groups

Conclusion: In an independent, multi-institutional, prospective trial of the 4Kscore test in the VA health system, we confirmed that the 4Kscore accurately predicts the likelihood of aggressive prostate cancer and outperforms standard clinical information for biopsy decision making in both AA and non-AA men.

Funding: OPKO Diagnostics.
Poster #96
EVALUATING THE IMPACT OF AFRICAN AMERICAN ANCESTRY AMONG MEN WITH LOCALIZED PROSTATE CANCER TREATED WITH RADICAL PROSTATECTOMY
Daniel Canter, MD¹; Julia Reid MStat²; Maria Latsis, MS¹; Margaret Variano¹; Shams Halat, MD¹; Kristen E. Gurtner, MD¹; Michael Brawer, MD²; Steven Stone, PHD² and Stephen Bardot, MD²
¹Ochsner Clinic, Department of Urology, New Orleans, LA; ²Myriad Genetics, Salt Lake City, UT
Presented By: Daniel J. Canter, MD

Introduction: Prostate cancer is the most common male malignancy. Prior data has suggested that African American men present with more aggressive disease when compared to men of other ancestries. Here, we examined the effects of ancestry on clinical and molecular measures of disease aggressiveness as well as pathologic outcomes in men treated with radical prostatectomy (RP) for localized prostate cancer.

Methods: Data was collected from patients undergoing RP at the Ochsner Clinic (New Orleans, LA) from 2006 to 2011. Formalin-fixed paraffin embedded biopsy tissue was analyzed for the RNA expression of 31 cell cycle progression (CCP) genes and 15 housekeeping genes in order to obtain a CCP score (a validated molecular measure of prostate cancer disease aggressiveness). Cancer of the Prostate Risk Assessment (CAPRA) scores were also determined based on clinicopathologic features at the time of diagnosis. Clinical (Gleason score, tumor stage, CAPRA score) and molecular (CCP score) measures of disease aggressiveness were compared based on ancestry (African American versus non-African American). Cox proportional hazards models were used to test association with ancestry to biochemical recurrence and progression to metastatic disease. Fisher’s exact and Wilcoxon rank sum tests were used to compare ancestries.

Results: A total of 384 patients were treated with RP, including 133 (34.8%) men of African American ancestry. At the time of diagnosis, the median age was 62 years (interquartile range (IQR) 56, 66) and PSA was 5.4 ng/mL (IQR 4.2, 7.6). When compared by ancestry, there were no significant differences in biopsy Gleason score (p=0.26), clinical stage (p=0.27), CAPRA score (p=0.58), or CCP score (p=0.87). In addition, there was no significant difference in the risk of biochemical recurrence between ancestries (p=0.55). Only men of non-African American ancestry progressed to metastatic disease within the ten years of follow-up.

Conclusion: Contrary to prior reports, these data appears to indicate that men of African American ancestry do not necessarily present with or develop a more biologically aggressive form of prostate cancer. Although these data represents only one institution’s experience, it contains a highly robust African American population compared to prior reports. Further research is required to account for the discrepancy in the previously published literature.

Funding: Myriad Genetic Laboratories, Inc.
**Poster Session I – Full Abstracts**

**Poster #97**

A BIOPSY-BASED 17-GENE GENOMIC PROSTATE SCORE TEST AS A PREDICTOR OF BIOCHEMICAL RECURRENCE IN PROSTATE CANCER PATIENTS WITH OR WITHOUT ADVERSE PATHOLOGY AT RADICAL PROSTATECTOMY

Jennifer Cullen, PhD, MPH¹; Ruixiao Lu, PhD²; Isabell Sesterhenn, MD³; Jeffrey Lawrence, MD³; Shiv Srivastava, PhD³; Timothy Brand, MD⁴; Athanasios Tsiatis, MD³; Bela Denes, MD³; Phillip Febbo, MD² and Alan Shindel, MD²

¹Center for Prostate Disease Research, Rockville, MD; ²Genomic Health, Redwood City, CA; ³Center for Prostate Cancer Research, Rockville, MD; ⁴Madigan Army Medical Center, Tacoma WA

Presented By: Jennifer Cullen, PhD

**Introduction:** A 17-gene expression panel combined with underlying clinical risk has been validated as a predictor of both adverse surgical pathology (AP, defined as pathological Gleason Score ≥ 4+3 and/or pT3 disease) and biochemical recurrence (BCR, defined as post-operative serum PSA ≥ 0.2) after radical prostatectomy (RP) for prostate cancer (PCa). Both AP and BCR are clinically relevant as they portend a negative prognosis and may necessitate adjuvant treatments. We report the performance of the Genomic Prostate Score (GPS) test for prediction of BCR controlling for the presence of AP.

**Methods:** 385 patients with NCCN Very Low, Low, and Intermediate risk PCa and evaluable BCR and AP outcome data from a prior validation study comprised the study cohort. The principal endpoint was BCR. Univariable and multivariable Cox proportional hazards models were used to analyze the association between GPS result and time to BCR, with adjustment for pathological status of the prostate (AP vs no-AP) and NCCN clinical risk group. Hazard Ratio (HR) for BCR was reported per 20-unit change in GPS result.

**Results:** AP was present in 170 (44%) men. Median GPS result was 36 (IQR 28-45) in men with AP and 27 (IQR 20-34) in men without AP, with wide distribution of GPS results within each group. Sixty men (16%) experienced BCR within 5 years (54 with and 6 without AP). GPS was a significant predictor of BCR after adjustment for AP (HR 1.93, 95% CI 1.28-2.87, p=0.002). Within the subset of patients with AP, GPS remained a strong predictor of BCR in univariable (HR 1.84, 95% CI 1.19-2.79, p=0.005) and multivariable adjustment (HR 1.82, 95% CI 1.17-2.79, p=0.007). GPS was a predictor of BCR in men without AP in univariable analysis but was not statistically significant due to limited number of BCR events (n=6, HR 3.43, 95% CI 0.8-14.1, p=0.09). NCCN risk group and AP were significant predictors of BCR (p<0.05).

**Conclusion:** Risk of AP is a key driver in management planning. GPS remains predictive of BCR even after controlling for AP. Higher GPS results are associated with a greater risk of AP and BCR, both of which are associated with aggressive PCa. GPS may inform management decisions for men with clinically low risk PCa.
Poster #98
A META-ANALYSIS OF PROSTATE CANCER CHARACTERISTICS IN THE U.S. PREVENTIVE SERVICES TASK FORCE GRADE D ERA
Matthew Clements, MD, MS; Basil Abdalla, BS; Stephen Culp, MD, PhD, MS; Tracey Krupski, MD, MPH and Raymond Costabile, MD University of Virginia, Charlottesville, VA
Presented By: Matthew B. Clements, MD, MS

Introduction: The US Preventive Services Task Force (USPSTF) assigned a grade D recommendation to prostate specific antigen screening in May 2012, advising against screening for any age group. Screening has decreased by up to 39% as a result, and use of the digital rectal exam is decreasing at primary care visits. Because ecological studies are limited by missing data and potential misclassification, our objective was to combine granular published data with our own institutional data to evaluate prostate cancer risk characteristics pre- and post-recommendation.

Methods: To evaluate and identify studies inclusive of data on Gleason score, clinical stage, and metastatic disease (M+) at diagnosis, we performed a structured PubMed search and reviewed abstracts from the American Urological Association Annual Meeting (2012 onward). Eligible studies included data acquired during a time interval of at least 1 year before and after the release of the USPSTF recommendation. We included prostate biopsy outcomes from our institution in the analysis, obtained via chart review. Our pre-recommendation cohort was comprised of men undergoing biopsy between 10/2007 and 10/2011 while the post-recommendation cohort included those biopsied between 6/2012 and 6/2016. We used a random effects model (DerSimonian and Laird) to determine the relative risk (RR) of M+, greater than or equal to Gleason 8, and High D’Amico risk disease in the pooled analysis.

Results: At our institution, we identified a total of 643 (pre) and 459 (post) men undergoing prostate biopsy, with 287 and 224 cases of prostate cancer diagnosed, respectively. The RR of M+ disease in our patients was 1.62 (p=0.117). No other study met our criteria for pooled analysis of M+ disease. The pooled RR of greater than or equal to Gleason 8 disease was 1.52 (p<0.001) with significant heterogeneity (I-squared=56%) and High D’Amico category disease was 1.29 (p=0.006) with no heterogeneity (I-squared=0%). (Figure)

Conclusion: While the number of men presenting with metastatic disease did not differ pre- and post-recommendation, the number of high grade or high risk cancers, both having worse treatment outcomes, increased at both a local and aggregate level.
INTRODUCTION: Gold nanoparticle (GNP) therapy is a novel treatment that focuses energy directly at the tumor, as opposed to a region of tissue resulting in tumor-specific ablation. Herein, we report the first four cases in the world using GNP-directed ultra-focal laser ablation of prostate tumors using ultrasound (US) and MR/US fusion technology.

METHODS: Patients were enrolled in a phase II trial, 'A Study of MRI/US Fusion Imaging and Biopsy in Combination with Nanoparticle Directed Focal Therapy for Ablation of Prostate Tissue.' Patients received intravenous infusion on treatment day 1, allowing GNP deposition and retention within the tumors. On day 2, patients underwent transperineal focal laser excitation of GNP under electromagnetic-tracked MR/US fusion guidance (Invivo, Gainesville, FL). Oncologic and adverse event outcome data with a minimum of 6 months follow-up were analyzed, including targeted biopsy at 3 months. Post-ablation imaging was performed at 48 hours and 3 months.

RESULTS: Four patients with low to intermediate risk disease have undergone treatment with minimum 6-months follow-up. Mean age was 67 +/- 4.3 years and mean prostate specific antigen (PSA) was 6.1 +/- 0.48 ng/ml. Mean tumor volume was 0.56 +/- 0.20 cc with a solitary lesion in each patient. Mean PSA decrease was 1.79 ng/ml, a 29.6% decrease in PSA at 3 months. No short-term complications were observed. On follow up targeted biopsy at 3 months, three patients had no detectable cancer while one had a microfocus of Gleason 3+3.

CONCLUSION: Advancements in prostate imaging and biopsy guidance technologies have sparked investigation into a variety of focal therapies for localized prostate cancer. Though in its infancy, GNP-directed ultra-focal therapy has shown promise for safe and effective treatment of prostate tumors. Larger patient numbers and longer follow-up are needed to further validate the efficacy of this novel focal therapy modality.

Funding: Nanospectra Biosciences, Inc, Houston, TX; Invivo, Gainseville, FL

<table>
<thead>
<tr>
<th>Patient</th>
<th>Index Lesion Pathology and Volume</th>
<th>3-Month Pathology</th>
<th>Initial PSA (ng/ml)</th>
<th>3-Month PSA (ng/ml)</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>3+4 (0.80 cc)</td>
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<td>4.01 (34.8%)</td>
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<tr>
<td>2</td>
<td>3+4 (0.30 cc)</td>
<td>3+3 (2.4 mm)</td>
<td>6.06</td>
<td>2.77 (54.3%)</td>
</tr>
<tr>
<td>3</td>
<td>3+3 (0.57 cc)</td>
<td>Negative</td>
<td>6.70</td>
<td>6.13 (8.5%)</td>
</tr>
<tr>
<td>4</td>
<td>3+4 (0.56 cc)</td>
<td>Negative</td>
<td>5.52</td>
<td>4.37 (20.8%)</td>
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Poster #100

PROSTATE CANCER PRESENTATION, TREATMENT SELECTION, AND OUTCOMES AMONG MEN WITH HIV/AIDS: A CONTEMPORARY CLINICAL STAGE AND AGE-MATCHED ANALYSIS

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Presented By: Sarah P. Psutka, MD, MSc

Introduction: The clinical presentation, oncologic outcomes and optimal management of prostate cancer (PC) among human immunodeficiency virus-seropositive (HIV+) men is poorly described. Our objective was to compare the clinical characteristics, treatment decisions, and oncologic outcomes in a contemporary series of matched HIV+ and HIV negative (HIV-) men with PC.

Methods: The charts of 3135 men treated for PC from 2000 to 2016 were reviewed. HIV+ patients (N=46) were matched 1:2-3 by age and clinical stage to HIV-negative controls (N=137). Clinicopathologic features, primary treatment, and oncologic outcomes were compared with Kaplan Meier and Cox proportional hazards analyses.

Results: Obtained HIV- and HIV+ patients were similar with respect to median age (58.2 vs. 57.2 years, p=0.2), initial PSA (10.6 vs. 10.5 ng/mL, p=1.0), clinical stage (cT1/2: 94% vs. 88%, p=0.4; cN1: 8% vs. 6.5%, p=1.0; cM1: 10.9% vs. 10.9%, p=1.0). ECOG performance status (ECOG 0-1: 99% vs. 100%, p=1.0; respectively). Among HIV+ men, 67.4% had a history of AIDS, and 91.3% were on HAART at PC diagnosis with median viral load and CD4+ count of 40 copies/mL and 400 cells/mm3. Median time from HIV diagnosis to PC diagnosis was 8.6 years. Among men with localized disease (N=153), HIV+ men (N=37) were more likely to receive radiation therapy (59.5% vs. 44.8%) or no therapy at all (13.5% vs. 4.3%) and less likely to receive surgery (16.2% vs. 30.2%), or to initiate active surveillance (10.8% vs. 16.4%; p=0.04 overall) than HIV-. There were no associations with HIV status with respect to rates of biochemical recurrence (Hazard ratio [HR] 0.79; p=0.6), clinical progression (HR 0.89, p=0.8), castration resistance (HR 0.71, p=0.1), or PC-death (HR 3, p=0.1). However, HIV+ status was associated with an increased risk of all-cause death (HR 2.89, p=0.04) with median follow-up of 4.2 years (range 0-14).

Conclusion: HIV+ men with localized PC were observed to receive surgery and definitive treatment overall at significantly lower rates than HIV- controls. While most HIV+ patients had a history of AIDS, HIV was well controlled in the majority of patients at the time of PC diagnosis. Oncologic outcomes were similar between stage- and age-matched HIV+ and HIV- men. To the authors’ knowledge, this represents the largest contemporary cohort of HIV-seropositive men with PC to be described to date. Further research is necessary to define optimal PC treatment selection in men with HIV.
Introduction: To evaluate the condensed 5-item frailty index (FFI) based on contemporary National Surgical Quality Improvement Program (NSQIP) database as a predictor of increased healthcare resource utilization (HRU) after robotic-assisted radical prostatectomy (RARP).

Methods: The NSQIP database (2012-2015) was used to identify patients with prostate adenocarcinoma who had elective RARP. The primary outcome of interest was increased HRU, which was pre-defined as prolonged length of hospital stay (PLOS) (> 2 d), discharged to continued care (DCC), and unplanned readmission (UR) within 30 days of surgery. FFI was calculated by scoring following items (full score of 6): diabetes (1 if on oral agents, 2 if on insulin), impaired functional status (1), chronic obstructive pulmonary disease (1), hypertension requiring medication (1), and congestive heart failure in 30 days before surgery (1). Patients were stratified into 4 groups by FFI (0, 1, 2, and ≥ 3) and outcomes were compared. Multivariable logistic regression was performed to determine whether FFI could independently predict increased HRU outcomes.

Results: A total of 18,556 patients were included. With each increase in FFI, there was greater likelihood for increased HRU (Figure 1). Multivariable logistic regression showed that FFI = 2 (OR = 1.21 [1.05-1.41], P 0.010) and FFI ≥ 3 (OR = 1.57 [1.24-1.99], P <0.001) were independent predictors of overall increased HRU. When the outcomes of PLOS, DCC, and UR were analyzed separately, FFI = 2 (OR = 1.26, P = 0.006 for PLOS) and FFI ≥ 3 (OR = 1.65, P < 0.001 for PLOS, and OR = 2.54, P 0.048 for DCC) were still independently associated with each individual outcome.

Conclusion: FFI is a less cumbersome and an easily reproducible method that correlates with increased HRU after RARP. FFI may ultimately be a useful tool for providers, healthcare systems, and policy makers to predict cost and allocate resources. Further studies are needed to validate our findings.
Poster #102
CIRCULATING AND DISSEMINATED TUMOR CELLS ARE RARE IN LOCALIZED PROSTATE CANCER
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Presented By: Heather J. Chalfin, MD

Introduction: Epithelial–marker negative circulating tumor cells (CTCs) have recently been discovered in metastatic prostate cancer. Unfortunately, many popular CTC detection methods such as the AdnaTest employ a selection–based first step of bead pull down against an epithelial marker such as EpCAM. It has previously been shown that disseminated tumor cells (DTCs) are rare at the time of localized prostate cancer using the AdnaTest. Here, we queried the matched epithelial–marker depleted buffy coat (DBC) fraction of the AdnaTest for the presence of DTCs/CTCs in a cohort of localized patients undergoing radical prostatectomy (RP).

Methods: 8 cc of bone marrow (BM) were collected from 23 patients (4 controls, 2 metastatic and 17 localized) along with 8 cc of matched peripheral blood (PB) from 10 patients (2 controls, 2 metastatic, 6 localized). 5cc of BM and PB were assayed with the AdnaTest ProstateCancer Select kit (Qiagen) to enrich for EGFR/EpCAM positive cells using immunomagnetic beads, and subsequently the remaining DBC was separately queried for the presence of CTCs/DTCs. Cells were lysed and reverse transcribed into cDNA followed by real time PCR for the expression of the prostate–specific markers PSA and HOXB13, as well as the non–specific epithelial marker EpCAM.

Results: No PSA or HOXB13 expression was detected in any DBC, demonstrating the absence of epithelial–marker negative DTCs. With the AdnaTest, DTCs were detected (HOXB13+, PSA+) in 0/17 localized patients, but were detected in both metastatic samples. PB and BM expression of PSA and HOXB13 matched in all cases. No controls expressed PSA or HOXB13. Notably, the DBC fraction was contaminated with EpCAM+ cells in 100% (23/23) BM samples, and 70% (7/10) PB specimens. In two instances, EpCAM was detected in the PB depleted fraction but not with the AdnaTest.

Conclusion: DTCs are confirmed to be rare in localized men undergoing RP. Epithelial–marker negative DTCs and CTCs were not detected in localized men. The AdnaTest bead selection step did not capture all epithelial cells, and ongoing investigation into a selection–free CTC/DTC detection platform is necessary.
Poster #103
RETZIUS-SPARING ROBOTIC-ASSISTED LAPAROSCOPIC RADICAL PROSTATECTOMY: A SAFE ONCOLOGIC SURGICAL TECHNIQUE WITH SUPERIOR CONTINENCE OUTCOMES
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Presented By: Rashid Sayyid, MD, MSc

Introduction: Conventional robotic-assisted laparoscopic prostatectomy is associated with significant side effects, including urinary incontinence. Our objective was to compare the peri-operative, oncologic, and functional outcomes of prostate cancer patients undergoing a Retzius-sparing robotic-assisted laparoscopic radical prostatectomy to those undergoing a conventional robotic-assisted laparoscopic radical prostatectomy.

Methods: This was a prospective, single-center, consecutive case series of 100 and 100 patients undergoing a Retzius-sparing and a conventional robotic-assisted laparoscopic radical prostatectomy, respectively, by a single surgeon between March 2015 and April 2017.

Results: Baseline patient characteristics were similar between the two groups. The Retzius-sparing approach required significantly less console time (120.0 vs. 144.0 mins, p<0.001). There were no differences in intra- or post-operative complication rates, and hospital length of stay was similar in the two groups. Patients in the Retzius-sparing group had significantly superior rates of achieving post-operative urinary continence (log-rank test: p<0.001), with 20% of patients continent within the first month, compared to 8% of patients in the conventional group. Mean number of pads per day needed at one (1.4 vs. 3.2, p<0.001), six (1.1 vs. 2.3, p<0.001), nine (0.9 vs. 2.0, p=0.003), and 12 months (0.7 vs. 1.4, p=0.04) post-operatively was also significantly lower in the Retzius-sparing group. Incidence of positive surgical margins was non-significantly different between the two groups, with 17% and 13% of pT2 patients (p=0.54) and 49% and 48% of pT3 patients (p=0.95) in the Retzius-sparing and conventional groups, respectively, having positive surgical margins. Similarly, there were no differences in rates of biochemical failure at three (8% vs. 9%, p=0.13) and six months (9% vs. 11%, p=0.22) post-operatively.

Conclusion: Retzius-sparing robotic-assisted laparoscopic radical prostatectomy requires shorter console time, is oncologically safe, and leads to significantly superior continence outcomes compared to conventional robotic-assisted laparoscopic radical prostatectomy.
Poster #104
WITHDRAWN

Poster #105
MOLECULAR RATIONALE FOR TARGETING DNA-PKC TO ENHANCE UTILITY OF RADIATION THERAPY IN PROSTATE CANCER
Timothy Clinton, MD; Yi Yin, MD, PhD and Ganesh Raj, MD, PhD
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Presented By: Timothy Clinton, MD, MPH

Introduction: The combination of radiation therapy (RT) and androgen deprivation therapy (ADT) is superior to RT alone for treatment of patients with localized prostate cancer. ADT acts to prevent the androgen receptor (AR) from promoting DNA damage repair (DDR), which thereby increases RT-mediated cell kill. Emerging evidence supports that AR variants can mediate DDR following RT allowing for increased cell survival. Further studies have demonstrated that irradiation of prostate cancer cells trigger binding of androgen receptors to the catalytic subunit of the critical DNA repair kinase (DNA-PKc). We set to study if the influence of DNA-PKc in RT-induced DNA damage of prostate cancer cells.

Methods: Using a prostate cancer cell line and a DNA-PKc inhibitor NU7441, cells were subjected to irradiation (IR) and the amount of damaged DNA was visualized with comet assays. The quantification of DNA damage was further evaluated with quantitative immunofluorescence of gamma-H2AX and 53BP1. To validate these findings in vivo, we established subcutaneous xenografts in Nu/Nu mice. When tumors reached 200mm3, mice were castrated and treated with NU7441, followed by 2Gy radiation. Treatment groups were compared for tumor growth.

Results: Pretreatment with DNA-PKc inhibitor NU7441 enhanced IR DNA damage with increased olive tail movement on comet assay. This was supported by the persistence of double-stranded breaks after IR as shown in Figure 1A. This demonstrated in vitro that DNA-PKc inhibition was associated with increased IR-induced DNA damage. The results of our in vivo model validated our findings. The combination of IR and DNA-PKc inhibitor NU7441 was more effective in slowing the tumor growth than control when assessed by split-plot ANOVA (p<0.001) (Figure 1B). DNA damage in these cells was again quantified by significant persistence of gamma-H2AX and 53BP1 after IR (p<0.001).

Conclusion: DNA-PKc is critical for DNA repair mechanisms following IR and that the combination of ADT and DNA-PKc enhances IR-mediated cell kill. This data establishes the molecular rationale for a potential clinical trial combining agents targeting DNA-PKc in combination with RT for patients with clinically localized prostate cancer.

Figure 1A: Persistence of DNA damage after RT in cells pretreated with NU7441 compared to control
Figure 1B: Xenografts with pretreatment NU7441 prior to a single IR dose (2Gy) compared to control
Poster #106
LEVERAGING SALVAGE PROSTATECTOMY SPECIMENS TO DEVELOP NOVEL BIOMARKERS OF RADIATION RESISTANCE
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UT Southwestern Medical Center in Dallas, TX
Presented By: Timothy Clinton, MD, MPH

Introduction: Primary radiation therapy (RT) has a relatively high rate of biochemical recurrence of 30-50% in intermediate and high-risk prostate cancer. While recurrence may be a function of advanced disease at the time of RT, the finding of viable radioresistant prostate cancer in salvage prostatectomy specimens suggests that some prostate cancers may be intrinsically resistant to RT. Salvage prostatectomy specimens provide foci of both radiation resistant and sensitive areas within the same prostate for comparison. We aim to understand the biological basis of radiation failure by leveraging salvage prostatectomy specimens.

Methods: Using our ex vivo culture system, a prostate explant technique is utilized to evaluate salvage prostatectomy specimens. Pathologists identify regions of the prostate that are consistent with radiation-sensitive and radiation-resistant foci. Prostate cancer cores are obtained from these regions and cultured. Specimens have been obtained from these different foci and treated with 2Gy radiation with or without enzalutamide. Evaluation of DNA damage was conducted with quantitative PCR. On a gross pathologic level, given the evaluation of multiple specimens, a grading schematic has been created for determining the level of radiation treatment effect.

Results: Evaluation of over 40 salvage prostatectomy samples has demonstrated a distinct grading scheme for radiation effect on prostate cancer cells. Pathology slides in Figure 1A demonstrate the difference in appearance. The effects of radiation therapy without or without enzalutamide to these specimens were further evaluated to determine any differences in DNA damage repair genes in response to radiation. Figure 1B demonstrates the differential expression of radiation induced DNA damage repair genes in these specimens.

Conclusion: The findings from our current evaluation demonstrate that there exists a biological difference between prostate cancer cells that are radiation sensitive to those that are resistant. In this manner, salvage prostatectomy specimens can be leveraged and are being sequenced to identify the novel biomarkers that characterize radiation resistance.
Poster #107
WITHDRAWN

Poster #108
RATES AND RISK FACTORS OF LOST TO FOLLOW UP IN PROSTATE CANCER PATIENTS MANAGED WITH ACTIVE SURVEILLANCE
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Presented By: Kevin Benjamin Ginsburg, MD

Introduction: Active surveillance (AS) has emerged as an appropriate management strategy for many men with prostate cancer (PC), however insufficient monitoring may increase the risk of undesired outcomes. We evaluated a large AS cohort across diverse practices in Michigan to determine rates of loss to follow-up (LTFU) and associated risk factors.

Methods: MUSIC maintains a prospective registry of PC patients from 44 academic and community urology practices within the state of Michigan. We identified all patients in the registry managed with AS from 2011-2015. We defined LTFU as any 18-month period where no pertinent surveillance information was identified in the medical record by trained data abstractors (i.e., no PSA, prostate CT/MRI, or prostate biopsy). LTFU events were stratified as either (1) prolonged loss to follow up (PLTFU): a LTFU event with no further data entered; or (2) insufficient follow up (IFU): a LTFU event followed by subsequent data. We fit multivariable logistic regression models and compared adjusted rates of LTFU events across MUSIC practices.

Results: Of 2211 men enrolled on AS from 2011-2015, 217 (9.8%) had a LTFU event. Of these, 184 (8.3%) patients had PLTFU and 33 (1.5%) had IFU. African American (AA) patients were more likely than Caucasian patients to be LTFU (17.0% vs 7.4%, p<0.05). In multivariable analyses, both AA race (OR 2.29, 95% CI 1.38-3.82) and Charlson comorbidity index (CCI) of 1 (OR 1.75, 95% CI 1.10-2.76) were independently associated with an increased likelihood of LTFU. There was wide variability in rates of LTFU across MUSIC practices, ranging from 3% to 43% of patients entering AS, p<0.05 (Figure 1).

Conclusion: Nearly ten percent of men placed on AS become LTFU, representing suboptimal implementation of this management strategy. Patient-specific factors associated with being LTFU include AA race and higher burden of medical comorbidity. Practice-level variability in LTFU may reveal opportunities to identify systems of care used in higher-performing practices that can reduce LTFU across all sites thereby improving the long-term safety of AS for men with early-stage PC.

Funding: MUSIC is sponsored by Blue Cross Blue Shield of Michigan.
Poster #109
DO AFRICAN AMERICAN MEN HAVE A HIGHER RATE OF DISCONTINUATION ON ACTIVE SURVEILLANCE?
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Presented By: Aaron Edward Katz, MD

Introduction: To compare the discontinuation rates of African American (AA) men with Prostate Cancer (PCa) on Active Surveillance (AS) to age and Gleason matched controls.

Methods: We retrospectively identified 33 AA men with PCa on AS at our institution. These men were matched by age and Gleason score to 33 Caucasian men with PCa on AS. The discontinuation rates of the two groups were calculated, and associated characteristics were analyzed. A Kaplan-Meier curve was used to compare the overall survival of AA men with the control group.

Results: 11 (33.3%) of the AA men on AS discontinued compared to 2 (6.0%) of men in the control group. The median time to failure for the AA men was 20 months compared to 29.5 months in the control group. 7 (63.6%) of the AA and 2 (100%) of the control group discontinued due to biopsy progression. The remaining 4 AA men discontinued due to MRI progression (18.2%) and rising PSA (18.2%). Following AS, 5 AA men received radiation, 2 received radical prostatectomy, 3 received cryotherapy and 1 received hormones. The 2 control patients received radiation following AS.

Conclusion: AA men have higher discontinuation rates of AS when compared to age and Gleason matched controls. This finding suggests a possible need for alternative protocol for AA men on surveillance.

Funding: Department of Urology, NYU Winthrop Hospital
Poster #110
DOES TIME FROM DIAGNOSIS TO TREATMENT OF VERY HIGH OR HIGH RISK PROSTATE CANCER AFFECT OUTCOME?
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Presented By: Chad Reichard, MD

Introduction: Limited data exist on the effect of time from diagnosis to treatment in high or very high risk (VHR) prostate cancer (PCa). The relevance of this issue beyond logistics and access to care is increasing with the advent of many neoadjuvant treatment protocols which may inherently delay local therapy. We examined whether time from diagnosis to treatment impacted outcomes in a large multi-institutional cohort of high and VHR PCa patients undergoing radical prostatectomy (RP).

Methods: 1415 patients from three tertiary referral institutions (Cleveland Clinic – 444 patients, Johns Hopkins – 582 patients, and MD Anderson – 389 patients) that underwent RP for either NCCN high risk or VHR disease from 2005-2015 were reviewed, after excluding patients who received neoadjuvant ADT. The cohort was divided into tertiles based on time from diagnostic biopsy to RP (1st: 12-61 days, 2nd: 62-98 days, 3rd: 99-3640 days). K-M estimates for time to BCR, time to metastasis, PCa specific mortality (PCSM), and all -cause mortality (ACM) were calculated for each tertile. We performed Cox-proportional hazards regression to adjust for factors that were significantly different among tertiles on univariate analyses (PCa grade group at diagnosis, race, institution). Analyses performed in STATA.

Results: Median age was 63 years (IQR 57-67). Median PSA at diagnosis was 7.0 (IQR 4.9-13.2). Mean time from biopsy to RP was 77±10.6 days. Mean follow up was 32 months (IQR 13-57). 483 (34%) patients experienced BCR. 93 (7%) developed metastasis. 20 (1.4%) died from PCa. 251 patients (18%) received adjuvant ADT and 306 (22%) underwent radiotherapy. K-M estimates of BCR (p=0.64), time to metastasis (p=0.28), PCSM (p=0.11), and ACM (p=0.23) did not significantly differ between tertiles. Cox-proportional hazards regression for BCR, time to metastasis, PCSM and ACM also did not significantly differ between tertiles for VHR patients (Table 1).

Conclusion: In this cohort of patients with high or very high risk prostate cancer, two thirds of whom underwent radical prostatectomy within 12 weeks of diagnostic biopsy, time from diagnosis to radical prostatectomy did not appear to significantly contribute to differences in clinical outcome.

| Table 1 Risk of adverse clinical outcome (BCR, Metastasis, PCSM, ACM) according to tertile of time to treatment |
|---------------------------------------------------------------|-------------|----------|----------|----------|----------|
| Time from biopsy to prostatectomy                              | Tertile 1   | Tertile 2 | Tertile 3 |
| Risk of event                                                 | reference   | HR (95% CI) | P value  | HR (95% CI) | P value  |
| BCR                                                           | 1           | 1.01 (0.8-1.4) | 0.9       | 0.82 (0.6-1.1) | 0.2       |
| Metastasis                                                    | 1           | 0.65 (0.3-1.3) | 0.2       | 0.81 (0.4-1.5) | 0.5       |
| PCSM                                                          | 1           | 0.60 (0.2-2.2) | 0.5       | 0.51 (0.2-1.6) | 0.3       |
| ACM                                                           | 1           | 0.65 (0.3-1.2) | 0.2       | 0.81 (0.4-1.5) | 0.5       |
Introduction: Intraoperative frozen pathology margin assessment during nerve sparing radical prostatectomy has previously been shown to increase nerve sparing and decrease positive surgical margins. With the introduction of robotic prostatectomy, timely intraoperative specimen extraction became technically challenging. Using the GelPOINT Mini (Applied Medical, CA, USA) for intraoperative specimen extraction, we aim to evaluate pathological margins, nerve sparing, and operative time during robotic radical prostatectomy.

Methods: Patients undergoing robotic radical prostatectomy with preoperative concern for extracapsular extension (ECE) based on transrectal ultrasound or MRI were included. Intraoperative whole prostate specimen extraction was done via the GelPOINT Mini placed at start of surgery using the open Hasson technique. Areas concerning for ECE based on pre-operative imaging were inked for frozen pathology. If frozen sections revealed positive or close (< 0.2 mm) margins, additional tissue was taken. We assessed margin status, nerve sparing, and operative time.

Results: In 47 patients, the median age was 60 (IQR 55-72) years, PSA 6.6 (IQR 4.8-10.1) ng/mL, prostate volume 29 (IQR 24-38) cc, and sexual health in men score 23 (IQR 15-25). Twenty-nine (62%) men had Gleason ≥4+3 on biopsy, 27 (57%) had ≥cT3a. The mean operative time was 226 minutes (p = 0.81, compared to our historical average). Fifty-nine unique sites were assessed with frozen pathology: 25% were positive for carcinoma at ink, 10% close, 2% benign glands, and 63% negative (Figure). Additional tissue taken contained carcinoma in 13% of initially positive sites and 17% of initially close sites (Figure). Of 50 posterior-lateral sites with frozen margin assessment, 36% had complete nerve sparing and 46% had partial nerve sparing. On final pathology, 57% of patients had ≥pT3a disease. No complications occurred using the GelPOINT Mini.

Conclusion: Intraoperative frozen pathology margin assessment during robotic radical prostatectomy using the GelPOINT Mini for specimen extraction maximizes nerve sparing while reducing positive margins in men at high risk for ECE.
Poster #112

SHOULD PATIENTS WITH NEGATIVE MULTI-PARAMETRIC MRI AVOID PROSTATE BIOPSY?

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Presented By: Masakatsu Oishi

Introduction: To evaluate detection rate and predictors of clinically significant prostate cancer (CSPCa) in patients with negative multi-parametric magnetic resonance imaging (mpMRI) prior to prostate biopsy (PBx).

Methods: We identified patients from our institutional board-approved database of 1500 patients. Inclusion criteria was negative mpMRI (3T; DWI, T2W, DCE), performed at our institution, prior to 12-core systematic PBx. Exclusion criteria was prior treatment for PCa and mpMRI performed elsewhere. Negative mpMRI was defined as Prostate Imaging-Reporting and Data System version 2 (PIRADS) score < 3. CSPCa was defined as Gleason score > 6 on PBx. mpMRIs and PBx were reviewed by experienced uroradiologist and uropathologist, respectively. Statistical analyses were performed using EZR software (graphical user interface for R). Mann-Whitney test was performed for continuous variables, Fisher’s exact test for categorical variables. Logistic regression analysis was applied for predicting CSPCa (p<0.05 significant).

Results: A total of 135 patients met inclusion/exclusion criteria. The median (IQR) age, PSA, prostate volume and PSA density (PSAD) were: 64 years (58-69), 5.9ng/mL (4.1-8.0), 55cc (38-79), and 0.1 ng/ml/cc (0.07-0.15), respectively. Of the patients, 48 (36%) were PBx-naive, 60 (44%) had previous negative PBx, and 27 (20%) had previous positive PBx, of those, 20 (15%) patients were on active surveillance. The PCa (any Gleason) and CSPCa detection rate were 37.8% (51/135) and 17.0% (24/135), corresponding to a negative predictive value (NPV) of 62.2% and 83%, respectively. Patients detected with CSPCa (N=24) had smaller prostate (p=0.00036), higher PSAD (p<0.0001) and previous positive PBx (p=0.025) when compared to non-CSPCa group (N=111). Multivariable analyses showed PSAD > 0.15ng/ml/cc as an independent predictor for detection of CSPCa (p<0.01).

Conclusion: Patients with high PSA density should consider prostate biopsy even if mpMRI is negative. Prostate cancer, Gleason > 7, can be detected in 17% of the patients with negative mpMRI undergoing systematic 12-core biopsy. PSA density > 0.15 ng/ml/cc is an independent predictor of CSPCa on biopsy. The NPV of mpMRI for clinically significant prostate cancer is 83%.
Poster #113
USING PSA DENSITY, ULTRASOUND STAGING, MRI, AND KALLIKREIN PANEL TO IMPROVE DETECTION OF HIGH- GRADE PROSTATE CANCER
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Presented By: Adam J. Gadzinski, MD, MS

Introduction: There are limitations in the accuracy of prostate specific antigen (PSA) testing for early detection of clinically significant prostate cancer. We aim to evaluate the value of multiparametric MRI (mpMRI), Kallikrein panel (4Kscore, OPKO Health, New Jersey, USA), and transrectal ultrasound (TRUS) alone, and in combination to predict high-grade prostate cancer (HG PCa) in men with PSA ≥ 3 ng/ml.

Methods: We retrospectively reviewed 188 participants referred for biopsy with a PSA ≥ 3 ng/ml. 69 men underwent 4Kscore analysis and mpMRI with subsequent TRUS biopsy and concurrent mpMRI fusion biopsy for lesions with PI-RADS ≥3. We defined our main outcome of HG PCa as Gleason Score ≥ 3+4 on biopsy pathology. We compared predictive capabilities of PSA alone (reference model) to a model where we added TRUS stage, PSA density (PSAD), mpMRI PI-RADS score, and 4Kscore using logistic regression models and the area under Receiver Operating Characteristic (ROC) curve (AUC).

Results: The median age was 67 (IQR 63-71), median 4Kscore and PSAD were 16% (IQR 5-32%), and 0.13 (IQR 0.10-0.20) respectively. HG PCa was detected in 30 (44%), whereas 7 (10%) had 3+3 and 32 (46%) had negative biopsy. In the multivariate model adjusted for PSA, TRUS stage ≥ cT2, PSA density (PSAD), mpMRI PI-RADS 4/5, and 4Kscore ≥7%, both PSAD (OR: 7.81, 95% CI: 1.59-38.27, p=0.011) and 4Kscore ≥7% (OR: 6.66, 95% CI: 1.08-41.00, p=0.041) were significantly associated with HG PCa. The AUC for the reference model was 0.494. Adding TRUS stage, PSA, 4Kscore, and mpMRI PI-RADS to the model increased the discriminatory detection of HG PCa to an AUC of 0.894 (95% CI: 0.815-0.973) (Figure).

Conclusion: In men with PSA ≥ 3 ng/ml, the addition of 4Kscore, mpMRI, PSAD, and TRUS stage improved accuracy of detecting HG PCa and may offer a more personalized approach to biopsy.
Poster #114
THE IMPACT OF BLEOMYCIN ON PULMONARY AND OPERATIVE MORBIDITY AFTER POST-CHEMOTHERAPY RETROPERITONEAL NODE DISSECTION IN GOOD RISK GERM CELL TUMORS

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Presented By: Adam C. Calaway, MD

Introduction: Three cycles of bleomycin, etoposide and cisplatin (BEPx3) or four cycles of etoposide and cisplatin (EPx4) are induction chemotherapy regimens for men with International Germ Cell Cancer Collaborative Group (IGCCCG) good risk metastatic disease. We sought to determine if bleomycin impacted pulmonary and operative morbidity after post-chemotherapy retroperitoneal lymph node dissection (PCRPLND) in IGCCCG good risk disease.

Methods: Our database was queried to identify IGCCCG good risk patients who received BEPx3 or EPx4 induction chemotherapy prior to PCRPLND from 2006-2016. Patients with combination of BEP and EP regimens were excluded. The primary outcomes of interest were pulmonary morbidity (prolonged intubation, reintubation, supplemental oxygen use and intensive care unit (ICU) stay) and operative morbidity (Operative Time, Length of Stay (LOS), concomitant procedures, and Estimated Blood Loss (EBL)).

Results: A total of 238 patients were analyzed. One hundred ninety-two received BEPx3 and 46 received EPx4. Baseline demographics, tumor and operative characteristics are shown in Table 1. All patients were extubated before leaving the operating room. No patient was re-intubated or discharged on oxygen. Five required ICU stay for non-pulmonary reasons (2 BEP vs 3 EP). Patients treated with EPx4 used supplemental oxygen longer than those treated with BEPx3 (1.61 days vs 0.98, p=0.005). There were no significant differences in preoperative mass size between groups, (p=0.73). Operative time was significantly shorter in patients treated with BEPx3 than EPx4 (131 mins vs 172 mins, p<0.01) as was EBL (194 cc vs 243 cc, p<0.01). Concomitant surgeries at time of PCRPLND were similar between groups (p=0.4). LOS was shorter in patients treated with BEPx3 (3.3 days vs 3.9, p<0.01).

Conclusion: Bleomycin does not seem to increase pulmonary morbidity after PCRPLND in patients with IGCCCG good risk metastatic testis cancer. Operative morbidity was less in men treated with BEPx3 despite similar numbers of concomitant procedures. Using a modern surgical cohort, bleomycin does not appear to significantly impact perioperative outcomes in this cohort.

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TESTICULAR CANCER AND SURVEILLANCE: IMPACT ON PATIENT ANXIETY OVER TIME, THE PRINCESS MARGARET CANCER CENTRE EXPERIENCE

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Presented By: Viranda H. Jayalath, MSc

Introduction: Surveillance has become a standard of care for stage 1 testicular cancer. Despite this shift in management, little is known about its effects on anxiety and mental health. With some centers advocating adjuvant therapy for higher risk stage I disease, partially on the basis of patient anxiety, a better understanding of patients' response to surveillance is required.

Methods: The Princess Margaret Cancer Centre (PMCC) institutional cohort of testicular cancer patients was queried for all patients who were initiated on surveillance. From 2014-2017, all patients were asked to complete a comprehensive questionnaire, including the Edmonton Symptom Assessment System (ESAS), which is scored from 0 [no anxiety] to 10 [worst possible anxiety]. Patients with a score ≥ 3 are prompted to complete a Generalized Anxiety Disorder 7 survey (GAD7), scored from 0 – 21, and correlates to mild (5), moderate (10), and severe anxiety (15+). We utilized descriptive statistics for temporal trends (median and interquartile ranges) and box plots for graphical representation.

Results: Of 805 patients who completed at least one survey, 349 patients were initiated and maintained on surveillance at PMCC. Of these, 101 had non-seminomatous germ cell tumors (NSGCT) and 245 had seminoma. Patients completed between 1-18 surveys during follow-up (median 2, mean 3.4). On the first survey, there was a 100% response rate for ESAS, and 25.1% were prompted and completed GAD7 surveys; response rates diminished over time. ESAS-anxiety and GAD7 scores for all responders were stratified by time from initial PMCC consultation. Patients had consistently mild anxiety during the follow-up period, regardless of metric. ESAS-anxiety demonstrated median scores 0-1 for 10+ years of follow-up, while Figure 1 highlights the GAD7 scores. Subset analysis of 82 patients who had a minimum of 2 responses within 6 months of orchiectomy demonstrated similar findings.

Conclusion: Patients on surveillance for testicular cancer have stable mild anxiety during long-term follow-up. Intervention based on concern for patient anxiety for higher-risk stage 1 testicular cancer may not be justified. Further study into this patient population is warranted.
Poster Session II & Reception
Thursday, November 30, 2017
4:50 p.m. – 6:20 p.m.
Poster Walks
Grand Ballroom
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Poster #117
INACCURACY OF CLINICAL STAGING AFTER NEOADJUVANT CHEMOTHERAPY FOR MUSCLE INVASIVE BLADDER CANCER
Alexa Meyer, MD; Aaron Brant¹; Paige Nichols¹; Max Kates, MD²; Noah Hahn, MD³; Mark Schoenberg, MD⁴ and Trinity Bivalacqua, MD⁵
¹Johns Hopkins Hospital, Baltimore, MD; ²Brady Urological Institute, Johns Hopkins Hospital, Baltimore, MD; ³Department of Oncology, Johns Hopkins Hospital, Baltimore, MD; ⁴Department of Urology, Montefiore, Bronx, NY
Presented By: Alexa Meyer, MD

Poster #118
DEFINING THE DNA DAMAGE REPAIR (DDR) GENOMIC LANDSCAPE OF UROTHELIAL CARCINOMA OF THE BLADDER (UCB)
Shawn Dason, MD; Victor McPherson, MD; Min Yuen Teo, MD; Sumit Isharwal, MBBS; Francois Audenet, MD; Aditya Bagrodia, MD; Eugene Cha, MD; Michael Berger, PhD; Ahmet Zehir, PhD; Nikolaus Schulz, PhD; Dean Bajorin, MD; Jonathan Rosenberg, MD; Hikmat Al-Ahmadie, MD; Bernard Bochner, MD; Eugene Pietzak, MD; David Solit, MD and Gopa Iyer, MD
Memorial Sloan Kettering Cancer Center, New York, NY
Presented By: Shawn Dason, MD, FRCSC

Poster #119
A QUALITY IMPROVEMENT INITIATIVE ADVANCING CARE PRACTICES FOR PATIENTS WITH MUSCLE-INVASIVE BLADDER CANCER
Matthew I. Milowsky, MD¹; Joshua Meeks, MD, PhD²; Thomas Lad, MD³; Sarah Psutka, MD, MSc⁴,⁵; David Chu, MD⁶; Maury Jayson, MD, FACS, CPI⁷; Kristina Fajardo, MS⁸; James Mateka, MS⁹; Jeffrey D. Carter, PhD⁺; Tamar Sapir, PhD¹⁰ and Daniel P. Petrylak, MD¹¹
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Presented By: Matthew I. Milowsky, MD

Poster #120
APPLICATION-BASED PERIOPERATIVE MANAGEMENT OF THE RADICAL CYSTECTOMY PATIENT
Meredith Metcalf, MD; Katie Glavin; Vassili Glazyrine; Lauren Hand, RDN, LD; Misty Bechtel; David Bishop, MD; Martin DeRuyter, MD; Jill Hamilton-Reeves, PhD, RD, CSO; Jeffrey Holzbeierlein, MD and Eugene Lee, MD
University of Kansas, Kansas City, Kansas
Presented By: Meredith Metcalf, MD

Poster #121
THE IMPACT OF PREOPERATIVE FRAILTY ON OVERALL SURVIVAL: A PROSPECTIVE STUDY OF PATIENTS UNDERGOING RADICAL CYSTECTOMY
Jeremy West, MD; Conrad Tobert, MD; Nathan Brooks, MD; Lewis Thomas, MD; Anthony Oberle, MD; Laura Quast, BS; Sara Bell, MS; Michael O’Donnell, MD and Kenneth Nepple, MD
University of Iowa Hospitals and Clinics, Department of Urology, Iowa City, IA
Presented By: Jeremy M. West, MD
Poster #122
PAPILLARY UROTHELIAL NEOPLASIA OF LOW MALIGNANT POTENTIAL (PUNLMP): RECURRENCE RATES FROM 2 RECENT PROSPECTIVE LARGE CLINICAL TRIALS WITH CENTRALIZED PATHOLOGY
Neal Shore, MD¹; Anne Simoneau, MD²; Larry Karsh, MD³; David Bostwick, MD⁴; Mark Soloway, MD⁵; Sharon Leu, PhD⁶ and Gajanan Bhat, PhD⁶
¹Carolina Urologic Research Center, Myrtle Beach, SC; ²Spectrum Pharmaceuticals; ³The Urology Center of Colorado, Denver, CO; ⁴Bostwick Laboratories, VA; ⁵Memorial Healthcare System, Aventura, FL; ⁶Spectrum Pharmaceuticals, Irvine, CA
Presented By: Neal D. Shore, MD, FACS

Poster #123
NEOADJUVANT VERSUS ADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER: A PROPENSITY MATCHED ANALYSIS
Joshua Jue, BS; Maria Velásquez, MD; Luís Sávio, MD; Mahmoud Alameddine, MD; Tulay Koru-Sengul, PhD, MHS; Feng Miao, MS; Chad Ritch, MD, MBA and Mark Gonzalgo, MD, PhD
Miami, FL
Presented By: Joshua S. Jue

Poster #124
A SIMPLER NEOBLADDER USING A PORCINE MODEL: THE DOUBLE LIMB U-POUCH
Ryan Werntz; Poone Shoureshi, MD; Kyle Gillis, MD; David Jiang, MD; Chris Amling, MD and John Barry, MD
OHSU
Presented By: Ryan P. Werntz, MD

Poster #125
SURGICAL APPROACH AS A DETERMINANT FACTOR OF CLINICAL OUTCOME FOLLOWING RADICAL CYSTECTOMY. DOES ENHANCED RECOVERY AFTER SURGERY (ERAS) LEVEL THE PLAYING FIELD?
Jian Chen, MD; Hooman Djaladat, MD; Anne Schuckman, MD; Gus Miranda; Jie Cai and Sia Daneshmand, MD
Catherine & Joseph Aresty Department of Urology, University of Southern California Institute of Urology, Los Angeles, California
Presented By: Jian Chen, MD

Poster #126
APPLICATION OF A NOVEL REGRESSION ALGORITHM TO PREDICT DRUG SENSITIVITY IN BLADDER CANCER CELL LINES USING GENE EXPRESSION MICROARRAY DATA
Thomas Sanford, MD; Reema Railkar, PhD and Piyush Agarwal, MD
NCI, Bethesda, MD
Presented By: Thomas Sanford, MD

Poster #127
DEVELOPING A PATIENT-CENTERED HEALTH INFORMATION SELF-EDUCATION (HISE) TOOL TO SUPPORT RECOVERY AFTER CYSTECTOMY AND URINARY DIVERSION
Charles Peyton, MD¹; Carmit McMullen, PhD²; Alison Firemark, MA, LPC²; Matthew Nielsen, MD³ and Scott Gilbert, MD¹
¹Moffitt Cancer Center, Tampa, FL; ²Kaiser Permanente Northwest, Portland, OR; ³University of North Carolina, Chapel Hill, NC
Presented By: Charles Peyton, MD

Poster #128
IMPACT OF VARIANT HISTOLOGY ON RESPONSE TO NEOADJUVANT CHEMOTHERAPY FOR BLADDER CANCER
Michael Lin-Brande, BS¹; Daniel Zainfeld¹; Saum Ghodoussipour¹; Jie Cai¹; Gus Miranda¹; Hooman Djaladat¹; Anne Schuckman¹; Sarmad Sadeghi²; Tanya Dorff²; David Quinn² and Siamak Daneshmand¹
¹USC Institute of Urology, USC/Noirs Comprehensive Cancer Center, Los Angeles, CA; ²USC Internal Medicine Division of Oncology, Norris Comprehensive Cancer Center, Los Angeles, CA
Presented By: Michael Lin-Brande, BS
Poster #129
NEOADJUVANT CHEMOTHERAPY WITH DOSE DENSE MVAC IS ASSOCIATED WITH HIGHER DOWN STAGING AND PATHOLOGIC T0 RATES AFTER RADICAL CYSTECTOMY
Dominic Tang, MD¹; Charles Peyton, MD¹; Juan Chipollini, MD¹; Richard Reich, MD¹; Wade Sexton, MD¹; Michael Poch, MD²; Philippe Spiess, MD¹; Jingsong Zhang, MD¹ and Scott Gilbert, MD¹
¹Moffitt Cancer Center; ²Moffitt Cancer Center
Presented By: Dominic Tang, MD

Poster #130
ONCOLOGIC OUTCOMES FROM A RANDOMIZED CONTROLLED TRIAL COMPARING OPEN AND ROBOT-ASSISTED LAPAROSCOPIC RADICAL CYSTECTOMY FOR BLADDER CANCER
Karim Marzouk, MD, FRCSC¹; Bernard Bochner, MD, FACS¹; Guido Dalbagni, MD¹; Daniel Sjoberg, MS²; Justin Lee, MD, FRCSC¹; S. Machele Donat, MD, FACS³; Jonathan Coleman, MD¹; Andrew Vickers, PhD²; Raul Parra, MD¹; Harry Herr, MD, FACS¹ and Vincent Laudone, MD¹
¹Memorial Sloan Kettering Cancer Center, Department of Surgery, Division of Urology, New York, NY; ²Memorial Sloan Kettering Cancer Center, Department of Epidemiology & Biostatistics, New York, NY
Presented By: Karim Marzouk, MD

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WITHDRAWN

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BLUE LIGHT IN COMBINATION WITH HEAMINOLEVULINATE (CYSVIEW®) LEADS TO BLADDER CANCER CELL DEATH IN AN IN VITRO MODEL
Justin Matulay, MD¹; Alanna Williams, BA²; Mark Silva, MD¹; Suk Lee, PhD²; James McKiernan, MD¹ and Michael Shen, PhD²
¹Columbia University Medical Center, Department of Urology, New York, NY, USA; ²Columbia University Medical Center, Herbert Irving Comprehensive Cancer Center, New York, NY, USA
Presented By: Justin T. Matulay, MD

Poster #133
HOSPITAL READMISSIONS AFTER RADICAL CYSTECTOMY: THE IMPACT OF AN ENHANCED RECOVERY PATHWAY
Abhinav Khanna, MD, MPH; Anna Zampini, MD, MBA; Kyle Ericson, MD; Michele Fascelli, MD; Prithvi Murthy, MD; Alice Crane, MD PhD; Byron Lee, MD, PhD and Georges Pascal Haber, MD, PhD
Cleveland Clinic
Presented By: Abhinav Khanna, MD

Poster #134
EXTERNAL VALIDATION OF EORTC BLADDER CANCER RISK CALCULATOR IN A CONTEMPORARY US POPULATION
Tullika Garg, MD, MPH¹; Carmit McMullen, PhD²; Michael Leo, PhD²; Maureen O’Keefe-Rosetti, PhD²; Sheila Weinmann, PhD²; Matthew Wagner, MD³ and Matthew Nielsen, MD, MS³
¹Geisinger Health System, Danville, PA; ²Kaiser Permanente Northwest, Portland, OR; ³UNC Lineberger Cancer Center, Chapel Hill, NC
Presented By: Tullika Garg, MD, MPH

Poster #135
CHEMOTHERAPY PRIOR TO RADICAL NEPHROURETERECTOMY IN PATIENTS WITH ADVANCED UPPER TRACT UROTHELIAL CARCINOMA
Tanner Miest, MD, PhD; Amir Toussi, MD; Stephen Boorjian, MD; Houston Thompson, MD; Brian Costello, MD; Bradley Leibovich, MD and Matthew Tollefson, MD
Department of Urology, Mayo Clinic, Rochester, MN
Presented By: Tanner Miest, MD, PhD
Poster #136
COMPARATIVE EFFECTIVENESS OF TREATMENT STRATEGIES FOR SQUAMOUS CELL CARCINOMA OF THE BLADDER
Kristian Stensland, MD, MPH¹; Jared Schober, MD¹; Harras Zaid, MD¹; David Canes, MD¹; Matt Galsky, MD² and Alireza Moinzadeh, MD¹
¹Lahey Hospital and Medical Center; ²Icahn School of Medicine at Mount Sinai
Presented By: Kristian D. Stensland, MD, MPH

Poster #137
INTEGRIN SIGNALING MODULATION DEMONSTRATES POTENTIAL THERAPEUTIC STRATEGY IN BLADDER CANCER USING THREE-DIMENSIONAL ORGANOID CULTURE AND CRISPR/CAS9 MODIFIED XENOGRAFTS
LaMont Barlow, MD; Kevin Newhall, BS; Rebecca Meyer, BS; David Chen, BS; Francesca Khani, MD; Douglas Scherr MD; Christopher Barbieri, MD, PhD; Bishoy Faltas, MD and Mark Rubin, MD
Weill Cornell Medical College, New York, NY
Presented By: LaMont J. Barlow, MD

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A NATIONWIDE ANALYSIS OF COMPLETE URINARY TRACT EXTRIPATION
Jacob Jipp, MD¹; Zachary Smith, MD²; Peter Langenstroer, MD¹; Kenneth Jacobsohn, MD¹ and Scott Johnson, MD²
¹Medical College of Wisconsin, Milwaukee, Wisconsin; ²University of Chicago, Chicago, Illinois; ³Medical College of Wisconsin, Milwaukee, Wisconsin
Presented By: Jacob Jipp, MD

Poster #139
COST EFFECTIVE ANALYSIS OF NEOADJUVANT CHEMOTHERAPY PRIOR TO RADICAL CYSTECTOMY IN T2 BLADDER CANCER
Zachary Hamilton, MD¹; Unwanaobong Nseyo, MD²; Katherine Fero, MD²; James Murphy, MD² and A. Karim Kader, MD, PhD²
¹Saint Louis University, MO; ²University of California, San Diego
Presented By: Zachary A. Hamilton, MD

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UPREGULATION OF PD-L1 TRANSCRIPTION IN BLADDER CANCER BY INTERFERON GAMMA AND TUMOR NECROSIS ALPHA IS REGULATED BY A NOVEL INTRONIC ENHANCER ELEMENT
William Tabayoyong, MD, PhD; Jinesh Goodwin, PhD and Ashish Kamat, MD
University of Texas MD Anderson Cancer Center, Houston, TX
Presented By: William Tabayoyong, MD, PhD

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UNDERUTILIZATION OF PELVIC LYMPH NODE DISSECTION DURING PARTIAL CYSTECTOMY FOR BLADDER CANCER: OPPORTUNITY FOR IMPROVEMENT
Vidit Sharma, MD; Mary E Westerman, MD; Stephen A Boorjian, MD; R. Houston Thompson, MD; R. Jeffrey Karnes, MD, Igor Frank, MD and Matthew K Tollefsen, MD
Mayo Clinic, Rochester, MN
Presented By: Vidit Sharma, MD

Poster #142
CANCER CARE DISPARITY IN RENAL CELL CARCINOMA AMONG HISPANICS IN SOUTH TEXAS REGION
Dharam Kaushik, MD¹; Joel Michalek, PhD²; Alex Bokov, PhD²; Wasim Chowdhury, MS²; Yidong Chen, PhD²; Jonathan Gelfond, MD, PhD²; Desiree Wilson, PhD²; Qiangian Liu, PhD²; Dorothy Long Parma, PhD²; Edgar Munoz, PhD²; Hanzhang Wang, MS²; Justin Guerrera, PhD²; Amelie Ramirez, PhD² and Ronald Rodriguez, MD, PhD²
¹University of Texas Health, San Antonio, Texas, USA; ²TexasPresented By: Dharam Kaushik, MD

Poster #143
UTILIZATION OF BCG FOR NON-MUSCLE INVASIVE BLADDER CANCER IN AN ERA OF BCG SUPPLY SHORTAGES
Abhinav Khanna, MD, MPH¹; Nitin Yerram, MD¹; Hui Zhu, MD, PhD²; Simon Kim, MD, MPH² and Robert Abouassaly, MD, MSc²
¹Cleveland Clinic; ²Cleveland Clinic and Louis Stokes VA Medical Center; ³University Hospital Medical Center
Presented By: Abhinav Khanna, MD, MPH
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ASSOCIATIONS OF SPECIFIC POSTOPERATIVE COMPLICATIONS WITH COSTS AFTER RADICAL CYSTECTOMY
Matthew Mossanen, MD¹; Ross Krasnow, MD, MS²; Stuart Lipsitz, ScD²; Mark Preston, MD, MPH³; Adam Kibel, MD⁴; Albert Ha, MD⁵; John Gore, MD, MS⁶; Angela Smith, MD, MS⁷; Jeffrey Leow, MD⁸; Quoc Trinh, MD⁹ and Steven Chang, MD, MS¹⁰
¹Boston, MA; ²Boston; ³Seattle; ⁴Chapel Hill
Presented By: Matthew Mossanen, MD

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HOSPITAL VOLUME AND SHORT-TERM OUTCOMES AFTER CYTOREDUCTIVE NEPHRECTOMY
Leilei Xia, MD¹; Jose Pulido, MD¹; Benjamin Taylor, MD² and Thomas Guzzo, MD, MPH¹
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Presented By: Leilei Xia, MD

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IDENTIFYING THE RATE AND RISKS OF CHRONIC KIDNEY DISEASE DEVELOPMENT AFTER CYTOREDUCTIVE NEPHRECTOMY
Christopher Martin, BS¹; Eric Mayer, MD²; Robert Uzzo, MD³; Brian Lane, MD, PHD⁴; Alexander Kutikov, MD⁵; Marc Smaldone, MD⁶; Jason Gee, MD⁶; Larry Karsh, MD⁶; Thomas Gardner, MD⁶; Viraj Master, MD⁶; William Huang, MD⁶; Jeffrey Holzbeierlein, MD⁷; Neal Shore, MD¹⁰ and William Lowrance, MD, MPH¹¹
¹Division of Urology, Department of Surgery, University of Utah, Salt Lake City, UT; ²David Geffen School of Medicine at UCLA, Los Angeles, CA; ³Fox Chase Cancer Center, Philadelphia, PA; ⁴Spectrum Health Urology Group, Grand Rapids, MI; ⁵Lahey Clinic, Burlington, MA; ⁶The Urology center of Colorado, Denver, CO; ⁷Indiana University, Indianapolis, IN; ⁸Emory University, Atlanta, GA; ⁹New York University Medical Center, New York, NY; ¹⁰Kansas University Medical Center, Kansas City, KS; ¹¹Carolina Urologic Research Center, Mt Pleasant, SC; ¹²Huntsman Cancer Institute, Salt Lake City, UT
Presented By: Christopher Martin, BS

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CYTOREDUCTIVE NEPHRECTOMY IN PATIENTS WITH METASTATIC RENAL CELL CARCINOMA AND TUMOR THROMBUS – TRENDS AND EFFECT ON OVERALL SURVIVAL
Andrew Lenis, MD, MS¹; Claire Burton, MD¹; Izak Faiena, MD¹; Amirali Salmasi, MD¹; Aydin Pooli, MD¹; David Johnson, MD¹; Amanda Drakaki, MD, PhD¹; Kiran Gollapudi, MD¹; Jeremy Blumberg, MD²; Allan Pantuck, MD, MS¹ and Karim Chamie, MD, MSHS¹
¹Department of Urology, UCLA, Los Angeles, California; ²Division of Urology, Harbor UCLA, Torrance, California
Presented By: Andrew Thomas Lenis, MD, MS

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IMPACT OF PREOPERATIVE COMORBIDITIES ON FUNCTIONAL RECOVERY FROM PARTIAL NEPHRECTOMY
Sudhir Isharwal, MBBS¹; Wenda Ye, BS²; Alice Wang, MD³; Joseph Abraham, MD²; Joseph Zabell, MD²; Wen Dong, MD²; Jitao Wu, MD²; Chalairat Suk-Ouiichai, MD²; Elvis Carabello, MD²; Tianming Gao, PhD² and Steven Campbell, MD²
¹Cleveland Clinic; ²Cleveland Clinic, Cleveland; ³Vanderbilt University
Presented By: Sudhir Isharwal, MBBS

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RENAL MEDULLARY CARCINOMA AND COLLECTING DUCT CARCINOMA OF THE KIDNEY: CLINICOPATHOLOGICAL AND SURVIVAL ANALYSIS FROM THE NATIONAL CANCER DATABASE
Alp Tuna Bek sac, MD¹; David Paulucci, MS²; Harry Anastos, MD²; Kyle Blum, MD²; John Sfakianos, MD² and Ketan Badani, MD²
¹Icahn School of Medicine at Mount Sinai, New York City, NY; ²Icahn School of Medicine at Mount Sinai, New York, NY
Presented By: Alp Tuna Bek sac, MD

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MULTIMODAL TREATMENT WITH CHEMOTHERAPY AND RADICAL NEPHROURETERECTOMY MAY IMPROVE OVERALL SURVIVAL IN PATIENTS WITH CLINICALLY POSITIVE LYMPH NODE DISEASE
Harry Anastos, MD¹; David Paulucci, MS²; Alp Tuna Bek sac, MD²; Greg Gin, MD²; Matthew Galsky, MD²; Ketan Badani, MD² and John Sfakianos, MD²
¹Icahn School of Medicine at Mount Sinai, New York City, NY; ²Icahn School of Medicine at Mount Sinai, New York, NY; ³VA Long Beach Healthcare System, Long Beach, CA
Presented By: Harry Anastos, MD
Poster #151
SAFE AND EFFECTIVE PARTIAL NEPHRECTOMY IS FEASIBLE IN APPROPRIATELY SELECTED PATIENTS WITH COMPLEX (RENAL NEPHROMETRY SCORE 10-12) RENAL TUMORS: A MULTI-INSTITUTIONAL ANALYSIS
Benjamin Ristau, MD, MHA¹; Zachary Hamilton, MD²; Lyudmila DeMora, MS³; Charles Field, BS⁴; Aaron Bloch, BS⁴; Sean Berquist, BS⁴; Richard Greenberg, MD⁴; Rosalia Viterbo, MD⁴; David Chen, MD⁴; Marc Smaldone, MD, MSHP⁴; Alexander Kutikov, MD⁵; Brian Lane, MD, PhD⁶; Ithaar Derweesh, MD² and Robert Uzzo, MD⁷
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Presented By: Benjamin T. Ristau, MD, MHA

Poster #152
DETERMINANTS OF ACTIVE SURVEILLANCE IN PATIENTS WITH SMALL RENAL MASSES
Kevin Nguyen, MS; Adam Nolte, BSE; Walter Hsiang, BS; Jamil Syed, MD; Amanda Lu, BA; Kamyar Ghabili, MD; Brian Shuch, MD and Michael Leapman, MD
Yale School of Medicine, Department of Urology, New Haven, CT
Presented By: Kevin Anh Nguyen, MS

Poster #153
PERIOPERATIVE OUTCOMES OF ASPIRIN USE IN PARTIAL NEPHRECTOMY
Matthew Ingham, MD; Ross Krasnow, MD; Matthew Mossanen, MD; Ye Wang, PhD and Steven Chang, MD, MS Division of Urology, Brigham and Women’s Hospital, Boston, MA
Presented By: Matthew D. Ingham, MD

Poster #154
U-SMART: (UCSD-SMALL MASS ALT RENAL SCORE TUMOR DIAMETER) A NOVEL SCORING SYSTEM OF PREOPERATIVE PREDICTORS TO STRATIFY ONCOLOGIC RISK OF SMALL RENAL MASS
Kendrick Yim, BS; Ahmet Bindayi, MD; Stephen Ryan, MD; Fang Wan, MS; Madhumitha Reddy, DO; Ryan Nasseri, BS; Zachary Hamilton, MD and Ithaar Derweesh, MD
University of California, San Diego
Presented By: Kendrick Yim, BS

Poster #155
LYMPHADENECTOMY IN HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER PATIENTS WITH KNOWN PREOPERATIVE NODAL DISEASE: THE NATIONAL CANCER INSTITUTE EXPERIENCE
Patrick Gomella, MD, MPH¹; Spencer Krane, MD²; Mark Ball, MD²; Ram Srinivasan, MD²; Marston Linehan, MD² and Adam Metwalli, MD²
¹Washington DC; ²Urologic Oncology Branch, NCI, Bethesda MD
Presented By: Patrick T. Gomella, MD, MPH

Poster #156
VALIDATION OF THE PREOPERATIVE NOMOGRAM PREDICTING 12-YEAR PROBABILITY OF METASTATIC RENAL CANCER
Mazyar Ghanaat, BS, MD¹; Chian Duzgol, MD²; Kyle Blum, MD³; Mahyar Kashan¹; Alejandro Sanchez, MD¹; Renzo DiNatale, MD¹; Maria Beccara, MD¹; Buddima Ranasinghe, MD¹; Nicole Benfante¹; Jonathan Coleman, MD²; Michael W. Kattan, PhD²; Oguz Akin, MD²; Inna Ostrovnaya, PhD²; Ar. Ari Hakimi, MD¹; and Paul Russo, MD¹
¹Urology Service at the Department of Surgery, Memorial Sloan Kettering Cancer Center, New York, USA.; ²Body Imaging Service, Department of Radiology, Memorial Sloan Kettering Cancer Center, New York, USA.; ³Department of Quantitative Health Sciences, Cleveland Clinic, Cleveland, OH, USA.; ⁴Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, New York, USA.
Presented By: Mazyar Ghanaat, BS, MD

Poster #157
UTILITY OF PREOPERATIVE MRI IN CHARACTERIZING THE PARENCHYMAL-TUMOR INTERFACE OF SMALL RENAL MASSES PRIOR TO SURGICAL INTERVENTION
Shalin Desai, MD¹; Arpeet Shah, MD¹; Marah Hehemann, MD¹; Conner Snarskis MD¹; Gopal Gupta MD¹; and Alex Gorbonos, MD, FACS²
¹Loyola University Medical Center; ²Maywood, IL
Presented By: Alex Gorbonos, MD, FACS
Poster #158

ASSESSMENT OF VOLUME PRESERVATION PERFORMED BEFORE OR AFTER PARTIAL NEPHRECTOMY ACCURATELY PREDICTS POST-OPERATIVE RENAL FUNCTION: RESULTS FROM A PROSPECTIVE MULTICENTER STUDY

Michael Klingler¹; Stephen Babitz²; Alexander Kutikov³; Riccardo Campi⁴; Georgios Hatzichristodoulou⁵; Francesco Sanguedolce⁶; Sabine Brookeman-May⁷; Bulent Akdogan⁸; Umberto Capitanio⁹; Marco Roscigno¹⁰; Alessandro Volpe¹¹; Martin Marszalek¹²; Robert Uzzo¹³; Alessandro Antonelli¹⁴; Hans Langenhuijsen¹⁵; Marco Carini⁴; Andrea Minervini⁴ and Brian Lane, MD, PhD, FACS²
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Presented By: Brian Robert Lane, MD, PhD, FACS

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EVALUATION OF URINARY RENAL BIOMARKERS FOR EARLY PREDICTION OF ACUTE KIDNEY INJURY FOLLOWING PARTIAL NEPHRECTOMY

Brian Lane, MD, PhD, FACS¹; Stephen Babitz²; Katerina Vlasakova³; Allen Wong⁴; Sabrina Noyes³; William Boshoven³; Pam Grady⁵; Cindy Zimmerman⁶; Susan Engerman⁶; Michael Tanen⁶; Warren Glaab⁶ and Frank Sistare⁶
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Presented By: Brian Robert Lane, MD, PhD, FACS

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KEYNOTE-564: PHASE 3, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL OF PEMBROLIZUMAB AS ADJUVANT TREATMENT FOR RENAL CELL CARCINOMA

Tian Zhang, MD; Howard Gurney, MBBS¹; Gurjot Doshi, MD²; Patrick Cobb, MD³; Francis Parnis, MBBS, FRACP⁴; Jae Lyun Lee, MD, PhD⁵; Se Hoon Park, MD⁶; Andrey Semenov, PhD⁷; Yen Hwa Chang, MD, PhD⁸; Thomas Powles, MD⁹; David I. Quinn, MBBS, PhD, FRACP, FAC¹⁰; Shuyan Wan, MD¹¹; Christian Poehlein, MD¹¹ and Toni K. Choueiri, MD¹²
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Presented By: Tian Zhang, MD

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MULTIPLEX PARTIAL NEPHRECTOMY IN A SOLITARY KIDNEY: THE NCI EXPERIENCE WITH PARTIAL NEPHRECTOMY FOR THREE OR MORE TUMORS IN COMPARISON TO STANDARD PARTIAL NEPHRECTOMY IN A SOLITARY KIDNEY

Joseph A. Baiocco, BS; Asha K. Pappajohn; Kareem N. Rayn; Shawna L. Boyle; W. Marston Linehan and Adam R. Metwalli
National Cancer Institute, National Institutes of Health, Bethesda, MD
Presented By: Joseph Andrew Baiocco, BS

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REPEAT MULTIPLEX PARTIAL NEPHRECTOMY IN A SOLITARY KIDNEY: THE NCI EXPERIENCE WITH INITIAL AND REPEAT PARTIAL NEPHRECTOMY FOR THREE OR MORE TUMORS IN PATIENTS WITH A SOLITARY KIDNEY

Joseph A. Baiocco; Asha K. Pappajohn; Kareem N. Rayn; Shawna L. Boyle; W. Marston Linehan and Adam R. Metwalli
National Cancer Institute, National Institutes of Health, Bethesda, MD
Presented By: Joseph Andrew Baiocco, BS
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Alejandro Sanchez, MD¹; Ming Liu, PhD²; Briana Nixon, PhD²; Mazyar Ghanaat, MD³; Kyle Blum, MD³; Renzo Dinatale, MD³; Paul Russo, MD³; Ming Li, PhD² and Ari Hakimi, MD³
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Presented By: Alejandro Sanchez, MD

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EFFECT OF SURGICAL APPROACH ON RECEIPT AND QUALITY OF LYMPH NODE DISSECTION AND SHORT AND LONG TERM SURVIVAL IN UPPER TRACT UROTHELIAL CARCINOMA: RESULTS FROM NATIONAL CANCER DATABASE
Hamed Ahmadi, MD; Ann Martinez, BS; Mark Garzotto, MD; Ryan Kopp, MD; Michael Conlin, MD; Christopher Amling, MD and Jen-Jane Liu, MD
OHSU, Portland, OR
Presented By: Hamed Ahmadi, MD

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ELEVATED NEUTROPHIL/LYMPHOCYTE RATIO IS A NOVEL PREDICTOR OF 30-DAY HIGH-GRADE COMPLICATIONS FOLLOWING RENAL SURGERY
Ryan Nasseri, BSc; Ahmet Bindayi, MD; Kendrick Yim, BS; Stephen Ryan, MD; Madhumitha Reddy, DO; Eric Ballon-Landa, MD, MPH; Fang Wan, MS; James Proudfoot, MS and Ithaar Derweesh, MD
University of California San Diego, La Jolla, California
Presented By: Ryan Isaac Nasseri, BSc

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Zachary Hamilton, MD¹; Alessandro Larcher, MD²; Brian Lanem MD, PhD³; Umberto Capitanio, MD⁴; Sumi Dey, MD⁴; Aaron Bloch, BS⁴; Charles Field, BS⁴; Samer Kirmiz, MD⁴; Daniel Han, MD⁴; Adam Bezique, MD⁴; Sean Berquist, BS⁴; Cristina Carenci⁴; Fang Wan, MS⁴; James Proudfoot, MS⁴; Francesco Montorsi, MD⁴ and Ithaar Derweesh, MD⁴
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Presented By: Zachary A. Hamilton, MD

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SARCOMATOID DIFFERENTIATION IN RENAL CELL CARCINOMA: DOES STAGE MAKE A MEANINGFUL DIFFERENCE ON SURVIVAL?
Kyle A. Blum, MD, MSc¹; Eden Axler²; Renzo G. DiNatale, MD³; Alejandro Sanchez, MD⁴; Nirmal T. John, MD⁴; Mazyar Ghanaat, MD⁴; Mahyar Kashan, BSc⁴; Maria Becerra, MD⁴; Paul Russo, MD⁴; Jonathan A. Coleman, MD⁴; Satish K. Tickoo, MD⁴ and A. Ari Hakimi, MD⁴
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Presented By: Kyle Blum, MD, MSc

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Madhumitha Reddy, DO¹; Umberto Capitanio, MD²; Benoit Peyronnet, MD²; Deepak Pruthi, MD²; Zachary Hamilton, MD²; Stephen Ryan, MD²; Ahmet Bindayi, MD²; Kendrick Yim²; Ryan Nasseri, BS²; Ruchir Gupta, MD²; Samer Kirmiz, MD²; Brian Lane, MD²; Karim Bensalah, MD²; Francesco Montorsi, MD² and Ithaar Derweesh, MD²
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Presented By: Madhumitha C. Reddy, DO
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IMPACT OF PRE-EXISTING DIABETES MELLITUS ON SURVIVAL OUTCOMES IN RENAL CELL CARCINOMA
Stephen Ryan, MD¹; Umberto Capitanio, MD²; Ahmet Bindayi, MD³; Alessandro Larcher, MD⁴; Zachary Hamilton, MD³; Ryan Nasser, MD³; James Proudfoot, MS²; Eric Ballon-Landa, MD⁴; Kendrick Yim, BS²; Madhumitha Reddy, DO⁴; Fang Wan, BS²; Francesco Montorsi, MD² and Ithaar Derweesh, MD³
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Presented By: Stephen T. Ryan, MD

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David Cahn, DO, MBS; Elizabeth Handorf, PhD; Benjamin Ristau, MD, MHA; Daniel Geynisman, MD; Jay Simhan, MD; Alexander Kutikov, MD; Richard Greenberg, MD; Rosalia Viterbo, MD; David Chen, MD; Robert Uzzo, MD and Marc Smaldone, MD, MSHP
Fox Chase Cancer Center, Philadelphia, PA
Presented By: David B. Cahn, DO, MBS

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Mary E. Westerman, MD; Vidit Sharma, MD; Derek J. Gearman, MD; Matthew K. Tollefson, MD; Stephen A. Boorjian, MD; Deborah J. Lightner, MD and R. Jeffrey Karnes, MD
Mayo Clinic Department of Urology, Rochester Minnesota
Presented By: Mary Elizabeth Westerman, MD

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THE ROLE OF INGUINAL LYMPH NODE DISSECTION IN MEN WITH URETHRAL SQUAMOUS CELL CARCINOMA
Ryan Werntz, MD; Richard Fantus; Zachary Smith; Melanie Adamsky; Chris Riedinger and Gary Steinberg
Presented By: Ryan P. Werntz, MD

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Vignesh T. Packiam, MD; Zachary L. Smith, MD; Richard J. Fantus, MD; Christopher B. Riedinger, MD; Ryan Werntz, MD, Andrew J. Cohen, MD; Norm D. Smith, MD and Gary D. Steinberg, MD
University of Chicago Medicine, Chicago, IL
Presented By: Vignesh Packiam, MD

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Andrew Hung, MD¹; Jian Chen, MD¹; Zhengping Che²; Tanachat Nilanon²; Micha Titus, BS¹; Paul Oh, BS¹; Anthony Jarc, PhD²; Inderbir Gill, MD³ and Yan Liu²
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Presented By: Andrew Hung, MD

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Catherine S. Nam, BA; Mehrdad Alemozaifar, MD; Dattatraya Patil, MBBS, MPH and Viraj A Master, MD, PhD
Department of Urology, Emory University, Atlanta, GA
Presented By: Catherine Soorim Nam, BA
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Juan Chipollini, MD, Dominic Tang, MD and Philippe Spiess, MD
Moffitt Cancer Center, Tampa, FL
Presented By: Juan J. Chipollini, MD

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Dominic Tang, MD; Mounsif Azizi, MD; Daniel Verduzco, MD; Juan Chipollini, MD; Braydon Schaible, MD; Jasreman Dhillon, MD and Philippe Spiess, MD
Moffitt Cancer Center
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R. Jeffrey Karnes, MD; Vidit Sharma; Voleak Cheeourung; Hussam Al-Deen Ashab; Nicholas Erho; Mohammed Alshalalfa; Bruce Trock; Ashley Ross; Kasra Yousefi; Harrison Tsai; Shuang G. Zhao; Jeffrey J. Tosoian; Zaid Haddad; Mandep Takhar; S. Laura Chang; Daniel E. Spratt; Firas Abdollah; Robert B. Jenkins; Eric A. Klein; Paul L. Nguyen; Adam P. Dicker; Robert B. Den; Elai Davicioni; Felix Y. Feng; Tamara L. Lotan and Edward M. Schaeffer
Presented By: R. Jeffrey Karnes, MD

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Walter Hsiang, BS; Kamyar Ghabili, MD; Jamil Syed, MD; Kevin Nguyen, MS; Alfredo Suarez-Sarmiento, MD; Michael Leapman, MD and Preston Sprenkle, MD
Yale School of Medicine Department of Urology, New Haven, CT
Presented By: Walter Hsiang, BS

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Raj Bhanvadia, BA¹; Calvin Van Opstall, BS²; Wen Ching Chan, PhD³; Erin McAuley, BS⁴; Gladell Paner, MD⁵ and Donlad Vander Griend, PhD⁶
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Presented By: Raj Ramnik Bhanvadia, BA

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Sanjay Das, BS Biomolecular Science; Simpa S. Salami; Samuel D. Kaffenberger; Amy Gursky; Lindsey Herrel; Tudor Borza; Elena Stoffel; Erin Cobain; Sofia Merajver; Kara Milliron; Alison Mondul; Laura Caba; Leander Van Neste and Todd M. Morgan
University of Michigan: Department of Urology, Ann Arbor MI
Presented By: Sanjay Das, BS
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Johns Hopkins University
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Fuad Elkhoury, MD¹; Edward Chang, MD³; Tonye Jones, MD³; Shyam Natarajan, PhD³; Demetrios Simopoulos, MD³; Devi Sharma, BA³; Daniel Margolis, MD³; Jiaoli Huang, MD³; Frederick Dorey, PhD³ and Leonard Marks, MD³
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Presented By: Fuad F. Elkhoury, MD

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Justin Gregg, MD¹; Johannes Fahrmann, PhD²; Christine Peterson, PhD²; Dilsher Dhillon, MS²; Jody Vykoukal, PhD²; Jennifer Dennison, PhD²; Samir Hanash, MD, PhD²; John Davis, MD²; Jeri Kim, MD² and Timothy Thompson, PhD⁴
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Presented By: Justin R. Gregg, MD

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Alp Tuna Beksac, MD¹; Akriti Gupta, MD²; Shivaram Cumarasamy, MD²; Kanika Mahajan, BDS, MPH²; Sonya Prasad, BA²; Ugo Falagario, MD²; Isuru Jayaratna, MD²; Sara Pasik, BA²; Andrew Charap, BS²; Emma Rosenbluth, BA² and Ash Tewari, MD²
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Presented By: Alp Tuna Beksac, MD

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Alp Tuna Beksac, MD¹; Shivaram Cumarasamy, MD²; Akriti Gupta, MD²; Kanika Mahajan, BDS, MPH²; Ugo Falagario, MD²; Sonya Prasad, BA²; Isuru Jayaratna, MD²; Andrew Charap, BS²; Emma Rosenbluth, BA²; Sara Pasik, BA² and Ash Tewari, MD²
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Presented By: Alp Tuna Beksac, MD

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THE REASURE ME TRIAL: SUPPORTING EMOTION REGULATION, POSITIVE HEALTH BEHAVIORS, AND SURVEILLANCE ADHERENCE FOR MEN WITH PROSTATE CANCER ON ACTIVE SURVEILLANCE
Lindsey Herrel, MD, MS¹; Todd Morgan, MD¹; Bruriah Gutierrez, MA²; Carly Maletich, MA²; Stephahine Schuette, BA²; Alexander Kutikov, MD²; Shilajit Kundu, MD²; Scott Eggener, MD²; Charles Brendler, MD¹; and David Victorson, PhD²
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Presented By: Lindsey Allison Herrel, MD, MS

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Nitin Yerram, BS, MD¹; Shree Agrawal, BS²; Dominic Grimberg, MD³; Karishma Gupta, MD⁴; Yaw Nyame, MD⁵; Daniel Sun, MD⁵; Daniel Greene, MD⁴; Hans Arora, MD⁴; Sudhir Isharwal, MD⁴; Paurush Babbar, MD⁵; Anna Zampini, MD⁴; Andrew Sun, MD⁵; Andrei Purysko, MD⁴; Ryan Berglund, MD⁵; Michael Gong, MD⁴; Andrew J Stephenson, MD⁴ and Eric Klein, MD⁴
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Presented By: Nitin K. Yerram, BS, MD

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TESTOSTERONE RESPONDERS TO CONTINUOUS ANDROGEN DEPRIVATION THERAPY EXHIBIT CONSIDERABLE VARIATIONS IN TESTOSTERONE LEVELS ON FOLLOW-UP: IMPLICATIONS FOR CLINICAL PRACTICE
Rashid Sayyid, MD, MSc¹; Abdallah Sayyid, BSc²; Zachary Klaassen, MD²; Kamel Fadaak, MD²; Thenappan Chandrasekar, MD²; Ardalanejaz Ahmad, MD²; Ricardo Leao, MD²; Nathan Perlis, MD, MSc²; Karen Chadwick, MSc²; Robert Hamilton, MD, MPH²; Girish Kulkami, MD, PhD²; Antonio Finelli, MD, MSc²; Alexandre Zlotta, MD, PhD² and Neil Fleshner, MD, MPH²
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Presented By: Rashid Sayyid, MD, MSc

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EVALUATION OF CANCER-SPECIFIC MORTALITY WITH SURGERY VS RADIATION AS PRIMARY THERAPY FOR LOCALIZED HIGH GRADE PROSTATE CANCER IN MEN YOUNGER THAN 60 YEARS OLD
Stefano Muscatelli; Michael Naslund, MD; Adeel Kaiser, MD and Mohammad Minhaj Siddiqui, MD
University of Maryland School of Medicine Baltimore, MD
Presented By: Stefano Muscatelli

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PERFORMANCE OF A PROSTATE CANCER GENOMIC CLASSIFIER IN MEN WITH PSA PERSISTENCE POST-PROSTATECTOMY
Daniel Spratt, MD¹; Darlene Dai, MSc²; Robert Den, MD³; Patricia Troncoso, MD⁴; Kasra Yousefi, MSc²; Ashley Ross, MD, PhD, MD⁵; Edward Schaeffer, MD, PhD, MD⁴; Zaid Haddad, BSc²; Elai Davicioni, PhD²; Rohit Mehra, MD⁴; Todd Morgan, MD⁴; Walter Rayford, MD, PhD⁴; Firas Abdollah, MD¹⁰; Eduouard Trabulsi, MD¹¹; Mary Achim¹²; Elsa Tapia¹²; Mireya Guerrero¹²; R. Jeffrey Karnes, MD¹³; Adam Dicker, MD, PhD; Mark Hurwitz, MD; Paul Nguyen, MD¹⁴; Felix Feng, MD¹⁵; Stephen Freedland¹⁶ and John Davis, MD¹²
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Presented By: Daniel Eidelberg Spratt, MD
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INITIAL EVALUATION OF 3D PRINTED AND AUGMENTED REALITY PROSTATE CANCER MODELS FOR ROBOTIC PROSTATECTOMY PLANNING
Nicole Wake, MSc¹; Marc Bjurlin, DO, MSc²,³; Hersh Chandarana, MD¹; Andrew Rosenkrantz, MD, MPA¹; Richard Huang, BS⁴; James Wysock, MD⁵; William Huang, MD⁶ and Samir Taneja, MD⁷
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Presented By: Marc A. Bjurlin, DO, MSc

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THE IMPACT OF ADJUVANT RADIATION THERAPY AFTER RADICAL PROSTATECTOMY ON LONG-TERM OUTCOMES
Ross J. Mason, MD, MSc; Stephen A. Boorjian, MD; Bimal Bhindi, MD; Laureano Rangel, MD; Igor Frank, MD; Matthew K. Tollefson, MD and R. Jeffrey Karnes, MD
Mayo Clinic, Rochester, MN
Presented By: Ross Jerome Mason, MD, MSc

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68GA-PSMA PET/CT VERSUS MPMRI FOR LOCOREGIONAL PROSTATE CANCER STAGING: CORRELATION WITH FINAL HISTOPATHOLOGY
Matthew Winter, BSc, BMBS (Hons), FRACS (Urol)¹; Israel Burger²; Chandra Chandra Annabattula³; Jeffrey Lewis⁴; Deepa Shetty⁵; Jonathan Kam⁶; Mohan Ariyanayagam⁷; Mohamed Khadra⁸; Han Loh⁹ and Celi Varol⁷
¹USC California, Nepean Hospital Sydney; ²Nepean Hospital, Sydney (Presented by: Matthew Winter)
Presented By: Matthew Winter, BMBS (Hons), FRACS

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PRIMARY FOCAL CRYOABLATION FOR LOW-, INTERMEDIATE- AND HIGH-RISK PROSTATE CANCER
Masakatsu Oishi¹; Inderbir Gill²; Toshitaka Shin³; Akbar Ashrafi³; Matthew Winter³; Giovanni Cacciamani³; Luis Medina³; Andre Berger³; Osamu Ukimura³; Duke Bahn³ and Andre Abreu²
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Presented By: Masakatsu Oishi

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ANTERIOR PROSTATE LESIONS AND PROSTATE CANCER DIAGNOSED IN AFRICAN AMERICAN MEN
Michelle Van Kuiken, MD¹; Bryan Bisanz, BS¹; Cara Joyce, PhD¹; Marcus Quek, MD¹ and Gopal Gupta, MD²
¹Loyola Univeristy Medical Center; ²Loyola University Medical Center, Maywood, IL
Presented By: Gopal Nand Gupta, MD

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PROSTATE CANCER SCREENING AMONG A COHORT OF US VETERANS
Benjamin Muller, BA¹; Michael Lipsky, MD¹; Glen McWilliams, MD² and Christopher Anderson, MD, MPH¹
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Presented By: Benjamin Muller, BA

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ROLE OF MPMRI PSA DENSITY AND PIRADS SCORE IN PREDICTING UPSTAGING IN MEN ON ACTIVE SURVEILLANCE
Michelle Van Kuiken, MD¹; Robert Blackwell, MD¹; Cara Joyce, PhD¹; Marcus Quek, MD¹ and Gopal Gupta, MD²
¹Loyola Univeristy Medical Center; ²Loyola University Medical Center, Maywood, IL
Presented By: Gopal Nand Gupta, MD

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Nancy Ye, BA; Jasleen Chopra, MD; Michael Naslund, MD; Jade Wong-You-Cheong, MD; Amelia Wnorowski, MD and Mohammad Siddiqui, MD
University of Maryland School of Medicine, Baltimore, MD
Presented By: Nancy Yating Ye, BA

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Micha Titus, BS; Jian Chen, MD; Paul Oh, BS; Inderbir Gill, MD and Andrew Hung, MD
Center for Robotic Simulation & Education, Catherine & Joseph Aresty Department of Urology, University of Southern California Institute of Urology, Los Angeles, California
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Sudhir Isharwal, MBBS¹; Alice Crane, MD²; Anna Zampini, MD³; Tianming Gao, PhD³; Michael Kattan, MD² and Andrew Stephenson, MD³
¹Cleveland Clinic; ²Cleveland Clinic, Cleveland
Presented By: Sudhir Isharwal, MBBS

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¹University of Alberta, Edmonton, Alberta; ²University of Calgary, Calgary, Alberta
Presented By: Adrian Stuart Fairey, MD, MS

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OHSU, Portland, OR
Presented By: Hamed Ahmadi, MD

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Nathan Wong, MD¹; Cameron Lam, MD²; Jen Hoogenes³; Bobby Shayegan, MD² and Edward Matsumoto, MD²
¹Hamilton; ²McMaster University, Hamilton, ON
Presented By: Nathan Wong, MD

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Jared Schober, MD; Kristian Stensland, MD, MPH; Harras Zaid, MD; Alireza Moinzadeh, MD and David Canes, MD
Lahey Hospital and Medical Center, Burlington MA
Presented By: Jared Schober, MD
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Daniel Lee, MD¹; Zhiguo Zhao; Li-Ching Huang; Tatsuki Koyama Tatsuki²; Matthew Resnick Matthew³; David Penson David⁴; Daniel Barocas Daniel⁵ and Karen Hoffman Karen⁶
¹Nashville; ²Koyama; ³Resnick; ⁴Penson; ⁵Barocas; ⁶Hoffman
Presented By: Daniel J. Lee, MD

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Chris Koller, BS; Hung-Jui Tan, MD, MSHPM and Eric Wallen, MD
UNC
Presented By: Christopher Koller, BS

Poster #210
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Samuel Gold; Jonathan Bloom, MD; Stephanie Harmon, PhD; Fatima Karzai, MD; Shawn Marhamati, MD; Graham Hale; Tyler Hwang; Kareem Rayn; Vladimir Valera, MD; Brad Wood, MD; David VanderWeele, MD, PhD; Ismail Turkbey, MD; William Dahut, MD and Peter Pinto, MD
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Marcelo P. Barboza, MD¹; Nachiketh Soodana Prakash, MD, MS¹; Isildinha M. Reis, PhD²; Feng Miao, PhD²; Maria C. Velasquez, MD¹; Rosa Castillo, MD¹; Chad R. Ritch, MD, MBA¹; Mark L. Gonzalgo, MD, PhD¹; Bruce Kava, MD¹; Ramgopal Satyanarayana, MD¹; Dipen J. Parekh, MD¹ and Sanoj Punnen, MD, MAS¹
¹Department of Urology, University of Miami Miller School of Medicine, Miami, FL, USA; ²Department of Public Health Sciences, University of Miami Miller School of Medicine, Miami, FL, USA; ³Department of Radiology, University of Miami Miller School of Medicine, Miami, FL, USA
Presented By: Marcelo Panizzutti Barboza, MD

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Presented By: Bruce Trock, PhD

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Alexander Kenigsberg, MD; Marc Bjurlin, DO, MSc; Andrew Rosenkrantz, MD; Xiaosong Meng, MD, PhD; Fang-Ming Deng, MD, PhD; Richard Huang, BS; James Wysock, MD, MSc; William Huang, MD; Herbert Lepor, MD and Samir Taneja, MD
NYU Langone Health
Presented By: Alexander Kenigsberg, MD
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Zeyad Schwen, MD¹; Mufaddal Mamawala, MBBS, MPH¹; Jeffrey Tosoi, MD, MPH¹; Sasha Druskin, MD¹; Ashley Ross, MD, PhD¹; Lori Sokoll, PhD²; Jonathan Epstein, MD²; Christian Pavlovich, MD¹ and H. Ballentine Carter, MD¹
¹James Buchanan Brady Urological Institute and Department of Urology, Johns Hopkins University School of Medicine, Baltimore, MD; ²Johns Hopkins University Department of Pathology, Baltimore, MD
Presented By: Zeyad Schwen, MD

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Daniel Pucheril, MD, MBA¹; Ye Wang, PhD²; Dimitar Zlatev, MD³; Paul Nguyen, MD³; Adam Kibel, MD⁴ and Steven Chang, MD, MS⁴
¹Division of Urology, Brigham and Women’s Hospital, Harvard Medical School, Boston, MA; ³Center for Surgery and Public Health, Harvard Medical School, Boston, MA; ⁴Radiation Oncology, Dana Farber Cancer Institute, Harvard Medical School, Boston, MA; ⁵Division of Urology, Brigham and Women’s Hospital, Center for Surgery and Public Health, Harvard Medical School, Boston, MA
Presented By: Daniel T. Pucheril, MD, MBA

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Walter Rayford, MD, PhD, MBA; Jennifer Jordan; Mandeep Takhar; Mohammed Alishalalfa; Darlene Dai; Nicholas Erho; Mark D. Greenberger; Randy Bradley and Elai Davicioni
Presented By: Walter Rayford, MD, PhD, MBA

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Sigrid Carlsson, MD, PhD, MPH¹,²; Michael Brooks, MD³; Alexander Zajichek, MS⁴; Kevin Chagin, MS⁴; Jonas Hugosson, MD²; Michael Kattan, PhD⁴ and Andrew Stephenson, MD, MBA³
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Presented By: Michael A. Brooks, MD

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Kamyar Ghabili Amirkhiz, MD¹; Alfredo Suarez-Sarmiento, MD²; Kevin A. Nguyen, BS³; Walter Hsiang³; Sarah Amalraj³; Jamil S. Syed, MD, Michael S. Leapman, MD³; Peter G. Schulam, MD, PhD³ and Preston C. Spreenkle, MD²
¹Department of Urology, Yale University School of Medicine, New Haven, CT; ²Department of Urology, Yale School of Medicine, New Haven, CT
Presented By: Kamyar Ghabili Amirkhiz, MD

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Presented By: Graham Hale, BS
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Alireza Aminsharifi, MD, PhD¹; Matvey Tsivian, MD¹; Ariel Schulman, MD¹; Efrat Tsivian, MD¹; Kae Jack Tay, MBBS¹,²; Ahmed Elshafei, MD¹; Thomas Polascik, MD¹ and Stephen Jones, MD³
¹Duke University Medical Center, Durham NC; ²SingHealth, Singapore General Hospital, Singapore; ³Glickman Urological & Kidney Institute, Cleveland Clinic, Cleveland, Ohio
Presented By: Alireza Aminsharifi, MD, PhD

Poster #221

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Robert Den, MD¹; Mandeep Takhar²; Jonathan Lehrer²; Mohammed Alshalalfa³; Nicholas Erho³; Elai Davicioni² and Felix Feng³
¹Department of Radiation Oncology, Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, PA; ²GenomeDx Biosciences, Vancouver BC, Canada; ³Helen Diller Family Comprehensive Cancer Center University of California at San Francisco, San Francisco, CA, USA
Presented By: Robert Den, MD

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EVALUATION OF DIRECTED ANTIMICROBIAL PROPHYLAXIS FOR TRANSRECTAL ULTRASOUND GUIDED PROSTATE BIOPSY (TRUSP). A PROSPECTIVE TRIAL
Mohamed Hendawi, MD¹; Ahmad Shabsigh, MD, FACS² and Robert Bahnson, MD, FACS³
¹The Ohio State University, Columbus, OH; ²The Ohio State University, Columbus, OH; ³The Ohio State University, Columbus, OH
Presented By: Mohamed Hendawi, MD

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NATIONAL TRENDS IN THE MANAGEMENT OF PATIENTS WITH POSITIVE SURGICAL MARGIN AT THE TIME OF RADICAL PROSTATECTOMY
Kamyar Ghabili Amirkhiz, MD¹; Kevin A. Nguyen, BS¹; Walter Hsiang¹; Jamil S. Syed, MD¹; Alfredo Suarez-Sarmiento, MD¹; Brian M. Shuch, MD¹; Henry S. Park, MD, MPH¹; James B. Yu, MD, MHS² and Michael S. Leapman, MD³
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Presented By: Kamyar Ghabili Amirkhiz, MD

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BMI IS NOT A RISK FACTOR FOR ACTIVE SURVEILLANCE PROGRESSION IN PROSTATE CANCER PATIENTS DIAGNOSED BY MRI-TRUS FUSION BIOPSY
Kareem N. Rayn, BS; Joseph A. Baiocco, BS; Abhinav Sidana, MD; Sam A. Gold, BS; Graham R. Hale, BS; Jonathan Bloom, MD, Vladimir Valera Romero, MD, PhD; Baris Turkbey, MD; Peter Choyke, MD; Bradford Wood, MD and Peter Pinto, MD
National Cancer Institute, National Institutes of Health, Bethesda, MD
Presented By: Kareem Rayn, BS

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Akbar Ashrafi, BHB, MBChB, FRACS¹; Masakatsu Oishi¹; Matthew Winter¹; Miltul Gulati²; Suzanne Palmer³; Manju Aron³; Marianna Stern¹; Daniel Park¹; Inderbir Gill¹ and Andre Abreu¹
¹USC Institute of Urology, Los Angeles, California; ²Department of Radiology, Keck Medical Center of USC, Los Angeles, California; ³Department of Pathology, Keck Medical Center of USC, Los Angeles, California
Presented By: Akbar Ashrafi, BHB, MBChB, FRACS

Poster #226

THE UTILIZATION OF HORMONE THERAPY AND CHEMOTHERAPY IN MEN WITH METASTATIC PROSTATE CANCER ACCORDING TO INSURANCE STATUS
Jared Schober, MD; Kristian Stensland, MD, MPH; Alireza Moinzadeh, MD; Harras Zaid, MD and David Canes, MD
Lahey Hospital and Medical Center, Burlington MA
Presented By: Jared Schober, MD
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Saum Ghodoussipour, MD; Nima Nassiri, MD; Michael Lin-Brande, BA; Ankeet Shah, MD; Massakatsu Oishi, MD; Toshitaka Shin, MD; Suzanne Palmer, MD; Manju Aron, MD; Jie Cai, MD; Osamu Ukimura, MD; Inderbir Gill, MD and Abreu Andre, MD
University of Southern California
Presented By: Nima Nassiri, MD

Poster #228
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Stephen Ryan, MD¹; Michael Liss, MD²; Jae Choi, MD³; Fred Millard, MD⁴; Mike Randall, MD⁴; Sij Hemal, MD⁴; S. Lilly Zheng, MD⁴; Jianfeng Xu, MD⁴ and A. Karim Kader, MD⁴
¹Department of Urology, University of California San Diego, San Diego, CA; ²Department of Urology, University of Texas Health Science Center San Antonio, San Antonio, TX; ³Department of Urology, University of California San Diego, San Diego, CA.; ⁴Department of Medicine, University of California San Diego, San Diego, CA.; ⁵Program for Personalized Cancer Care, NorthShore University Health System, Evanston, IL
Presented By: Stephen T. Ryan, MD

Poster #229
IS ALVIMOPAN BENEFICIAL IN MEN UNDERGOING RETROPERITONEAL LYMPH NODE DISSECTION FOR TESTIS CANCER?
Adam Calaway, MD and Clint Cary
Indiana University, Indianapolis, Indiana
Presented By: Adam C. Calaway, MD

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Adam Calaway, MD; Clint Cary; Richard Bihrlle and Richard Foster
Indiana University, Indianapolis, Indiana
Presented By: Adam C. Calaway, MD

Poster #231
RETROPERITONEAL LYMPH NODE DISSECTION (RPLND) AS AN ALTERNATIVE LOCAL CONTROL STRATEGY FOR LOW-VOLUME, CLINICAL STAGE II TESTICULAR SEMINOMA: A SURVEY OF PATIENTS
Jason Warncke, MD¹; Amanda Saltzman, MD¹; Siamak Daneshmand, MD² and Nicholas Cost, MD¹
¹University of Colorado, Department of Surgery, Division of Urology, Aurora, CO; ²University of Southern California, Department of Urology, Los Angeles, CA
Presented By: Jason Warncke, MD

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DECISION ANALYSIS DEFINING OPTIMAL MANAGEMENT OF CLINICAL STAGE 1 HIGH-RISK NONSEMINOMATOUS GERM CELL TESTICULAR CANCER (CS1 NSGCT) WITH LYMPHOVASCULAR INVASION (LVI)
Svetlana Avulova, MD; Clayton Allen, MD; David Penson, MD, MPH; Alicia Morgans, MD, MPH and Kelvin Moses, MD, PhD
Vanderbilt University Medical Center, Nashville, TN
Presented By: Svetlana Avulova, MD
Poster #116
EARLY BIOLOGICAL ASSESSMENT OF MIR371 IN GERM CELL TUMORS
Lucia Nappi, MD, PhD¹; Brock O’Neil, MD²; Marisa Thi¹; Ladan Fazli¹; Kim Chi¹; Bernhard Eigl¹; Craig Nichols, MD³; Martin Gleave¹ and Christian Kollmannsberger¹
¹University of British Columbia, Vancouver, British Columbia, Canada; ²University of Utah/Huntsman Cancer Hospital; ³Intermountain Medical Center, Salt Lake City, Utah
Presented By: Brock B. O’Neil, MD

Introduction: The pathological constitution of retroperitoneal lymph nodes after chemotherapy for germ cell tumors or of borderline enlarged nodes in clinical stage I disease managed with surveillance is uncertain. This is especially true in the setting of negative tumor markers. Currently, accurate assessment requires pathological confirmation with surgical excision or clinical follow-up to establish a pattern of growth. MicroRNAs are small, non-coding molecules involved in post-transcriptional gene regulation thus playing an essential role in many biological processes including cell differentiation, apoptosis and tumor development. Serum miR371 may be informative as a biomarker for germ cell tumors, overcoming limitations of traditional markers.

Methods: To confirm expression of miR371 in germ cell tumors, 10 formalin-fixed paraffin embedded (FFPE) samples were examined. Plasma from 21 men with various stages of germ cell tumors was then used to examine performance characteristics of miR371. Non-cancer FFPE testicular tissue and plasma from healthy volunteers were used as negative controls. miR371 expression was detected by RT-PCR and relative expression calculated by the 2-ΔΔCt method. miR-93-5p was used as positive internal control. Results were analyzed for associations with clinicopathologic features using Fisher’s exact test.

Results: miR371 was over-expressed in FFPE tissue of all primary testicular (n=4) and mediastinal (n=3) samples while it was undetectable in an atrophic testis (n=1) and mediastinal or gonadal teratoma (n=2). Plasma studies of 21 metastatic samples showed miR371 expression in: 2 lung, 1 brain, 17 lymph nodes and 1 IVC tumor thrombus. These samples were collected prior to (n=2) or after (n=12) chemotherapy and 7 pts were treated only with surgery. miR371 was undetectable in all the samples (0/9) with no viable tumor on pathological examination and over-expressed in 11/12 (91.6%) of those with viable germ cell tumor (OR 145.7; p<0.0001). Of those with negative traditional tumor markers but viable tumor, 90% were positive for miR-371 and none with negative miR-371 had positive traditional tumor markers.

Conclusion: miR-371 appears to be a promising marker for the presence of viable germ cell tumors. These encouraging findings suggest that plasma miR371 may be able to be used for biological rather than radiographic assessment of the presence of active germ cell tumor.
**Poster #117**  
**INACCURACY OF CLINICAL STAGING AFTER NEOADJUVANT CHEMOTHERAPY FOR MUSCLE INVASIVE BLADDER CANCER**  
Alexa Meyer, MD; Aaron Brant¹; Paige Nichols¹; Max Kates, MD²; Noah Hahn, MD³; Mark Schoenberg, MD⁴ and Trinity Bivalacqua, MD, PhD²  
¹Johns Hopkins Hospital, Baltimore, MD; ²Brady Urological Institute, Johns Hopkins Hospital, Baltimore, MD; ³Department of Oncology, Johns Hopkins Hospital, Baltimore, MD; ⁴Department of Urology, Montefiore, Bronx, NY  
Presented By: Alexa Meyer, MD

**Introduction:** The standard of care (SOC) for patients with muscle invasive bladder cancer (MIBC) is radical cystectomy (RC) +/- neoadjuvant chemotherapy (NC). A subset of patients have complete clinical response (cT0) to NC, with reports of such patients foregoing RC. We routinely perform restaging workup post-NC prior to RC including imaging and cystoscopy with resection/biopsy. In the current study we evaluate the accuracy of restaging after NC by comparing post-NC with final RC pathology.

**Methods:** We reviewed our institutional IRB-approved database to identify patients with MIBC that underwent NC followed by RC from March 2003 to August 2016. Patients with evidence of lymph node or distant metastasis were excluded. Following NC prior to RC, cystoscopy routinely performed; visible tumor resected and/or biopsy of scars taken. Pathology accuracy was defined as concordance between biopsy/resection and final specimen with respect to presence or absence of disease. Wilcoxon, chi-squared, and multivariate logistic regression analyses were used to compare differences between groups and identify predictors of accurate biopsy.

**Results:** We identified 328 patients with MIBC that underwent NC and RC. Following NC, 302 patients underwent cystoscopy, with 118 having biopsy/resection. 57 patients had no evidence of disease (NED) on biopsy; of those only 26 (45.6%) were NED on final pathology (table 1). Patients with accurate versus inaccurate biopsies differed with respect to race (p=0.02), tumor progression from non-MIBC (p=0.02), pathologic stage (p<0.01), and tumor size (p<0.01). On multivariate analysis, lack of tumor progression and tumor size >2cm were predictive of accurate biopsy (p=0.03 and p<0.01, respectively). The sensitivity of post-NC biopsy was 65.2% and specificity 89.7%. When imaging and gross cystoscopy included, sensitivity of post-NC clinical staging improved to 98.3%, while specificity decreased to 19.2%.

**Conclusion:** This study highlights the inadequacy of clinical staging after NC, namely the ability of biopsy to accurately assess residual disease. Even when biopsy taken, cT0 was unreliable in 50% of cases. Caution must be taken when determining cT0 status and deviating from SOC.

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<td>13(22.8)</td>
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<td>cTis n (%)</td>
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<td>10</td>
<td>15</td>
<td>23</td>
<td>16</td>
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Table 1: Stage-for-stage biopsy pathology to final cystectomy specimen pathology. The values in parentheses indicate the percentage of patients within each clinical stage that were found to be a particular pathologic stage.
Poster #118
DEFINING THE DNA DAMAGE REPAIR (DDR) GENOMIC LANDSCAPE OF UROTHELIAL CARCINOMA OF THE BLADDER (UCB)
Shawn Dason, MD; Victor McPherson, MD; Min Yuen Teo, MD; Sumit Isharwal, MBBS; Francois Audenet, MD; Aditya Bagrodia, MD; Eugene Cha, MD; Michael Berger, PhD; Ahmet Zehir, PhD; Nikolaus Schultz, PhD; Dean Bajorin, MD; Jonathan Rosenberg, MD; Hikmat Al-Ahmadie, MD; Bernard Bochner, MD; Eugene Pietzak, MD; David Solit, MD and Gopa Iyer, MD
Memorial Sloan Kettering Cancer Center. New York, NY
Presented By: Shawn Dason, MD, FRCSC

Introduction: Impaired DDR is associated with response to chemotherapy. Several genomically directed trials have been proposed using DDR alteration status for enrolment. In this study, we characterized the deleterious DDR alteration (DDRa) landscape of UCB across various clinical states.

Methods: Targeted exon capture and sequencing of at least 341 cancer-associated genes was performed prospectively on 451 UCB specimens (MSK-IMPACT assay). Over 23000 tumors have been sequenced in a CLIA-certified laboratory with this assay at MSKCC. We assessed sequencing data for deleterious alterations in 34 genes representing canonical DDR pathways. Deleterious alterations included truncating mutations, homozygous deletions, and functionally validated missense mutations.

Results: Figure 1. The frequency of deleterious DDRa in chemo-naïve MIBC was enriched relative to post-neoadjuvant chemotherapy (NAC) residual MIBC ([33/70, 29.5%] vs. [8/55, 14.5%]; p=0.01). Deleterious DDRa were also enriched in the pre-NAC transurethral resection specimens of NAC responders compared to non-responders ([11/24, 45.8%] vs. [4/22, 18.2%]; p=0.06) of which ERCC2 mutations were most common (5/24 responders vs. 2/22 non-responders). Deleterious alterations in ATM and FANCC were found in no responders and 1 nonresponder. In NMIBC, deleterious DDRa were enriched in high-grade disease ([39/136, 28.7%] high grade vs. low-grade [2/28, 7.1%]; p=0.02). Patients with metastatic disease had similar rates of deleterious DDRa to MIBC ([31/116, 26.7%] vs. [33/70, 29.5%]). The percentage of patients having any type of DDR alteration was similar across states (47% NMIBC, 63% chemo-naïve MIBC, 49% post-NAC residual MIBC, 59% metastatic disease). The proportion of patients with a deleterious DDRa relative to any DDRa was 41/77 (53.2%) in NMIBC, 33/65 (50.8%) in chemo-naïve MIBC, 8/27 (29.6%) in post-NAC residual MIBC, and 31/68 (45.6%) in metastatic disease.

Conclusion: DDRa are found across the UCB disease spectrum. ERCC2 and ATM are the most common DDRa although alterations were seen in most other DDR genes. Many alterations are of unknown significance. Functional validation and further characterization are needed to develop genomically directed treatment.
Introduction: In response to evidence of suboptimal care quality for patients with muscle-invasive bladder cancer (MIBC), leaders have called for quality improvement (QI) initiatives. Through independent education grant support, a QI program on MIBC in 2 settings was conducted to evaluate the impact of quality-focused interventions on assessment, treatment, and patient-centered care processes.

Methods: The IRB-approved program occurred in a large public health system and a private regional oncology center. Participants were teams of medical and urologic oncologists, urologists, nurses, radiologists, and pathologists (n = 47 across both systems). At baseline, we reviewed 200 consecutive charts of MIBC patients (100 charts in each system) for documentation of guideline-directed practices including staging and neoadjuvant chemotherapy, and provision of patient-centered care processes central to new national healthcare delivery and payment programs. After the baseline chart reviews, the teams participated in a series of QI interventions, including 2 onsite and 2 online accredited educational activities. In the onsite activities, the teams received chart audit feedback and developed written action plans for improvement of suboptimal measures. Six months after the interventions, 200 charts were reviewed according to methods of the baseline review. Chi-square tests were conducted to analyze pre- and post-intervention differences in rates of chart documentation.

Results: Rates of chart documentation were significantly higher in the post-intervention versus baseline samples for use of neoadjuvant chemotherapy (+12%); assessment of quality of life (+11%) and depression (+12%); provision of patient counseling and education about bladder cancer and its treatment (+36%); and shared decision-making (+13%). High rates of bladder cancer staging were documented in the baseline (84%) and post-intervention (86%) samples. The teams’ action plans included initiating multidisciplinary MIBC tumor board meetings and updating methods for assessing patient-centered needs.

Conclusion: QI educational interventions are associated with increased team-based adherence to guideline-directed treatment and patient-centered care processes in MIBC.
Poster #120
APPLICATION-BASED PERIOPERATIVE MANAGEMENT OF THE RADICAL CYSTECTOMY PATIENT
Meredith Metcalf, MD; Katie Glavin; Vassili Glazyrine; Lauren Hand, RDN, LD; Misty Bechtel; David Bishop, MD; Martin DeRuyter, MD; Jill Hamilton-Reeves, PhD, RD, CSO; Jeffrey Holzbeierlein, MD and Eugene Lee, MD
University of Kansas, Kansas City, Kansas
Presented By: Meredith Metcalf, MD

Introduction: Radical cystectomy patients are a vulnerable population, with up to 65% suffering complications and 26% readmitted within 90 days. Perioperative education, early identification of patients at risk, and discharge transitions remain central to improving outcomes. The aim of this project was to examine the feasibility of using LifeScience Technologies tablet-based application (LST app) for perioperative patient education, transition care communications, and post-discharge monitoring.

Methods: Prospectively enrolled patients were provided an iPad with the LST app, a Garmin VivoFit, and equipment to measure vital signs for use during the study. Initially 6 patient education videos were assigned, with subsequent videos sent via the app depending on patient gender and diversion type. Postoperatively patients logged activity, medication compliance, and vital signs through the app, which was remotely monitored by the care team. HIPAA-compliant bi-directional communication was available in the app, and messages from the care team were triggered by variation in patient data. Phone exit surveys were completed after study completion.

Results: To date 13 patients have been enrolled. Two patients discontinued the study related to difficulty with electronics and one due to oncologic restaging. One patient was readmitted twice, related to pain and nausea after ureteral stent removal and subsequently for dehydration with acute kidney injury. Patients watched 73% of assigned education videos. Videos were viewed an average of 2.2 times (range 0-3.9), and 71% of all videos viewed were watched more than once. Complete vital sign entries occurred on 86% of patient study days. There were 8 occasions for potential interventions to be triggered via the app, with 6 occurring: one patient was prescribed antibiotics for a UTI, while the other 5 received education and encouragement. All patients completing the exit survey reported enjoying use of the app. Survey responses were unanimously positive, echoing themes of improved engagement and communication.

Conclusion: Tablet-based applications are emerging as adjuncts to traditional clinical practice. This protocol had good patient compliance and was feasible for extending educational content beyond the office while allowing for repetition of viewing, vital for improving comprehension and recall. It also demonstrated ability for early identification of problems, with potential for reducing readmissions.
THE IMPACT OF PREOPERATIVE FRAILTY ON OVERALL SURVIVAL: A PROSPECTIVE STUDY OF PATIENTS UNDERGOING RADICAL CYSTECTOMY

Jeremy West, MD; Conrad Tobert, MD; Nathan Brooks, MD; Lewis Thomas, MD; Anthony Oberle, MD; Laura Quast, BS; Sara Bell, MS; Michael O'Donnell, MD and Kenneth Nepple, MD
University of Iowa Hospitals and Clinics, Department of Urology, Iowa City, IA
Presented By: Jeremy M. West, MD

Introduction: Radical cystectomy is the standard of care for muscle invasive bladder cancer; however, perioperative morbidity and mortality is common. Frailty (decreased functional reserve) has been shown to be associated with complications to varying degrees in patients undergoing cystectomy. The purpose of this study was to prospectively evaluate the association of preoperative frailty with overall survival in the radical cystectomy population.

Methods: 103 cystectomy patients from January 2015 to April 2017 were prospectively evaluated preoperatively with four frailty indices: Fried Frailty Index (FFI), Duke Activity Status Index (DASI), Edmonton Frailty Index (EFI), and Schonberg Mortality Index (SMI). Cox regression analysis was performed to evaluate the association of each frailty index with overall survival.

Results: Over a median follow-up of 17.38 months (IQR: 10.2-30.0), 22 of 103 (21.4%) cystectomy patients died. Cause of death was metastatic disease in 12 patients and other causes in 10 patients. Association of age, neoadjuvant chemotherapy, and frailty indices on overall survival are displayed in Table 1. Increased frailty by FFI and lower activity by DASI were significantly associated with overall survival (HR 1.59, 95%CI 1.05-2.41, p<0.03; HR 0.97, 95%CI 0.95-1.00, p<0.04).

Conclusion: In this prospective evaluation, increased frailty appears to be associated with early postoperative mortality after radical cystectomy; however, the magnitude of that association depended on the index used. Increased frailty by FFI and decreased activity by DASI was most strongly associated with increased mortality. Evaluation of patients preoperatively can be used to better counsel patients about postoperative complication risks and survival after cystectomy as well as identify patients who may benefit from prehabilitation or early rehabilitation.

Funding: American Cancer Society Seed Grant

Table 1: Univariate analysis of variables on overall survival

<table>
<thead>
<tr>
<th>Covariate</th>
<th>N</th>
<th>Hazard Ratio</th>
<th>95% CI</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>103</td>
<td>1.04</td>
<td>1.00-1.08</td>
<td>0.08</td>
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<tr>
<td>Necadjuvant Chemotherapy (yes)</td>
<td>71</td>
<td>1.17</td>
<td>0.46-2.99</td>
<td>0.75</td>
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<tr>
<td>Duke Activity Status Index</td>
<td>103</td>
<td>0.97</td>
<td>0.95-1.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Fried Frailty Index</td>
<td>103</td>
<td>1.59</td>
<td>1.05-2.41</td>
<td>0.03</td>
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<tr>
<td>Edmonton Frailty Index</td>
<td>103</td>
<td>1.12</td>
<td>0.98-1.28</td>
<td>0.11</td>
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<tr>
<td>Schonberg Mortality Index</td>
<td>103</td>
<td>1.06</td>
<td>0.98-1.15</td>
<td>0.17</td>
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Poster #122
PAPILLARY UROTHELIAL NEOPLASIA OF LOW MALIGNANT POTENTIAL (PUNLMP): RECURRENCE RATES FROM 2 RECENT PROSPECTIVE LARGE CLINICAL TRIALS WITH CENTRALIZED PATHOLOGY
Neal Shore, MD¹; Anne Simoneau, MD²; Larry Karsh, MD³; David Bostwick, MD⁴; Mark Soloway, MD⁵; Sharon Leu, PhD⁶ and Gajanan Bhat, PhD⁶
¹Carolina Urologic Research Center, Myrtle Beach, SC; ²Spectrum Pharmaceuticals; ³The Urology Center of Colorado, Denver, CO; ⁴Bostwick Laboratories, VA; ⁵Memorial Healthcare System, Aventura, FL; ⁶Spectrum Pharmaceuticals, Irvine, CA
Presented By: Neal D. Shore, MD, FACS

Introduction: PUNLMP is a recent addition to the uropathology reporting, and the interpretation of this diagnosis may affect treatment and surveillance decisions. Endorsed by the World Health Organization (WHO) in 2004 this classification stratifies well, moderate and poorly differentiated tumors-WHO 1973 Grade 1 to 3, into PUNLMP, LG and HG disease. The new system proposes to have better reproducibility and clinical guidance on recurrence and progression risks. Some pathologists report a straight 1:1 exchange-G1: PUNLMP, G2: LG, G3: HG while others propose a sliding comparison designating G1 to either PUNLMP or LG, G2 to either LG or HG.Despite literature of PUNLMP, recurrence ranging between 17 to 62%, many are still uncertain regarding its low risk of recurrence. We reviewed a contemporary database from 2 Phase 3, randomized placebo controlled Nonmuscle Invasive Bladder Cancer (NMIBC) trials with prospective central pathology to report PUNLMP incidence and 2 year recurrence rates (2YRR) and also to see the benefit of a single dose of an intravesical therapy (IPOC).

Methods: From 2007 to 2011, 1614 pts with presumed TaG1-2 NMIBC were randomized either to placebo or apaziquone (APZ) post-resection. Study assessment was based on Central review by Bostwick Laboratories. There were 1146 pts with TaG1-2 disease. WHO 2004 grading was also performed with 700 patients having both grades recorded. Cystoscopic follow up occurred every 3 months for 2 years.

Results: In the cohort of TaG1-2, Central review diagnosed PUNLMP more often than LG (519:181). Local and Central 2004 grading were compared in 312 pts for concurrence. PUNLMP by Central lab was diagnosed locally as PUNLMP 51, LG 179, and HG in 11 patients. The 2YRR for patients with PUNLMP and LG tumors treated with placebo and APZ were 45 and 53% respectively. Both PUNLMP and LG had improved 2YRR after single dose of APZ, Odds Ratio 0.71 and 0.69 respectively (Table 1).

Conclusion: The incidence of PUNLMP increases with central pathology. This prospective trial reports that 2YRR for PUNLMP to be 45% which improved with of a single IPOC dose APZ. Further research on the PUNLMP diagnosis, its clinical significance and response to intravesical therapy is warranted.

<table>
<thead>
<tr>
<th>Grade2004</th>
<th>Treatment</th>
<th>N</th>
<th>Recur</th>
<th>2-yr Recur Rate</th>
<th>Odds Ratio (95% CI)</th>
<th>Hazard Ratio (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Low</td>
<td>Apaziquone</td>
<td>91</td>
<td>40</td>
<td>43.96%</td>
<td>0.69 (0.38, 1.23)</td>
<td>0.72 (0.47, 1.09)</td>
</tr>
<tr>
<td></td>
<td>Placebo</td>
<td>90</td>
<td>48</td>
<td>53.33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUNLMP</td>
<td>Apaziquone</td>
<td>262</td>
<td>96</td>
<td>36.64%</td>
<td>0.71 (0.50, 1.02)</td>
<td>0.75 (0.57, 0.98)</td>
</tr>
<tr>
<td></td>
<td>Placebo</td>
<td>257</td>
<td>115</td>
<td>44.75%</td>
<td></td>
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</tbody>
</table>
Poster #123
NEOADJUVANT VERSUS ADJUVANT CHEMOTHERAPY FOR MUSCLE-INVASIVE BLADDER CANCER: A PROPENSITY MATCHED ANALYSIS
Joshua Jue, BS; María Velásquez, MD; Luis Sávio, MD; Mahmoud Alameddine, MD; Tulay Koru-Sengul, PhD, MHS; Feng Miao, MS; Chad Ritch, MD, MBA and Mark Gonzalgo, MD, PhD
Miami, FL
Presented By: Joshua S. Jue

Introduction: Neoadjuvant (NAC) or adjuvant (AC) chemotherapy have become increasingly utilized for management of muscle-invasive bladder cancer (MIBC) in combination with radical cystectomy (RC). We directly compared survival outcomes among patients who received either NAC or AC and RC.

Methods: We identified patients in the National Cancer Data Base (NCDB) diagnosed with clinical T2-T4, N0, M0 urothelial cell carcinoma who underwent RC. Patients who received NAC were propensity matched by age, race, ethnicity, sex, insurance type, academic/research program, comorbidity, and clinical stage to patients receiving AC within 90 days of RC. Median survival was calculated using Kaplan-Meier analysis. Adjusted hazard ratios (aHR) and 95% confidence intervals (95% CI) were calculated from multivariable Cox regression models to compare overall survival (OS), downstaging to non-MIBC (NMIBC), and N upstaging.

Results: A total of 509 patients treated with NAC and 283 patients treated with AC were identified from 2004-2013. Patients who received NAC had better 5 year OS (50.3%, 95% CI: 43.2%-57.0%) compared to patients who received AC (38.0%, 95% CI: 32.0%-44.0%). NAC was a significant predictor of decreased mortality, decreased progression to node positivity, and downstaging to NMIBC (0.68, 0.54-0.86, p=0.001; 0.18, 0.12-0.26, p<0.001; 12.75, 6.06-26.81, p<0.001). Increasing clinical T stage was a significant predictor of decreasing probability of pathologic node positivity in patients who received AC.

Conclusion: The use of NAC+RC was associated with better OS compared to RC+AC for patients diagnosed with T2-T4, N0, M0 bladder cancer. The increased survival benefit associated with NAC compared to AC among patients undergoing RC may be due to decreased progression to node positivity and pathologic downstaging.
Poster #124

A SIMPLER NEOBLADDER USING A PORCINE MODEL: THE DOUBLE LIMB U-POUCH

Ryan Werntz; Poone Shoureshi, MD; Kyle Gillis, MD; David Jiang, MD; Chris Amling, MD and John Barry, MD
OHSU

Presented By: Ryan P. Werntz, MD

Introduction: Orthotopic bladder substitution is an option for patients who undergo radical cystectomy. Currently, the most commonly performed bladder substitution is a Studer neobladder. Issues with current bladder substitution options include the complexity of reconstruction and application to robotic intracorporeal surgery and extensive mobilization of the left ureter leading to the observed higher stricture rate. The goal of this study was to create a simpler neobladder that obviated the need to mobilize the left ureter. The capacity, compliance, and distance to the urethral anastomosis were compared between diversions.

Methods: The porcine genitourinary organs and intestine were procured in conjunction with Oregon Health and Science University (OHSU) Trauma Lab at the time of scheduled autopsy. We constructed three different urinary diversions comparing capacity and compliance of the 40 cm pouches only (Camey I, Studer, D-LUP). A single-leg manometer concept, involving a 60mL catheter tip syringe, a ruler, and a 12 F catheter, were used to measure the pressure inside the diversions in centimeters of water. Maximum cystometric capacity was defined as total volume of water added to the diversion at 30 cm of water. Compliance was measured by adding 20 mL aliquots of water and measuring the volume of water and pressure in centimeters of water. The most dependent ileo-urethrostomy site was determined by the completed diversion with an intact mesentery.

Results: The maximum capacity at 30 cm was of water for the Camey I, Studer, and D-LUP were 250mL, 350mL, and 430mL, respectively (Table 2). The ileo-urethrostomy site was 0 cm from the urethra for the Camey I, 0 cm for the D-LUP, and -10 cm away from the urethra for the Studer neobladder (Figure 3). The Camey I had the lowest compliance (10mL/cmH20), the Studer neobladder was second (15mL/cmH20), and the D-LUP was the most compliant diversion tested (16.3mL/cmH20) (Graph 1).

Conclusion: The DLUP had a more dependent ileo-urethrostomy site, higher capacity, and better compliance when compared to the Studer neobladder.
Introduction: To determine whether surgical approach is still a determinant factor for clinical outcomes after radical cystectomy (RC) and urinary diversion using an Enhanced Recovery After Surgery (ERAS) protocol.

Methods: Patients underwent open radical cystectomy (ORC) and robotics assisted radical cystectomy (RARC) and urinary diversion with ERAS for bladder urothelial carcinoma from May 2012 to December 2016 were identified from our institutional IRB approved bladder cancer database. Data were captured prospectively, including surgical approach and diversion type, length of stay (LOS), 30-day and 90-day complications and readmission rates. Outcomes were compared between ORC and RARC. We also compared data between patients with expected LOS (≤4 days) and extended LOS (>4 days). Multivariable logistic regression modeling was used to determine predictive factors of extended LOS.

Results: A total of 345 patients underwent ORC, 143 patients underwent RARC. ORC group had higher proportion of continent urinary diversion (71.9% vs 40.6%, p<0.001), shorter operative time (5.4 vs 7.3 h, p<0.001), but with higher estimated blood loss (500 vs 200 ml, p<0.001), and higher intraoperative and postoperative transfusion rate (20.9 vs 9.1%, p=0.002 and 20 vs 11.9%, p=0.04 respectfully). Median LOS of ORC was 4 days (IQR 4-6 days), median LOS of RARC was 6 days (IQR 4-7 days) (p<0.001). No significant difference was observed in readmission rate within 30 days and 90 days after surgery, minor or major complication rate except ORC group had higher wound complication rate (7.8 vs 2.8%, p=0.04). Patients with extended LOS had older age (73 vs 68, p<0.001), more comorbidities (p<0.001), longer operative time (6.3 vs 5.6 h, p<0.001), higher intraoperative and postoperative transfusion rate (24 vs 9.5%, p<0.001 and 22.5 vs 11.8%, p=0.002 respectfully). Age over 70 (p<0.001), Charlson comorbidity index ≥2 (p=0.03), longer operative time (p=0.03), intraoperative and postoperative transfusion (p<0.001, p=0.01 respectfully) were associated with extended LOS.

Conclusion: Surgical approach is not a determinant factor for clinical outcome following RC. ORC and RARC achieve similar clinical outcomes in the context of a well-established ERAS protocol. Use of perioperative patient care protocols is the key factor for optimal patient recovery.
Poster #126
APPLICATION OF A NOVEL REGRESSION ALGORITHM TO PREDICT DRUG SENSITIVITY IN BLADDER CANCER CELL LINES USING GENE EXPRESSION MICROARRAY DATA
Thomas Sanford, MD; Reema Railkar, PhD and Piyush Agarwal, MD
NCI, Bethesda, MD
Presented By: Thomas Sanford, MD

Introduction: Classification approaches have been used to develop gene expression models to predict drug sensitivity using specific cutoffs to define sensitivity. However, the ability to predict drug sensitivity without cutoffs may provide greater precision. This study evaluates a novel regression algorithm to predict drug sensitivity in bladder cancer cell lines.

Methods: Gene expression and drug sensitivity data were obtained from the Genomics of Drug Sensitivity in Cancer Project (cancerrxgene.org), a database that includes >900 cell lines. Only cell lines derived from carcinoma specimens were selected. All drugs selected for evaluation were experimentally evaluated in at least 75% of cell lines. An algorithm was developed utilizing regression functions in the scikit-learn machine learning library to create models to predict drug sensitivity with gene expression data. Models developed for each drug were then tested on bladder cancer cell lines, which had been excluded in the development of the drug sensitivity models.

Results: A total of 574 carcinoma cell lines were used to create drug sensitivity models for each drug. Twenty drugs were evaluated in at least 75% of cell lines and were selected for further evaluation. For the 20 bladder cancer cell lines used as a validation cohort, the algorithm was able to predict the IC50 values within a 2-fold dilution of the measured IC50 value in 20% of samples, within a 5-fold dilution in 65% of samples, and within a 10-fold dilution in 85% of samples. When the IC50 values were ranked, the algorithm was able to predict the relative sensitivity of drugs with 20% of samples ranked correctly, and 90% of samples within a rank difference of 3 or less. This rank-based approach is demonstrated using the bladder cancer cell line J82 as an example as seen in the table below.

Conclusion: We demonstrate the feasibility of a regression-based algorithm to predict IC50 values of bladder cancer cell lines without the need for specific cutoffs. The ability to predict IC50 values allows for a rank-based evaluation of potential therapies based on the gene expression of each tumor.

| Bladder Cancer Cell Line J82 with Agents Ranked by Measured and Predicted IC50 Values |
|---------------------------------|-------------|------------------|------------------|------------------|------------------|
| Drug Name                       | Measured IC50 | Measured IC50 Rank | Predicted IC50 | Predicted IC50 Rank | Rank Difference |
| EpothiloneB                     | 0.0014       | 1                 | 0.0656          | 1                 | 0                |
| Thapsigargin                    | 0.0075       | 2                 | 0.0393          | 2                 | 0                |
| Mitomycin C                     | 0.0152       | 3                 | 0.2016          | 6                 | -3               |
| Luminespib                      | 0.0182       | 4                 | 0.0606          | 3                 | 1                |
| Doxorubicin                     | 0.0257       | 5                 | 0.0755          | 4                 | 1                |
| Obatoclax Mesylate              | 0.1030       | 6                 | 0.5446          | 8                 | -2               |
| Shikonin                        | 0.1900       | 7                 | 0.8024          | 11                | -4               |
| JNK 9L                          | 0.4080       | 8                 | 0.0891          | 5                 | 3                |
| TW 37                           | 1.1200       | 9                 | 0.2666          | 7                 | 2                |
| OSU 03012                       | 1.1300       | 10                | 2.4297          | 16                | -6               |
Poster #127
DEVELOPING A PATIENT-CENTERED HEALTH INFORMATION SELF-EDUCATION (HISE) TOOL TO SUPPORT RECOVERY AFTER CYSTECTOMY AND URINARY DIVERSION
Charles Peyton, MD¹; Carmit McMullen, PhD²; Alison Firemark, MA, LPC²; Matthew Nielsen, MD³ and Scott Gilbert, MD¹
¹Moffitt Cancer Center, Tampa, FL; ²Kaiser Permanente Northwest, Portland, OR; ³University of North Carolina, Chapel Hill, NC
Presented By: Charles Peyton, MD

Introduction: Radical cystectomy is a complex surgery associated with significant complications and morbidity. Although patient-centered educational interventions can be effective in supporting self-efficacy and management, few tools exist for bladder cancer patients.

Methods: The need for a health information self-education (HISE) tool for cystectomy patients emerged from a formative and multi-stakeholder design process to identify intervention priorities. After cataloging educational needs of patients, caregivers and clinicians, we convened four confirmatory focus groups attended by cystectomy patients and caregivers to review the content, structure and format of the tool in development. Focus groups were recorded, transcribed, and summarized using standard techniques. A survey gathered rankings of the content areas and the preferred format of the HISE tool.

Results: We invited 100 patients/caregiver dyads recently treated with cystectomy at Moffitt Cancer Center to participate, yielding 25 patients and 5 caregivers who attended one of four focus groups. The median age was 68 years (range 38 – 93). Eight of the 25 patients (32%) reported readmission after cystectomy. Participants reported an average of 4.2 months to “feel normal” after surgery, most were dissatisfied with education prior to surgery, and most obtained information from former patients without the aid of any formal educational resource. Patients desired improved information about the surgery, risks and complications, and long-term functional and quality of life issues. Discharge information was described as overwhelming. We constructed a prototype educational website in accordance with patients’ expressed preferences for self-navigable content, limited text, videos, pictures, vignettes and downloadable information.

Conclusion: Preoperative patient education about cystectomy is inadequate. Our formative stakeholder engagement work and feedback from focus groups has guided development of a tool for cystectomy patients in the format of an interactive concept map. Next, we will test the HISE tool prospectively to explore impact on self-efficacy, knowledge, and other outcomes.
**Poster #128**

**IMPACT OF VARIANT HISTOLOGY ON RESPONSE TO NEOADJUVANT CHEMOTHERAPY FOR BLADDER CANCER**

Michael Lin-Brande, BS¹; Daniel Zainfeld¹; Saum Ghodoussipour¹; Jie Cai¹; Gus Miranda¹; Hooman Djaladat¹; Anne Schuckman¹; Sarmad Sadeghi²; Tanya Dorff²; David Quinn² and Siamak Daneshmad¹

¹USC Institute of Urology, USC/Norris Comprehensive Cancer Center, Los Angeles, CA; ²USC Internal Medicine Division of Oncology, Norris Comprehensive Cancer Center, Los Angeles, CA

Presented By: Michael Lin-Brande, BS

**Introduction:** Urothelial carcinoma comprises 90 percent of bladder cancers in the United States and can be further categorized as pure urothelial carcinoma (PUC) or variant histology. The addition of neoadjuvant chemotherapy (NAC) to cystectomy provides a survival benefit for PUC, however it is unclear if histologic variants receive the same benefit. Our primary objective was to assess the ability of NAC to downstage variants prior to radical cystectomy and secondary objectives were to quantify variant subtype, extravesicular involvement, and overall survival (OS) for histologic variants.

**Methods:** Using our IRB approved, prospectively maintained bladder cancer database, we identified 1440 patients who underwent radical cystectomy with curative intent for urothelial carcinoma between 2003 and 2016. Neuroendocrine variants were excluded. Clinical histology was identified at time of TURBT with final pathology following cystectomy. Multivariate Cox proportional hazards regression analysis was used to assess effect of variant histology on OS.

**Results:** Of the 1440 patients, 1171 (81.3%) had PUC and 269 (18.7%) had variant histology. Variants were classified as squamous cell carcinoma 121 (44.9%), glandular 54 (20.0%), micropapillary 30 (11.2%), sarcomatoid 14 (5.2%), nested 10 (3.7%), clear cell 5 (1.9%), rhabdoid 3 (1.1%), and plasmacytoid 2 (0.7%). 28 (10.4%) patients had >1 variant. Specimens with variant histologic patterns had higher incidence of extravesicular involvement at time of clinical staging (20.8% vs 13.3%, p=0.003). 193 (16.5%) patients with PUC received NAC, of which 105 (54.4%) were downstaged. 69 (25.6%) patients with variant histology received NAC resulting in pathologic downstaging for 43 (62.3%). Variants were more likely to be downstaged in response to NAC compared to PUC (p<0.0001). Variant histology identified either during TURBT or cystectomy did not affect overall survival (HR=1.04, 95% CI (0.81-1.34), p=0.760; HR=0.79, 95% CI (0.61-1.02) p=0.070, respectively).

**Conclusion:** Histologic variants compared to PUC are more likely to have extravesicular involvement at time of diagnosis and have a greater pathologic response to neoadjuvant chemotherapy. NAC should be offered to eligible patients regardless of the presence of histologic variants. Variant histology identified at either TURBT or radical cystectomy had no effect on overall survival.

**Funding:** None
Poster #129
NEOADJUVANT CHEMOTHERAPY WITH DOSE DENSE MVAC IS ASSOCIATED WITH HIGHER DOWN STAGING AND PATHOLOGIC T0 RATES AFTER RADICAL CYSTECTOMY
Dominic Tang, MD¹; Charles Peyton, MD¹; Juan Chipollini, MD¹; Richard Reich, MD¹; Wade Sexton, MD¹; Michael Poch, MD²; Philippe Spiess, MD¹; Jingsong Zhang, MD¹ and Scott Gilbert, MD¹
¹Moffitt Cancer Center; ²Moffitt Cancer Center
Presented By: Dominic Tang, MD

Introduction: Neoadjuvant chemotherapy (NAC) followed by radical cystectomy improves survival compared to cystectomy alone. Dose dense methotrexate, vinblastine, doxorubicin, and cisplatin (ddMVAC) is being adopted at some high-volume centers, but efficacy data compared to more commonly used regimens is limited.

Methods: Data on bladder cancer patients treated with cystectomy at our institution between 2011 and 2016 (n=994) were collected using a Health and Research Informatics system, which includes clinical, administrative, pharmacy and cancer registry data. Down staging to pT0 was examined according to receipt of NAC and across chemotherapy regimens using logistic regression. Survival differences according to down staging were examined using the Kaplan-Meier method.

Results: 423 (43%) patients received NAC. Down staging and complete responses were more common with ddMVAC compared to other regimens. For example, down-staging rates were 43%, 34%, and 10% for ddMVAC, gemcitabine/cisplatin and gemcitabine/carboplatin, respectively, while pT0 rates were 36%, 18% and 6% (p <0.001). In unadjusted and adjusted analyses, ddMVAC was associated with a 2.5 to 3.5 increased likelihood of pathological T0 stage after cystectomy compared to gemcitabine/cisplatin (Table). Patients who experienced pathologic down staging had improved overall survival (p=<0.001).

Conclusion: Dose dense MVAC is associated with improved down staging and pT0 rates after radical cystectomy compared to other commonly used NAC regimens.

<table>
<thead>
<tr>
<th>Chemo Regimen</th>
<th>N (%)</th>
<th>pT0 down-staging (%)</th>
<th>Unadjusted OR</th>
<th>Adjusted OR*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gem/Cis</td>
<td>232</td>
<td>42 (18)</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>ddMVAC</td>
<td>28</td>
<td>10 (36)</td>
<td>2.51 (1.08-5.83)</td>
<td>3.55 (0.74-16.91)</td>
</tr>
<tr>
<td>Gem/Carbo</td>
<td>68</td>
<td>4 (6)</td>
<td>0.28 (0.10-0.82)</td>
<td>0.60 (0.11-3.42)</td>
</tr>
<tr>
<td>Other</td>
<td>104</td>
<td>10 (9)</td>
<td>0.48 (0.23-1.00)</td>
<td>0.88 (0.20-3.95)</td>
</tr>
<tr>
<td>None</td>
<td>562</td>
<td>66 (12)</td>
<td>0.60 (0.39-0.92)</td>
<td>0.45 (0.19-1.11)</td>
</tr>
</tbody>
</table>

*adjusted for age, comorbidity, gender, clinical stage, chemo regimen, and histology
Poster #130

ONCOLOGIC OUTCOMES FROM A RANDOMIZED CONTROLLED TRIAL COMPARING OPEN AND ROBOT-ASSISTED LAPAROSCOPIC RADICAL CYSTECTOMY FOR BLADDER CANCER

Karim Marzouk, MD, FRCSC¹; Bernard Bochner, MD, FACS¹; Guido Dalbagni, MD¹; Daniel Sjoberg, MS²; Justin Lee, MD, FRCSC¹; S. Machele Donat, MD, FACS¹; Jonathan Coleman, MD¹; Andrew Vickers, PhD²; Raul Parra, MD¹; Harry Herr, MD, FACS¹ and Vincent Laudone, MD¹

¹Memorial Sloan Kettering Cancer Center, Department of Surgery, Division of Urology, New York, NY; ²Memorial Sloan Kettering Cancer Center, Department of Epidemiology & Biostatistics, New York, NY

Presented By: Karim Marzouk, MD

Introduction: There is a paucity of long-term oncologic outcomes comparing robot-assisted laparoscopic radical cystectomy (RARC) and open radical cystectomy (ORC). We have previously reported the primary endpoints evaluating perioperative outcomes from a randomized trial. Herein, we report secondary endpoints of cancer specific outcomes from our prospective, randomized trial comparing RARC & ORC.

Methods: Between 2010 and 2013, 118 patients with clinical stage Ta-T3 bladder cancer (Bca) were randomized, with 60 undergoing RARC and 58 ORC. Recurrent Bca was defined according to the first site of disease detection. Disease location was defined as: (1) distant recurrence (2) local pelvic recurrence (3) abdominal recurrence (carcinomatosis or abdominal wall involvement) and (4) secondary urothelial carcinoma. Kaplan-Meier methods were used to estimate recurrence and cancer-specific survival after radical cystectomy (RC), and the log-rank test to compare differences in recurrence and cancer-specific survival rates.

Results: The median follow-up was 4.9 years (IQR 3.9, 5.9). There were 44 patients with recurrences: 25 after ORC, and 19 after RARC. In total, there were 36 deaths, including 19 deaths from bladder cancer. Overall recurrence rates and bladder cancer specific death rates were not statistically different between groups (p=0.4 and p=0.4, respectively). Risk of recurrence 2 years after surgery was 25% in the RARC arm and 28% in the ORC arm (difference -2.6%; 95% CI -19%, 14%) and 37% and 45% at 5 years (difference -8%; 95% CI -27%, 11%). The wide confidence intervals around the difference in recurrence risk preclude us from making conclusions regarding oncologic equivalence of the surgical modalities. Overall we found 14 abdominal recurrences in 5 RARC patients, and 4 recurrences in 2 patients following ORC. Two of the 5 RARC patients with abdominal recurrences had organ-confined disease, including one with HG, pTa Bca. In the ORC group, 2 patients had non-organ confined disease and developed carcinomatosis but no abdominal wall involvement.

Conclusion: Our secondary analysis of cancer outcomes revealed no significant difference in disease recurrence rates or cancer-specific survival. Observed patterns of recurrence based on surgical technique, were of interest, however the study was not powered to establish differences in patterns of recurrence. Future studies are needed to determine if variations in sites of recurrence exist based on surgical technique.
Poster #132
BLUE LIGHT IN COMBINATION WITH HEAMINOLEVULINATE (CYSVIEW®) LEADS TO BLADDER CANCER CELL DEATH IN AN IN VITRO MODEL
Justin Matulay, MD¹; Alanna Williams, BA²; Mark Silva, MD¹; Suk Lee, PhD²; James McKiernan, MD¹ and Michael Shen, PhD²
¹Columbia University Medical Center, Department of Urology, New York, NY, USA; ²Columbia University Medical Center, Herbert Irving Comprehensive Cancer Center, New York, NY, USA
Presented By: Justin T. Matulay, MD

Introduction: Blue light cystoscopy with hexaminolavulinate (HAL, Cysview®) improves detection of bladder cancer over white light cystoscopy alone, and is FDA-approved for this purpose. Photodynamic therapy (PDT) is used as a treatment for various malignancies, but aside from small phase I trials, has not been utilized in treatment of bladder cancer. The purpose of this study was to measure the cell death effect of HAL/Blue light on patient-derived bladder cancer organoids.

Methods: Fresh bladder cancer specimens were collected as part of an IRB approved protocol (AAAN8850) and grown as 3D bladder cancer organoids per lab protocol. A single patient-derived organoid line was selected for all experiments based on robust growth and genetic analysis showing correlation with parental tumor mutations. After drug administration organoids were incubated for 4 hours, then one group was exposed to blue light while the other remained in the incubator. The blue light source was calibrated to deliver a peak wavelength of 410nm at an energy of 1J/cm². All sources of light contamination were minimized. Cell viability was assessed using the Promega CellTiter-Glo® luminescent cell viability assay 18 hours after blue light exposure. The resultant luminescence values were normalized for graphic representation.

Results: A range of HAL concentrations from 0.25μM to 4μM were selected based on results of pilot experiments not shown here. There was a statistically significant decrease in cell survival at HAL concentrations ≥0.5μM (p<0.001 for 0.5, 1, 2, 4μM) in the blue light exposed group when compared to the non-blue light exposed (Figure 1). There was no difference in survival between non-drug treated control groups exposed and not exposed to the blue light (p=0.849). The IC50 and IC20 were 0.70μM and 0.50μM, respectively.

Conclusion: The combination of HAL and blue light drastically reduces cell survival in patient-derived bladder cancer organoids. The concentration of HAL required to see a significant effect is well below the clinically administered dose of 8μM. These results suggest that beyond the diagnostic utility of Blue Light Cystoscopy with HAL there is a potential for therapeutic benefit.
Poster #133
HOSPITAL READMISSIONS AFTER RADICAL CYSTECTOMY: THE IMPACT OF AN ENHANCED RECOVERY PATHWAY
Abhinav Khanna, MD, MPH; Anna Zampini, MD, MBA; Kyle Ericson, MD; Michele Fascelli, MD; Prithvi Murthy, MD; Alice Crane, MD PhD; Byron Lee, MD, PhD and Georges Pascal Haber, MD, PhD
Cleveland Clinic
Presented By: Abhinav Khanna, MD

Introduction: Radical cystectomy is associated with greater morbidity and health service utilization than any other surgical procedure in urology. Enhanced recovery pathways have demonstrated decreases in length of stay for cystectomy patients, but it has been suggested that earlier discharge may lead to increased readmission rates. We report our return to hospital outcomes following implementation of a peri-operative optimization pathway for patients undergoing radical cystectomy at a high volume tertiary care center.

Methods: All patients undergoing radical cystectomy at our institution were enrolled in a post-operative enhanced recovery pathway beginning October, 2016. We compared outcomes for the first six months of patients enrolled in this pathway to the cohort of patients undergoing cystectomy in the nine months immediately prior to pathway initiation. Categorical and continuous variables were compared between groups using chi-square and t-test, respectively.

Results: Ninety-eight patients underwent radical cystectomy after initiation of the peri-operative optimization pathway from October 2016 through March 2017. This cohort was compared to 112 patients undergoing radical cystectomy from January 2016 through September 2016. There were no baseline differences between groups in age, sex, BMI, operative blood loss, nor presence of diabetes, COPD, hypertension, or smoking. Median length of stay decreased from 7 days to 5 days following implementation of the protocol (p<0.001). The proportion of patients with any unplanned return to the hospital after discharge decreased from 50.9% before protocol implementation to 30.6% after implementation (p=0.003). There was a 40% reduction in post-discharge emergency room visits (p=0.16), 31.3% reduction in “observation” stays (p=0.34), and 25.4% reduction in 30-day readmissions (p=0.32) following protocol implementation. As shown in figure 1, the majority of hospital readmissions occurred in the first 11 days irrespective of study group.

Conclusion: Implementation of an enhanced recovery pathway for radical cystectomy at our institution reduced length of stay as well as unplanned returns to the hospital.

Funding: None
Poster #134
EXTERNAL VALIDATION OF EORTC BLADDER CANCER RISK CALCULATOR IN A CONTEMPORARY US POPULATION
Tullika Garg, MD, MPH¹; Carmit McMullen, PhD²; Michael Leo, PhD²; Maureen O'Keefe-Rosetti, PhD²; Sheila Weinmann, PhD²; Matthew Wagner, MD² and Matthew Nielsen, MD, MS³
¹Geisinger Health System, Danville, PA; ²Kaiser Permanente Northwest, Portland, OR; ³UNC Lineberger Cancer Center, Chapel Hill, NC
Presented By: Tullika Garg, MD, MPH

Introduction: Most bladder cancer is non-muscle-invasive (NMIBC), with substantial heterogeneity in recurrence and progression risk. The EORTC risk calculator, based on a pooled analysis of NMIBC clinical trials (Sylvester 2006), is a practical tool to predict these risks. We evaluated how well it predicted outcomes in a large contemporary population of US NMIBC patients treated in a real-world practice setting.

Methods: In a cohort of 1498 patients treated in an integrated delivery system with a median follow-up of 2.1 years for recurrence and 4.1 years for progression, we calculated the prognostic index (PI) for recurrence and progression using the published EORTC weights and classification of cases into four risk categories. We followed Royston & Altman’s (2013) guidelines for the external validation of prognostic calculators based on methods of evaluating discrimination and calibration in the Cox model.

Results: For recurrence, discrimination as measured by Harrell’s C was smaller in the validation sample (.66) compared to that reported in the developmental paper (.61), whereas for progression it was larger in the validation sample (.78 vs .75). Comparing the Kaplan-Meier curves in the validation and developmental samples for the four risk groups, calibration and discrimination were adequate for all groups except the highest risk group. For progression, the cumulative incidence was smaller for the three highest risk groups compared to the developmental sample, suggesting some miscalibration.

Conclusion: 2016 AUA/SUO NMIBC guidelines support the development and implementation of risk-stratified care pathways as an important way to improve clinical care. Our findings suggest the EORTC calculator has limited discrimination and calibration for US patients treated in a real-world setting, particularly for the large group with lower-risk NMIBC. Future work will develop novel predictive models evaluating more granular intermediate NMIBC outcomes to inform implementation of risk-stratified care pathways. National Institutes of Health 1R21CA191610-01
Poster #135
CHEMOTHERAPY PRIOR TO RADICAL NEPHROURETERECTOMY IN PATIENTS WITH ADVANCED UPPER TRACT UROTHELIAL CARCINOMA
Tanner Miest, MD, PhD; Amir Toussi, MD; Stephen Boorjian, MD; Houston Thompson, MD; Brian Costello, MD; Bradley Leibovich, MD and Matthew Tollefson, MD
Department of Urology, Mayo Clinic, Rochester, MN
Presented By: Tanner Miest, MD, PhD

Introduction: Chemotherapy improves survival in muscle-invasive urothelial carcinoma of the bladder. However, its use in the management of upper tract urothelial carcinoma (UTUC) either before or after radical nephroureterectomy remains unclear. Our goal was to determine the outcomes of neoadjuvant chemotherapy in patients with UTUC.

Methods: We identified 676 patients who underwent radical nephroureterectomy for UTUC from 1995-2011 at our institution. Patients were categorized by radiographic and pathologic response to neoadjuvant chemotherapy. Postoperative cancer-specific survival was estimated using the Kaplan-Meier method and compared using the log rank test.

Results: We identified 42 patients (6.2%) that underwent chemotherapy prior to nephroureterectomy. The majority of these patients had clinical lymphadenopathy (25, 59.5%) or limited metastatic disease (8, 19%) prior to chemotherapy. Most patients (40, 95%) received a cisplatin-based regimen. Patients received a median of 4 cycles of chemotherapy prior to surgery. The median reduction in radiographic tumor size was 36%. A total of 13 patients (31%) were downstaged to non-invasive, node negative disease at surgery. Cancer-specific survival was significantly associated with complete radiographic response (p=0.04) and pathologic downstaging to non-invasive, node negative UC (p=0.018). The majority of patients that harbored residual invasive or nodal disease died of UTUC.

Conclusion: Neoadjuvant cisplatin-based chemotherapy demonstrates similar efficacy in downstaging UTUC as bladder urothelial carcinoma. Patients that experience complete radiographic response and/or pathologic downstaging have durable long-term survival. Due to the high mortality of advanced UTUC, further studies into the timing, method and type of chemotherapy are needed.
**Poster #136**

**COMPARATIVE EFFECTIVENESS OF TREATMENT STRATEGIES FOR SQUAMOUS CELL CARCINOMA OF THE BLADDER**

Kristian Stensland, MD, MPH¹; Jared Schober, MD¹; Harras Zaid, MD¹; David Canes, MD¹; Matt Galsky, MD² and Alireza Moinzadeh, MD¹

¹Lahey Hospital and Medical Center; ²Icahn School of Medicine at Mount Sinai

Presented By: Kristian D. Stensland, MD, MPH

**Introduction:** Treatment recommendations for muscle invasive bladder cancer (MIBC) are limited by their study primarily in urothelial carcinoma. The effectiveness of treatment strategies in the variant histologies has been understudied, and in some histologies has not been studied at all. Herein, we present comparative effectiveness of primary treatment strategies for squamous cell carcinoma.

**Methods:** The National Cancer Database was queried for cases of localized MIBC (T2-3, N0, M0). Permutations of surgery (radical cystectomy, RC), chemotherapy (single or multiagent), and external beam radiation were selected using treatment and timing variables. Neoadjuvant chemotherapy was defined as receipt of chemotherapy within 180 days pre-RC; adjuvant chemotherapy was defined as receipt of chemotherapy within 180 post-RC. Cases with missing survival time or that received no treatment were excluded. A multinomial propensity score method was used to create treatment weights which were then applied in weighted Cox proportional hazards models to assess the comparative effectiveness of treatments on overall survival adjusting for age, TNM clinical stage, Charlson comorbidity index and sex.

**Results:** A total of 828 cases were included, with treatments comprising RC alone (n=465, 56%), neoadjuvant chemotherapy + RC (n=53, 6.4%), RC + adjuvant chemotherapy (n=48, 5.7%), chemotherapy alone (n=72, 8.7%), radiation alone (n=88, 11%), and chemoradiation (n=102, 12%). There were 639 (77%) clinical T2 and 189 (23%) clinical T3 cases. The results of the weighted Cox proportional hazard are presented in Table 1. Non-surgical treatments were all associated with significantly worse outcomes. The addition of neoadjuvant (HR 1.32, 95% CI 0.93-1.89) or adjuvant chemotherapy (HR 0.74, 95% CI 0.47-1.17) did not appear to significantly improve overall survival in this population.

**Conclusion:** RC with or without perioperative chemotherapy is associated with better survival for squamous cell muscle invasive bladder cancer and should be considered an upfront treatment in this population. While there was a non-statistically significant association of adjuvant chemotherapy on survival in this population, this warrants evaluation in prospective trials.

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**Table 1: Weighted, Post-Multinomial Propensity Score Matching Cox Proportional Hazard Model for Overall Survival**

<table>
<thead>
<tr>
<th>Factor</th>
<th>HR</th>
<th>Low 95% CI</th>
<th>High 95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC Alone</td>
<td>(Ref)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neoadjuvant Chemotherapy + RC</td>
<td>1.32</td>
<td>0.93</td>
<td>1.89</td>
<td>0.12</td>
</tr>
<tr>
<td>RC + Adjuvant Chemotherapy</td>
<td>0.74</td>
<td>0.47</td>
<td>1.17</td>
<td>0.20</td>
</tr>
<tr>
<td>Chemo Alone</td>
<td>2.16</td>
<td>1.54</td>
<td>3.02</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Radiation Alone</td>
<td>2.81</td>
<td>1.79</td>
<td>4.42</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chemo + Radiation</td>
<td>1.64</td>
<td>1.26</td>
<td>2.12</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Age (years)*</td>
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<td>1.00</td>
<td>1.02</td>
<td>0.020</td>
</tr>
<tr>
<td><strong>TNM Clinical T Stage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(Ref)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1.20</td>
<td>0.50</td>
<td>1.59</td>
<td>0.22</td>
</tr>
<tr>
<td>Female Sex</td>
<td>1.07</td>
<td>0.81</td>
<td>1.40</td>
<td>0.65</td>
</tr>
<tr>
<td>Charlson Comorbidity Index**</td>
<td>1.16</td>
<td>1.00</td>
<td>1.36</td>
<td>0.056</td>
</tr>
</tbody>
</table>

*For each additional year, risk of death increases by 1%.
**For each unit increase, risk of death increases by 16%.
Poster #137
INTEGRIN SIGNALING MODULATION DEMONSTRATES POTENTIAL THERAPEUTIC STRATEGY IN BLADDER CANCER USING THREE-DIMENSIONAL ORGANOID CULTURE AND CRISPR/CAS9 MODIFIED XENOGRAFTS
LaMont Barlow, MD; Kevin Newhall, BS; Rebecca Meyer, BS; David Chen, BS; Francesca Khani, MD; Douglas Scherr MD; Christopher Barbieri, MD, PhD; Bishoy Faltas, MD and Mark Rubin, MD
Weill Cornell Medical College, New York, NY
Presented By: LaMont J. Barlow, MD

Introduction: Integrin signaling plays an important role in cellular proliferation and migration via interactions with extracellular matrix proteins. Prior laboratory investigations indicate that integrin signaling facilitates tumor invasion and metastasis in multiple cancers, and there are several ongoing clinical trials using agents that modulate this pathway. We recently identified clonal enrichment in missense mutations in the integrin cell surface interactions pathways in advanced chemotherapy-resistant urothelial carcinoma. An ideal strategy for investigating integrin signaling is via 3D organoid culture, which maintains intercellular interactions that more closely replicate the epithelial microenvironment. We hypothesize that genetic and pharmacologic integrin signaling modulation will impair organoid growth as well as in vivo tumor formation and demonstrate a potential therapeutic utility for this approach.

Methods: The RT4 cell line and a patient-derived bladder cancer cell line (WCM748) were grown in 3D culture to promote organoid formation as previously described. A CRISPR/Cas9 lentiviral vector was designed to knock out focal adhesion kinase (FAK, a convergent and conserved enzyme activated by integrin ligand binding) in both cell lines, which were then used for organoid and xenograft experiments. A FAK inhibitor (defactinib) was used for pharmacologic inhibition assays.

Results: CRISPR/Cas9-mediated FAK knockout cell lines produced significantly smaller organoids compared to controls (mean size for RT4 FAK knockout: 121.1 um, control 228.9 um, p<0.0001). Three-dimensional culture of single-cell suspensions of unaltered cell lines in the presence of defactinib produced a dose-dependent decrease in mean organoid size, and preformed bladder cancer organoids showed a dose-dependent regression in size after 72 hours of defactinib exposure. Additionally, xenografts established from FAK knockout cell lines formed significantly smaller tumors in mice compared to controls.

Conclusion: Integrin modulation via genetic and pharmacologic manipulation impacts growth of human bladder cancer cells in both organoid and xenograft models. This is the first study to demonstrate the potential therapeutic benefit of integrin modulation in human bladder cancer cells and suggests a utility for this strategy in both intravesical and systemic therapy for bladder cancer.
Poster #138

A NATIONWIDE ANALYSIS OF COMPLETE URINARY TRACT EXTRIPATION

Jacob Jipp, MD¹; Zachary Smith, MD²; Peter Langenstroer, MD³; Kenneth Jacobsohn, MD¹ and Scott Johnson, MD³

¹Medical College of Wisconsin, Milwaukee, Wisconsin; ²University of Chicago, Chicago, Illinois; ³Medical College of Wisconsin, Milwaukee, Wisconsin

Presented By: Jacob Jipp, MD

Introduction: Complete urinary tract extirpation (CUTE) involves bilateral nephroureterectomy and radical cystectomy. This major operation may be necessary for patients with concomitant upper and lower tract urothelial carcinoma (UC) or patients with chronic renal failure and UC. Given the rarity of this operation, descriptions of CUTE are limited to case reports and small case series. However, long-term outcomes following CUTE are not well known, and data regarding oncologic success is limited.

Methods: The United States Renal Data System is a prospective database that includes every hemodialysis (HD) patient in the United States. The database was queried for all patients undergoing radical cystectomy and bilateral nephroureterectomy for UC and resultant need for HD. Post-operative details and complications were assessed. Competing risks analysis was used to estimate overall and cancer-specific survival. Cox regression was used to identify predictors of death.

Results: During the study period, a total of 317 patients were identified for analysis, of which 70.9% were male. Mean age was 65.3 ± 12.9 years. Mean length of stay was 16.2 ± 15.3. Overall, 46.0% of patients experienced a complication within 30 days, of which infectious-related complications were most common (13.6%). On multivariable analysis, only female sex was predictive of experiencing a complication (OR 2.37, p<0.01). The 30-day mortality rate was 8.5%. Overall mortality at 1, 3, and 5 years was 45.3%, 69.0%, and 82.7%, respectively. Cancer-specific mortality at 1, 3, and 5 years was 10.0%, 15.7%, and 16.8%, respectively. Predictors of overall mortality were age (subhazard ratio, 1.03; 95%CI, 1.02-1.04) and active smoking status (subhazard ratio, 3.35; 95%CI, 1.50-7.50).

Conclusion: To our knowledge, this represents the largest study evaluating outcomes following CUTE. CUTE is associated with significant morbidity and mortality, with less than 20% of patients surviving 5 years. Complication rate is similar to radical cystectomy, with nearly half of patients experiencing one within 30 days.
Introduction: Meta-analyses of neoadjuvant chemotherapy support a 5% overall survival benefit in bladder cancer; however, the cost effectiveness of this strategy is debated. We present a cost effectiveness analysis of neoadjuvant chemotherapy prior to radical cystectomy (RC) in the setting of T2 bladder cancer.

Methods: We constructed a Markov model to simulate neoadjuvant platinum based chemotherapy followed by RC vs. primary RC, disease recurrence, and survival in patients with T2 bladder cancer. Transition probabilities were derived from clinical trial data; costs (converted to 2016 US dollars) and health utilities were estimated from the literature. Incremental cost-effectiveness ratios (ICER), expressed as dollar per quality-adjusted life-year (QALY), were calculated with ICER less than $50,000/QALY considered cost effective. We conducted one-way and probabilistic sensitivity analyses to examine model uncertainty.

Results: Our base-case model found that over a lifetime platinum based neoadjuvant chemotherapy prior to RC increased overall costs by $16,527 and improved effectiveness by 1.0 QALYs compared with primary RC alone, leading to an ICER of $16,527. On tornado analysis plot of ICER, the model was most sensitive to age of patient, cost of neoadjuvant chemotherapy, and probability of mortality with neoadjuvant chemotherapy. Probabilistic sensitivity analysis found that neoadjuvant chemotherapy prior to RC was cost effective >90% of the time at a willingness-to-pay threshold of $50,000/QALY.

Conclusion: Platinum based neoadjuvant chemotherapy prior to RC in the setting of T2 urothelial cell carcinoma reduces costs with an acceptable ICER. This is a cost effective treatment strategy for patients with T2 disease.
Poster #140

UPREGULATION OF PD-L1 TRANSCRIPTION IN BLADDER CANCER BY INTERFERON GAMMA AND TUMOR NECROSIS ALPHA IS REGULATED BY A NOVEL INTRONIC ENHANCER ELEMENT

William Tabayoyong, MD, PhD; Jinesh Goodwin, PhD and Ashish Kamat, MD
University of Texas MD Anderson Cancer Center, Houston, TX
Presented By: William Tabayoyong, MD, PhD

Introduction: Programmed death-ligand 1 (PD-L1) expression in bladder cancer cells has been associated with Bacillus Calmette-Guerin (BCG) failure and high grade, high stage, high rate of post-operative recurrence, and increased risk of death after cystectomy. Indeed, disruption of the PD1-PD-L1 axis with immune checkpoint inhibitors has demonstrated improved overall response rates and increased overall survival for patients with metastatic bladder cancer compared to standard primary cisplatin based chemotherapy. Understanding the molecular mechanisms governing PD-L1 expression in bladder cancer will allow us to optimize the delivery of immune checkpoint inhibitor therapy to achieve maximal therapeutic effect and minimize immune related adverse events; however, little is known about the regulation of PD-L1 expression in bladder cancer. Here, our objective was to investigate the mechanism by which PD-L1 expression in bladder cancer cells is regulated.

Methods: Bladder cancer cells were stimulated in vitro with the BCG immunotherapy-associated cytokines interferon-gamma (IFN-gamma) and tumor necrosis factor-alpha (TNF-alpha) and expression of PD-L1 was measured by Western Blot. In addition, the DNA and mRNA sequences of the PD-L1 promoter and all known PD-L1 gene transcript variants, respectively, were systematically examined for putative regulators of gene transcription.

Results: IFN-gamma and TNF-alpha stimulation synergistically augmented PD-L1 expression in bladder cancer cells in a transcription-dependent manner. We discovered that an activator protein-1 binding site within a novel putative intronic enhancer element was responsible for this synergistic upregulation of PD-L1 expression, whereas a serum response factor binding site within the same intronic enhancer element negatively regulated PD-L1 expression. Validation studies to confirm these findings are ongoing with bladder cancer cells that have had CRISPR/Cas9 targeted deletion of the putative intronic enhancer element.

Conclusion: The BCG immunotherapy-associated cytokines IFN-gamma and TNF-alpha induced upregulation of PD-L1 expression in bladder cancer cells. The increased expression of PD-L1 by bladder cancer cells in response to IFN-gamma and TNF-alpha is regulated by an intronic enhancer element that acts as an on-off switch for transcription of PD-L1.
Poster #141
UNDERUTILIZATION OF PELVIC LYMPH NODE DISSECTION DURING PARTIAL CYSTECTOMY FOR BLADDER CANCER: OPPORTUNITY FOR IMPROVEMENT
Vidit Sharma, MD; Mary E. Westerman, MD; Stephen A. Boorjian, MD; R. Houston Thompson, MD; R. Jeffrey Karnes, MD, Igor Frank, MD and Matthew K. Tollefson, MD
Mayo Clinic, Rochester, MN
Presented By: Vidit Sharma, MD

Introduction: Guidelines recommend pelvic lymph node dissection (PLND) during both partial cystectomy (PCx) and radical cystectomy (RCx). Here we analyze practice patterns using the National Cancer Database (NCDB) to determine the utilization of PLND during PCx relative to RCx.

Methods: Localized bladder cancer patients without concurrent malignancies receiving either RCx or PCx were identified using years 2004-2013 of NCDB, a dataset recording ~70% of cancer diagnoses in the United States. Standard descriptive statistics and multivariable logistic regression were used to identify an association of PCx vs RCx and PLND rates.

Results: Of 29,981 patients [14.5%(4,357) PCx and 85.5%(25,624) RCx], PCx patients had lower rates of PLND compared to RCx patients (40.3% vs 90.9%, p<0.001). This discrepancy remained for subsets of patients with cT2 disease (53.2% vs 92.6%), cT3 disease (42.5% vs 90.7%), and cN+ (64.3% vs 95.7%, p<0.001 for all). The incidence of PLND increased from 2004 to 2013 for both PCx (37.3% to 46.5%) and RCx (86.0% to 94.0%, p<0.001 for both). When a PLND was performed during PCx, 16.6% of patients had positive nodes. On multivariable logistic regression analysis, PCx was associated with lower odds of receiving a PLND relative to RCx (OR=0.078, p<0.001) after adjusting for age, Charlson Comorbidity Count, year, Grade, cT stage, cN stage, and academic status.

Conclusion: Among patients captured in the National Cancer Database, those treated with a PCx were significantly less likely to receive a PLND compared to RCx patients, despite a 16% risk of harboring positive lymph nodes when a PLND was performed. While PLND rates improved over time, more than half of all PCx patients did not receive a PLND, as recommended by current guidelines. Thus, these results suggest an opportunity for improvement.
Poster #142  
CANCER CARE DISPARITY IN RENAL CELL CARCINOMA AMONG HISPANICS IN SOUTH TEXAS REGION  
Dharam Kaushik, MD¹; Joel Michalek, PhD²; Alex Bokov, PhD²; Wasim Chowdhury, MS³; Yidong Chen, PhD²; Jonathan Gelfond, MD, PhD³; Desiree Wilson, PhD²; Qianqian Liu, PhD²; Dorothy Long Parma, PhD²; Edgar Munoz, PhD²; Hanzhang Wang, MS³; Justin Guerrera, PhD²; Amelie Ramirez, PhD² and Ronald Rodriguez, MD, PhD²  
¹University of Texas Health, San Antonio, Texas, USA; ²San Antonio  
Presented By: Dharam Kaushik, MD  

Introduction: Recent evidence suggests increased cancer care disparity in Hispanics. We report kidney cancer incidence during 2008 to 2012 in the catchment area for UT (University of Texas) Health, San Antonio, Texas.  

Methods: We utilized I2B2 (Informatics for Integrating Biology and the Bedside) an open-source, vendor-independent academic data warehouse platform designed to combine, organize, and search patient data from multiple electronic medical record (EMR) systems. We identified 383,752 patients from 2008 to the present who presented at UT Health. To identify the at-risk Hispanic population we selected all patients reported as Hispanic or Latino with visits between January 1 2008 and December 31 2012. For the at-risk Non-Hispanic White (NHW) population we selected all patients reported as White or Caucasian with visits during the same time but excluding those who were also reported as Hispanic or Latino. The sample sizes were 75,837 and 103,694 for Hispanic and NHW, respectively. To identify patients whose first occurrence of kidney cancer was in 2008-2012 we selected patients from the above respective cohorts with an ICD9 code of 189.0 (“Malignant neoplasm of kidney except renal pelvis”) recorded at least once during that period but excluding from that set any patients who also had this code prior to 2008.  

Results: The resulting cohorts totaled 179,531 patients (Hispanics: 75,837; NHW: 103,694). Kidney cancer incidence was significantly increased in Hispanics relative to NHW in all age brackets among individual older than 20 years (Table 1).  

Conclusion: This pattern suggests that Hispanics in South Texas will continue to be disproportionally affected by current patterns of very high incidence of RCC. Therefore, examining novel factors that may explain this disparity of higher incidence of RCC in South Texas Hispanic is urgently needed. While obesity is a strong risk factor for kidney cancer, the findings in our data set demonstrates a strong male to female ratio among all patients, a previously well-known distribution, which is out of proportion to known obesity rates for this population. Hence obesity alone does not appear to account for these differences.  

Table 1. Kidney Cancer Incidence by Ethnicity and Age Bracket at UT Medicine 2008-2012  

<table>
<thead>
<tr>
<th>Age</th>
<th>Non-Hispanic White</th>
<th>Hispanic</th>
<th>OR²</th>
<th>95% CI²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>n (%)</td>
<td>N</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>[0,20]</td>
<td>12060</td>
<td>6 (0.05%)</td>
<td>20255</td>
<td>6 (0.03%)</td>
<td>0.60 (0.19, 1.85)</td>
</tr>
<tr>
<td>(20,30)</td>
<td>9205</td>
<td>2 (0.02%)</td>
<td>8152</td>
<td>8 (0.10%)</td>
<td>4.52 (0.96, 21.29)</td>
</tr>
<tr>
<td>(30,40)</td>
<td>12558</td>
<td>7 (0.10%)</td>
<td>9007</td>
<td>16 (0.20%)</td>
<td>3.19 (1.31, 7.76)</td>
</tr>
<tr>
<td>(40,50)</td>
<td>13401</td>
<td>29 (0.20%)</td>
<td>9476</td>
<td>47 (0.50%)</td>
<td>2.30 (1.45, 3.65)</td>
</tr>
<tr>
<td>(50,60)</td>
<td>18543</td>
<td>69 (0.40%)</td>
<td>10435</td>
<td>106 (1.00%)</td>
<td>2.75 (2.03, 3.72)</td>
</tr>
<tr>
<td>(60,70)</td>
<td>19302</td>
<td>107 (0.60%)</td>
<td>9933</td>
<td>128 (1.30%)</td>
<td>2.34 (1.81, 3.03)</td>
</tr>
<tr>
<td>(70, +)</td>
<td>18625</td>
<td>111 (0.60%)</td>
<td>8579</td>
<td>82 (1.00%)</td>
<td>1.61 (1.21, 2.14)</td>
</tr>
</tbody>
</table>

1: Odds ratio, 2: 95% Confidence Interval for the odds ratio
Poster #143

UTILIZATION OF BCG FOR NON-MUSCLE INVASIVE BLADDER CANCER IN AN ERA OF BCG SUPPLY SHORTAGES

Abhinav Khanna, MD, MPH¹; Nitin Yerram, MD¹; Hui Zhu, MD, PhD²; Simon Kim, MD, MPH³ and Robert Abouassaly, MD, MSc²

¹Cleveland Clinic; ²Cleveland Clinic and Louis Stokes VA Medical Center; ³University Hospital Medical Center

Presented By: Abhinav Khanna, MD, MPH

Introduction: In November 2016, the manufacturer of the Connaught strain of bacillus Calmette-Guerin (BCG) announced that it would discontinue BCG production effective 2017. This has led to concerns about potential BCG shortages. Prior interruptions in BCG production occurred in 2011 and 2012, leading to worldwide shortages and anecdotal reports of rationed BCG use. However, utilization trends of BCG for non-muscle invasive bladder cancer (NMIBC) during prior BCG supply shortages have not been described. We aim to study trends in BCG utilization before and during national BCG shortages.

Methods: We utilized the National Cancer Database to identify patients with NMIBC. We included patients with urothelial carcinoma, stages Ta, T1, or CIS, without nodal or metastatic disease. We assessed BCG utilization over time using chi-square and the Cochran-Armitage trend test. We also performed segmented regression analysis of interrupted time series to compare BCG utilization before and during BCG shortages.

Results: We identified 292,446 patients with NMIBC from 2004-2014. Overall, 13.8% of patients with NMIBC received intravesical BCG during the study period. BCG utilization was highest among patients with CIS and T1-high grade disease. Figure 1 demonstrates trends in BCG utilization over time. Cochran-Armitage trend test suggested a rise in BCG utilization over the study period for all patients with NMIBC (p<.0001), including TaHG (p<.0001), T1LG (p=.0003), T1HG (p<.0001), and CIS (p<.0001) subsets. There was no change in BCG utilization in the TaLG subset (p=0.46). Segmented regression revealed a decrease in the rate of rise of BCG utilization following major supply interruptions in 2011 and 2012 (2004-2012: 0.47% increase per year [p<.0001]; 2012-2014: 0.03% increase per year [p=0.83]).

Conclusion: BCG utilization for NMIBC increased significantly over the study period, possibly representing increased adoption of national guidelines for BCG in NMIBC. However, the rate of increase in BCG utilization was blunted in the years following interruptions in BCG supply. Efforts should be made to boost BCG supply to keep up with rising demand, especially in the setting of upcoming production disruptions.

Funding: None
ASSOCIATIONS OF SPECIFIC POSTOPERATIVE COMPLICATIONS WITH COSTS AFTER RADICAL CYSTECTOMY

Matthew Mossanen, MD¹; Ross Krasnow, MD, MS²; Stuart Lipsitz, ScD²; Mark Preston, MD, MPH³; Adam Kibel, MD²; Albert Ha, MD⁴; John Gore, MD, MS²; Angela Smith, MD, MS⁴; Jeffrey Leow, MD²; Quoc Trinh, MD⁵ and Steven Chang, MD, MS²

¹Boston, MA; ²Boston; ³Seattle; ⁴Chapel Hill

Presented By: Matthew Mossanen, MD

Introduction: Radical cystectomy (RC) is a morbid surgery plagued by complications. Expenditures attributed to specific complications after RC is not well characterized. We sought to quantify the financial impact of complications after RC and their associations with respective 90-day costs.

Methods: We used the Premier Hospital Database to identify 9,137 RC patients (weighted population of 57,553) from 360 hospitals between 2003-2013. Complications were categorized according to Agency for Healthcare Research and Quality Clinical Classifications. Patients with and without complications were compared and multivariable analysis was performed.

Results: An index complication increased costs by $9,262 [95% CI 8300-10,223] and a readmission complication increased costs by $20,697 [95%CI 18,735-22,660]. The four most costly index complications (descending order) were venous thromboembolism (VTE), infection, wound and soft tissue event, and pulmonary (p<0.001, vs. no complication). A complication increased length of stay by 4 days [95%CI 3.6-4.3]. One in 5 patients were readmitted in 90 days and the four costliest readmission complications (descending order) were pulmonary, bleeding, VTE, and gastrointestinal complications (p<0.001, vs. no complication). Readmitted patients had multiple complications upon readmission (median of 3, IQR 2-4). On multivariable analysis, more comorbidities, longer surgery (>6 hours), transfusions > 3 units, and teaching hospitals were associated with higher costs (p<0.05) while high volume surgeons and shorter surgeries (<4 hours) were associated lower costs (p<0.05).

Conclusion: Complications after RC increase index and readmission costs for hospitals, and can be categorized based on magnitude. Future quality improvement initiatives may consider prioritizing complications based on financial impact.
Poster #145
HOSPITAL VOLUME AND SHORT-TERM OUTCOMES AFTER CYTOREDUCTIVE NEPHRECTOMY

Leilei Xia, MD¹; Jose Pulido, MD¹; Benjamin Taylor, MD² and Thomas Guzzo, MD, MPH¹
¹Division of Urology, Department of Surgery University of Pennsylvania Perelman School of Medicine, Philadelphia, PA; ²Department of Urology, Weill Cornell Medical College, New York, NY
Presented By: Leilei Xia, MD

Introduction: Cytoreductive nephrectomy (CN) is considered a treatment option for selected patients with metastatic renal cell carcinoma (mRCC). CN is a complex surgery with significant perioperative morbidities. There have been no studies reported on volume-outcome associations in the CN setting.

Methods: We identified mRCC patients who underwent CN from 2006 to 2013 in the National Cancer Database (NCDB). Hospital volume was categorized as high (upper 20th%ile by hospital volume) and low (lower 80%). Univariable analyses and multivariable logistic regressions adjusted for patient (age, sex, race, comorbidity, insurance, education, income, and residence location), tumor (grade, pathology, T stage, N stage, and metastasis location), and treatment (metastasectomy, neoadjuvant systemic therapy, and neoadjuvant radiation) characteristics were used to compare 30-day mortality, 90-day mortality, prolonged length of stay (PLOS, ≥7 days), and 30-day readmission rates between high-volume and low-volume hospitals. Sensitivity analyses were performed with hospital volume considered as a continuous variable in the regression models.

Results: A total of 9,789 patients were included with high-volume (n=1,916) as ≥8 cases per year and low-volume (n=7,873) as 1-7 cases per year. Unadjusted comparisons showed consistently better outcomes in the high-volume group (Figure). Multivariable logistic regression showed that high-volume was associated with lower risks of 30-day mortality (OR=0.69, 95%CI=0.51-0.92, P=0.013), 90-day mortality (OR=0.65, 95%CI=0.55-0.77, P<0.001), PLOS (OR=0.82, 95%CI=0.73-0.93, P=0.002), and 30-day readmission (OR=0.78, 95%CI=0.63-0.97, P=0.028). Sensitivity analyses showed that increasing hospital volume (per case) was associated with decreased risks of 30-day mortality (OR=0.965, 95%CI=0.941-0.991, P=0.008), 90-day mortality (OR=0.966, 95%CI=0.953-0.980, P=0.001), PLOS (OR=0.982, 95%CI=0.972-0.993, P=0.001), and 30-day readmission (OR=0.975, 95%CI=0.957-0.994, P=0.012).

Conclusion: Higher hospital volume is associated with substantially improved mortality and other short-term outcomes after CN. The concept of centralizing complex surgical procedures may apply to CN.
Identifying the Rate and Risks of Chronic Kidney Disease Development After Cytoreductive Nephrectomy

Christopher Martin, BS¹; Eric Mayer, MD²; Robert Uzzo, MD³; Brian Lane, MD, PHD⁴; Alexander Kutikov, MD³; Marc Smaldone, MD³; Jason Gee, MD⁵; Larry Karsh, MD⁶; Thomas Gardner, MD⁷; Viraj Master, MD⁸; William Huang, MD³; Jeffrey Holzbeierlein, MD⁹; Neal Shore, MD¹¹ and William Lowrance, MD, MPH¹²

¹Division of Urology, Department of Surgery, University of Utah, Salt Lake City, UT; ²David Geffen School of Medicine at UCLA, Los Angeles, CA; ³Fox Chase Cancer Center, Philadelphia, PA; ⁴Spectrum Health Urology Group, Grand Rapids, MI; ⁵Lahey Clinic, Burlington, MA; ⁶The Urology center of Colorado, Denver, CO; ⁷Indiana University, Indianapolis, IN; ⁸Emory University, Atlanta, GA; ⁹New York University Medical Center, New York, NY; ¹⁰Kansas University Medical Center, Kansas City, KS; ¹¹Carolina Urologic Research Center, Mt Pleasant, SC; ¹²Huntsman Cancer Institute, Salt Lake City, UT

Presented By: Christopher Martin, BS

Introduction: Radical cytoreductive nephrectomy has been shown to improve overall survival in patients with metastatic renal cell carcinoma (mRCC). While radical nephrectomy in localized tumors has been estimated on recent meta-analysis to have a 32% risk of chronic kidney disease (CKD) development, treatment outcomes in patients with more advanced disease have not been adequately assessed. Using patients enrolled in The Autologous Dendritic Cell Immunotherapy (AGS-003) Plus Standard Treatment of Advanced Renal Cell Carcinoma (ADAPT) trial that received cytoreductive nephrectomy in the metastatic setting, we intend to study the effect of this procedure on renal function in patients with mRCC.

Methods: Patients were identified based on screening for the ADAPT trial undertaken from 2012−2015. Of the initial 1148 screened patients, 450 were enrolled in the trial. However, preoperative creatinine was unavailable for 5 of these patients. Our study also excluded patients with an abnormal estimated glomerular filtration rate (<60ml/min/1.73 m²) prior to nephrectomy. Univariate logistic regression analysis was used to evaluate the impact of patient and disease specific factors on post-operative renal function.

Results: Our cohort included 371 patients; 15 underwent partial nephrectomy and 354 underwent radical nephrectomy (surgical approach was unknown for 2 patients). 169 patients (45.5%) developed chronic kidney disease stage 3 or worse (<60ml/min/1.73 m²) with short-term follow up. Factors associated with post-operative glomerular filtration rate <60ml/min/1.73 m² were: age (p<0.001), hypertension (p=0.005), Charlson Comorbidity Index score (p<0.001), prior history of nephrolithiasis (p=0.021), and presence of liver metastasis (p=0.004).

Conclusion: Our findings indicate that nearly half of patients with mRCC develop new CKD after cytoreductive nephrectomy. This risk appears more pronounced than treatment in lower stage tumors. Older patients and those with a history of hypertension and a higher comorbidity index appear to be at an increased risk of post-operative CKD. This has important implications as renal replacement therapy could be a competing factor for morbidity and mortality in these patients. More follow-up is needed to better understand the long-term impact of these findings.

Funding: ARGOS Industry Funding for the ADAPT trial
Poster #147
CYTOREDUCTIVE NEPHRECTOMY IN PATIENTS WITH METASTATIC RENAL CELL CARCINOMA AND TUMOR THROMBUS – TRENDS AND EFFECT ON OVERALL SURVIVAL
Andrew Lenis, MD, MS¹; Claire Burton, MD¹; Izak Faiena, MD¹; Amirali Salmasi, MD¹; Aydin Pooli, MD¹; David Johnson, MD¹; Alexandra Drakaki, MD, PhD¹; Kiran Gollapudi, MD²; Jeremy Blumberg, MD²; Allan Pantuck, MD, MS¹ and Karim Chamie, MD, MSHS¹
¹Department of Urology, UCLA, Los Angeles, California; ²Division of Urology, Harbor UCLA, Torrance, California
Presented By: Andrew Thomas Lenis, MD, MS

Introduction: Patients with metastatic renal cell carcinoma (mRCC) commonly present with tumor thrombi in the renal vein and inferior vena cava (IVC). The use of cytoreductive nephrectomy (CN) in this population is controversial and the effect on overall survival (OS) is unknown.

Methods: We queried the National Cancer Database (NCDB) from 2010 to 2013 for patients diagnosed with mRCC and tumor thrombi, which was defined as T3a (renal vein), T3b (IVC below the diaphragm), or T3c (above the diaphragm). Descriptive statistics were performed and associations between clinicopathologic variables and utilization of CN were analyzed. Kaplan Meier analyses and multivariable Cox proportional hazards models were used to estimate survival.

Results: In total, 9,015 patients were found to have mRCC during the study period. Approximately 28% (n=2,487) had tumor thrombi (79% T3a, 16% T3b, 6% T3c). Median OS was 16, 15, and 11 months for patients with mRCC and T3a, T3b, and T3c disease, respectively. CN was performed in 76%, 71%, and 60% of patients with T3a, T3b, and T3c disease, respectively. Independent predictors of CN in this cohort included treatment at an academic or research facility, East Central US region, non-clear cell histology, high-grade disease, concurrent metastasectomy, and more recent year of treatment. Patients with T3b and T3c were significantly less likely to undergo CN than patients with T3a disease. On multivariable analysis controlling for patient and tumor specific variables, CN was associated with improved OS (HR 0.36, 95% CI: 0.31–0.42, p<0.001) in patients with mRCC and tumor thrombi. However, this effect was limited to those with T3a (HR 0.34, 95% CI: 0.29–0.41, p<0.01) and T3b (HR 0.31, 95% CI: 0.20–0.50, p<0.01) disease, but not T3c (HR 0.62, 95% CI: 0.31–1.21, p=0.16) disease.

Conclusion: Tumor thrombus is relatively common in patients with mRCC. OS for this patient population is poor and various factors influence the use of CN, including clinicodemographic and tumor specific variables. Despite discrepancies in utilization, CN is associated with improved OS, although this effect appears to be limited to those with mRCC and tumor thrombus limited to the renal vein and infra-diaphragmatic IVC.
Poster #148
IMPACT OF PREOPERATIVE COMORBIDITIES ON FUNCTIONAL RECOVERY FROM PARTIAL NEPHRECTOMY

Sudhir Isharwal, MBBS¹; Wenda Ye, BS²; Alice Wang, MD³; Joseph Abraham, MD³; Joseph Zabell, MD²; Wen Dong, MD²; Jitao Wu, MD²; Chalairat Suk-Ouchai, MD⁴; Elvis Carabello, MD²; Tianming Gao, PhD² and Steven Campbell, MD²
¹Cleveland Clinic; ²Cleveland Clinic, Cleveland; ³Vanderbilt University
Presented By: Sudhir Isharwal, MBBS

Introduction: Preservation of parenchymal mass and ischemia type/duration can influence functional recovery after partial nephrectomy (PN). Some have hypothesized that relevant comorbidities may also impact functional recovery, but this has not been adequately investigated.

Methods: 405 patients with PN at our center (2007-2015) had necessary data to determine function/parenchymal mass preserved within the ipsilateral kidney. Comorbidities potentially associated with renal functional status were reviewed retrospectively, including: hypertension stage, coronary artery disease, diabetes and type, use of oral-hypoglycemic or insulin, smoking status, BMI, congestive heart failure, peripheral vascular disease, and use of NSAIDS/statins/angiotensin receptor blockers. Functional recovery was defined as percent GFR preserved in the operated kidney. Multivariable linear regression assessed factors associated with functional recovery.

Results: Median tumor size was 3.5 cm and median R.E.N.A.L. score was 8. Overall, 264 (65%) patients had warm ischemia and 141 cold ischemia, with median duration of 21/27 minutes, respectively. The median ipsilateral GFR preserved was 79%. Age, comorbidity index, hypertension, proteinuria, and use of NSAIDs or statins all associated with preoperative GFR (all p<0.01). On univariable and multivariable analyses, parenchymal mass preserved was strongly associated with functional recovery, and ischemia type and duration also associated albeit to a more modest degree (all p<0.001). On univariable analysis of comorbidities, only hypertension associated significantly with functional recovery. However, on multivariate analysis, none of the analyzed comorbidities associated with functional recovery.

Conclusion: Recovery of function after PN depends primarily on parenchymal preservation and secondarily on ischemia characteristics, while comorbidities failed to associate with functional outcomes. Comorbidities impact renal function leading into surgery and may influence long-term functional stability, yet our data suggest that they do not influence short-term recovery after PN.

Funding: None
Poster #149

RENAL MEDULLARY CARCINOMA AND COLLECTING DUCT CARCINOMA OF THE KIDNEY: CLINICOPATHOLOGICAL AND SURVIVAL ANALYSIS FROM THE NATIONAL CANCER DATABASE

Alp Tuna Beksac, MD¹; David Paulucci, MS²; Harry Anastos, MD²; Kyle Blum, MD²; John Sfakianos, MD² and Ketan Badani, MD²

¹Icahn School of Medicine at Mount Sinai, New York City, NY; ²Icahn School of Medicine at Mount Sinai, New York, NY

Presented By: Alp Tuna Beksac, MD

Introduction: Collecting duct carcinoma (CDC) and renal medullary carcinoma (RMC) are rare subtypes of renal cell carcinoma with poor survival. There is no standard way to treat these subtypes in advanced stages. We sought to characterize the demographic, clinical, pathologic profile and overall survival (OS) of patients diagnosed with CDC and RMC of the kidney.

Methods: The National Cancer Database was utilized to identify 670 patients diagnosed with CDC and 128 patients with RMC from 2004 to 2014. Demographic, clinical and pathological variables were summarized with descriptive statistics. OS was estimated for overall and stratified by TNM staging using the Kaplan-Meier method. Multivariable models adjusting for confounders were used to evaluate the association between a positive surgical margin, cN+, treatment type and OS.

Results: For CDC, 23.1% presented with nodal metastases, 35.2% with distant metastases and 83.4% with high grade tumor. For CDC, the 3 year OS was 33.1% (median survival time=16.8 months) and for RMC was 10.8% (median survival time=9.5 months). Among cM0 CDC patients, cN+ vs. cN0 was associated with worse OS (HR=1.28; 95% CI=1.03, 2.34; p=.035). For patients with clinically localized CDC (n=166), a positive surgical margin (n=10, 6.2%) was associated with worse OS (HR=1.18; 95% CI=1.37, 7.17; p=.004). For metastatic CDC patients, nephrectomy + systemic therapy was associated with improved OS compared to nephrectomy alone (HR=0.67; 95% CI=0.50, 0.89; p=.007) but not compared to systemic therapy alone (HR=0.81; 95% CI=0.55, 1.19; p=.298). For metastatic RMC, nephrectomy + systemic therapy was not associated with improved OS compared to nephrectomy alone (HR=0.76; 95% CI=0.48, 1.21; p=.248) or systemic therapy alone (HR=0.99; 95% CI=0.43, 2.28; p=.978).

Conclusion: Adverse pathologic features with poor survival are very common for patients with CDC and RMC. Systemic therapy + nephrectomy was found to be associated with improved OS for patients with metastatic CDC. Prospective studies are needed to identify effective treatment strategies in patients with these aggressive forms of renal cancer.
MULTIMODAL TREATMENT WITH CHEMOTHERAPY AND RADICAL NEPHROURETERECTOMY MAY IMPROVE OVERALL SURVIVAL IN PATIENTS WITH CLINICALLY POSITIVE LYMPH NODE DISEASE

Harry Anastos, MD¹; David Paulucci, MS²; Alp Tuna Bekac, MD³; Greg Gin, MD³; Matthew Galsky, MD²; Ketan Badani, MD² and John Sfakianos, MD²

¹Icahn School of Medicine at Mount Sinai, New York City, NY; ²Icahn School of Medicine at Mount Sinai, New York, NY; ³VA Long Beach Healthcare System, Long Beach, CA

Presented By: Harry Anastos, MD

Introduction: Patients with upper tract urothelial carcinoma (UTUC) with clinical lymph node involvement (cN+) have a high incidence of mortality. Like patients with distant metastatic disease, the standard of treatment for those patients is chemotherapy alone.

Methods: We identified 481 patients with cTanyN1-3M0 UTUC who underwent radical nephroureterectomy (RNU) alone (n=193, 40.1%), received chemotherapy alone (n=130, 27.0%), preoperative chemotherapy prior to RNU (41, 8.5%), or postoperative chemotherapy after RNU (n=117, 24.3%). Overall survival (OS) was compared between treatment types using inverse probability of treatment weighted cox proportional hazards regression models weighted for patient and tumor-specific characteristics.

Results: For the overall cohort, OS at 1, 3 and 5 years was 58.7%, 24.9% and 14.5%, respectively with a median survival time of 15.7 months (95% CI=13.9, 17.9 months). Improved OS for preoperative chemotherapy prior to RNU compared to chemotherapy alone (HR=0.61; 95% CI=0.41, 0.92; p=.019) and RNU alone (HR=0.62; 95% CI=0.39, 0.99; p=.044) was observed (Figure 1). Postoperative chemotherapy after RNU was associated with improved OS compared to chemotherapy alone (HR=0.60; 95% CI=0.44, 0.83; p=.002) but not compared to RNU alone (HR=1.09; 95% CI=0.79, 1.46; p=.617). There was no difference in OS for chemotherapy alone vs. RNU alone (HR=0.87; 95% CI=0.65, 1.16; p=.341).

Conclusion: Combined-modality treatment with chemotherapy and RNU is associated with the best results for cN+ UTUC patients.
Poster #151
SAFE AND EFFECTIVE PARTIAL NEPHRECTOMY IS FEASIBLE IN APPROPRIATELY SELECTED PATIENTS WITH COMPLEX (RENAL NEPHROMETRY SCORE 10-12) RENAL TUMORS: A MULTI-INSTITUTIONAL ANALYSIS

Benjamin Ristau, MD, MHA¹; Zachary Hamilton, MD²; Lyudmila DeMora, MS³; Charles Field, BS⁴; Aaron Bloch, BS⁴; Sean Berquist, BS⁴; Richard Greenberg, MD⁵; Rosalia Viterbo, MD⁵; David Chen, MD⁵; Marc Smaldone, MD, MSHP⁵; Alexander Kutikov, MD⁵; Brian Lane, MD, PhD⁶; Ithaar Derweesh, MD² and Robert Uzzo, MD⁵

¹Division of Urology, UConn Health, Farmington, CT; ²Department of Urology, University of California at San Diego, La Jolla, CA; ³Biostatistics and Bioinformatics Facility, Fox Chase Cancer Center, Philadelphia, PA; ⁴University of California at San Diego School of Medicine, La Jolla, CA; ⁵Division of Urologic Oncology, Fox Chase Cancer Center, Philadelphia, PA; ⁶Urologic Oncology, Spectrum Health Medical Group, Grand Rapids, MI

Presented By: Benjamin T. Ristau, MD, MHA

Introduction: Current guidelines recommend partial nephrectomy (PN) for clinical T1a renal masses; however, the decision to perform PN or radical nephrectomy (RN) for localized, anatomically complex renal masses remains debated. We examined differences in oncologic and perioperative outcomes between PN and RN for highly complex tumors.

Methods: Prospective renal surgery databases from four institutions were combined. Patients were included if they had PN/RN for RENAL nephrometry score (NS) 10-12 tumors. Exclusion criteria were pathologic evidence of N+ or M+ disease and benign histology. The primary outcome was overall survival (OS). Secondary outcomes were recurrence-free survival (RFS), positive margins (PM), and 30-day complications. Multivariable logistic regression was used to test for associations with receipt of RN, PM, and 30-day complications. OS and RFS were analyzed using Kaplan-Meier and Cox proportional hazards models (CPHM).

Results: 741 patients (271 PN, 470 RN) had a median follow-up of 30.6 (IQR 7.8-59.3) months. RN was more often performed in females (OR 1.57, 95% CI 1.02-2.41, p=0.04), age>70 (OR 2.81, 1.44-5.48, p<0.01), or higher NS tumors (OR for NS 12: 7.29, 1.67-31.9, p=0.01). 5-year OS was 94.7% for PN and 67.3% for RN (p<0.01). This OS difference was not apparent after adjustment (HR 5.18, 0.70-38.05, p=0.11). Factors associated with reduced OS on CPHM were age>70 years (HR 2.62, 1.82-3.78), NS 12 (HR 1.96, 1.67-2.30), Fuhrman grade 3-4 (HR 2.03, 1.91-2.15) and ≥pT3 stage (HR 2.01, 1.54-2.62, p<0.01 for all). 5-year RFS was 92% for PN and 76.9% for RN (p < 0.01) and persisted on CPHM (HR 3.58, 2.84-4.53,p<0.01). Risk of PM was not different between PN and RN (OR 0.55, 0.22-1.39); however, each 100ml increase in EBL was associated with a 3.8% increase in PM (OR 1.038, 1.01-1.06, p < 0.01). No differences in 30-day complications between PN and RN (OR 1.48, 95% CI 0.90-2.42) were observed.

Conclusion: PN for complex NS was not associated with increased oncologic risk or 30-day complications. The finding of worse RFS for RN likely reflects unmeasured selection bias. For patients with highly complex tumors and an indication for nephron-sparing, PN remains an option at experienced centers.

Figure 1. (A) Unadjusted OS (months) for PN vs. RN (B) Unadjusted RFS (months) for PN vs. RN
Poster #152
DETERMINANTS OF ACTIVE SURVEILLANCE IN PATIENTS WITH SMALL RENAL MASSES
Kevin Nguyen, MS; Adam Nolte, BSE; Walter Hsiang, BS; Jamil Syed, MD; Amanda Lu, BA; Kamyar Ghabili, MD; Brian Shuch, MD and Michael Leapman, MD
Yale School of Medicine, Department of Urology, New Haven, CT
Presented By: Kevin Anh Nguyen, MS

Introduction: Active surveillance (AS) has been increasingly recognized as a viable management strategy for patients with small renal masses, that affords the delay or avoidance of definitive treatment. However, little is known about national utilization trends for AS, or the factors that influence initial expectant management.

Methods: We identified patients with clinical T1a renal masses within the National Cancer Database (NCDB) between 2010 to 2013. Patients were excluded based on the following criteria: metastatic or locally advanced disease, unknown management, or those who were offered but refused treatment outside of surveillance. Patients were dichotomized according to receipt of AS versus definitive treatment. Chi square test and t-test were used to evaluate differences in clinical, demographic, socioeconomic, and treatment-related characteristics between the two groups. We examined determinants of AS versus definitive treatment among patients with small renal masses using multivariate logistic regression models.

Results: We identified 30,873 patients who satisfied the inclusion criteria. Of the total cohort, 829 (2.7%) individuals received initial management with AS, while 30,044 (97.3%) received definitive treatment. Treatment modality received included: partial nephrectomy in 16,266 (52.7%); radical nephrectomy in 6,005 (19.5%), cryo-ablation in 3,305 (10.7%), thermal ablation in 1,059 (3.4%), and other definitive therapy in 3,409 (11.0%). On multivariate analysis, increasing patient age (OR: 1.09, 95% CI: 1.08-1.10, p<0.0001), smaller tumor size (OR: 0.957, 95% CI: 0.949-0.965, p<0.0001), treatment at an academic center vs. community center (OR: 1.98, 95% CI: 1.70-2.30, p<0.0001), and African American vs. Caucasian race (OR: 1.65, 95% CI:1.36-1.99, p=0.0001) were significantly associated with increased use of active surveillance as opposed to definitive treatment.

Conclusion: We observed clinical and facility-level differences in the utilization of active surveillance in patients with T1a renal masses. Further investigation is warranted to better understand the forces underlying initial management decisions for patients with small renal masses.
Poster #153
PERIOPERATIVE OUTCOMES OF ASPIRIN USE IN PARTIAL NEPHRECTOMY
Matthew Ingham, MD; Ross Krasnow, MD; Matthew Mossanen, MD; Ye Wang, PhD and Steven Chang, MD,
MS Division of Urology, Brigham and Women’s Hospital, Boston, MA
Presented By: Matthew D. Ingham, MD

Introduction: Increasing cardiovascular disease has led to increases in the patient population on anti-platelet therapy who require urologic surgery. We sought to study perioperative outcomes for those undergoing partial nephrectomy (PN) while taking or not taking perioperative aspirin (pASA).

Methods: A retrospective review of patients undergoing PN was performed on the Premier Hospital Database from 2003 to 2015, with survey projection weighting resulting in a cohort of 10,807 patients. Two groups were formed – those continued on pASA (group 1, n=774) and those with no pASA (group 2, n=10,033). Both in-hospital and 90-day complication rates were examined. Specifically, we assessed in-hospital rates of: major bleeding, overall transfusion, day-of-surgery transfusion, prolonged (>4 days) length of stay (LOS), and prolonged (>285 minutes) operative time. We also assessed 90-day rates of: cardiovascular catastrophe, readmission, major complication, and deep vein thrombosis/pulmonary embolism. Unadjusted rates were calculated for all PN patients and further subdivided into open PN and minimally invasive PN. Odds ratios (OR) were then calculated between groups 1 and 2 after adjusting for all baseline characteristics.

Results: Patients in group 1 tended to be older (58% vs 38% ≥65 years, p<0.0001), predominantly male (73.1% vs 58.7%, p=0.001), and less healthy (34.8% vs 18.4% with a CCI score ≥2, p=0.003) compared to those in group 2. For in-hospital outcomes, no significant differences were noted between the groups. Stratifying by surgical approach, those in group 1 undergoing minimally invasive PN were slightly less likely to require a day-of-surgery transfusion (OR 0.29, CI [0.05-0.99], p<0.05). For 90-day outcomes, group 1 were far more likely to suffer a cardiovascular catastrophe (OR 7.56, CI [3.38-16.92], p<0.001) regardless of surgical approach. Conversely, group 1 was slightly less likely to experience readmission (OR 0.48, CI [0.24-0.94], p<0.05) and was likely driven by those undergoing minimally invasive PN.

Conclusion: This large review of academic and community hospitals provides insight into the impact perioperative ASA has on PN outcomes. As noted, in-hospital outcomes were largely equivalent between groups while 90-day cardiovascular catastrophe rates were much higher in the ASA group. Despite this, this study lends support to the belief that pASA should not be considered an absolute contraindication to PN.
Poster #154
U-SMART: (UCSD-SMALL MASS ALT RENAL SCORE TUMOR DIAMETER) A NOVEL SCORING SYSTEM OF PREOPERATIVE PREDICTORS TO STRATIFY ONCOLOGIC RISK OF SMALL RENAL MASS

Kendrick Yim, BS; Ahmet Bindayi, MD; Stephen Ryan, MD; Fang Wan, MS; Madhumitha Reddy, DO; Ryan Nasseri, BS; Zachary Hamilton, MD and Ithaar Derweesh, MD
University of California, San Diego
Presented By: Kendrick Yim, BS

Introduction: Small renal masses (SRMs, <4 cm in diameter) are heterogeneous, with significant proportions of benign tumors as well as high grade malignancy. We developed a scoring system incorporating patient factors, serum markers, and morphometric characteristics to elucidate benign and high grade pathology and guide clinical decision making.

Methods: Single institution retrospective review of surgically treated SRMs from 2003-2017. Demographic and clinical factors, serum laboratories, and RENAL nephrometry were analyzed. Patients were categorized into 3 groups: benign (BNGN), low grade (LG), or high grade (HG) disease. Logistic regression was used to screen for association between potential parameters and the 3 groups. Each significant variable was analyzed by risk group and broken into quartiles. The 75th percentile of the HG group was assigned a value of 3. Below the 75th percentile of the BNGN group was assigned a value of 1; values that fell between these cutoffs were assigned 2 points. Variables were summed to develop a comprehensive index score. Receiver-operating-characteristic (ROC) analysis was used to assess predictive capability.

Results: 312 patients with SRMs were analyzed (65 BNGN, 204 LG, 43 HG). Factors associated with increased risk of HG malignancy were male sex (OR 1.868, p=0.045), higher ALT (OR 1.036, p=0.022), higher RENAL score (OR 1.318, p=0.002), and larger tumor diameter (OR 2.415, p<0.001). Scoring system was created based on these variables. Due to the binary outcome of sex, a score of 1-2 was applied. Due to OR >2, tumor diameter score was doubled (2-6). All other variables retained a score of 1-3; final scores ranged 5-14. Patients with low (5-8), intermediate (9-11) and high (12-14) scores had 32.8%, 5.2% and 0% frequency of BNGN pathology. Patients with low, intermediate and high scores had 7.7%, 18.6% and 34.9% frequency of HG pathology. ROC analysis revealed an area under the curve of 0.767 for the index score.

Conclusion: Preoperative clinical parameters were incorporated into a model that significantly predicts benign and aggressive pathology for SRMs. This risk stratification may provide a non-invasive method to aid in clinical decision making. External validation is requisite.

Table 1: Index Score Key (U-SMART)

<table>
<thead>
<tr>
<th>Preoperative Parameter</th>
<th>Range</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT (IU/L)</td>
<td>&gt;35</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>28-34</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>&lt;27</td>
<td>1</td>
</tr>
<tr>
<td>RENAL Score</td>
<td>9-10</td>
<td>3</td>
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<tr>
<td></td>
<td>7-8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>1</td>
</tr>
<tr>
<td>Tumor Diameter (cm)</td>
<td>3.4-4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>2.4-3.3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>&lt;2.4</td>
<td>2</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 1: Index Score AUC Analysis
Poster #155
LYMPHADENECTOMY IN HEREDITARY LEIOMYOMATOSIS AND RENAL CELL CANCER PATIENTS WITH KNOWN PREOPERATIVE NODAL DISEASE: THE NATIONAL CANCER INSTITUTE EXPERIENCE
Patrick Gomella, MD, MPH¹; Spencer Krane, MD²; Mark Ball, MD²; Ram Srinivasan, MD²; Marston Linehan, MD² and Adam Metwalli, MD²
¹Washington DC; ²Urologic Oncology Branch, NCI, Bethesda MD
Presented By: Patrick T. Gomella, MD, MPH

Introduction: Hereditary Leiomyomatosis with Renal Cell Carcinoma (HLRCC) patients have a germline mutation in the fumarate hydratase (FH) gene, causing a predilection for aggressive papillary type 2 renal cell carcinomas. This subset of tumors has a propensity for primarily lymphatic metastasis at small primary tumor sizes. Based on these clinical observations the surgeons of Urologic Oncology Branch of the National Cancer Institute (NCI) have managed these patients aggressively with early loco-regional lymphadenectomy (LND) even in the face of preoperative nodal disease on imaging. We hypothesized that this would provide extended intervals of disease free survival following the procedure.

Methods: We retrospectively identified patients undergoing loco-regional resection of patients with HLRCC or confirmed FH mutation at the NCI. We included all patients with documented renal malignancy. All patients had axial abdominal and chest imaging prior to surgery and subsequently were followed at 3 month intervals postoperatively.

Results: A total of 17 patients who had preoperative imaging demonstrating lymph node positive disease underwent primary salvage LND at the NCI. Median size of primary renal mass was 6 cm (IQR 3-9 cm). Median number of nodes removed was 24 (IQR 10-38) and the median number of nodes noted positive were 4 (IQR 2-10). Four patients (24%) have not developed newly metastatic or increased burden of previous metastatic disease at most recent follow up. Amongst those with new disease following the procedure, 9 (69%) had disease recurrence within the template of the lymphadenectomy. Figures 1a and b demonstrate kaplan-meier estimations of recurrence free and overall survival.

Conclusion: Lymphadenectomy alone is not sufficient in managing local disease amongst lymph node positive patients with HLRCC. Clinical trials involving combination therapy with either systemic therapy or retroperitoneal topical chemotherapeutics are warranted in this very high risk patient cohort.
Poster #156
VALIDATION OF THE PREOPERATIVE NOMOGRAM PREDICTING 12-YEAR PROBABILITY OF METASTATIC RENAL CANCER
Mazyar Ghanaat, BS, MD¹; Cihan Duzgol, MD²; Kyle Blum, MD¹; Mahyar Kashan¹; Alejandro Sanchez, MD¹; Renzo DiNatale, MD¹; Maria Becerra, MD¹; Buddima Ranasinghe, MD¹; Nicole Benfante¹; Jonathan Coleman, MD¹; Michael W. Kattan, PhD³; Oguz Akin, MD²; Irina Ostrovnya, PhD⁴; Ar. Ari Hakimi, MD¹; and Paul Russo, MD¹
¹Urology Service at the Department of Surgery, Memorial Sloan Kettering Cancer Center, New York, USA.; ²Body Imaging Service, Department of Radiology, Memorial Sloan Kettering Cancer Center, New York, USA; ³Department of Quantitative Health Sciences, Cleveland Clinic, Cleveland, OH, USA; ⁴Department of Epidemiology and Biostatistics, Memorial Sloan Kettering Cancer Center, New York, USA.
Presented By: Mazyar Ghanaat, BS, MD

Introduction: We previously published a predictive model to determine the preoperative risk of metastatic recurrence in localized renal cell carcinoma. We sought to validate this initial nomogram and interrogate the additive value of somatic mutations in a subcohort with available genomic data.

Methods: We conducted a retrospective review of all non metastatic patients at a single tertiary referral center from 2004-2011 who underwent a surgical extirpation for a renal mass (n=2391). Mutations in VHL, PBRM1, SETD2, BAP1, KDM5C for those patients who had genomic analysis by previously described MSK IMPACT were recorded. Nomogram for 12-year metastasis free survival published by Raj et al in 2008 was validated using Kaplan-Meier estimates. Associations between covariates and time to metastasis were calculated by Cox regression.

Results: An initial cohort of 281 patients was available for analysis. Median age at time of surgery was 61.3 (24.7-84). Table 1 lists the clinical characteristics and associations to time to metastasis. There were 33 patients who developed metastatic disease on median follow-up of 9 years (Figure 1). Associations between the five preoperative characteristics and time to metastasis were similar to the original report. The linear predictor from the nomogram was highly associated with metastasis free survival (p<0.0001). We split the predicted 12-year metastasis free probability into quartiles, and used them to calculate the estimated 12-year survival in this cohort: it was not estimable in the first quartile, and 37.5%, 71% and 92% in 2nd, 3rd and 4th quartile, indicating good calibration of the original nomogram (Figure 2). KDM5C was significantly associated with metastasis-free survival and remained significant after incorporating nomogram prediction into the model (p=0.04, HR=3.6, 95% CI 1.05,12.4).

Conclusions: Univariate assessment of factors in our original model are associated with metastatic recurrence. Further statistical analysis of the complete cohort and integration of genomic data is ongoing.

Funding: The Sidney Kimmel Center for Prostate and Urologic Cancers, Ruth L. Kirschstein National Research Service Award T32CA082088 (MG& AS)
Poster #157
UTILITY OF PREOPERATIVE MRI IN CHARACTERIZING THE PARENCHYMAL-TUMOR INTERFACE OF SMALL RENAL MASSES PRIOR TO SURGICAL INTERVENTION
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¹Loyola University Medical Center; ²Maywood, IL
Presented By: Alex Gorbonos, MD, FACS

Introduction: Identification and utilization of tumor pseudocapsule are critical steps in renal tumor enucleation for small renal masses, an nephron-sparing surgical approach aimed at minimizing parenchymal loss. The objective of this study is to systematically characterize tumor pseudocapsule using preoperative MRI, and compare imaging findings with final tumor pathology.

Methods: Records from all robotic-assisted partial nephrectomy patients at a single institution between June 2008 and March 2016 were retrospectively reviewed. A single, blinded urologic oncologist reviewed the preoperative MR imaging, characterizing each mass and describing the tumor pseudocapsule contour and intactness. Surgical specimens were analyzed by renal pathologists and scored using the i-Cap scoring system.

Results: Among 43 patients who underwent robotic-assisted partial nephrectomy and had preoperative MRI, 26/43 (60.5%) underwent tumor enucleation, and 17/43 (39.5%) underwent standard partial nephrectomy. All tumors had visible pseudocapsule on preoperative MRI. When the pseudocapsules were described, the majority (76.7%) were circumferential rather than fragmented (18.6%) or invasive (4.7%). Optimal visualization of pseudocapsule on MRI sequences depended on whether the mass was predominantly solid versus cystic. Histologically, a pseudocapsule was identified in all tumor specimen, with an average i-Cap score of 1.92. Preoperative MRI characterization of pseudocapsule as fragmented or invasive predicted higher average i-Cap score than circumferential pseudocapsules (2.3 vs. 1.6; p=0.01).

Conclusion: Preoperative MRI is useful in identifying and characterizing the pseudocapsule of small renal masses and this characterization correlates with final pathology using the i-Cap scoring system.
ASSessment of Volume Preservation Performed Before or After Partial Nephrectomy Accurately Predicts Post-operative Renal Function: Results from a Prospective Multicenter Study

Michael Klingler¹; Stephen Babitz²; Alexander Kutikov³; Riccardo Campi⁴; Georgios Hatzichristodoulou⁵; Francesco Sanguedolce⁶; Sabine Brookeman-May⁷; Bulent Akdogan⁸; Umberto Capitanio⁹; Marco Roscigno¹⁰; Alessandro Volpe¹¹; Martin Marszalek¹²; Robert Uzzo¹³; Alessandro Antonelli¹⁴; Hans Langenhuijsen¹⁵; Marco Carini⁴; Andrea Minervini⁴ and Brian Lane, MD, PhD, FACS²

¹Michigan State University College of Human Medicine, Grand Rapids, MI; ²Spectrum Health, Grand Rapids, MI; ³Fox Chase Cancer Center, Philadelphia, PA; ⁴University of Florence, Careggi Hospital, Florence, Italy; ⁵University Hospital Klinikum rechts der Isar, Technical University of Munich, Munich, Germany; ⁶King’s College Hospital NHS Foundation Trust, Northampton General Hospital NHS Trust, London, UK; ⁷Ludwig-Maximilians-University, Campus Grosshadern, Munich, Germany; ⁸Hacettepe University, Ankara, Turkey; ⁹Vita-Salute San Raffaele University, IRCCS San Raffaele Scientific Institute, Milan, Italy; ¹⁰AO Papa Giovanni XXIII, Bergamo, Italy; ¹¹‘Maggiore della Carita’ Hospital, University of Eastern Piedmont, Novara, Italy; ¹²Graz Medical University, Graz, Austria; ¹³Fox Chase Cancer Center, Albert Einstein Medical center, Philadelphia, PA; ¹⁴Spedali Civili Hospital, University of Brescia, Brescia, Italy; ¹⁵Radboudumc, Nijmegen, the Netherlands

Presented By: Brian Robert Lane, MD, PhD, FACS

Introduction: Partial nephrectomy (PN) is the gold standard for small renal masses, improving renal functional outcomes by preserving functioning renal parenchyma when compared with radical nephrectomy. Recent work demonstrated that postoperative surgeon assessment of volume preservation (SAVP) is a reliable approximation when compared with formal measurements obtained with 3D imaging and SAVP correlates with renal function after PN. Whether surgeons can accurately perform preoperative assessment of volume preservation (PAVP) based on preoperative imaging has yet to be determined. We hypothesize that PAVP, like SAVP, will be a reliable indicator of renal function after surgery.

Methods: Data were collected from 336 patients who underwent PN for suspected renal cancer by 40 surgeons at 12 centers in Europe and the US within the SIB International Consortium. Surgeons documented PAVP and SAVP for individual patients; renal function was assessed by CKD-EPI equations. Correlations were assessed with linear regression models. Bland-Altman analysis was used to assess agreement between PAVP and SAVP.

Results: Median PAVP was 90% (interquartile range: 85-100%) and SAVP was 90% (IQR: 80-94%). PAVP and SAVP were moderately correlated (R² = 0.67, p<0.0001) and were found to be “interchangeable” by Bland-Altman analysis at a 5% acceptable rate of difference (95% CI: -5.4, 3.1). Median postoperative GFR was 77.3 (IQR: 56.2, 92.0). Both PAVP (R² = 0.82, p<0.0001) and SAVP (R² = 0.83, p < .0001) were correlated with postoperative GFR. Multivariable models utilizing volume adjusted GFR for both PAVP and SAVP significantly and similarly predicted postoperative GFR (R²=0.72 vs. R²=0.70 respectively). Limitations include interobserver variability and lack of central review of volume preservation assessments.

Conclusion: Renal function is closely linked to the volume of parenchyma preserved, as assessed by PAVP and SAVP. Similar to and interchangeable with SAVP, PAVP is shown to be a strong indicator of functional outcome following PN, with the advantage of being able to assist in pre-treatment decision-making with individual patients. Further studies are needed to validate our results and to better define the differential role of PAVP, SAVP, and other patient- or tumor-covariates for long-term functional outcomes after PN.
Poster #159
EVALUATION OF URINARY RENAL BIOMARKERS FOR EARLY PREDICTION OF ACUTE KIDNEY INJURY FOLLOWING PARTIAL NEPHRECTOMY
Brian Lane, MD, PhD, FACS¹; Stephen Babitz²; Katerina Vlasakova³; Allen Wong⁴; Sabrina Noyes²; William Boshoven²; Pam Grady²; Cindy Zimmerman²; Susan Engerman²; Michael Tanen⁴; Warren Glaab³ and Frank Sistare³
¹Spectrum Health, Grand Rapids, Michigan; ²Spectrum Health Hospital System, Grand Rapids, MI; ³Merck Research Laboratories, West Point, PA; ⁴Merck Research Laboratories, Rahway, NJ
Presented By: Brian Robert Lane, MD, PhD, FACS

Introduction: Partial nephrectomy (PN) is the current accepted gold standard treatment of patients with small localized renal masses. Urinary biomarkers (UBMs) may serve as early indicators of acute kidney injury (AKI) during PN allowing for preservation of renal function. In this pilot study, we evaluated UBMs before and after PN to determine timing, specificity, and sensitivity of UBMs in this setting.

Methods: Patients undergoing PN underwent paired urine collections via ureteral catheterization of the affected kidney and foley catheter to collect unaffected kidney urine. Renal BM concentrations were measured in urine using human MSD multiplexed ELISA. Among 22 patients with grade 1-4 RCC, 91% underwent PN and 9% radical nephrectomy. Urinary samples were collected by free catch at a preop visit, preop by catheterization, postop at 30, 60, 90 min, and 24 hr after vascular occlusion and reperfusion, and days 14-42 by free catch at postsurgical office visit.

Results: Mean preoperative estimated glomerular filtration rate (eGFR) was 65 ml/min/1.73m². Warm ischemia time varied between 20 and 25 min, average tumor size was 4 cm. Trends in several BMs increased after time 0, peaking around 60-90 minutes after renovascular occlusion more in the affected kidney than from the bladder specimens. Significant increases (p<0.05) were detected in ALB, CALB, total protein, CysC, and α-GST. Trends in higher levels of BMs in affected kidneys when compared to unaffected at the same time points (mostly 60 or 90 min) included ALB, CALB, CLU, CysC, OA, total protein, Kim-1, and α-GST. Blood contamination does affect BM levels; ALB and CLU are the most sensitive to the contamination; NGAL, TFF3, and α-GST are less affected. Contamination does not alter Kim-1, CALB, and OPN.

Conclusion: The most significant BM level increases were observed when comparing samples obtained at the pre-surgery office visit and after anesthesia and before clamp time, suggesting anesthesia may alter kidney physiology. Hematuria does affect some BMs, like ALB and CLU. ALB, CALB, total protein, CysC, and α-GST are BMs that are increased in the affected kidney after PN, but other perioperative factors did not correlate with BM increases.
Introduction: Adjuvant therapies with durable clinical benefit are needed for patients with renal cell carcinoma (RCC) who are at risk of recurrence after nephrectomy. Anti-programmed death 1 (PD-1) antibodies have proven effective in advanced, metastatic RCC. Preliminary data from phase 1/2 trials suggest a possible benefit of PD-1-targeted therapies on both disease-free survival (DFS) and overall survival (OS) in patients who are at high risk of recurrence following surgery. The randomized, double-blind, placebo-controlled phase 3 KEYNOTE-564 trial (NCT03142334) is designed to evaluate the efficacy and tolerability of pembrolizumab monotherapy as adjuvant therapy in patients with RCC who have T2 grade 4, T3, T4, N(+), or stage M1 with no evidence of disease (M1 NED) following nephrectomy and/or metastasectomy.

Methods/Results: Eligibility criteria include: age ≥18 years; histologically confirmed RCC with a clear cell component; intermediate-high or high risk of recurrence, or M1 NED; no prior systemic therapy for advanced RCC; disease-free following complete or partial nephrectomy (and metastasectomy in M1 NED patients) with negative surgical margins; and Eastern Cooperative Oncology Group (ECOG) performance status of 0 or 1. Patients will be randomly assigned 1:1 to receive pembrolizumab 200 mg intravenously every 3 weeks or placebo. Randomization will be stratified by metastatic stage (M0 vs M1 NED); within the M0 group, randomization will be further stratified by ECOG performance status (0 vs 1) and region (US vs rest of world). Treatment will continue until disease recurrence, an adverse event requiring discontinuation, patient/investigator decision, or the completion of 17 cycles. Imaging will be performed every 12 weeks. The primary end point is DFS per investigator assessment. Secondary objectives include OS, safety, disease recurrence-specific survival, DFS and OS according to PD-L1 expression status, pharmacokinetics and antidrug antibodies, and patient-reported outcomes. An exploratory objective is the identification of molecular biomarkers that may be associated with response, safety, pharmacodynamic activity, or mechanism of action. Recruitment is ongoing and will continue until ~950 patients are enrolled.

Funding: Merck & Co., Inc., Kenilworth, NJ, USA.
Poster #161
MULTIPLEX PARTIAL NEPHRECTOMY IN A SOLITARY KIDNEY: THE NCI EXPERIENCE WITH PARTIAL NEPHRECTOMY FOR THREE OR MORE TUMORS IN COMPARISON TO STANDARD PARTIAL NEPHRECTOMY IN A SOLITARY KIDNEY
Joseph A. Baiocco, BS; Asha K. Pappajohn; Kareem N. Rayn; Shawna L. Boyle; W. Marston Linehan and Adam R. Metwalli
National Cancer Institute, National Institutes of Health, Bethesda, MD
Presented By: Joseph Andrew Baiocco, BS

Introduction: Multiplex partial nephrectomy (MxPNx) is the excision of three or more tumors during the same procedure and has been shown to have distinct outcomes from standard partial nephrectomy (sPNx) for 1 or 2 tumors. Outcomes for MxPNx in the setting of a solitary kidney has not been previously reported.

Methods: Retrospective review of a prospectively maintained database of patients undergoing PNx on a solitary kidney at the NIH from 2010 to present was performed. Patient demographics, clinical data, imaging, pathology, and follow-up data were collected. Patients were stratified into MxPNx and sPNx groups by number of tumors removed. Resection of 1 or 2 tumors was termed sPNx, whereas excision of 3 or more tumors was classified as MxPNx. Statistical analysis was performed with SPSS software.

Results: Forty-six patients who underwent 55 PNxs with a median follow-up of 26.9 months were included in analysis (median age 53.8 years). Sixteen patients underwent 16 sPNxs, and 35 patients underwent 39 MxPNxs. Five patients underwent sPNx and MxPNx. Of sPNxs, 4 (25.0%) were repeat PNx, and 25 (64.1%) MxPNxs were repeat PNx. There were significant differences between sPNx and MxPNx, including percentage of robotic PNxs (15.4% vs. 50.0%, p=0.02), blood loss and intra-op transfusions (median 1.0 L vs. 2.3 L, p=0.001; 0.5 units vs. 5 units, p=0.001), and hospital stay (median 5.5 vs. 8.0 post-op days, p=0.001). While no difference in overall complication rate was seen between MxPNx and sPNx (56.3% vs. 66.7%, p=0.7), all 15 patients experiencing Clavien class III or higher complications (42.9% of all complications) underwent MxPNx. Of MxPNx patients, 12.8% required eventual long term hemodialysis (HD), whereas no sPNx patients required HD. One MxPNx patient (2.6%) had a completion Nx during a subsequent planned partial Nx. Renal functional outcomes are presented in Table 1. Patients requiring MxPNx were more likely to have local recurrence (66.7% vs. 25.0%, p=0.01) more quickly post-op (median 22.7 vs. 39.8 mo).

Conclusion: MxPNx is feasible in a solitary kidney, but intra- and post-operative outcomes differ substantially compared to sPNx. However, these procedures are largely successful in preserving native kidney function.
**Poster #162**

**REPEAT MULTIPLEX PARTIAL NEPHRECTOMY IN A SOLITARY KIDNEY: THE NCI EXPERIENCE WITH INITIAL AND REPEAT PARTIAL NEPHRECTOMY FOR THREE OR MORE TUMORS IN PATIENTS WITH A SOLITARY KIDNEY**

Joseph A. Baiocco; Asha K. Pappajohn; Kareem N. Rayn; Shawna L. Boyle; W. Marston Linehan and Adam R. Metwalli
National Cancer Institute, National Institutes of Health, Bethesda, MD
Presented By: Joseph Andrew Baiocco, BS

**Introduction:** Multiplex partial nephrectomy (MxPNx)—the removal of 3 or more tumors as one procedure—can be performed on a solitary kidney. A comparison of outcomes between initial MxPNx (iMxPNx) and repeat MxPNx (rMxPNx) has not been reported.

**Methods:** Retrospective review of a prospectively maintained database of patients undergoing MxPNx on a solitary kidney at the NIH from 2010 to present was performed. Patient demographics, clinical data, imaging, pathology and follow-up data were collected. Patients who did not have a prior ipsilateral nephrectomy (Nx) were stratified into the iMxPNx group, and patients who had undergone prior ipsilateral Nx were included in the rMxPNx group. Statistical analysis was performed with SPSS software.

**Results:** Thirty-three patients undergoing 39 MxPNxs were included in analysis (median age 53.8, median follow-up 34.2 months). The iMxPNx group included 14 patients, and 22 patients undergoing 25 operations were included in the rMxPNx group.

Three patients underwent iMxPNx then rMxPNx. Between the groups, there were no significant differences in percentage of robotic Nxs (21.4% vs. 12.0% p=0.6), number of tumors removed (median 10 vs. 9, p=0.5), blood loss (median 2.4 L vs. 2.3 L, p=1.0) or intra-op transfusions (median 4.5 units vs. 7.0 units, p=0.2). The complication rate was 57.1% for iMxPNx and 72.0% for rMxPNx (p=0.2). Of the iMxPNx complications, 62.5% were Clavien class III or higher, and 55.6% of rMxPNx complications were class III or higher. Of patients receiving iMxPNx, 2 (14.3%) required long-term hemodialysis (HD), and 3 (12.0%) rMxPNx patients required HD. One rMxPNx patient (4.0%) had a completion Nx during subsequent planned partial Nx. Renal functional outcomes are listed in Table 1. Patients undergoing rMxPNx were more likely to have local recurrence than iMxPNx patients (42.9% vs. 80.0%, p=0.03) more quickly post-op (median 11.9 mo vs. 38.6 mo).

**Conclusion:** MxPNx is a challenging procedure with a high complication rate. rMxPNx appears to have intra- and post-operative outcomes similar to iMxPNx. Successful preservation of native kidney function is possible in most patients. These results are limited by small sample size despite being the largest series in the literature.

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Table 1. Pre-Operative Renal Functional Outcomes

<table>
<thead>
<tr>
<th>Operation</th>
<th>IMxPNx n=14</th>
<th>MxPNx n=25</th>
<th>Total n=39</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine</td>
<td></td>
<td></td>
<td></td>
<td>p=0.2</td>
</tr>
<tr>
<td>Pre-op</td>
<td>1.3 (0.9, 1.8)</td>
<td>1.4 (0.9, 1.8)</td>
<td>1.5 (0.9, 1.8)</td>
<td></td>
</tr>
<tr>
<td>Discharge</td>
<td>1.2 (0.9, 1.8)</td>
<td>1.5 (0.9, 1.8)</td>
<td>1.4 (0.9, 1.8)</td>
<td>p=0.7</td>
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<tr>
<td>Median</td>
<td>1.2 (0.9, 1.8)</td>
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<td>1.4 (0.9, 1.8)</td>
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<td>1.4 (0.9, 1.8)</td>
<td>p=0.3</td>
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<tr>
<td>Post-op</td>
<td>1.2 (0.9, 1.8)</td>
<td>1.5 (0.9, 1.8)</td>
<td>1.4 (0.9, 1.8)</td>
<td>p=0.1</td>
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<tr>
<td>Median</td>
<td>1.2 (0.9, 1.8)</td>
<td>1.5 (0.9, 1.8)</td>
<td>1.4 (0.9, 1.8)</td>
<td></td>
</tr>
<tr>
<td>eGFR</td>
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<td></td>
<td></td>
<td>p=0.07</td>
</tr>
<tr>
<td>Pre-op</td>
<td>61.6 (18.3)</td>
<td>48.9 (18.3)</td>
<td>53.5 (19.2)</td>
<td></td>
</tr>
<tr>
<td>Discharge</td>
<td>57.5 (20.5, 94.3)</td>
<td>47.0 (17.0, 82.0)</td>
<td>55.0 (27.0, 94.0)</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>57.5 (20.5, 94.3)</td>
<td>47.0 (17.0, 82.0)</td>
<td>55.0 (27.0, 94.0)</td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>54.1 (21.7)</td>
<td>42.7 (15.4)</td>
<td>46.5 (18.7)</td>
<td>p=0.1</td>
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<tr>
<td>Post-op</td>
<td>56.5 (15.0, 100.0)</td>
<td>39.5 (15.0, 100.0)</td>
<td>47.5 (15.0, 100.0)</td>
<td></td>
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<tr>
<td>Median</td>
<td>56.5 (15.0, 100.0)</td>
<td>39.5 (15.0, 100.0)</td>
<td>47.5 (15.0, 100.0)</td>
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</tbody>
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Introduction: To characterize the TME among ccRCC patients and correlate immune cell populations with clinicopathologic characteristics. Clear cell renal cell carcinoma (ccRCC) has a moderate mutational load but is highly infiltrated by immune cells. Understanding the immune cell populations in the tumor microenvironment (TME) may be leveraged to identify patients at risk for poor oncologic outcomes and to select appropriate candidates for immunotherapy.

Methods: We performed flow cytometric immunophenotyping analysis of immune cells isolated from tumor tissue and adjacent normal renal tissue from a prospective cohort of patients who underwent surgical extirpation from 6/2015-7/2017. Immune cell populations were compared to baseline age, sex, body mass index (BMI), SSIGN score, sarcomatoid differentiation, and localized (Stage I-III) vs advanced (Stage IV) disease. Correlations between continuous variables and percent of immune cell populations were performed using Spearman’s rank correlation. Comparisons of means were made using the Wilcoxon signed-rank test.

Results: Among our 48 patients, 32 (71%) were male, median age was 59 (IQR 52-66), BMI of 38.5 (IQR 26-32.6), SSIGN score of 8 (IQR 5-12), 9 (20%) had sarcomatoid differentiation, and 20 (44%) had metastases at presentation. No correlation was found between age, BMI, and different immune cell populations. Total CD8+ T-cell count was not significantly associated with clinicopathologic outcomes; however, a higher ratio of tissue resident (CD8a+CD49a+CD103+) to circulating (CD8a+CD49a-CD103-) CD8+ T-cells in the TME was associated with advanced disease at presentation (p=0.045). Furthermore, higher SSIGN score correlated with a higher concentration of resident CD8+ T-cells (p=0.017) (Figure 1).

Conclusion: Total CD8+ T-cell population in the TME was not associated with poor oncologic features; however, a higher proportion of resident CD8+ T-cells correlated with advanced disease at presentation. This population of CD8+ T-cells should be validated and further investigated in a larger cohort to understand their function and association with aggressive disease in patients with ccRCC.

Funding: Ruth L. Kirschstein Research Service Award T32CA082088
POSTER SESSION II — FULL ABSTRACTS

Poster #164
EFFECT OF SURGICAL APPROACH ON RECEIPT AND QUALITY OF LYMPH NODE DISSECTION AND SHORT AND LONG TERM SURVIVAL IN UPPER TRACT UROTHELIAL CARCINOMA: RESULTS FROM NATIONAL CANCER DATABASE
Hamed Ahmadi, MD; Ann Martinez, BS; Mark Garzotto, MD; Ryan Kopp, MD; Michael Conlin, MD; Christopher Amling, MD and Jen-Jane Liu, MD
OHSU, Portland, OR
Presented By: Hamed Ahmadi, MD

Introduction: Performance of lymph node dissection (LND) is variable during nephroureterectomy (NU), despite the known survival benefit of LND in bladder cancer. Surgical approach may have an effect on receipt and quality of LND during NU. Specifically, an open surgical approach (OUN) may facilitate performance of LND compared to laparoscopic NU (LNU), and robotic nephroureterectomy (RNU) may also facilitate performance of LND due to improved dexterity. This study examines receipt and quality of LND as well as short and long term survival among different surgical approaches for NU.

Methods: The National Cancer Database (NCDB) was queried for patients with upper tract urothelial carcinoma (clinical stage ≥ T2, N0 M0) who underwent NU between 2004 and 2013. The cohort was categorized based on surgical approach (OUN, LNU, or RNU). Performance of lymph node dissection (LND) and LN yield (LNY) were determined. LNY was also divided into quartiles and the top quartile was selected as the reference value. Predictors of LND performance and LNY and effect of surgical approach on short and long term survival were evaluated using multivariable logistic regression modeling.

Results: 28,986 patients were identified; 44% underwent ONU, 36% LNU, and 20% RNU. 25% of patients underwent LND. Patients who underwent RNU were more likely to have LND compared to ONU and LNU (31, 27, and 18%, respectively). Median LNY was 3 (range 1-75). Median LNY was similar between ONU and RNU but significantly higher compared to LNU (4 vs 2, p<0.01). After controlling for age, distance to treatment facility, type and surgical volume of facility, Charlson comorbidity index and clinical stage and grade; the laparoscopic approach was negatively associated with performance of LND (OR=0.58; P <0.001) and LNY ≥ 8 (OR=0.49, p <0.001) compared to ONU. There was no significant difference between ONU and RNU regarding performance of LND or LNY. There was no difference in 90-day mortality among different approaches however RNU was associated with improved overall survival at 5 years. (OR=0.7; p = 0.007).

Conclusion: Patients undergoing LNU are less likely to undergo LND and tend to have lower LNY compared to those undergoing open or robotic surgery. Patients who undergo RNU seem to have improved survival at 5 years.
Poster #165

ELEVATED NEUTROPHIL/LYMPHOCYTE RATIO IS A NOVEL PREDICTOR OF 30-DAY HIGH-GRADE COMPLICATIONS FOLLOWING RENAL SURGERY

Ryan Nasseri, BSc; Ahmet Bindayi, MD; Kendrick Yim, BS; Stephen Ryan, MD; Madhumitha Reddy, DO; Eric Ballon-Landa, MD, MPH; Fang Wan, MS; James Proudfoot, MS and Ithaar Derweesh, MD

University of California San Diego, La Jolla, California

Presented By: Ryan Isaac Nasseri, BSc

Introduction: Radical nephrectomy (RN) and partial nephrectomy (PN) for patients with renal cortical masses may carry significant risk for postoperative complications. We analyzed patient demographics and serum laboratories and morphometric measures to determine predictors of 30-day complications following RN and PN.

Methods: Single institution retrospective analysis of RNs and PNs between 7/2008-4/2017. Demographic and clinical characteristics, serum laboratories, and RENAL nephrometry score were recorded. 30-day complications were graded according to the modified Clavien classification system. Factors were screened with logistic regression analysis. Primary purpose was to identify predictive factors associated with 30-day complications overall. Secondary purposes included identification of predictive factors high-grade complications (HGC; Clavien 3-5) overall and in the PN group.

Results: 734 patients were analyzed (420 PN, 314 RN). 156 (21%) patients developed 30-day complications, 94 (22.4%) PN and 62 (19.7%) RN (p=0.393). 71 (9.7%) HGCs occurred overall, 50 of which were in PN (p=.023). Mean age was 59.1 and 61.3 in patients without complications and patients with complications, respectively (p=0.061). On Logistic regression, no significant difference was noted between RN and PN for overall and (p=0.725) and HGC risk (p=0.157). Predictive factors associated with 30-day complications were increasing age (OR 1.017, p=0.021) and coronary artery disease (OR 1.904, p=.018), while minimally invasive surgery (MIS) was negatively associated (OR 0.477, p<.001). Predictive factors associated with HGC were preoperative Neutrophil-Lymphocyte Ratio (NLR) of ≥2.78 (OR 3.282, p=.003) and increasing RENAL score (OR 1.176, p=.049) while MIS was negatively associated with HGCs (OR 0.274, p=.001). In the PN group NLR ≥2.78 was associated with HGCs (OR 3.764, p=.018) while MIS was negatively associated with HGCs (OR 0.201, p=.007).

Conclusion: Elevated preoperative NLR is a novel predictor for HGC in PN and in the entire cohort. Increasing tumor complexity was associated with HGN in the entire cohort, while increasing age and coronary artery disease were associated with complications overall in renal surgery. Compared to the other mostly non-modifiable factors, elevated preoperative NLR represents a potential marker for risk factor reduction and preoperative optimization prior to renal surgery. Further investigation is requisite.
Poster #166

SHOULD PARTIAL NEPHRECTOMY BE CONSIDERED ELECTIVE IN STAGE 2 CHRONIC KIDNEY DISEASE? PROPENSITY SCORE Matched analysis of functional and survival outcomes after radical and partial nephrectomy

Zachary Hamilton, MD¹; Alessandro Larcher, MD²; Brian Lanem MD, PhD³; Umberto Capitanio, MD²; Sumi Dey, MD³; Aaron Bloch, BS⁴; Charles Field, BS⁴; Samer Kirmiz, MD³; Daniel Han, MD³; Adam Bezique, BS⁴; Sean Berquist, BS⁴; Cristina Carenzi²; Fang Wan, MS⁴; James Proudfoot, MS³; Francesco Montorsi, MD² and Ithaar Derweesh, MD⁴

¹Saint Louis University, MO; ²Vita-Salute San Raffaele University, Milan, Italy; ³Spectrum Health, Grand Rapids, Michigan; ⁴University of California, San Diego

Presented By: Zachary A. Hamilton, MD

Introduction: While partial nephrectomy (PN) is strongly indicated for patients with stage 3-4 chronic kidney disease [(CKD), eGFR<60 ml/min/1.73m2], higher GFRs are thought to be elective. We compared renal function and survival outcomes in patients with baseline stage II CKD who underwent PN or radical nephrectomy (RN).

Methods: Retrospective analysis of patients with baseline CKD 2 undergoing PN or RN from 1987−2015. Patients were stratified into CKD 2a (GFR 75−89) and CKD 2b (GFR 60–74.9) and analyzed between type of surgery. Primary outcome was change in GFR at last follow-up (?eGFR). Secondary outcomes included occurrence of GFR<60, GFR<45 and overall survival. Propensity score matching on subset of patients with all available covariates (n=1163). For a binary treatment indicator of CKD stage (CKD 2a vs. 2b), matching was performed 1:1 between groups with a logistic regression estimation and a nearest neighbor matching algorithm. Matching was achieved for 1158 patients (579 per cohort) in this subset. Additionally, for a binary treatment indicator of surgical approach (PN vs RN), matching was achieved for 1044 patients (522 per cohort).

Results: 1213 patients analyzed (50.2% CKD 2a, 49.8% were CKD 2b, median follow-up 49 months). Overall rate of development of eGFR<60, <45, and <30 was 47.6%, 15.2%, and 3.4%, respectively. Rate of development of eGFR<60 and <45 at last follow-up was greater for CKD 2b as opposed to CKD 2a (57.8% vs. 39.0%, p<0.001; 20.5% vs. 10.4%, p<0.001; respectively). After propensity score matching, rates of development of eGFR <60 and <45 at last follow up remained significantly higher for CKD 2b compared to CKD 2a (58.0% vs. 38.9%, p<0.001; 20.6% vs. 10.5%, p<0.001; respectively).On logistic regression for GFR<45, RN (OR 3.68, p=0.001) and CKD 2b (OR 3.3, p=0.002) were predictive. On logistic regression for all cause mortality, RN (OR 3.68, p=0.001) and CKD 2b (OR 3.3, p=0.002) were predictive. Similarly, after propensity matching we noted a consistently negative effect for RN compared to PN for development of eGFR <60 (64.8% vs. 35.6%, p=0.001) and eGFR <45 (23.8% vs. 9.0%, p<0.001).

Conclusion: Patients with baseline CKD 2, particularly CKD 2b and undergoing RN, are at increased risk of GFR<45 and decreased overall survival. As such, these patients should not be considered purely elective indications for nephron-sparing surgery, and PN should be prioritized when feasible.
Poster #167
SARCOMATOID DIFFERENTIATION IN RENAL CELL CARCINOMA: DOES STAGE MAKE A MEANINGFUL DIFFERENCE ON SURVIVAL?
Kyle A. Blum, MD, MSc¹; Eden Axler²; Renzo G. DiNatale, MD³; Alejandro Sanchez, MD³; Nirmal T. John, MD³; Mazyar Ghanaat, MD³; Mahyar Kashan, BSc³; Maria Becerra, MD³; Paul Russo, MD³; Jonathan A. Coleman, MD³; Satish K. Tickoo, MD³; and A. Ari Hakimi, MD³
¹Memorial Sloan Kettering Cancer Center, New York, NY; ²University of Michigan, Ann Arbor, MI
Presented By: Kyle Blum, MD, MSc

Introduction: Sarcomatoid differentiation is present in approximately 4% of patients with renal cell carcinoma (sRCC) and is associated with poor clinical outcomes. However, limited studies have evaluated the impact of sarcomatoid differentiation among patients, especially with lower stage pT1-2 disease.

Methods: This is a single-institution, retrospective study evaluating 3850 patients with RCC who underwent partial or radical nephrectomy from 2000-2017. Patients were divided into four groups for the analysis: pT1-2NxMx RCC without sarcomatoid features (Group 1), pT1-2NxMx sRCC (Group 2), pT3-4 sRCC (Group 3) and pT3-4 RCC without sarcomatoid features (Group 4). Clinicopathological outcomes including age, sex, race, primary histology, lymph node (LN) involvement and margin status were compared between groups using T and Chi-squared tests. Overall survival rates were analyzed by constructing Kaplan-Meier curves, p-values were calculated using log-rank tests and fitting Cox proportional hazards models for adjusted analyses.

Results: From a total of 3850 cases, 168 (4.4%) sRCC were identified of which 33 (19.6%) were pT1-2. The mean overall follow-up time was 59.9 months. When comparing CCS between groups, survival was poorer in patients with sarcomatoid features regardless of pT stage (p<0.0001), Figure 1. Of note, CSS was worse in sRCC pT1-2 patients than in non-sarcomatoid pT3-4 patients. Overall survival (OS) results were similar, with sarcomatoid tumors having worse estimates on survival analysis (p<0.0001).

Conclusion: Patients with pT1-2 sRCC demonstrated worse CSS when compared to pT3-T4 RCC without sarcomatoid features, regardless of primary histology. Sarcomatoid differentiation in low-stage disease may be a marker of poor oncologic outcomes requiring more vigilant surveillance and possible inclusion in adjuvant therapy trials. Our next steps are to pursue a multi-institutional collaborative effort to include a large cohort of sRCC.

Funding: Supported by the Sidney Kimmel Center for Prostate and Urologic Cancers, Ruth L. Kirschstein National Research Service Award T32CA082088 (MG, AS), P30-CA008748 National Institutes of Health cancer center support grant.
Poster #168
ONCOLOGIC AND FUNCTIONAL OUTCOMES OF RADICAL AND PARTIAL NEPHRECTOMY IN PT3A PATHOLIGICALLY UPSTAGED RENAL CELL CARCINOMA: A MULTI INSTITUTIONAL ANALYSIS

Madhumitha Reddy, DO¹; Umberto Capitanio, MD²; Benoit Peyronnet, MD³; Deepak Pruthi, MD⁴; Zachary Hamilton, MD⁴; Stephen Ryan, MD⁴; Ahmet Bindayi, MD⁴; Kendrick Yim¹; Ryan Nasser, BS¹; Ruchir Gupta, MD⁶; Samer Kirmiz, MD³; Brian Lane, MD⁵; Karim Bensalah, MD⁶; Francesco Montorsi, MD² and Ithaar Derweesh, MD¹
¹University of San Diego, La Jolla, California, USA; ²Ospedale San Raffaele, Milan, Italy; ³University of Rennes, Rennes, France; ⁴UT San Antonio, San Antonio, Texas, USA; ⁵Spectrum Health, Grand Rapids, Michigan, USA
Presented By: Madhumitha C. Reddy, DO

Introduction: Radical Nephrectomy (RN) has been the standard of care for complex and locally advanced renal cell carcinoma (RCC). Partial Nephrectomy (PN) utilization has increased in recent years. Efficacy of PN in the setting of pT3a pathologic upstaged disease is controversial. We compared oncologic and functional outcomes of RN and PN in patients with pathologically upstaged pT3a RCC.

Methods: Multicenter retrospective analysis of patients with cT1-2N0M0 RCC undergoing RN or PN. The cohort was subanalyzed based on presenting clinical T stage (i.e., for RN vs. PN, in subgroups of cT1 and cT2). Primary outcome was Overall Survival (OS), with secondary outcomes being Recurrence Free Survival (RFS) and eGFR<60 at last follow up. Cox and Logistic regression (LG) analyses were performed to identify predictive factors for oncologic and functional outcomes, respectively. Kaplan Meier analyses (KMA) were obtained.

Results: 6278 patients were analyzed (mean follow up 48 months). 822 (13.1%) were upstaged to pT3a [688 (85.7%) RN, 115 (14.3%) PN]. Recurrence occurred in 247 (30%) and death in 291 (35.4%). For cT1 →pT3a RN had an increased risk of recurrence (HR 3.3, p=0.005) and death (HR 3.59, p=0.002) compared to PN. For cT2 →pT3a, there was no statistically significant difference in recurrence (p=0.737) or death (p=0.203) between PN and RN. KMA revealed 5-year OS for PN cT1→pT3a, RN cT1→pT3a, PN cT2→pT3a, RN cT2→pT3a of 88%, 62%, 78% and 54% respectively (p<0.001, Figure). KMA revealed 5-year RFS for PN cT1→pT3a, RN cT1→pT3a, PN cT2→pT3a, RN cT2→pT3a of 88%, 70%, 37% and 51% respectively (p<0.001, Figure). There was no difference in 30-day complications (p=0.234). PN was associated with higher risk of positive margin (OR 3.0, p=0.023), and lower risk of blood transfusion (OR 0.177, p< 0.001) and eGFR<60 at last follow up (OR 0.43, p=0.004).

Conclusion: PN did not adversely affect oncologic outcomes in select patients who are upstaged to pT3a RCC from cT1 or cT2 disease, and may provide renal functional benefit without significant increase in risk of complications. Improvements with respect to RFS or OS for PN are most likely driven by selection bias. Further investigation is requisite.
Poster #169
IMPACT OF PRE-EXISTING DIABETES MELLITUS ON SURVIVAL OUTCOMES IN RENAL CELL CARCINOMA
Stephen Ryan, MD¹; Umberto Capitanio, MD²; Ahmet Bindayi, MD³; Alessandro Larcher, MD²; Zachary Hamilton, MD³; Ryan Nasseri, MD¹; James Proudfoot, MS³; Eric Ballon-Landa, MD³; Kendrick Yim, BS³; Madhumitha Reddy, DO³; Fang Wan, BS³; Francesco Montorsi, MD² and Ithaar Derweesh, MD³
¹Department of Urology, University of California San Diego, San Diego, CA; ²San Raffaele Research Institute, Milan IT; ³Dept of Urology, University of California San Diego, San Diego CA; °University of San Diego Medical School, San Diego, CA
Presented By: Stephen T. Ryan, MD

Introduction: Diabetes Mellitus (DM) is a known risk factor for renal cell carcinoma (RCC) and chronic kidney disease (CKD). We investigated impact of DM on patients with RCC.

Methods: Two center retrospective analysis of patients with surgically treated RCC were identified from 1998-2016 with or without a pre-existing diagnosis of Diabetes Mellitus (DM+ or DM-), and surgical approach (PN or RN). Primary outcome was overall survival (OS). Cohort was analyzed according to status of Diabetes (DM + or DM-) and surgical approach for each AJCC stage. Secondary outcomes were recurrence free survival (RFS), and decrease in estimated glomerular filtration rate (GFR). Kaplan-Meier Analysis (KMA) and Cox proportional hazard ratios (HR) were utilized for OS and RFS.

Results: 3041 total patients were analyzed [2604 (85.6%) DM-/437 (14.4%) DM+, 1812 (59.6%) RN/ 1224 (40.2%) PN, median follow up 48 months]. Cox analysis demonstrated that DM and RN were associated with decreased OS in the full cohort (DM: HR 1.59, p<0.01 and RN: HR 2.99, p<0.01), and in patients with AJCC Stage 1 (DM: HR 2.15, p<0.01 an RN: HR 1.51, p<0.01) DM+ was not associated with OS in Stages II-IV. Subgroup analysis of Stage1 revealed significantly worsened OS for RN in DM+ (RN: HR 2.38, p=0.005) and DM- groups (RN: HR 2.57, p<0.001). KMA of Stage1 RCC is in the figure. Log rank was significant p<0.01. RN was associated lower RFS (HR 1.75, p=0.016), while DM was not associated (HR 1.41 p=0.29). RN was associated with a greater decrease in GFR vs PN in DM+ (-21.7 vs -11.3, p<0.01) and DM- (-19.6 vs -9.8, p=0.013).

Conclusion: Presence of DM impacted OS but not RFS in RCC. The impact was driven based on differences in Stage I RCC, while no difference was observed in higher stages. In Stage I RCC, patients who received RN and had DM had distinctly worse outcomes than patients who did not have DM, and patients who underwent PN. Presence of DM in patients presenting with clinical T1 disease should be considered as a strong indication for NSS. Further investigation is requisite.
**Introduction:** Primary urethral carcinoma (PUC) has an aggressive natural history, however controversy exists regarding the role of multimodal therapy for its treatment. Our objective was to examine practice patterns and survival outcomes for locally advanced urethral cancers.

**Methods:** The National Cancer Database (NCDB) was queried for patients with T2-4 or N1-2M0 PUC with urothelial, squamous, or adenocarcinoma histology from 2004-2013. Temporal trends for receipt of local or definitive surgery, radiotherapy (XRT), and systemic therapy were assessed. Adjusting for clinicopathologic characteristics, we evaluated the impact of tumor stage and histology on receipt of definitive multimodal therapy (cystectomy + chemotherapy ± XRT) and effects of treatment on overall survival.

**Results:** 1,749 patients met inclusion criteria (22.2% adenocarcinoma, 29.3% squamous, 48.5% urothelial). Only 29.6% underwent cystectomy ± XRT and 15.6% underwent definitive multimodal therapy. Following adjustment, older patients (age 50-75: OR 0.42 [95%CI 0.28-0.63]; age 75+: OR 0.06 [95%CI 0.03-0.13]), and those with squamous histology (OR 0.46 [95%CI 0.3-0.7]) were less likely to receive definitive multimodal therapy. More advanced stage (T3: OR 1.66 [95%CI 1.15-2.41]; T4: OR 3.57 [95%CI 2.47-5.16]) and N2 status (OR 1.88 [95%CI 1.27-2.78]) were more likely to receive definitive multimodal therapy. On adjusted analysis, an overall survival benefit was only observed with definitive multimodal therapy for PUC of urothelial origin (HR 0.61 [95%CI 0.45-0.83]).

**Conclusion:** Despite a survival benefit, most patients with locally advanced PUC do not undergo definitive multimodal therapy. We advocate for a multidisciplinary-based treatment approach for these patients. Future prospective trials of multimodal therapy are crucial.

**Table of Histology and Treatment Outcomes**

<table>
<thead>
<tr>
<th>Histology</th>
<th>Treatment Group</th>
<th>HR</th>
<th>95% CI</th>
<th>P-value</th>
<th>Medias OS (Months)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urothelial</td>
<td>Definitive</td>
<td>0.61</td>
<td>0.45-0.83</td>
<td>0.0016</td>
<td>52.6</td>
<td>30.9-79.2</td>
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<td></td>
<td>Surgery + CT ± XRT</td>
<td>0.84</td>
<td>0.67-1.06</td>
<td>0.1375</td>
<td>36.1</td>
<td>27.4-43.7</td>
</tr>
<tr>
<td></td>
<td>Local Excision</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>23.9</td>
<td>19.8-29.9</td>
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<tr>
<td>Squamous</td>
<td>Definitive</td>
<td>1.22</td>
<td>0.86-1.85</td>
<td>0.3582</td>
<td>27.6</td>
<td>20.2-Undefined</td>
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<td></td>
<td>Surgery + CT ± XRT</td>
<td>0.96</td>
<td>0.70-1.32</td>
<td>0.8012</td>
<td>47.8</td>
<td>29.3-73.5</td>
</tr>
<tr>
<td></td>
<td>Local Excision</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>40.5</td>
<td>30.4-53.1</td>
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<td>Adenocarcinoma</td>
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<td>1.11</td>
<td>0.79-1.57</td>
<td>0.535</td>
<td>55.1</td>
<td>21.8-39.3</td>
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<td></td>
<td>Surgery + CT ± XRT</td>
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<td>0.2845</td>
<td>47.6</td>
<td>35.3-73.7</td>
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<td>---</td>
<td>30.7</td>
<td>23.7-47.5</td>
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</table>
Introduction: Primary urethral cancers account for less than 1% of all GU cancers. Due to the rarity of this condition, we sought to describe the practice patterns in management of female urethral cancer in a contemporary cohort.

Methods: Years 2004–2013 of the National Cancer Database (NCDB) were used to identify primary urethral neoplasms among women. Clinicopathologic variables including age, race, tumor histology, grade, and treatment modality (surgery, chemotherapy, radiation) were analyzed. Overall survival (OS) was estimated using the Kaplan-Meier method. Associations with survival were evaluated using Cox regression models.

Results: Between 2004 and 2013 there were 1,088 cases of primary female urethral cancer in NCDB. The median age at diagnosis was 66 years (IQR 56, 77) and the majority of women were Caucasian (66%) or African-American (30%). Adenocarcinoma (AC) was the most common histologic subtype (34%), followed by squamous (SCC) (26%) and urothelial cell carcinoma (UC) (25%). Women with AC were younger and more likely to be African American (both p<0.001). At diagnosis 31.2% of all patients were ≥cT3, 16.3% had clinical node positive disease while 8.5% had distant metastatic disease. Among the 1042 patients who received treatment, 49% received one treatment modality, 25% received two, and 10% received three. For patients with clinical T2-T4N0M0 disease those that received tri-modal therapy had significantly better 5 year overall survival (55% for trimodal vs 40% for bimodal vs 25% for unimodal, p=0.03) (Figure 1). On multivariate analysis, trimodal therapy remained independently associated with improved overall survival (HR 0.47 p = 0.02). In a sub-analysis of patient with N1 disease, those who received chemotherapy had significantly improved survival (HR 0.33, p=0.003).

Conclusion: Women with AC are younger, more likely African American, and present at more advanced clinical & pathologic stage. Trimodal therapy is independently associated with significantly improved OS for clinically localized, advanced urethral cancer and receipt of chemotherapy is independently associated with significantly improved OS for patients with nodal disease

Funding: None
THE ROLE OF INGUINAL LYMPH NODE DISSECTION IN MEN WITH URETHRAL SQUAMOUS CELL CARCINOMA
Ryan Werntz, MD; Richard Fantus; Zachary Smith; Melanie Adamsky; Chris Riedinger and Gary Steinberg
Presented By: Ryan P. Werntz, MD

Introduction: Urethral squamous cell carcinoma (SCC) is a rare disease with limited clinical recommendations. Despite the similarities to penile cancer in terms of histology and lymphatic drainage, no consensus exists on the role of inguinal lymph node dissection (LND) for men with high-risk tumors. We sought to define the rate of inguinal LND performance and its implication on survival.

Methods: The National Cancer Database was queried for all cases of primary urethral cancer in men from 2004 to 2014. Patients with other cancer diagnoses, metastasis, non-squamous histology, and a history of radiation therapy or chemotherapy were excluded. For penile cancer comparative purposes, only male patients with urethral SCC of the anterior urethra with clinical stage ≥T1 were included for analysis. Overall survival (OS) was compared using multivariable Cox regression.

Results: Seven hundred twenty five men met inclusion criteria. Median age was 63 years (IQR 33-83). Of the 725 men, only 189 (26%) underwent LND. Patients who underwent LND were of significantly higher clinical T and N stage. In patients with clinical N0, the LND rate was 21.8%, with 9% pathologically positive. In patients with clinical N1-2, the LND rate was 76%, with 84% pathologically positive. On multivariable Cox regression, lymph node positivity was associated with worse overall survival when controlling for clinical T stage, clinical N stage, Charleston comorbidity, age, and sex (HR 1.56, 95% CI 1.3-1.9, p<0.001). On multivariable analysis, LND was not associated with improved OS in clinically N0 patients (HR 1.4, 95% 0.96-2.00 p=0.07). On multivariable analysis, performance of LND was associated with improved OS in patients with clinical N1 or N2 disease (HR 0.46, 95% 0.28-0.78 p=0.002).

Conclusion: The lymph node positivity rate in patients with clinical T1-T4 and N0 urethral SCC is 9%, substantially lower than reported in penile cancer, arguing against routine prophylactic inguinal LND in this population. LND in clinically N0 patients was not associated with improved OS. However, performance of LND in clinical N1-2 disease is associated with improved OS.
Poster #173
UPPER TRACT SQUAMOUS CELL CARCINOMA CONFERS POORER STAGE-SPECIFIC SURVIVAL VERSUS UROTHELIAL CARCINOMA AFTER RADICAL NEPHROURETERECTOMY
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Presented By: Vignesh Packiam, MD

Introduction: Pure squamous cell carcinoma (SCC) of the upper urinary tract is an extremely rare entity and is generally diagnosed on final pathology. Historical series suggest that these tumors have similar prognosis as urothelial carcinoma (UC) when controlled for stage. We compared the prognosis from SCC to UC after radical nephroureterectomy (RNU) using a modern national cancer registry.

Methods: We queried the National Cancer Database (NCDB) from 2004 to 2014 to identify patients with non-metastatic SCC and UC of the renal pelvis and/or ureter who underwent RNU. Patients with prior malignancies were excluded. Overall survival (OS) was evaluated using Kaplan-Meier analysis. All-cause mortality was compared using multivariable Cox regression controlling for clinicopathologic covariates.

Results: The study included 140 patients (0.93%) with SCC and 14,943 patients (99%) with UC. Median age of patients with SCC was 73 (IQR 63 - 79) years and median follow-up for the overall cohort was 34 (IQR 17 - 61) months. SCC and UC cohorts did not have significantly different age, gender, race, or comorbidities. Positive lymph nodes (LN+) were found in 16% and 7.2% of patients with SCC and UC, respectively (p<0.01). Of patients with organ confined disease (pN0M0), 86% vs 34% of patients with SCC vs UC were stage ≥pT3, respectively. Patients with SCC had decreased median OS compared to UC when considering only ≥pT3 (9 vs 37 months) or pN1 (7 vs 15 months) tumors (≥pT3 shown in Figure 1). On multivariable Cox regression, after controlling for demographics, tumor grade, pT stage, pN stage, tumor location, surgical margins, and receipt of perioperative chemotherapy, SCC was associated with increased all-cause mortality vs UC (HR 1.4, 95%CI 1.1 - 1.8, p=0.003).

Conclusion: In this contemporary population-based analysis, upper tract SCC presented at more advanced stages and conferred a poorer stage-for-stage prognosis than UC. Given the radio- and chemo-refractory nature of these tumors, novel effective adjuvant treatments are needed.

Funding: None
**Poster #174**

**UTILIZATION OF MACHINE LEARNING ALGORITHM TO EVALUATE SURGEON PERFORMANCE DURING ROBOT ASSISTED RADICAL PROSTATECTOMY**

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Presented By: Andrew Hung, MD

**Introduction:** Surgeon performance is crucial for clinical outcome. Thus, its evaluation is of great value. Herein, we present a novel machine learning (ML) method of processing objective performance data derived directly from the da Vinci robot to predict clinical outcome after robot assisted radical prostatectomy (RARP).

**Methods:** A novel device, the “dVLogger” (Intuitive Surgical), recorded synchronized surgical footage and robotic performance data (instrument motion tracking metrics and system events) directly from the da Vinci Si robot during 100 consecutive RARPs. For this study, we focused on cases performed by a single surgeon in its entirety. Patient outcome data were prospectively collected and stratified into top 25%, middle 50% and bottom 25%. By using the robotic data as training input and patient outcome data as the label, we first trained a Random Forest ML algorithm to learn and predict surgeries as ‘Good’, ‘Intermediate’, and ‘Poor’ performances accordingly. We then compared mean outcomes between predicted groups using one-way ANOVA test. Secondly, the same model was utilized to directly predict clinical outcomes of each case. Finally, we determined the association between the ML predicted results and the actual patient clinical outcome data using Spearman’s correlation study and Fisher’s exact test.

**Results:** We studied 15 RARPs. Nine cases were predicted as ‘Good’ performance, 3 were predicted as ‘Intermediate’ and 3 were predicted as ‘Poor’ performance by RF model. There was no significant difference in patient age, body mass index, PSA, or Gleason score among the 3 groups (p>0.05). Surgeries predicted in the ‘Good’ and ‘Intermediate’ groups outperformed the ‘Poor’ group in OR time (3.5 vs 7.7h, p=0.003; 3.7 vs 7.7 h, p=0.02, respectively), LOS (1.9 vs 4 days, p=0.003; 2 vs 4 days p=0.02, respectfully) and readmission rate (0 vs 66.7%, p=0.003; 0 vs 66.7%, p=0.01, respectively). Also, we observed that clinical outcome values predicted directly by RF model had significant association with ground truth value in OR time (r=0.84, p<0.001), LOS (r=0.61, p=0.01), Foley catheter duration (r=0.65, p=0.02) and readmission (p=0.008).

**Conclusion:** Objective surgeon performance metrics, measured during live surgery and processed by ML algorithms, are associated with select clinical outcomes after RARP. With further refinement, ML can be applied to evaluate surgical performance and provide feedback in real time, and predict patient outcome.
AVOIDING THE NEED FOR BOWEL ANASTOMOSIS DURING PELVIC EXENTERATION - URINARY SIGMOID CONDUIT - SHORT AND LONG TERM COMPLICATIONS

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Presented By: Catherine Soorim Nam, BA

Introduction: During pelvic exenteration for malignancy, urinary diversion is typically performed with an ileal conduit as this is what most urologists are familiar with. Sigmoid colon conduit is an alternative that uses the more proximal colon for bowel diversion, thereby avoiding the need for a bowel anastomosis. We reviewed our series with sigmoid urinary conduit during pelvic exenteration focusing on perioperative and long-term surgical and metabolic complications.

Methods: We identified 15 patients in our IRB approved database from 1/2005 – 7/2017 who underwent total pelvic exenteration and sigmoid conduit urinary diversion for malignancy.

Results: Of these 15 patients 11 (73.3%) were male with mean age of 58.5 years and mean BMI of 25.5. Six (40%) had history of prior pelvic radiation and 7 (47%) had history of prior pelvic surgery, 6 (40%) received neoadjuvant chemotherapy, and 6 (40%) received neoadjuvant radiation. Median operative time was 9 hours 10 mins, median estimated blood loss (EBL) was 1175ml, and median length of stay was 11 days. Mean pre-op serum creatinine (Cr) was 1.3± 1 and discharge serum Cr was 1± 0.3. Surgical and metabolic complications are highlighted in Table 1 stratified by early (<30days), intermediate (31-89 days), and late (>90 days). There were 2 (13.3%) ureterocolonic strictures - 1 was managed endoscopically and the other with nephrostomy tubes. One patient had stomal hemorrhage requiring 3 units of pRBC during their hospital stay. Within 30 days, there were 2 patients with partial small bowel obstructions (SBO) requiring nasogastric (NGT) placement with 1 requiring total parenteral nutrition (TPN). Five patients had prolonged ileus with 4 requiring TPN and NGT placement. For > 90 days, 3 patients had partial SBO requiring NGT placement with only 1 requiring TPN. Long-term metabolic complications included hypokalemia (8 patients), hyperchloremia (5 patients), and metabolic acidosis (8 patients) managed medically.

Conclusion: Sigmoid colon urinary conduit with more proximal colon is a safe and feasible option for patients getting total pelvic exenteration for malignancy and obviates the need for small bowel anastomosis and possible associated complications.
Poster #176
DISTRIBUTION OF PELVIC AND RETROPERITONEAL LYMPHATIC METASTASIS IN PENILE CANCER: IMPLICATIONS FOR TREATMENT
Juan Chipollini, MD, Dominic Tang, MD and Philippe Spiess, MD
Moffitt Cancer Center, Tampa, FL
Presented By: Juan J. Chipollini, MD

Introduction: Squamous cell carcinoma (SCC) of the penis is an uncommon disease in Europe and North America. Although rare, it can be an aggressive with early spread to the regional lymph nodes (LN). Once disease in present in the pelvic nodes (peN+), outcomes are poor with reported 5-year survival of less than 10%. In this study, we evaluate patterns of lymphatic metastasis and outcomes in a contemporary cohort of patients that underwent pelvic and extended LN dissection at our institution.

Methods: We retrospectively reviewed medical records of consecutive patients with penile SCC treated with inguinal lymphadenectomy from March 1994 to May 2014. From this group, 19 patients proceeded to unilateral (n= 10) or bilateral (n= 9) pelvic lymphadenectomy. Three of these patients received extended dissections involving the common iliac, pericaval, interaortocaval and periaortic nodes. Clinicopathologic features, number of nodes, location and amount of involvement for each nodal packet were assessed. Cox proportional hazard regression was used to evaluate predictors of progression free survival (PFS).

Results: A total of 140 lymph nodes from 28 unilateral pelvic basins were evaluated. Median follow-up was 22 months (IQR: 11.2-44.8) and median overall survival was 34.4 months (95%CI: 18.1-50.6). Mean LN yield was 7.3 (range: 1-21) and peN+ rate was 31.6%. In peN+ patients, mean number of positive nodes was 3 (1-7) with a mean tumor diameter of 17.3 mm (3-50). The external iliac nodes were the most commonly involved packet (13.5%). All 3 patients with extended dissections were alive at mean follow-up of 13.1 months (6.8-18.5). Overall median PFS was 8.9 months (1.1-16.9). As a continuous variable, tumor node diameter was significant for worse PFS (HR= 1.08,1.01-1.15;p=0.020) while lymph node yield (p=0.619), number of positive nodes (p=0.168), or pN+ status (p=0.325) were not significant.

Conclusion: The external iliac nodes are most commonly involved in peN+ penile cancer. Tumor node diameter can further stratify these patients. Extended surgical resection along with integration with multimodal therapy can have a role in advance penile cancer.
**Poster #177**

**AKT AND S6 STATUS IS ASSOCIATED WITH IMPROVED OVERALL AND RECURRENCE-FREE SURVIVAL IN SQUAMOUS CELL CARCINOMA OF THE PENIS**

Dominic Tang, MD; Mounsif Azizi, MD; Daniel Verduzco, MD; Juan Chipollini, MD; Braydon Schaible, MD; Jasreman Dhillon, MD and Philippe Spiess, MD

Moffitt Cancer Center

Presented By: Dominic Tang, MD

**Introduction:** Few studies have examined the role of molecular markers in the mammalian target of rapamycin (mTOR) pathway in penile carcinoma. We sought to determine the clinical utility of AKT and S6 in its use in clinical practice in men with penile carcinoma treated at our institution.

**Methods:** Tissue microarrays were constructed for 57 consecutive cases of invasive penile squamous cell carcinoma. Immunohistochemistry was performed to stain AKT and S6. Presence of human papilloma virus (HPV) was detected via in situ hybridization for high-risk subtypes. The Kaplan Meier method was performed to calculate survival and recurrence and compared with the log rank test. The Cox regression proportional hazard model was used to calculate univariate and multivariate analysis for survival and recurrence. Variables were selected using backwards elimination with p<0.10 for the multivariable analyses.

**Results:** The median age was 60 years (IQR 53-73) and median follow-up was 25 months (IQR 3-47). (68%) underwent partial penectomy and 12 patients (21%) underwent total penectomy. PTEN, AKT, and S6 were positive in 14 (40%), 27 (48%), and 12 (21%) patients, respectively. Positive AKT and S6 expression was associated with improved overall survival on univariate analysis (p=0.011 and p=0.039, respectively). On multivariable analysis, negative AKT (HR 2.4, 95% CI 1.0-5.8, p=0.05), negative S6 (HR 4.6, 95% CI 1.1-19.4, p=0.03), higher nodal stage (HR 7.8, 95% CI 3.1-19.8, p<0.001), and negative HPV status (HR 4.7, 95% CI 1.9-11.3, p<0.001) were associated with worse overall survival. Univariate analysis for recurrence showed positive AKT (p=0.004) and S6 (p=0.015) status to be associated with improved recurrence-free survival. Multivariable analysis showed negative AKT (HR 4.5, 95% CI 1.7-12.1, p=0.002) and higher nodal stage (HR 4.2, 95% CI 1.7-12.1, p=0.002) to be associated with worse recurrence-free survival.

**Conclusion:** Positive AKT and S6 status is associated with improved overall and recurrence-free survival. Although the mTOR pathway may not contribute to penile carcinoma pathogenesis, this may serve as potential use as biomarkers in accessing patients’ outcomes.
Posters

POSTER SESSION II — FULL ABSTRACTS

Poster #178
DEVELOPMENT AND VALIDATION OF A PROSTATE CANCER GENOMIC SIGNATURE THAT PREDICTS EARLY ADT TREATMENT RESPONSE FOLLOWING RADICAL PROSTATECTOMY
R. Jeffrey Karnes, MD; Vidit Sharma; Voleak Choeurng; Nicholas Erho; Mohammed Alshalalfa; Bruce Trock; Ashley Ross; Kasra Yousefi; Harrison Tsai; Shuang G. Zhao; Jeffrey J. Tosoian; Zaid Haddad; Mandeep Takhar; S. Laura Chang; Daniel E. Spratt; Firas Abdollah; Robert B. Jenkins; Eric A. Klein; Paul L. Nguyen; Adam P. Dicker; Robert B. Den; Elai Davicioni; Felix Y. Feng; Tamara L. Lotan and Edward M. Schaeffer
Presented By: R. Jeffrey Karnes, MD

Introduction: Currently no genomic signature exists to distinguish men most likely to progress on adjuvant androgen deprivation therapy (ADT) after radical prostatectomy (RP) for high risk prostate cancer. Here, we develop and validate a gene expression signature to predict response to postoperative ADT.

Methods: A training set consisting of 284 RP patients was established after 1:1 propensity score matching metastasis (based on clinicopathologic variables) between adjuvant-ADT treated (a-ADT) and non-ADT treated (no-ADT) groups. Using a combination of logistic regressions with aADT interaction to rank features and forward feature selection with generalized linear modeling, an 84 gene ADT response signature (ARS) was identified from neuroendocrine related genes. Two independent cohorts were used to form three separate data sets for validation (Set I, n=232; Set II, n=435; Set III, n=612). Multivariable cox regression was used to associate the interaction between ARS and ADT with metastatic progression in the validation sets. Cumulative incidence curves for metastasis according to Low and High ARS were constructed after 1:1 propensity-score matching a-ADT to no-ADT patients from validation Set II on clinical variables.

Results: The ARS achieved a cross-validated AUC of 0.836 for metastasis. Increases in ARS score were associated with a reduction in risk of metastasis only a-ADT patients and not no-ADT patients. On multivariable analysis, ARS by ADT treatment interaction term remained associated with metastasis in both validation sets (Set I: Hazard Ratio (HR)=0.18, pinteraction=0.009; Set II: HR=0.25, pinteraction=0.019). In a matched validation set III, patients with Low ARS scores had similar 10-year metastasis rates in the a-ADT and no-ADT groups (30.1% vs 31.0%, p=0.989). Among High ARS patients, 10-year metastasis rates were significantly lower for a-ADT vs no-ADT patients (9.4% vs 29.2%, p=0.021). The marginal ARS by ADT interaction remained significant in the matched data set (pinteraction=0.035). As opposed to ARS, the prognostic Decipher prostate cancer classifier and cell cycle progression signature did not predict response to ADT (pinteraction>0.05 for all).

Conclusion: Patients with High ARS benefited from adjuvant ADT while those with Low ARS had no improvement in metastasis rates. ARS may thus allow for identification of ADT- resistance tumors that may be more optimal candidates for multimodal systemic therapy or clinical trials of novel agents.
Introduction: The outcomes and utility of serial magnetic resonance imaging (MRI)/ultrasound (US) fusion targeted prostate biopsy in men with prostate cancer (PCa) on active surveillance (AS) have not been clearly defined. We sought to investigate the rate of Gleason upgrading both on sequential fusion targeted and systematic biopsies among men with low-risk PCa managed with AS.

Methods: We retrospectively queried an institutional database of 800 patients undergoing MRI-ultrasound fusion biopsy to identify 209 patients on AS with at least two fusion biopsies between December 2013 and November 2016 or patients on AS prior to their first MRI and biopsy. Men with National Comprehensive Cancer Network (NCCN) very low-risk and low-risk criteria were included. Gleason upgrade was defined as detection of Gleason score ≥3+4. The proportion of patients experiencing upgrade on systematic biopsy, fusion biopsy, or both techniques was tabulated. Associations of clinical, pathologic, and imaging characteristics with biopsy upgrade were examined using descriptive characteristics and multivariable logistic regression.

Results: Of 209 patients undergoing MRI-ultrasound fusion biopsy on AS, 73 (35.0%) had at least two targeted biopsies (66% very low-risk and 34% low-risk disease). The time interval between biopsies was 12.6 months (11.2-17.7). The median PSA and PSA density were 5.4 ng/mL (4.2-7.1) and 0.11 ng/mL/mL (0.07-0.18), respectively. Twenty-one (29%) patients experienced Gleason upgrade on subsequent biopsy. Of those, 6 (8%), 5 (7%), and 10 (14%) had upgrade on systematic biopsy only, fusion biopsy only, and both systematic and fusion biopsy, respectively. Patients with upgrade on subsequent biopsy had higher PSA (p=0.02) and PSA density (p=0.02), greater number of positive systematic cores (p=0.001), and were among low-risk disease population (p=0.03). In logistic regression models including PSA density, and NCCN risk groups, greater number of positive cores in systematic biopsy (OR 1.88; 95% CI 1.23-2.92; p=0.005) was associated with the total Gleason upgrade on repeated biopsy.

Conclusion: In men with favorable-risk prostate cancer managed with AS, Gleason upgrade was detected in a 29% of patients on a second MRI fusion biopsy including both targeted and systematic regions. These findings support the continued use of MRI fusion biopsy during surveillance due to risks of reclassification over time.
Poster #180
LOSS OF MEIS1 AND MEIS2 PREDICTS PROSTATE CANCER PROGRESSION: A ROLE FOR HOXB13 BINDING PARTNERS IN UNDERSTANDING METASTATIC DISEASE

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Presented By: Raj Ramnik Bhanvadia, BA

Introduction: MEIS (myeloid ecotropic viral integration site) proteins have been identified as a putative biomarkers capable of prognostic prediction in men on active surveillance for prostate cancer (PCa). The functional and prognostic role of MEIS in progression to metastatic PCa (mPCa) after radical prostatectomy (RP) is unknown.

Methods: RNA-sequencing (RNA-Seq) and GEO microarrays of benign, localized PCa, and mPCa, were queried for MEIS1/2. Changes in MEIS1/2 associated with PCa progression as well as correlation in MEIS1 and MEIS2 expression among patients was determined. Tissue Microarrays (TMA) of Post-RP patients were stained for MEIS and scored by a single genitourinary pathologist into MEIS positive (MEIS+) and negative (MEIS-) groups. Kaplan Meier curves, and multivariable Cox models were constructed to determine if MEIS predicted biochemical recurrence (BCR) and progression to clinical mPCA, defined as radiographic or pathologic evidence of metastasis. RNA-seq of 26 local PCa were stratified by MEIS, and pair-wise analysis to mPCA samples with subsequent Ingenuity Pathway Analysis (IPA) identified gene networks associated with MEIS and mPCa, validated with RT-PCR and western blotting.

Results: Both GEO array (R2=0.60; P<0.05) and RNA-Seq (R2=0.47; P<0.05) showed positive correlation between MEIS1 and MEIS2 expression. Progression from benign, to local PCa, to mPCa was associated with decrease in total MEIS expression in array (140.3 vs. 84.4 vs. 11.1; P<0.05) and RNA-seq (434.7 vs. 242.0 vs. 57.6; P<0.05) data sets. 321 patients underwent RP for PCa, and were stained for total MEIS expression. 11% (n=36) of patients were MEIS+. There was no difference in age, race, pre-operative PSA, or Gleason grade between MEIS- and MEIS+ patients. MEIS+ patients had greater 5-year BCR free survival (57% vs. 31%; P<0.01) and 10-year metastasis free survival (74% vs. 59%, P=0.013). On multivariable Cox analysis, MEIS+ expression predicted lower risk of clinical metastasis (HR=0.40, P<0.01). IPA identified 1082 MEIS associated genes across networks related to cell survival and proliferation. Subsequent validation identified changes in WNT5A, OSR1, and F3 among other gene targets.

Conclusion: Our data shows that MEIS proteins play a significant role in progression to mPCa, and support its role as a potential prognostic biomarker. Elucidation and validation of these MEIS associated networks may identify novel pathways in PCa progression.
**Poster Session II — Full Abstracts**

**Poster #181**

**TARGETED EARLY DETECTION IN MEN AT HIGH GENETIC RISK FOR PROSTATE CANCER**

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Presented By: Sanjay Das, BS

**Introduction:** Heritable mutations that predispose to prostate cancer are increasingly recognized, and the NCCN Early Detection guidelines now include “family or personal history of BRCA1/2 mutations” as an important factor in the decision whether to perform prostate cancer screening. Despite this, many U.S. patients at high genetic prostate cancer risk are unaware of the need for screening, and there is little data in U.S. patients regarding how best to tailor screening. We therefore sought to develop an early detection program for this patient population.

**Methods:** Patients with known mutations in prostate cancer susceptibility genes are enrolled into the Prostate Cancer Risk Clinic. Eligible patients have known mutations, including: BRCA 1/2, Lynch syndrome (MLH1, MSH2, MSH6), p53, HOXB13, ATM, PALB2, CHEK2, RAD51D, ATR, NBN, GEN1, RAD51C, MRE11A, BRIP1, or FAM175A. Total planned enrollment is 200 men aged 35-70 years and without a prior known prostate cancer. Annual screening is performed, including PSA, DRE, and SelectMDx urine assay. Baseline dietary and quality of life survey data are collected as well. Indications for biopsy include: 1) abnormal DRE, 2) PSA above threshold (>2 ng/ml for patients <50 years, >2.5 ng/ml for patients 50-70 years), or 3) abnormal SelectMDx score (Figure). Participants with normal DRE, PSA, and SelectMDx scores or who do not show prostate cancer on biopsy will be seen annually for repeat screening.

**Results:** Over the first 2 months of this study, there have been 6 patients enrolled: 2 with BRCA 1 mutations, 3 with BRCA 2 mutations, and 1 with Lynch Syndrome (MSH6 mutation). Two participants have elevated PSAs above threshold and prostate biopsies are pending. SelectMDx and DRE were normal for all patients.

**Conclusion:** Early data indicate the feasibility of opening a dedicated early detection clinic for men at high genetic risk for prostate cancer. We continue to enroll patients and anticipate further accrual will help optimize early detection in this population at substantially elevated risk of aggressive prostate cancer.

**Funding:** MDxHealth, Inc
**Poster #182**

**INCORPORATING PROSTATE HEALTH INDEX DENSITY, MRI, AND PRIOR NEGATIVE BIOPSY STATUS TO IMPROVE THE DETECTION OF CLINICALLY SIGNIFICANT PROSTATE CANCER**

Sasha Druskin, MD; Jeffrey Tosoian, MD; Allen Young, MD; Sarah Collica, BA; Arnav Srivastava, BA; Kamyar Ghabili, MD; Katarzyna Macura, MD, PhD; Herbert Carter, MD; Alan Partin, MD, PhD; Lori Sokoll, PhD; Ashley Ross, MD, PhD; and Christian Pavlovich, MD

Johns Hopkins University

Presented By: Sasha Courand Druskin, MD

**Introduction:** We determined the performance of Prostate Health Index (PHI) density (PHID) combined with MRI and prior negative biopsy (PNB) status for the diagnosis of clinically-significant prostate cancer (PCa).

**Methods:** Patients without a prior diagnosis of PCa, with elevated PSA and a normal digital rectal exam who had PHI testing prospectively prior to prostate biopsy were included. PHID was calculated retrospectively. Logistic regression, along with receiver operating characteristic analysis, was used to determine the ability of serum biomarkers to predict clinically-significant cancer (GG≥2 or GG1 in >2 cores or >50% of any one core) on biopsy. Age, PNB status and PIRADS were incorporated into the regression models.

**Results:** Of the 241 men who qualified for the study, 91 (37.8%) had clinically-significant cancer on biopsy. The median PHID was 0.74 (IQR 0.44-1.24); it was 1.18 (IQR 0.77-1.83) and 0.55 (IQR 0.38-0.89) in those with and without clinically-significant PCa on biopsy, respectively (p<0.0001). On univariable logistic regression, age and PNB status were associated with clinically-significant cancer. PHID demonstrated the highest discriminative ability for clinically-significant disease (AUC 0.78 for the univariable model). That continued to be the case in multivariable logistic regression models incorporating age and PNB status (AUC 0.82). At a threshold of 0.44, representing the 25th percentile of PHID in the cohort, PHID was 92.3% sensitive and 35.3% specific for clinically-significant PCa; the sensitivity/specificity was 93.0/32.4 and 97.4/29.1 for GG≥2 and GG≥3 disease, respectively. In the 104 men who had MRI, PIRADS score was complementary to PHID, with PIRADS ≥3 or, if PIRADS ≤2, PHID≥0.44 detecting 100% of clinically-significant disease. For that subgroup, PHID (AUC 0.90) demonstrated the highest discriminative ability for clinically-significant disease on multivariable logistic regression incorporating age, PNB status and PIRADS score.

**Conclusion:** In this contemporary cohort of men at risk for PCa, PHID outperformed PHI and other PSA-derivatives for the diagnosis of clinically-significant PCa. Incorporating age, PNB status, and PIRADS led to even further gains in the diagnostic performance of PHID. Furthermore, PIRADS was found to be complementary to PHID. Using 0.44 as a cutoff for PHID, 35.3% of unnecessary biopsies could have been avoided at the cost of missing 7.7% of clinically-significant cancers.

**Funding:** None
Poster #183
THE VALUE OF TRACKING BIOPSY IN MEN UNDERGOING ACTIVE SURVEILLANCE OF PROSTATE CANCER
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Presented By: Fuad F. Elkhoury, MD

Introduction: To compare the upgrading rate obtained by re-sampling precise spots of prostate cancer (tracking biopsy) vs conventional systematic re-sampling, during follow-up of men in active surveillance.

Methods: Subjects were all 352 men, from 2009 to 2017, with Gleason 3+3 (n=268) or Gleason 3+4 (n=84) prostate cancer at initial MRI/ultrasound fusion biopsy and who subsequently had a second fusion biopsy. At first biopsy session, all men underwent 12-core systematic biopsies and, when MRI-visible lesions were present, targeted biopsies. All cancerous sites were recorded electronically. During active surveillance, at a second fusion-biopsy session 6-18 months later, both tracking and systematic non-tracking samples were obtained. Primary outcome measure was an increase in Gleason Score (upgrading) at follow-up sampling, stratified by biopsy method.

Results: Overall, 91 of 352 men (25.9%) experienced upgrading at second biopsy, during an 11-month median interval. Upgrade rates for Gleason 3+3 and Gleason 3+4 groups were 26.9% and 22.6%, respectively. Mean number of cores taken at second biopsy was 12.2 +/- 3.3 for those who upgraded and 12.4 +/- 4.1 for those who remained stable (p= NS). Men with MRI targets of grade 0-4 all upgraded at approximately the same rate (20-30%) (p=NS); but, 58.8% of men with grade 5 MRI targets upgraded. 48 of 91 upgrades (53%) were detected only by tracking.

Conclusion: The tracking function of MRI/US fusion biopsy warrants further study, since resampling specific sites, when used in men undergoing active surveillance of prostate cancer, leads to detection of upgrading more often than non-tracking biopsy.
Poster #184
PROTEOMIC-BASED BIOMARKERS FOR RISK OF PROGRESSION IN EARLY PROSTATE CANCER
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Presented By: Justin R. Gregg, MD

Introduction: Active surveillance (AS) is an increasingly utilized management strategy for newly diagnosed localized prostate cancer. Enrollment onto AS relies on the identification of indolent tumors. A number of genomic markers have been developed to predict disease aggressiveness in men eligible for AS; however, many require patient tissue or have not been validated in AS cohorts. Therefore, minimally invasive plasma-based biomarkers of aggressive disease for use in men on AS are urgently needed.

Methods: We performed untargeted analysis of proteomic data generated using mass spectroscopy coupled with tandem mass tag analysis on fractionated plasma samples prospectively collected at baseline from a matched (with respect to age, clinical stage, PSA and Gleason score) exploratory cohort of patients with early stage prostate cancer on AS. Cases were defined as patients who had progression of disease with 18 months of enrollment while controls had no progression at five or more years of follow-up. After normalization, protein level data were analyzed by the Wilcoxon test. A total of 1,919 proteins were examined. Multiple comparisons testing was not completed due to the exploratory nature of the study.

Results: Among the 16 cases and 16 controls, the average age was 64.4 (SD 7.9) and PSA was 3.8 (2.1). In total, 24 of 32 patients (12 cases and 12 controls) had Gleason 3+3 disease. The below table shows six proteins that had significantly different expression levels when comparing cases to controls, some of which have been previously implicated in prostate cancer progression. The combined protein panel of markers was able to accurately classify cases and controls (AUC = 1).

Conclusion: Using untargeted analysis of exploratory proteomic data we have identified six potential plasma-based protein biomarkers that may differentiate aggressive versus indolent prostate cancer in an AS cohort. Confirmatory studies are under way to determine plasma protein expression differences and to evaluate associations with disease aggressiveness in a larger AS cohort.

<table>
<thead>
<tr>
<th>Protein</th>
<th>Function</th>
<th>Aggressive Baseline (Mean +/- Stdev)</th>
<th>Indolent Baseline (Mean +/- Stdev)</th>
<th>Fold Change</th>
<th>P-Value*</th>
<th>AUC</th>
<th>Wilcoxon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Promotes cell adhesion and spreading</td>
<td>2.3e7 +/- 4.9e6</td>
<td>1.8e7 +/- 5.1e6</td>
<td>1.27</td>
<td>0.017</td>
<td>0.75</td>
<td>0.018</td>
</tr>
<tr>
<td>2</td>
<td>Regulates actin filaments</td>
<td>2.9e7 +/- 1.3e7</td>
<td>1.9e7 +/- 7.1e6</td>
<td>1.52</td>
<td>0.026</td>
<td>0.73</td>
<td>0.012</td>
</tr>
<tr>
<td>3</td>
<td>Regulates plasminogen</td>
<td>7.8e6 +/- 3.5e6</td>
<td>3.4e6 +/- 2.0e6</td>
<td>2.29</td>
<td>&lt;0.001</td>
<td>0.86</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>4</td>
<td>Component of cytokeratins and lipoproteins</td>
<td>6.3e5 +/- 4.7e5</td>
<td>4.4e5 +/- 1.9e5</td>
<td>1.44</td>
<td>&lt;0.001</td>
<td>0.91</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5</td>
<td>Extracellular glycoprotein</td>
<td>2.0e7 +/- 9.8e6</td>
<td>5.6e6 +/- 2.7e6</td>
<td>3.52</td>
<td>&lt;0.001</td>
<td>0.96</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>6</td>
<td>Multifunctional protein in the albumin family</td>
<td>2.5e8 +/- 2.4e7</td>
<td>3.0e8 +/- 3.2e7</td>
<td>0.86</td>
<td>&lt;0.001</td>
<td>0.84</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*Mann-Whitney U Test
Poster #185
PREOPERATIVE MRI FINDINGS ARE ASSOCIATED WITH THE PATHOLOGIC AND GENOMIC FEATURES OF PROSTATECTOMY SPECIMENS
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¹Icahn School of Medicine at Mount Sinai, New York City, NY; ²Icahn School of Medicine at Mount Sinai, New York, NY
Presented By: Alp Tuna Beksac, MD

Introduction: MRI imaging can predict clinically significant prostate cancer, but its relationship with final pathology and genomic correlates is unclear. We sought to evaluate the association of preoperative MRI features with final pathology and Decipher genomic prostate scores (GPS) in our radical prostatectomy (RP) cohort.

Methods: We retrospectively analyzed the data of 333 patients who underwent RP between October 2013 and December 2016 with available preoperative MRI and postoperative GPS. The RP tumor that was submitted for GPS analysis was matched to the MRI nodule in the same location. 156 patients had corresponding lesions and qualified for further analysis. We analyzed the association of GPS with MRI, clinical and pathologic factors. We created an adverse pathology variable that was defined as Gleason group >2, pT3-4 or pN1 disease.

Results: Final pathology was as follows: pT2 (69.2%), pT3a (21.2%) pT3b (9.6%). The PI-RADS score distribution was 11%, 45.6% and 43.4% for 3, 4 and 5, respectively. DWI score distribution was 0.9%, 12.5%, 42.9%, 43.8% for 2,3,4 and 5, respectively.

Age (p=0.16), BMI (p=0.80), PSA (p=0.34), presence of a dominant nodule on MRI (p=0.43) and MRI lesion size (p=0.98) had no association with GPS. In final pathology, Gleason score (p<0.001), pT stage (p=0.007), pN stage (p=0.002) and extra-prostatic extension (EPE) (p=0.006) were significantly associated with GPS. On univariate analysis, PI-RADS (p=0.004), diffusion weighted imaging (DWI) scores (p=0.029) PI-RADS was also associated with adverse pathology features (p=0.012). When stratified by D'Amico risk classification, PI-RADS was only associated with GPS for high risk patients (p=0.031). EPE on MRI (p=0.004) had significant association with GPS. EPE on MRI was associated with pT3 disease (p=0.007) but not with adverse pathology (p=0.55).

Conclusion: Higher PI-RADS and DWI scores were associated with increased GPS on final pathology in our cohort. When stratified by D'Amico risk groups, PI-RADS was associated with GPS for only high risk patients. Furthermore, PI-RADS scores were associated with adverse pathologic features.
Poster #186
MRI FUSION BIOPSY IS ASSOCIATED WITH A HIGHER RATE OF PATHOLOGIC DOWNGRADING AT RADICAL PROSTATECTOMY

Alp Tuna Beksac, MD¹; Shivaram Cumarasamy, MD²; Akriti Gupta, MD²; Kanika Mahajan, BDS, MPH²; Ugo Falagario, MD²; Sonya Prasad, BA²; Isuru Jayaratna, MD²; Andrew Charap, BS²; Emma Rosenbluth, BA²; Sara Pasik, BA² and Ash Tewari, MD²
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Presented By: Alp Tuna Beksac, MD

Introduction: MRI targeted fusion biopsy (FB) has higher sensitivity and specificity in predicting Gleason score compared with standard 12-core biopsy (SB). However, Gleason score discordance may still occur post radical prostatectomy (RP), which can impact decision-making. We sought to analyze the patterns of Gleason downgrading after SB versus FB.

Methods: An IRB approved retrospective study was performed on 589 prostate cancer patients who received RP between February 2014 and October 2015 at our institution. All preoperative biopsies were re-reviewed by a genitourinary pathologist. Gleason score concordance of biopsy and final pathology was compared between FB and SB groups. Downgrading was defined as the change from Gleason Group 3, 4 or 5 on biopsy to Gleason Group 1 or 2 on RP pathology. We also considered the change from Gleason Group 2 on biopsy to Gleason Group 1 at RP. Additional clinical and pathologic factors associated with downgrading were analyzed. Statistical analysis was performed using Student’s t-test or Mann Whitney U test for continuous variables and Chi-square or Fisher’s exact tests for categorical variables. Multivariate analysis was done using a binomial logistic regression model.

Results: There was no significant difference between the two groups (476 SB patients and 104 FB patients) in terms of PSA (p=0.49), PSA density (p=0.17), maximum % core (p=0.83), clinical stage (p=0.13), MRI volume (p=0.10) and MRI ECE (p=0.13). The FB group had more patients who downgraded on final pathology compared with SB. (18.5% vs. 9.7%, respectively, p=0.01) Downgrading did not impact pathological outcome. Downgrading was not associated with pathologic stage (p=0.53), extraprostastic extension (p=0.39), lymph node invasion (p=0.24), nor positive surgical margin status (p=0.41). A multivariate regression model including PSA, maximum % core, MRI volume and MRI ECE demonstrated that targeted biopsy was the only factor independently associated with downgrading after RP. (p=0.01)

Conclusion: In our cohort, we observed increased downgrading from high/intermediate risk groups to low risk groups after FB compared with SB. This information should be used in shared decision making for prostate cancer management.
Poster #187
THE REASSURE ME TRIAL: SUPPORTING EMOTION REGULATION, POSITIVE HEALTH BEHAVIORS, AND SURVEILLANCE ADHERENCE FOR MEN WITH PROSTATE CANCER ON ACTIVE SURVEILLANCE
Lindsey Herrel, MD, MS¹; Todd Morgan, MD¹; Bruriah Gutierrez, MA²; Carly Maletich, MA²; Stephahine Schuette, BA²; Alexander Kutikov, MD³; Shilajit Kundu, MD²; Scott Eggener, MD⁴; Charles Brendler, MD³ and David Victorson, PhD²
¹University of Michigan, Ann Arbor, MI; ²Northwestern University, Chicago, IL; ³Fox Chase Cancer Center, Philadelphia, PA; ⁴University of Chicago, Chicago, IL; ⁵NorthShore University Health System, Chicago, IL
Presented By: Lindsey Allison Herrel, MD, MS

Introduction: While active surveillance (AS) for the management of low risk prostate cancer is becoming an increasingly adopted treatment paradigm, many men and their partners can face a host of psychosocial stressors related to this approach. This can negatively affect short and long term psychosocial adjustment and quality of life and contribute to withdrawal from AS prematurely to seek definitive therapies such as surgery. With this multi-site NIH-funded study, we will examine the efficacy of mindfulness training compared with a time/attention-matched health promotion control among a large sample of men on AS and their spouses.

Methods: The study seeks to examine the psychological response and adherence to AS when patients participate in instructor-led mindfulness training (mindfulness-based stress reduction [MBSR]) over 12 months (n=120 men on AS plus spouses), compared with a health promotion control course (n=120 men on AS plus spouses). The trial utilizes a randomized, placebo-controlled, partially double-blinded study design over a four-year enrollment period. Each course consists of weekly, in-person, instructor led sessions devoted to mindful awareness practices or general health promotion practices over 8 weeks. Baseline measures (e.g., anxiety, fear of progression, quality of life) are obtained just prior to randomization, followed by repeated assessments at 2, 6, and 12 months.

Results: Enrollment is ongoing at all four sites, with a total enrollment in the first year of 57 men with newly diagnosed prostate cancer enrolling on AS and 27 spouses across three cities and four academic medical centers. Randomization of participants over the first year resulted in completion of three health promotion control courses and one mindfulness course. No adverse events were noted during these courses.

Conclusion: In this early report of a randomized controlled trial to evaluate the efficacy of mindfulness training for men on AS for prostate cancer, we have demonstrated feasibility of enrollment, randomization, initial survey participation and compliance with course attendance. This work has the potential to offer men and their partners facing the stressors of AS with specialized emotional, cognitive, and physiological self-regulatory skills to cope more effectively and possibly prolong adherence to medically-warranted AS protocols.
**Poster #189**

**UTILIZATION OF MRI AND GENOMIC MARKERS IN SURVEILLANCE AND TREATMENT SELECTION AMONG PATIENTS DIAGNOSED WITH PROSTATE CANCER**

Nitin Yerram, MD¹; Shree Agrawal, BS²; Dominic Grimberg, MD³; Karishma Gupta, MD⁴; Yaw Nyame, MD¹; Daniel Sun, MD¹; Daniel Greene, MD¹; Hans Arora, MD⁴; Sudhir Ishaival, MD⁴; Paurush Babbar, MD⁴; Anna Zampini, MD⁴; Andrew Sun, MD¹; Andrei Purysko, MD¹; Ryan Berglund, MD¹; Michael Gong, MD¹; Andrew J. Stephenson, MD⁷ and Eric Klein, MD¹

¹Cleveland Clinic, Cleveland OH; ²Case Western Reserve University School of Medicine, Cleveland OH; ³Duke University, Durham NC; ⁴University Hospitals of Cleveland, Cleveland OH

Presented By: Nitin K. Yerram, BS, MD

**Introduction:** Contemporary assessment tools for patients with prostate cancer (PCa) include genomic marker testing, and multiparametric magnetic resonance imaging (mp–MRI). The purpose of this study is to assess the utilization of these clinical assessments in the management of NCCN very low to intermediate risk prostate cancer with active surveillance (AS) or primary intervention (radical prostatectomy or radiotherapy).

**Methods:** The records of men diagnosed with NCCN very low to intermediate risk PCa between January 2013 and September 2016 with Oncotype Dx were reviewed. Multivariate logistic regression model was used to assess participation in an AS protocol or primary intervention protocol.

**Results:** A total of 389 men were identified. Patients who selected an AS protocol (235, 60%) or primary intervention (154, 40%) were followed for median of 19 (IQR: 11−31) months. Median age at diagnosis was 64 years (IQR: 59−69). In addition to standard transrectal ultrasound (TRUS) biopsy, 217 (56%) men received MRI/TRUS fusion biopsy. On multivariate logistic regression, a higher genomic prostate score (favorable pathology) correlates with increased participation in an AS protocol (HR 1.05, p = 0.002); while an increased number of lesions found on mp–MRI (OR: 0.57, p = 0.012), and higher PSA levels at presentation (OR: 0.82, p = 0.001), correlated with less participation in an AS protocol.

**Conclusion:** In our institutional, both Oncotype Dx score and mp–MRI lesions correlated with the shared decision to participate in an AS protocol. Future studies should assess the impact of genomic testing and mp–MRI on intermediate– and long– term oncologic outcomes.
Poster #190

TESTOSTERONE RESPONDERS TO CONTINUOUS ANDROGEN DEPRIVATION THERAPY EXHIBIT CONSIDERABLE VARIATIONS IN TESTOSTERONE LEVELS ON FOLLOW-UP: IMPLICATIONS FOR CLINICAL PRACTICE

Rashid Sayyid, MD, MSc¹; Abdallah Sayyid, BSc²; Zachary Klaassen, MD³; Kamel Fadaak, MD³; Hanan Goldberg, MD³; Thenappan Chandrasekar, MD³; Ardalannejaz Ahmad, MD³; Ricardo Leao, MD³; Nathan Perlis, MD, MSc³; Karen Chadwick, MSc³; Robert Hamilton, MD, MPH³; Girish Kulkarni, MD, PhD³; Antonio Finelli, MD, MSc³; Alexandre Zlotta, MD, PhD³ and Neil Fleshner, MD, MPH³

¹Medical College of Georgia, Augusta University, Augusta, GA; ²Department of Surgical Oncology, Division of Urology, University Health Network, University of Toronto, Toronto, ON, Canada

Presented By: Rashid Sayyid, MD, MSc

Introduction: The goal of androgen deprivation therapy is to reduce serum testosterone to castrate levels, inducing regression of androgen-sensitive prostate cancer cells. Our goal was to determine whether continuous androgen deprivation therapy users achieving testosterone levels <0.7 nmol/L demonstrate subsequent testosterone level elevations on follow-up and whether such events predict worse oncologic outcomes.

Methods: This was a random, retrospective sample of 514 prostate cancer patients treated with continuous androgen deprivation therapy and having serum testosterone levels <0.7 nmol/L, at the University Health Network between 2007-2016. Patients were followed from date of first testosterone level <0.7 nmol/L till progression to castrate resistance, death, or end of study period. Study outcomes were occurrence of testosterone level elevations >0.7, >1.1, and >1.7 nmol/L and progression to castrate-resistant state. Survival curves were used to determine rates of occurrence of testosterone level elevations. Multivariate Cox regression analysis was used to assess whether occurrence of elevations predicts progression to castrate-resistance.

Results: Median age was 74 years. Median follow-up was 20.3 months. 82%, 45%, and 18% of patients had subsequent testosterone levels >0.7, >1.1, and >1.7 nmol/L within five years of follow-up, respectively, and 96-100% of such patients subsequently re-established levels <0.7 nmol/L within five years. None of the patient baseline characteristics were associated with occurrence of elevations. Occurrence of elevations was not a significant predictor of progression to castrate-resistant state.

Conclusion: Continuous androgen deprivation therapy users having initial testosterone levels <0.7 nmol/L frequently exhibit subsequent elevations in serum testosterone levels. Such occurrences should not trigger an immediate response from physicians as these events are prognostically insignificant with regards to oncologic outcomes, and patients eventually re-establish levels <0.7 nmol/L.
Poster #191
EVALUATION OF CANCER-SPECIFIC MORTALITY WITH SURGERY VS RADIATION AS PRIMARY THERAPY FOR LOCALIZED HIGH GRADE PROSTATE CANCER IN MEN YOUNGER THAN 60 YEARS OLD
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University of Maryland School of Medicine Baltimore, MD
Presented By: Stefano Muscatelli

Introduction: Conflicting data support the use of surgery versus radiation for primary therapy in high-risk prostate cancer, particularly in a younger male cohort where life expectancy is generally longer and non-prostate cancer mortality is lower. There is a paucity of literature addressing survival outcomes by treatment modality in this younger population with high-grade disease. The primary objective of this study was to evaluate, in a national cohort, the cancer-specific and overall mortality for surgery compared to radiation as primary therapy for men with high-grade prostate cancer diagnosed before the age of 60.

Methods: The Surveillance, Epidemiology, and End Results (SEER) Program was accessed for data retrieval. Men diagnosed with prostate cancer after 2003 with at least Gleason Score 8 at an age younger than 60 years were queried. Only localized prostate cancer with documented NO and M0 status were included. The program SEER*Stat was used for data organization. Gathered data included demographic, pathologic, therapy received, and survival outcome. Using the software R, Kaplan-Meier cause specific survival curves were generated for therapy with radiation and surgery. Comparison between the curves was calculated using a hazard ratio.

Results: A total of 52,624 patients were included for analysis with 10,038 who underwent primary radiation and 42,586 with primary surgery. Ten year cancer-specific mortality was 2.56% for surgery patients versus 7.79% for radiation patients (Figure 1, p < 0.001). The hazard ratio of the cancer specific mortality for surgery compared to radiation was 3.53 (p<0.0001) in favor of surgery. Controlling for known confounders of age, race, and stage, primary treatment with surgery versus radiation retained a significant hazard ratio for cancer-specific mortality (HR=4.76, p<0.001).

Conclusion: National data of men with localized high grade disease diagnosed before the age of 60 reveal that prostate cancer specific mortality is improved when surgery is the primary definitive therapy as compared to radiation. Future prospective studies are warranted.

Funding: None
Introduction: Prostate cancer patients who have a detectable prostate specific antigen (PSA) post-prostatectomy may harbor pre-existing metastatic disease. To our knowledge, none of the commercially available genomic biomarkers have been investigated in such men. The objective of this study is to evaluate if Decipher can independently predict for development of metastasis in men with PSA persistence post-operatively.

Methods: A multi-institutional study of 477 men who underwent radical prostatectomy (RP) between 1990-2015 from three academic centers. Patients were categorized as detectable PSA (n=150) or undetectable (n=327) based on post-RP PSA nadir ≥0.1 ng/mL. Cumulative incidence curves for metastasis were constructed using Fine-Gray competing risks analysis. Penalized Cox univariable and multivariable (MVA) proportional hazards models were performed to evaluate the association of Decipher with metastasis.

Results: The median follow-up for censored patients was 59 months. The median time from RP to first post-operative PSA was 1.4 months. Detectable PSA patients were more likely to have higher pre-RP PSA, extraprostatic extension, seminal vesicle invasion, and positive margins, compared to undetectable PSA patients. On MVA including Decipher, detectable PSA, grade groups, margin status, T-stage, post-operative radiotherapy use, and lymph node invasion, only Decipher high-risk (hazard ratio [HR] 5.85, 95% confidence interval[CI] 2.18-18.99, p=0.001), detectable PSA (HR 3.86, 95% CI 1.01-21.43, p=0.048) and lymph node invasion (HR 12.48, 95% CI 2.1-100.25, p=0.006) remained prognostic factors for metastasis. Among detectable PSA patients, the 5-year metastasis rate was 0.9% for Decipher low/intermediate and 17.9% for Decipher high-risk (p<0.001). Decipher high-risk remained independently prognostic on MVA (HR 5.49, 95% CI 1.45-22.32, p=0.013) among detectable PSA patients.

Conclusion: Despite patients with a detectable PSA harboring significantly higher rates of aggressive clinicopathologic features, Decipher independently predicts for metastasis. Prospective validation of these findings is warranted and will be collected as part of the ongoing randomized trial NRG GU-002.
Poster #193
INITIAL EVALUATION OF 3D PRINTED AND AUGMENTED REALITY PROSTATE CANCER MODELS FOR ROBOTIC PROSTATECTOMY PLANNING
Nicole Wake, MSc¹; Marc Bjurlin, DO, MSc²,³; Hersh Chandarana, MD¹; Andrew Rosenkrantz, MD, MPA¹; Richard Huang, BS⁴; James Wysock, MD³; William Huang, MD³ and Samir Taneja, MD³
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Presented By: Marc A. Bjurlin, DO, MSc

Introduction: Three-dimensional (3D) printing and augmented reality (AR) are adjunctive methods of image data visualization that may facilitate anatomical understanding and assist with surgical planning. Although 3D models either physically printed (3D-P) or in virtual form (AR) are preferred by surgeons over conventional imaging, there is a paucity of data regarding the added value of 3D models and the impact that they can make in patient care. The objective of this study was to assess whether 3D-P and AR prostate cancer models influence pre-surgical planning decisions.

Methods: Patients with MRI-visible prostate cancer scheduled to undergo robotic prostatectomy were prospectively enrolled in this IRB approved study (n=13). Patients were randomized to receive pre-surgical planning with a 3D-P prostate cancer model or an AR prostate cancer model. Physicians completed pre-surgical planning surveys regarding the surgical approach and possible complications in two settings: 1) using conventional imaging only and 2) using 3D model (3D-P or AR) in addition to imaging. Survey results were compared to each other and also to the actual surgical procedure.

Results: Out of the 13 patients, 6 had 3D-P models and 7 had AR models. Figure 1 shows representative 3D-P and AR models. The survey results showed changes in the surgical plan or predicted complications in ten patients: expected positive margin (n=1); nerve-sparing (n=2); positive margin and nerve-sparing (n=1); positive margin, continence, and nerve-sparing (n=1); nerve-sparing and potency (n=2); and potency (n=3). Planned decisions regarding nerve-sparing using both imaging and 3D model matched actual surgical procedure for 6 patients, matched surgical approach for 2 patients with 3D model but not with imaging, matched for 1 patient with imaging but not 3D model, and did not match for either imaging or 3D model in 4 patients.

Conclusion: In this study, we performed an initial evaluation prospectively evaluating 3D-P and AR models for patients undergoing robotic prostatectomy. Our preliminary results suggest that the insights that surgeons gain from 3D-P and AR models can influence surgical planning decisions.

Funding: Stratasys and www.cai2r.net.

Figure 1: (A) Posterior view of a 3D-P model (prostate-clear, lesion blue, urethra pink, rectal wall white, neurovascular bundles-yellow) and (B) Anterior view of an AR model (prostate-clear, lesions-blue, urethra-yellow, rectal wall-white, neurovascular bundles-pink)
Poster #194
THE IMPACT OF ADJUVANT RADIATION THERAPY AFTER RADICAL PROSTATECTOMY ON LONG-TERM OUTCOMES
Ross J. Mason, MD, MSc; Stephen A. Boorjian, MD; Bimal Bhindi, MD; Laureano Rangel, MD; Igor Frank, MD; Matthew K. Tollefson, MD and R. Jeffrey Karnes, MD
Mayo Clinic, Rochester, MN
Presented By: Ross Jerome Mason, MD, MSc

Introduction: The role of adjuvant radiation (ART) after radical prostatectomy (RP) remains controversial. Herein, we examined the association between ART after RP and outcomes in a matched cohort of patients with long-term follow-up.

Methods: We matched 361 patients who received ART due to pathological features in a 1:2 fashion to patients who did not receive ART based on age, surgery year, preoperative PSA, pathological Gleason score, tumor stage and surgical margin status (1980-2003). Biochemical recurrence (BCR), local recurrence (LR), systemic progression (SP), and overall survival (OS) were compared using the Kaplan-Meier method with log-rank test.

Results: Among the entire cohort, there were 359 (33.3%) patients with extracapsular extension, 195 (18.1%) with seminal vesicle invasion, and 995 (92.2%) with positive surgical margins. Additionally, the majority of patients (55.2%) had pathologic Gleason 7 disease or higher. With a median follow-up of 15.9 years (IQR 12.4 – 19.8), there were 571, 161, and 169 who experienced BCR, LR, and SP, respectively and there were 553 patients who died of any cause. The receipt of ART was associated with improved BCR free survival (15 year 58.6% versus 39.0%, p <0.001) and LR free survival (15 year 97.3% versus 79.3%; p<0.001). However, the receipt of ART was not found to be associated with either SP free survival (15 year 84.8% versus 85.6%; p = 0.64) or OS (15 year 69.4% versus 65.8%; p=0.73).

Conclusion: Our results suggest that ART can reduce the risk of BCR and LR. However, ART does not appear to be associated with the risk of SP or OS. As such, the benefits of ART need to be weighed against the side effects of radiation therapy and the potential benefits of early salvage treatments.
Poster #195
68GA-PSMA PET/CT VERSUS MPMRI FOR LOCOREGIONAL PROSTATE CANCER STAGING: CORRELATION WITH FINAL HISTOPATHOLOGY
Matthew Winter, BSC, BMBS (Hons), FRACS (Urol)¹; Israel Burger²; Chandra Chandra Annabattula²; Jeffrey Lewis²; Deepa Shetty²; Jonathan Kam²; Mohan Arianayagam²; Mohamed Khadra²; Han Loh² and Celi Varol²
¹USC California, Nepean Hospital Sydney; ²Nepean Hospital, Sydney (Presented by: Matthew Winter)
Presented By: Matthew Winter, BMBS (Hons), FRACS

Introduction: Prostate-specific membrane antigen (PSMA) positron emission tomography (PET) can be used to locate lesions based on PSMA avidity, however guidelines on its use are limited by its infancy. We aimed to compare multiparametric magnetic resonance imaging (mpMRI) and PSMA PET/CT to prostatectomy histopathology.

Methods: We conducted a chart review from February 2015 to January 2017 of 50 patients staged using PSMA PET/CT and mpMRI who then underwent radical prostatectomy. Pre-operative PSMA PET/CT and mpMRI were paired with their corresponding histological tumor. Pearson’s correlations, sensitivity, and specificity were used for comparisons.

Results: A total of 84 lesions were identified by histopathology. Fifty index lesions were detected across the three modalities: 50 by histopathology (gold standard), 50 by PSMA PET/CT, and 47 by mpMRI. Thirty-four intra-prostatic secondary lesions were detected: 31 by histopathology, 31 by PSMA PET/CT, and 17 by mpMRI. PSMA had better sensitivity for index lesion localisation than mpMRI (81.1% vs. 64.6%). mpMRI failed to detect 18 histology-confirmed lesions (3 index, 15 secondary) in 16 patients. Specificity for mpMRI and PSMA PET/CT was similar (84.6% vs. 82.7%). SUVmax of index lesions ranged from 2.9 to 39.6 (M=9.27 ± 6.41). There was good differentiation between background SUV and lesion SUVmax (R=0.24, p=0.09). Index lesion SUVmax was positively correlated with PSA (R=0.41, p=0.004) and ISUP grade (R=0.48, p<0.001).

Conclusion: PSMA-PET/CT provided superior detection of prostate cancer lesions with better sensitivity than mpMRI. PSMA-PET/CT can be used to enhance locoregional mpMRI to provide improved detection and characterization of lesions.
Poster #196
PRIMARY FOCAL CRYOABLATION FOR LOW-, INTERMEDIATE- AND HIGH-RISK PROSTATE CANCER
Masakatsu Oishi¹; Inderbir Gill²; Toshitaka Shin²; Akbar Ashrafi²; Matthew Winter²; Giovanni Cacciamani²; Luis Medina²; Andre Berger²; Osamu Ukimura²; Duke Bahn² and Andre Abreu²
¹USC Institute of Urology, Los Angeles, CA; ²USC Institute of Urology, Los Angeles, California
Presented By: Masakatsu Oishi

Introduction: To evaluate the oncologic and functional outcomes of primary focal cryoablation (PFC) for low-, intermediate- and high-risk prostate cancer (PCa) patients.

Methods: We retrospectively reviewed the records of 177 men that underwent PFC, from 2002 to 2016 for clinically localized PCa, from an institutional review board-approved database. The percentage PSA decrease at 6 months of follow up was recorded. Five year free-survival (FS) rates were evaluated and defined as follows: Biochemical failure (BFFS = PSA nadir +2.0ng/mL); Prostate cancer (PCaFS = Gleason score > 7 on follow up biopsy); salvage treatment (STFS = any salvage treatment after PFC). Continence was defined as use of no pads and potency defined as the ability to have intercourse. High-risk PCa patients had pre-PFC work up to rule out metastatic disease. No patients had adjuvant androgen deprivation therapy. Statistical analyses were performed using Kaplan-Meier methods.

Results: The median (IQR) age, PSA, prostate volume and median follow up time were 66 (61-73) years, 6.4 (4.2-9.1) ng/ml, 40 (31-50) cc and 33 (17-56) months. D’Amico PCa risk category, follow up biopsy and 5 years survival rates are summarize on the Table. No patient developed metastasis or died. No rectal fistulas had occurred. Continence and potency were retained in 98% and 73% of the patients, respectively.

Conclusion: PFC for low-, intermediate-, and high-risk prostate cancer provides acceptable oncologic and functional outcomes.

<table>
<thead>
<tr>
<th>Prostate cancer risk by D’Amico criteria</th>
<th>Low</th>
<th>Intermediate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. patients (%)</td>
<td>31  (18%)</td>
<td>121 (68%)</td>
<td>25 (14%)</td>
</tr>
<tr>
<td>PSA decreased %, mean (SD)*</td>
<td>68 (22)</td>
<td>75 (23)</td>
<td>76 (16)</td>
</tr>
<tr>
<td>No. patients PSA decreased &gt; 70% (%)*</td>
<td>19 (61%)</td>
<td>74 (61%)</td>
<td>14 (56%)</td>
</tr>
<tr>
<td>No. follow up biopsy (%)</td>
<td>25 (81%)</td>
<td>63 (52%)</td>
<td>15 (60%)</td>
</tr>
<tr>
<td>Follow up biopsy outcomes</td>
<td>Any Gleason</td>
<td>Treated lobe, N (%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td></td>
<td>Untreated lobe, N (%)</td>
<td>8 (26%)</td>
<td>24 (20%)</td>
</tr>
<tr>
<td></td>
<td>Gleason &gt; 7</td>
<td>Treated lobe, N (%)</td>
<td>1 (3%)</td>
</tr>
<tr>
<td></td>
<td>Untreated lobe, N (%)</td>
<td>1 (3%)</td>
<td>16 (13%)</td>
</tr>
<tr>
<td>5 Years BFFS</td>
<td>80%</td>
<td>56%</td>
<td>64%</td>
</tr>
<tr>
<td>5 Years PCaFS</td>
<td>87%</td>
<td>69%</td>
<td>77%</td>
</tr>
<tr>
<td>5 Years STFS</td>
<td>82%</td>
<td>70%</td>
<td>71%</td>
</tr>
</tbody>
</table>

BFFS, biochemical failure-free survival; PCaFS, prostate cancer-free survival; STFS, salvage treatment-free survival; *Within 6 months post-focal cryoablation.
ANTERIOR PROSTATE LESIONS AND PROSTATE CANCER DIAGNOSED IN AFRICAN AMERICAN MEN
Michelle Van Kuiken, MD¹; Bryan Bisanz, BS¹; Cara Joyce, PhD¹; Marcus Quek, MD¹ and Gopal Gupta, MD²
¹Loyola University Medical Center; ²Loyola University Medical Center, Maywood, IL
Presented By: Gopal Nand Gupta, MD

Introduction: African American (AA) men often present with higher risk prostate cancer (CaP) than non-AA men. It’s believed that anterior prostate lesions (APL) may be greater and more aggressive in AA men leading to evasion of detection, and studies of pathologic specimens have supported this notion. Using multiparametric MRI of the prostate (mpMRI), we aim to compare the rates and grade of APLs in AA and non-AA men without an existing diagnosis of CaP.

Methods: We analysed 463 men without a prior diagnosis of CaP (64 AA, 399 non-AA) who underwent prostate biopsy following mpMRI over a 3 year period. mpMRI was used to identify lesions suspicious for CaP. A 3-Tesla MRI and Invivo software was utilized for fusion. Statistical significance of differences by race were tested with t-tests for means, Wilcoxon rank-sum tests for medians, Cochran-Armitage trend tests for lesion counts, and chi-square or Fisher’s exact test for nominal variables.

Results: In patients without a prior diagnosis of CaP, there was no difference in age or gland volume between the two cohorts; however median PSA (7.9 vs. 6.3; p<0.001) and PSA density (PSAD) (.134 vs.111; p<0.03) were higher in AA men. The two cohorts were found to harbor APLs at a similar rate (AA men: 15/64, 23.4%; non-AA men: 112/399, 28.1%; p=0.37). Additionally, AA men were not more likely to have a Gleason ≥7 from an APL (AA men: 4/15, 26.7%; non-AA men: 28/112, 25%, p=0.89) or be diagnosed Gl ≥7 CaP overall (AA men: 11/64, 17.2%; non-AA men: 74/399, 18.5%; p=0.79).

Conclusion: In men without a previous diagnosis of prostate cancer, AA men were not found to have increased rates of APLs or more Gleason ≥7 in these lesions compared to a non-AA cohort. Additionally, despite higher PSA and PSAD, AA men were equally likely to be diagnosed with Gl ≥7 CaP overall.
Poster #198

PROSTATE CANCER SCREENING AMONG A COHORT OF US VETERANS

Benjamin Muller, BA¹; Michael Lipsky, MD¹; Glen McWilliams, MD² and Christopher Anderson, MD, MPH¹

¹James J Peters Veterans Administration Hospital, Bronx, NY, and Department of Urology, Columbia University Medical Center, New York, NY; ²James J Peters Veterans Administration Hospital, Bronx, NY

Presented By: Benjamin Muller, BA

Introduction: Prostate cancer is the most commonly diagnosed cancer among patients in the Veterans Affairs (VA) Healthcare System, making up nearly a third of cancer diagnoses. Screening recommendations have shifted recently, but little is known about prostate cancer screening practices in a VA population. We assessed current screening practices at the James J. Peters (JJP) VA hospital in New York City based on patients’ age, race, and comorbidity burden.

Methods: Using medical record data, all men 40-80 years old who had ≥1 outpatient visit to JJP from 2006-2016 were initially included. Patients with prostate cancer diagnosis, prostatectomy, or cystectomy before the start of a calendar year were excluded from that year forward. PSA tests were identified using laboratory codes. PSA screening was dichotomized to ≥1 versus 0 screenings in a calendar year. Rates of screening by age, race, and comorbidity groups were described and compared using relative risk regression. All analyses were performed in R Studio.

Results: Among 36,132 patients, rates of PSA screening declined from 2006 to 2016 (relative risk [RR] per year 0.94, p<0.001). Screening varied significantly by age (see figure): Patients 50-59 and ≥70 were less likely to be screened than those 60-69 (RR 0.98, p=0.013; 0.76, p<0.001, respectively). Among patients ≥70, 30% had at least one PSA test. An increased comorbidity burden was associated with an increased screening rate; versus 0 comorbidities, patients with 1 and ≥2 were 1.89 and 2.18 times more likely to be screened (both p<0.001). African American patients were more likely to be screened than white patients (RR 1.48, p<0.001), as were patients of other races (combined RR 1.38, p<0.001).

Conclusion: PSA-based prostate cancer screening decreased over time in VA patients in New York City. Screening declined with age, but elderly patients and those with several comorbidities were commonly screened. These high rates of PSA testing in groups that would be expected to benefit less from screening and treatment suggest that additional work is needed to understand screening patterns among patients in the VA system, and to identify patients who would benefit from prostate cancer screening.

![PSA Screening Rates by Age](image_url)
ROLE OF MPMRI PSA DENSITY AND PIRADS SCORE IN PREDICTING UPSTAGING IN MEN ON ACTIVE SURVEILLANCE

Michelle Van Kuiken, MD¹; Robert Blackwell, MD¹; Cara Joyce, PhD¹; Marcus Quek, MD¹ and Gopal Gupta, MD²
¹Loyola University Medical Center; ²Loyola University Medical Center, Maywood, IL

Introduction: Active surveillance (AS) has gained increased popularity for its role in reducing overtreatment of low-risk prostate cancer. One concern about AS is the potential for understaging more aggressive disease, and men on AS are often subject to numerous biopsies which carries morbidity risk. Multiparametric MRI (mpMRI) of the prostate has demonstrated its ability to better detect clinically significant prostate cancer (CSPC) versus standard TRUS-biopsy alone. Using mpMRI, we aim to determine which men on AS are at risk of being upstaged, and which men could avoid repeat biopsy while remaining on AS.

Methods: We reviewed men on AS who underwent mpMRI of the prostate followed by Uronav fusion biopsy between 2014 and 2017. All men had a standard 12-core biopsy simultaneously or within the past year. For this study, CSPC is defined as Gleason score ≥7. Using univariate and multivariate logistic regression analyses, we examined the effect of age, race, PSA, PSA density (PSAD), prostate volume by MRI, PIRADS score, lesion size, number of lesions, and DRE to determine the likelihood of upstaging to CSPC. The multivariate model was selected using Akaike Information Criterion to optimize model parsimony and fit.

Results: A total of 101 men on AS underwent Uronav biopsy. Patients had a median age of 66.5 years, PSA of 6.5ng/mL, prostate volume of 47.9mL, and PSAD of 0.14. Univariate analysis revealed that PSA, PSAD, increasing PIRADS score, lesion size >2cm, and 3 or more lesions on MRI increased the odds of CSPC. Multivariate logistic regression demonstrated that PSAD ≥0.15 (OR 2.66, CI 1.0-7.03, p=0.049) and increasing PIRADS score (PIRADS 4: OR 10.6, CI 2.1-53, p=0.004; PIRADS 5: OR 15, CI 2.8-80, p=0.002) were independent predictors of CSPC. Men with a PIRADS score of ≥3 with a PSAD ≥0.15 had a 55% chance of being upstaged to CSPC. Conversely, in men with PIRADS score ≤3 with a PSAD <0.15, no upstaging was seen (Figure).

Conclusion: In men on AS, the combination of mpMRI PSAD and PIRADS score predicts upstaging when PIRADS score is ≥3 with a PSA density ≥0.15. When this criteria is not met, men may potentially forgo repeat biopsy while safely remaining on AS. Prospective study is warranted.

<table>
<thead>
<tr>
<th>PI-RADS Score</th>
<th>PSA Density &lt;0.15</th>
<th>PSA Density ≥0.15</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0% (N=0/5)</td>
<td>0% (N=0/2)</td>
</tr>
<tr>
<td>1-2</td>
<td>0% (N=0/1)</td>
<td>0% (N=0/1)</td>
</tr>
<tr>
<td>3</td>
<td>0% (N=0/21)</td>
<td>40% (N=2/5)</td>
</tr>
<tr>
<td>4</td>
<td>47.1% (N=8/17)</td>
<td>57.1% (N=12/21)</td>
</tr>
<tr>
<td>5</td>
<td>45.5% (N=5/11)</td>
<td>70.6% (N=12/17)</td>
</tr>
</tbody>
</table>
LEARNING CURVE FOR MAGNETIC RESONANCE IMAGING/ULTRASOUND-FUSION BIOPSY IN DETECTING PROSTATE CANCER USING CUSUM ANALYSIS

Nancy Ye BA; Jasleen Chopra, MD; Michael Naslund, MD; Jade Wong-You-Cheong, MD; Amelia Wnorowski, MD and Mohummad Siddiqui, MD

University of Maryland School of Medicine, Baltimore, MD
Presented By: Nancy Yating Ye, BA

Introduction: Targeted magnetic resonance imaging (MRI) with ultrasound (US) fusion guided biopsy has been shown to improve detection of prostate cancer. This approach, however, requires integration of radiologists, who may not be heavily experienced in prostate MRI, and surgeons, who may not be familiar with fusion biopsy. Objective methods of assessment for learning curves, such as the cumulative sum (CUSUM) analysis, may identify the presence and duration of a learning curve for this process. The aim of this study was to determine the learning curve for MRI/US fusion guided biopsy in detecting prostate cancer using CUSUM analysis.

Methods: 2 urologists performed MRI/US fusion guided prostate biopsies between March 2015 and May 2017. MRI was interpreted by 1 of 4 radiologists. The primary outcome measure was the rate of diagnosis of prostate cancer in relation to MRI Prostate Imaging Reporting and Data System (PI-RADS) score. For patients with multiple lesions, the highest suspicion lesion was assessed. The CUSUM analysis assesses how close or how far to target accuracy actual performance is, on a sequential case-by-case basis. For this analysis, target performances of >90% cancer detection rate (CDR) for PIRADS 5, >50% CDR for PIRADS 4, and <20% CDR for PIRADS 1-3. Retrospective data were collected and analyzed using CUSUM methods.

Results: In total, complete data were available for MRI/US fusion guided biopsies performed on 72 patients. 26 of these patients were PIRADS 1-3, 33 were PIRADS 4, and 13 were PIRADS 5. Figure 1 features the CUSUM learning curve analysis for these 72 cases, and demonstrates intermittent poor performance (upward-sloping line) and good performance (downward-sloping line) until approximately 50 cases. At this inflection point, there was a steadily downward-sloping line consistent with evidence that no further learning curve was encountered.

Conclusion: CUSUM analysis objectively assesses the acquisition of competence in MRI/US fusion guided prostate biopsies in detecting prostate cancer. At a new center implementing this technology, the learning curve was approximately 50 cases before consistent, high performance for prostate cancer detection.

Funding: None
Poster #202

OBJECTIVE SURGEON PERFORMANCE METRICS AND CLINICAL OUTCOME DATA COMPARISON DURING ROBOTIC-ASSISTED RADICAL PROSTATECTOMIES BETWEEN ATTENDING ONLY VERSUS TEACHING CASES

Micha Titus, BS; Jian Chen, MD; Paul Oh, BS; Inderbir Gill, MD and Andrew Hung, MD
Center for Robotic Simulation & Education, Catherine & Joseph Aresty Department of Urology, University of Southern California Institute of Urology, Los Angeles, California
Presented By: Micah Titus, BS

Introduction: Teaching institutions balance the need for physician training with patient safety. In this study, we compare performance of an attending surgeon alone to performance of his supervised cases for robotic-assisted radical prostatectomies (RARPs). We have developed and utilized objective surgeon performance data and collected clinical outcomes to use for comparison between the two groups.

Methods: Clinical data was collected prospectively. A dVLogger (Intuitive Surgical) recorded surgical video and robotic performance data (instrument motion and system events) directly from the da Vinci Si robot. Kruskal-Wallis was used to measure the difference in clinical outcome metrics and dVLogger data between groups.

Results: Seventeen RARPs were split into two groups: 4 cases performed by a single attending surgeon and 13 cases supervised by the same surgeon with physician-in-training involvement. Patient profiles of age, BMI, PSA, and prostate volume did not differ between the groups (p>0.05). dVLogger metrics and 7 clinical outcomes were compared between the groups. The attending-only total operating room (OR) time was less than the supervised cases (p=0.047), but other clinical outcomes including estimated blood loss, length of stay, length of intra-abdominal (JP) drain, ratio of JP creatinine to serum creatinine, standardized 24-hour JP drain output, and length of indwelling Foley catheter did not differ between the groups (p>0.05). Total RARP completion time was shorter for attending-only cases (p=0.007). Attending-only cases had less time operating the dominant, non-dominant, and camera arms (p=0.009, 0.009, 0.013 respectively) and had less idle time on all robotic arms (dominant p=0.009, non-dominant p=0.031, 3rd arm p=0.007, camera p=0.007). They exhibited superior economy of motion measured by instrument path length with the dominant, non-dominant and camera arms (p=0.024, p=0.017, p=0.031 respectively) and readjusted the camera fewer times while having a higher frequency of 3rd arm swaps (p=0.041, p=0.013 respectively).

Conclusion: While attending-only cases have a different robotic movement profile than cases involving physicians-in-training, the clinical outcomes do not significantly differ except for OR time. This supports that physician-in-training involvement is safe for patients and supervised cases’ clinical outcomes can be attributed to the supervising surgeon.

Funding: Intuitive Surgical provided dVLogger for data capture.
Poster #203
LONGITUDINAL ASSESSMENT OF HEALTH-RELATED QUALITY OF LIFE AND DECISIONAL REGRET IN MEN WITH LOCALIZED PROSTATE CANCER
Sudhir Isharwal, MBBS¹; Alice Crane, MD²; Anna Zampini, MD²; Tianming Gao, PhD²; Michael Kattan, MD² and Andrew Stephenson, MD²
¹Cleveland Clinic; ²Cleveland Clinic, Cleveland
Presented By: Sudhir Isharwal, MBBS

Introduction: Patients with clinically localized prostate cancer (PCa) are faced with the challenging process of selecting an optimal therapy for their disease. Treatment choice can impact health-related quality of life (HRQOL) specifically urinary, sexual, and bowel functioning that can further lead to the decisional regret. In this study, we assessed changes in domain-specific HRQOL and association with decisional regret in men treated with active surveillance (AS), open radical prostatectomy, robotic radical prostatectomy, and brachytherapy.

Methods: Men with clinically localized PCa referred to our Institute (2011-2014) were prospectively enrolled in the study. Patients with prior pelvic radiation therapy or surgery were excluded. HRQOL was assessed at baseline with survey collecting demographic information (6 items), urinary function (16 items), sexual function (19 items), bowel function (13 items), and global health (12 items) information using Likert-type response. Post-treatment assessment was done at 1, 3, 6, 12, and 24 months with a survey assessing decisional regret, in addition to the functional domains assessed at baseline. Multivariable analysis with mixed effects model was fitted to account for baseline differences between subjects.

Results: A total of 556 patients were enrolled in the study. Treatment options selected by the patients were AS (18%), brachytherapy (19%), open radical prostatectomy (29%) and robotic radical prostatectomy (34%). Compared to the group of patients undergoing AS; sexual function, bowel function, urinary function, and global health score significantly changed with time from baseline (p<0.001) in all other treatment groups. Decisional regret score was similar in the treatment groups at 1 month postoperatively. However, there was greater decisional regret in men undergoing any other treatment compared to AS at subsequent time points. Decline in urinary function and global health score were associated with increased decisional regret (p<0.001), while changes in bowel function and sexual function domain did not associate with the decisional regret.

Conclusion: HRQOL domains significantly differ between the treatment groups with time after treatment selection. Decline in urinary function and global health domain are associated with increased decisional regret among patients. Counselling regarding changes in HRQOL may help in treatment selection and decreasing decisional regret.

Funding: None
Poster #204
EXTRACELLULAR VESICLE BLOOD FINGERPRINT IMPROVES DIAGNOSTIC ACCURACY AND REDUCES UNNECESSARY BIOPSY DURING PROSTATE CANCER SCREENING: DATA FROM THE ALBERTA PROSTATE CANCER RESEARCH INITIATIVE
Adrian Fairey, MD, MS¹; Robert Paproski, PhD¹; Desmond Pink, PhD¹; Catalina Vasquez, MS¹; Deborah Sosnowski, PhD¹; Bryan Donnelly, MD²; Eric Hyndman, MD, PhD² and John Lewis, PhD¹
¹University of Alberta, Edmonton, Alberta; ²University of Calgary, Calgary, Alberta
Presented By: Adrian Stuart Fairey, MD, MS

Introduction: Prostate-specific antigen (PSA) is used to detect prostate cancer but the low positive predictive value of elevated PSA results in high numbers of unnecessary prostate biopsies. Extracellular vesicles (EV) are released by all cells in the body, abundant in bio-fluids, and contain a repertoire of macromolecules representative of the cell of origin. We determined whether a multivariable model including a prostate cancer EV blood fingerprint could predict prostate biopsy outcome in men with elevated total PSA.

Methods: A prospective cohort study of 419 men from 2 Canadian academic centers undergoing prostate biopsy for elevated total PSA between 2013 and 2016 was performed. Pre-prostate biopsy plasma samples were analyzed using the Apogee A50 micro-flow cytometer. A panel of biomarkers including prostate membrane specific antigen (PSMA) and ghrelin was used to enumerate specific EV populations from the bulk EV present in plasma. A customized XGBoost machine learning approach was used to generate an EV fingerprint predictive score (EV-FPS) to differentiate patients with aggressive prostate cancer (Gleason Grade Group [GGG] 3-5) from those with no malignancy or non-aggressive prostate cancer (GGG 1-2). The area-under-the-curve (AUC) for predicting aggressive prostate cancer at biopsy was calculated. AUCs for a model including age and total PSA (lab model) and age, total PSA, and digital rectal examination (DRE; clinic model) were compared to a model that also included the EV blood fingerprint.

Results: The prevalence of any prostate cancer (GGG 1-5) was 62% whereas the prevalence of aggressive prostate cancer (GGG 3-5) was 18%. Addition of the EV blood fingerprint to the lab and clinic models improved the AUC from 0.72 to 0.84 (p=0.0002 for lab model; p=0.0067 for clinic model). Using a cancer detection threshold of 90% would have reduced the number of biopsies by 47%.

Conclusion: This EV blood fingerprint can predict the result of prostate biopsy in men with elevated total PSA. A multivariable model can determine which men should be advised to undergo immediate biopsy to identify aggressive prostate cancer and which men should be advised to defer biopsy and continue screening. External validation is underway.

Funding: Alberta Cancer Foundation.
Poster #205

DOES AGENT ORANGE EXPOSURE (AOE) AFFECT TREATMENT CHOICE IN PROSTATE CANCER (PC)?

Hamed Ahmadi, MD; Wesley Stoller, BS; Ryan Kopp, MD; Michael Conlin, MD and Mark Garzotto, MD
OHSU, Portland, OR

Presented By: Hamed Ahmadi, MD

Introduction: AOE in Viet Nam Veterans is associated with the detection of aggressive PC in men undergoing a biopsy. Public awareness of this link creates anxiety about the risk of cancer development and progression and thus may affect the treatment choice.

Methods: Using data from the Veteran Affairs PC Registry, patients with NCCN low- and intermediate-risk PC (PSA < 20 ng/mL, Stage <= T2, Gleason (GS) <= 7) diagnosed between 2003 and 2014 were identified. Using logistic regression, factors including age, clinical stage, GS, AOE, Charlson comorbidity index (CCI) and PSA at time of diagnosis was used to assess the risk of choosing AS versus PC-directed therapy. Of patients who chose PCa-directed treatment, we used the same set of variables to identify the predictors of choosing radical prostatectomy versus radiation ± hormonal therapy.

Results: Of 1362 patients with low- or intermediate-risk PC, 621 (46%) patients chose AS. Of 741 patients who chose PCa-directed treatment, 451 (60%) patients underwent radical prostatectomy. In multivariate analysis, AOE was not associated with selection of PC-directed therapy as compared to AS (p=0.09). However, AOE was associated with 40% less chance of receiving radiation ± hormonal therapy versus radical prostatectomy (p=0.003).

Conclusion: AOE is not associated with a reduced rate of acceptance of AS for low- and intermediate-risk PC when adjusting for tumor and demographic factors. Potential biases about the effect of AOE on medical decision making in PC do not appear to reduce the rate of acceptance of AS in appropriate patients. However, it seems to affect the choice of intervention in favor of radical prostatectomy in this population.

Funding: Veterans Administration
Poster #206
DEVELOPMENT OF A ROBOTIC SIMULATOR TRAINING CURRICULUM AND PREDICTION OF ROBOTIC ANASTOMOSIS COMPETENCE EVALUATION (RACE) SCORES OF A ROBOTIC URETHROVESICAL ANASTOMOSIS ON A 3-D MODEL
Nathan Wong, MD¹; Cameron Lam, MD²; Jen Hoogenes²; Bobby Shayegan, MD² and Edward Matsumoto, MD²
¹Hamilton; ²McMaster University, Hamilton, ON
Presented By: Nathan Wong, MD

Introduction: Presently, there are a lack of guidelines for the introduction of robotic surgical skills into residency training. We aimed to develop a robotics simulator training curriculum and to determine predictors of robotic skills to optimize simulation training and to potentially allow for a quicker acquisition of skills that can be transferred to the operating room (OR). In particular, we focused on the urethrovesical anastomosis (UVA) performed during a robotic prostatectomy.

Methods: Medical students, surgical residents, and fellows were recruited and randomized to two different virtual reality (VR) robotic simulation training curricula designed at our teaching hospital to incorporate robotic surgery to our residency program. The two simulators used were the MIMIC da Vinci trainer and the da Vinci Surgical Skills Simulator. Each trainee began by watching online videos and then completed set simulation exercises on their assigned simulators and, three weeks later, were then asked to perform a UVA in the OR on a novel 3-D printed bladder model used to replicate a live prostatectomy. Three blinded expert robotic surgeons evaluated each UVA and scored using the validated Robotic Anastomosis Competency Evaluation (RACE) scoring system.

Results: Thirty-nine participants were recruited and randomized to train using one of two robotic simulators. The average age of the participants was 26.7 years of age with 23 males and 16 females. On univariate analyses, the da Vinci Surgical Skills Simulator training curricula (p = 0.016), high Thread the Ring1 (p = 0.018) and Tubes1 scores (p = 0.007), and faster Tubes1 completion times (p = 0.028) were significantly associated with higher RACE scores for the UVA on the 3-D printed bladder model. Level of training (p = 0.122) or previous robotic OR experience (p = 0.582) did not appear to be a significant factor contributing to higher RACE scores. Following multivariate regression analysis, the simulation task Tubes1 was shown to be the only independent predictor for higher RACE scores (p = 0.047).

Conclusion: Robotic VR simulation proved effective in training for the bench model task of a UVA, and could be considered as an important training tool in residency training. In particular, focusing on specific simulator tasks such as Tubes1 may help to focus robotics training programs, optimize trainee skills, and reduce the robotics learning curve in the OR.

Funding: None
Poster #207
DOES INSURANCE STATUS LEAD TO A DELAY IN THERAPY FOR PATIENT PRESENTING WITH METASTATIC PROSTATE CANCER?

Jared Schober, MD; Kristian Stensland, MD, MPH; Harras Zaid, MD; Alireza Moinzadeh, MD and David Canes, MD
Lahey Hospital and Medical Center, Burlington MA
Presented By: Jared Schober, MD

Introduction: Insurance status has been linked to the risk of metastatic disease at initial diagnosis of prostate cancer. However, the association of insurance status on the receipt and timing of appropriate care remains underexplored in this population. Herein, we sought to determine if insurance type is associated with the receipt and timeliness of therapy in patients presenting with metastatic prostate cancer (mPCa).

Methods: We reviewed the National Cancer Database to identify patients presenting with mPCa from 2004-2014, defined as M1 disease at initial evaluation. Univariate and multivariate logistic regression models were utilized to assess factors associated with receipt of treatment, defined as hormonal or chemotherapy, in men with private insurance, no insurance, Medicare, or Medicaid. The Kaplan-Meier method was used to assess the timing of care from diagnosis and compared with the log-rank test. Lastly, factors independently associated with timing of therapy were evaluated using Cox multivariate regression analysis.

Results: A total of 43,578 incidental cases of mPCa met inclusion criteria, of whom 62% had Medicare, 25% private insurance, 7% Medicaid, and 6% no insurance. Men with private insurance received therapy at the highest rate (82.4%) compared to 80%, 78%, 75.8%, and for Medicaid, no insurance, Medicare, respectively (p < 0.05). After adjusting for age, race, income, education level, Charlson Comorbidity Index, and PSA at presentation, the only covariate associated with no receipt of therapy was lack of insurance (adjusted OR 0.77, 95% CI 0.69-0.85). Kaplan-Meier estimated median time to receipt of treatment was 38 days in patients with Medicaid, 35 days with no insurance, 32 days with Medicare, and 31 days with private insurance (log-rank P-value 0.63). On Cox multivariate regression analysis, there was no statistically significant delay in treatment for patient with Medicaid or no insurance. Medicare coverage was independently associated with a shorter time from diagnosis to treatment (adjusted OR 1.04, 95% CI 1.01-1.07).

Conclusion: Men without health insurance are significantly less likely to receive treatment for mPCa at initial diagnosis. For men receiving care, however, timeliness of therapy appears adequate, and similar between insurance statuses. Barriers to care in the uninsured and underinsured remain even after a diagnosis of mPCa, thus remains an important opportunity to improve care delivery.
Introduction: The recently published Androgen Suppression Combined with Elective Nodal and Dose Escalated Radiation Therapy (ASCENDE-RT) Trial demonstrated combined external beam radiation therapy and low-dose rate brachytherapy prostate boost (EB-LDR) improved biochemical control compared to external beam prostate boost (EBRT), but caused greater physician reported toxicity. The purpose of this study is to compare patient reported outcomes between EB-LDR and EBRT to inform treatment selection.

Methods: The Comparative Effectiveness Analysis of Surgery and Radiation (CEASAR) trial is a prospective population-based cohort study of men with localized prostate cancer. The primary outcome measure was patient-reported function measured on the 26-item Expanded Prostate Cancer Index Composite (EPIC)-26 at 6, 12 and 36 months after treatment. Multivariable regression models were adjusted for age, race, comorbidity, D’Amico risk criteria, baseline function, use of androgen deprivation therapy, time since treatment, and site of radiation therapy.

Results: A total of 578 men underwent EBRT and 109 underwent EB-LDR. After adjusting for covariates, patients undergoing EB-LDR had worse urinary irritative domain scores than EBRT at 6 months (-14.3 points, p <0.001) through 3 years (-4.6 points, p=0.03). Men undergoing EB-LDR had significantly higher odds of having a moderate to severe problem with dysuria compared to EBRT at 6 months through three years after treatment (OR 5.2, 5.7 respectively; p<0.01). In men with low baseline bowel domain scores, those undergoing EB-LDR had worse scores than EBRT at three years after treatment (-9.1 points; p=0.02). Men undergoing EB-LDR had lower urinary incontinence domain scores (-4.7 points, p=0.03) than EBRT at one year, but was not maintained through three years. There were no significant differences in sexual function or hormonal function scores between the treatment groups at 3 years.

Conclusion: EB-LDR was associated with a significant and sustained worsening of urinary irritative symptoms compared to EBRT after three years. No meaningful differences were detected in sexual function after treatment. Any potential benefit from EB-LDR should be weighed against the increased toxicity from treatment. These findings may help facilitate shared decision making for different radiotherapy treatment options for localized prostate cancer and improve understanding of the comparative harms from radiation treatment.
**Poster #209**

**OPERATOR VARIATION IN MAGNETIC RESONANCE IMAGING-ULTRASOUND FUSION-GUIDED BIOPSY FOR PROSTATE CANCER**

Chris Koller, BS; Hung-Jui Tan, MD, MSHPM and Eric Wallen, MD

UNC

Presented By: Christopher Koller, BS

**Introduction:** Magnetic resonance imaging-ultrasound (MRI-US) fusion-guided prostate biopsy is a promising method of detecting prostate cancer. However, as this technology spreads, operator and technical variability may influence its utility. Accordingly, we evaluated inter-physician variation for prostate cancer detection using MRI-US fusion-guided biopsy at our institution.

**Methods:** From February 2016 to July 2017, we identified men who underwent MRI-US fusion-guided prostate biopsy. Suspicious lesions were graded by Prostate Imaging and Reporting Data System v2. The primary exposures were the performing urologist and radiologist for each biopsy, and study endpoints included the presence of any prostate cancer and of clinically significant prostate cancer (Gleason 3+4 or higher). Bivariable and multivariable analyses were performed to examine the relationship between participating physicians and prostate cancer diagnosis.

**Results:** We identified 187 lesions among 133 men undergoing MRI-US fusion-guided biopsy. The mean age was 66.4 years, with mean pre-biopsy PSA of 6.38 ng/ml. Three urologists performed the biopsies, and 7 radiologists interpreted the MRIs. Overall, 89/187 lesions (47.85%) were malignant on pathology and 71/187 (38.17%) were clinically significant. In our bivariable analysis, the scoring of MRI lesions varied significantly by the reading radiologist (Figure), with yields ranging from 36.96% to 100%. In contrast, we found no difference in target yield by urologist (p=0.24). On multivariable analysis, we found significant variability in radiologist reads resulting in diagnostic accuracy of MRI-US fusion-guided biopsy, but not urologist performing biopsy. There were significant interactions between the interpreting radiologist and PI-RADS scoring, after adjusting for age, race, PSA, prostate volume, and indication.

**Conclusion:** At our institution, the diagnostic performance of MRI-US fusion-guided biopsy for prostate cancer varied with the radiologist and his or her PI-RADS scoring, illustrating the importance of the interpreting radiologist to technical quality. Future study and quality assurance activity should focus on the radiologist training.
Poster #210
SURGICAL AND IMAGING FINDINGS OF NEOADJUVANT ENZALUTAMIDE AND ANDROGEN DEPRIVATION THERAPY FOR HIGH RISK PROSTATE CANCER: AN INITIAL CASE STUDY FOR AN ONGOING CLINICAL TRIAL
Samuel Gold; Jonathan Bloom, MD; Stephanie Harmon, PhD; Fatima Karzai, MD; Shawn Marhamati, MD; Graham Hale; Tyler Hwang; Kareem Rayn; Vladimir Valera, MD; Brad Wood, MD; David VanderWeele, MD, PhD; Ismail Turkbey, MD; William Dahut, MD and Peter Pinto, MD
Presented By: Samuel Alexander Gold

Introduction: Neoadjuvant androgen deprivation therapy (ADT) for high-risk prostate cancer (PCa) has shown decreased risk of positive surgical margins, but no improvements in biochemical recurrence (BCR) or survival. Little research has been conducted to evaluate the efficacy of neoadjuvant enzalutamide (NA-enz), a selective androgen receptor blocker, plus ADT on PCa. In this study, we evaluate the surgical and imaging results of an ongoing clinical trial of NA-enza and ADT therapy prior to radical prostatectomy (RP).

Methods: An ongoing clinical trial (NCT02430480) at a single institution recruited treatment-naïve patients with intermediate risk (IR) (Gleason score [GS] 7, PSA 10-20, or stage T2b on magnetic resonance imaging [MRI]) or high risk (HR) (GS 8, PSA >20, or stage T3) PCa. Patients with distant metastases detected on imaging were excluded. Patients underwent MRI-transrectal ultrasound (TRUS)-guided fusion biopsy (Fbx), a six-month course of enzalutamide and goserelin, followed by MRI and RP. Evidence of BCR was monitored with PSA measurements.

Results: 17 enrolled patients completed neoadjuvant treatment, MRIs, and robotically-assisted RP. Four patients were classified as IR PCa and 13 as HR PCa. 16 patients demonstrated treatment response based on post-NA-enza PSA (0.02 ng/mL, 0.02-0.35) and testosterone (20.0 ng/dL, 14.0-34.1). Prostate volume on post-NA-enza MRI decreased by 54.8% (35.2-66.7%) and index lesion diameter decreased by 46.2% (11.8-100%). Five of eight patients with multifocal cancer on pre-NA-enza MRI had unifocal cancer on post-NA-enza MRI. RP average estimated blood loss was 341.2mL and four cases had positive surgical margins. Based on the tumor location, nerve-sparing was achieved in 12 cases. No complications were noted. Three men were cancer-free on final pathology. Two HR patients, with confirmed pT3bN1 disease, experienced BCR at 20 and 35 months, respectively.

Conclusion: Enzalutamide/ADT neoadjuvant therapy showed marked changes on pre- and post-treatment MRI, most notably prostate volume, lesion quantity, and lesion size. We will continue to investigate how these changes may affect surgical decision-making, efficacy, and complications. In addition, changes in rates of BCR and survival will be monitored, and further work will assess effects of NA-enza on PCa tumor biology.

Funding: Intramural Research Program of the National Cancer Institute, NIH and NIH Medical Research Scholars Program
Introduction: Multi-parametric MRI (mpMRI) of the prostate has emerged as the most reliable method for localizing cancer within the prostate gland. As a result we have seen an increased utilization of mpMRI both in men being evaluated for prostate cancer (pCa) and those considering active surveillance (AS). While there is evidence supporting the use of mpMRI in both these groups of men, we wanted to compare its performance between these populations.

Methods: We identified a consecutive series of men who underwent MRI-US fusion biopsy of the prostate for evaluation of prostate cancer or active surveillance at our institution. We selected men who underwent MRI-US fusion targeted biopsy for PIRADS 3 or higher regions of interest (ROI) on the mpMRI. The detection rate of Grade Group 2 or higher (GG2+) pCa in targeted biopsies for PIRADS 3, 4 and 5 ROI’s were compared between men undergoing biopsy for evaluation of pCa versus those for AS. Logistic regression was used to assess the likelihood of having a GG2+ between the two groups after adjusted for important MRI and clinical risk factors. Finally, we matched men from both cohorts based on age, PIRADS score, and year of mpMRI and repeated the analysis.

Results: Among men undergoing MRI-US fusion biopsy at our institution, 102 were on AS, while 349 were undergoing evaluation for pCa. The proportion of targeted biopsies that found GG2+ cancer in men in the AS cohort versus the evaluation cohort were 8.3% vs. 11.1% (p=0.540) for PIRADS 3, 16.9% vs. 35.8% (p=0.007) for PIRADS 4, and 36.8% vs. 44.1% (p=0.571) for PIRADS 5 ROI’s, respectively. After adjusting for relevant mpMRI and clinical risk factors, we found that men in the evaluation cohort had a higher likelihood of finding a GG2+ pCa in the targeted biopsy, compared to men on AS [OR 2.0 (95%CI: 1.2-3.5), p=0.01]. Matching men by age, PIRADS score, and year of mpMRI left us 138 men in each group. Repeat analyses on the matched cohort continued to show an increased likelihood of GG2+ cancer on targeted biopsy in men undergoing evaluation for pCa, compared to men on AS [OR 2.1 (95%CI: 1.1-4.0), p=0.03].

Conclusion: Targeted biopsy of similar risk ROI’s yielded more GG2+ cancer in men undergoing evaluation for pCa compared to those on AS. This could be due to a higher prevalence of GG2+ cancer in men undergoing evaluation for pCa or a higher propensity for the radiologist to overcall an mpMRI in men with known cancer.
Poster #212
VALIDATION OF A GENOMIC RISK CLASSIFIER TO PREDICT METASTASIS AND PROSTATE CANCER-SPECIFIC MORTALITY IN MEN WITH POSITIVE LYMPH NODES
Bruce Trock, PhD¹; Jeffrey Karnes, MD²; Frank Claessens, MD³; John Davis, MD⁴; Zaid Haddad, MS⁵; Kasra Yousefi, MS⁶; Elai Davicioni, PhD⁷ and Ashley Ross, MD, PhD¹
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Presented By: Bruce Trock, PhD

Introduction: To validate whether the Decipher genomic classifier (GC) can improve upon clinical models for men with LNI to predict metastasis within 5 years (MET5) and prostate cancer specific mortality within 10 years (PCSM10). Men with lymph node involvement (LNI) at radical prostatectomy (RP) are at high risk of dying from prostate cancer. However, survival following surgery is highly variable, with some men apparently cured. Nomograms developed for men with LNI have been based on series where all or the vast majority of men received adjuvant treatment. Because administration of adjuvant treatment is not universal, even for LNI, we evaluated whether a molecular genomic classifier could improve prediction of metastasis and death in this high risk population.

Methods: 142 patients from 4 institutions (Johns Hopkins, Mayo Clinic, Leuven, MD Anderson) had LNI at RP, and had adequate tissue and relevant clinical data for analysis of MET5, and 87 were analyzed for PCSM10. 43% of men received adjuvant therapy. RP tumor tissue was analyzed by Affymetrix Human Exon 1.0 ST GeneChip; for each patient the GC was calculated based on the 22 genes in the previously trained and validated algorithm. Logistic regression was used to evaluate whether the GC, dichotomized as high risk (GC score>0.6) vs low-intermediate risk (<0.6), improved prediction of MET5 and PCSM10 beyond that achieved with clinical models.

Results: 62 men (44%) developed MET5, and 35 (40%) developed PCSM10. A clinical logistic regression model included CAPRA-S and the number of positive lymph nodes, with institution as a random effect. Adjuvant therapy was not significant in the model. GC was a significant independent prognostic factor when added to the clinical model for prediction of MET5, odds ratio=2.83 (95% CI: 1.06, 7.55), p=0.038, and prediction of PCSM10, odds ratio=4.24 (95% CI: 1.24, 14.47), p=0.021. Addition of GC to the clinical model for MET5 improved the AUC from 0.68 to 0.70, and for PCSM10 the GC increased the AUC from 0.73 to 0.80.

Conclusion: The Decipher GC significantly improves upon clinical variables to predict metastasis and prostate cancer specific mortality in men at high risk due to LNI. Larger studies are needed to evaluate whether it is a predictive factor for adjuvant therapy.
Poster #213
OPTIMIZING THE NUMBER OF TARGETED CORES DURING PROSTATE MRI-FUSION TARGET BIOPSY
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Presented By: Alexander Kenigsberg, MD

Introduction: MRI-fusion targeted biopsies (MRF-TB) have emerged as a tool to better characterize and risk stratify prostate cancer. The optimal number of biopsy cores that should be obtained from each MRI region of interest (ROI), however, is unknown. The objective of this study is to better characterize the incremental value of additional MRI-US fusion-targeted biopsy cores in defining an optimal number when planning biopsy.

Methods: For men undergoing MRF-TB between 2015 and 2017, 4 cores were directed to each MRI-targeted ROI, 1 and 2 from center of ROI and 3 and 4 bracketing, and placed into individually labeled containers for pathologic analysis. The MRI-targeted core in which the highest Gleason Score (GS) was first encountered was defined as the first highest Gleason core (FHGC). The first MRI-targeted core to provide diagnosis of clinically significant (CS) cancer (GS ≥ 3+4) was defined as the first CS core (FCSC). We analyzed the frequency of a FCSC on cores 3 or 4 and determined differences in pre-procedure characteristics between FCSC in cores 1, 2 or 3.

Results: 425 patients underwent MRF-TB with 4 individual cores, with 555 ROIs biopsied. 315 lesions had cancer on MRF-TB, of which 220 were CS. Among those, the FHGC was found on core 1 in 197 (62.5%), core 2 in 60 (10.8%), core 3 in 35 (6.3%), and core 4 in 23 (4.1%) men with any cancer (Figure 1). Of men with clinically significant cancer, the FCSC was found on core 1 in 171 (77.7%), core 2 in 23 (10.5%), core 3 (7.3%), and core 4 (4.6%). Of total lesions sampled, the FCSC was on core 1 in 30.8%, core 2 in 4.1%, core 3 in 2.9%, and core 4 in 1.8%. There were no differences in preoperative characteristics in men for whom the FCSC was in cores 1 or 2 vs. cores 3 or 4.

Conclusions: The FHGC and FCSC were found in cores 1 or 2 81.6% and 88.18% of the time, respectively. ROI size, visibility on ultrasound, and suspicion score may influence the necessity for >2 cores in targeting of MRI suspicious regions.
Introduction: Prostate Health Index (PHI) and multiparametric magnetic resonance imaging (mpMRI) have independently been shown to be valuable tools for predicting prostate cancer (PCa) grade reclassification (GR, Gleason score > 6) in patients enrolled in active surveillance (AS). We aimed to identify the value of combining PHI or PHI density (PHID) with mpMRI for the purpose of predicting GR at next surveillance biopsy in order to reduce unnecessary biopsies in AS.

Methods: We retrospectively identified 205 men in the Johns Hopkins AS program with a median follow-up of 2 years (IQR 1-4 years) who underwent a mpMRI and PHI within 6 months of each other followed by a systematic +/- mpMRI-TRUS fusion targeted prostate biopsy. PHI and PHID were evaluated across PI-RADS V2.0 scores and compared between men with and without GR to Gleason score > 6. The negative predictive value (NPV) and area under the receiver operating characteristic curve (AUC) were calculated to compare the diagnostic value of PI-RADS score combined with PHI, PHID, or PSAD for GR using the cohort 25th percentile value as a threshold.

Results: Of the 205 men, 27 men (13%) experienced GR. The median (IQR) PHI, PHID and PSAD was 32.0 (24.4-42.3), 0.57 (0.37-0.89) and 0.11 (0.07-0.16), respectively. Men with GR had a higher median PHI (34.6 vs. 31.6, p=0.03) and PHID (0.79 vs. 0.56, p=0.03) as compared to men without GR, while PSA and PSAD were not significantly different between men with and without GR. PHI and PHID both had an AUC of 0.61 for GR. Overall, 150/205 (73%) men had a PI-RADS ≤3, which had a NPV of 91% for GR (AUC 0.66). Using a PHI cut-off of 24.4 in combination with PI-RADS ≤3, the NPV and AUC were both increased to 98% and 0.70, respectively. While using a PHID cut-off of 0.37 in addition to PI-RADS ≤3, the NPV was 91% with an AUC of 0.67. Combining PI-RADS and a PSAD threshold of 0.07 yielded an AUC of 0.67 and NPV of 93%. Ultimately, the combined use of PHI < 24.4 and PI-RADS ≤3 could have avoided 24% of AS biopsies at the cost of missing only 4% of GRs.

Conclusion: PHI and mpMRI in combination are valuable tools for AS that can predict GR at next surveillance biopsy more accurately than either mpMRI or PHI alone. Together, PHI and mpMRI may be useful for decreasing the burden of surveillance prostate biopsies.

Funding: None
Poster #215
CONTEMPORARY TRENDS IN ABIRATERONE AND ENZALUTAMIDE PRESCRIPTION BY PROVIDER SPECIALTY: ANALYSIS OF MEDICARE PART D 2013-15

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Presented By: Daniel T. Pucheril, MD, MBA

Introduction: Androgen deprivation therapy (ADT) with LHRH-agonists and anti-androgens, is established in the management of prostate cancer and is administered by urologists, medical oncologists, and radiation oncologists. Newer agents for ADT, abiraterone acetate (ABI) and enzalutamide (ENZA) were approved by the FDA in 2011 and 2012, respectively, for the management of metastatic castrate resistant prostate cancer (mCRPC) after failing chemotherapy. We evaluated the contemporary economic burden of ABI and ENZA and their adoption by provider specialty.

Methods: Because a majority of men with mCRPC are >65 years of age, we utilized Medicare Part D data from 2013-15. The specific outcome variables of interest included the aggregate reimbursement and total number of prescriptions for ABI and ENZA, by provider specialty. Descriptive statistics and trend analysis were performed.

Results: From 2013-15, the total number of prescription rose from 52457 to 81058 for ABI and from 17141 to 69181 for ENZA. Though medical oncologists prescribed more than 75% of ABI/ENZA prescriptions each year, the proportion of prescriptions written by urologists increased annually (Figure). The greatest increase in the percentage of prescriptions originating from urology occurred from 2013-2014 for ABI (3.96% to 8.62%) and from 2014-15 for ENZA (5.42% to 15.64%); meanwhile, prescriptions by radiation oncology were negligible throughout the study. Southern states accounted for greater than one third of ABI and ENZA prescriptions. By 2015, the aggregate reimbursement of Part D claims for ENZA and ABI was $790 million each. Among all medication claims, ENZA and ABI represent the 29th and 30th most expensive by aggregate cost.

Conclusion: While medical oncologists account for the vast majority of ENZA and ABI prescriptions, the prescriptions by urologists is increasing while prescriptions by radiation oncologists remain negligible. Though approved for mCRPC patients, ENZA and ABI are already among the costliest medications covered by Medicare. As Level 1 indications for the use of these medications increase and now include castrate-sensitive patients, further study should be directed at determining optimal timing and indication for prescription.
Poster #216
GENOMIC VARIATIONS ASSOCIATED WITH PROSTATE CANCER IN LARGE COHORT OF AFRICAN AMERICAN MEN
Walter Rayford, MD, PhD, MBA; Jennifer Jordan; Mandeep Takhar; Mohammed Alshalalfa; Darlene Dai; Nicholas Erho; Mark D. Greenberger; Randy Bradley and Elai Davicioni
Presented By: Walter Rayford, MD, PhD, MBA

Introduction: Racial disparities in prostate cancer (PCa) incidence and mortality are well known. PCa is known to be more aggressive in African American men (AAM) compared to European American men (EAM) in terms of higher incidence and mortality rates. Here we validate a tumor gene expression pan-cancer race model in men with PCa and further characterize genomic differences that may contribute to disparate clinical outcomes.

Methods: We obtained de-identified genome-wide expression profiles from clinical use of the Decipher RP test in 9,953 men from the GRID registry database. A subset of men (n=313) had known race status. A pan-cancer race model, developed to predict patient AAM race from analysis of gene expression patterns in 4,162 tumors from retrospective cohorts with known race status was applied to the prospective cohort for race prediction. Hallmarks of cancer, immune modulators, AR activity, and prognostic gene signatures available in the GRID were used to gain a molecular perspective on PCa racial disparities.

Results: The race model was independently validated in the subset of men with known race and had an AUC of 0.98 for differentiating AAM from EAM. The model was then applied to the 9,640 GRID patients with unknown race status and classified 6,831 as EAM, 1,058 as AAM with 1,751 as having indeterminate race. Characterizing the molecular subtypes, we found known and predicted AAM to be enriched with SPINK1+ tumors (21% and 24%, respectively) compared to predicted EAM (8%). In contrast, while ERG+ was found 22% and 19% in known and predicted AAM, respectively compared to 46% in predicted EAM. Based on PAM50 prostate cancer classifier, 61% of AAM were classified as basal-like tumors, whereas 41% were basal-like in EAM. Similarly, 28% of AAM had low AR-A while only 11% of EAM had low AR-A. AAM tumors had higher levels of immune infiltration signatures as well as higher scores for inflammatory and interferon gamma responses, NF-KB mediated tumor necrosis factor (TNF) activity, and Interleukin 6 (IL6) signaling activity scores. AAM had lower DNA repair glycolysis scores compared to EAM.

Conclusion: Known and predicted AAM, were enriched with SPINK1+ tumors, higher immune infiltration and activation but lower ERG+, DNA repair and AR activity tumors. Using such large data with known race, we will further understand the underlying causes associated with prostate cancer racial disparities.
DEVELOPMENT OF PROSTATE SPECIFIC ANTIGEN (PSA) SCREENING NOMOGRAMS FOR 15-YEAR PREDICTION OF PROSTATE CANCER DIAGNOSIS (PCDX), MORTALITY (PCM), AND ALL-CAUSE MORTALITY (ACM)

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Presented By: Michael A. Brooks, MD

Introduction: To develop PSA screening nomograms using demographic and follow-up data from two large randomized screening trials: the Göteborg Screening Trial (Lancet Oncol. 2010;11:725-32) and Prostate, Lung, Colon, and Ovarian (PLCO) Cancer Screening Trial (N Engl J Med. 2009;360:1310-9). The endpoints of the models were PCDx, PCM, and ACM at 15 years. Current recommendations for PSA screening encourage shared decision making between patients and providers, rather than population-based screening. Nomograms provide individualized risk predictions potentially enhancing informed decisions to undergo screening.

Methods: Patients with screening prior to trial entry were excluded, leaving 59,951 total subjects: 19,899 and 40,052 from Göteborg and PLCO, respectively. Multiple data reviews were conducted to ensure reliability across each data set. Demographic information including age, family history of PCDx, ethnicity, Charlson Comorbidity Index, marital status, education, and control vs. screening arm were used as predictive variables. If screened, baseline PSA was used as an additional continuous variable. Models for ACM were first developed, then models predicting PCDx and PCM using competing risk analysis. Predictive accuracy was assessed using the concordance index (c-index) and calibration plots. Bootstrapping was used to reduce over-fit.

Results: On multivariable analysis, all variables were significant (P<0.05) for predicting at least one outcome. Nomograms predicting PCDx, PCM, and ACM demonstrated reasonable discrimination: c-index 0.59, 0.65, 0.70, respectively. When a single baseline PSA was included, discriminative accuracy improved for PCDx and PCM, but remained the same for ACM: c-index 0.81, 0.77, 0.70, respectively. Calibration plots revealed well-calibrated estimates for all endpoints.

Conclusion: Using demographic information, we developed PSA screening nomograms, with good discrimination and calibration in predicting all three outcomes. A single baseline PSA improved nomogram discrimination substantially for PCDx and PCM. In future efforts, we will study the implementation of these nomograms into clinic practice to aid decisions for previously unscreened patients, and whether to continue PSA screening for patients with a known prior PSA.

Funding: None
ASSOCIATION OF SYSTEMATIC BIOPSY VS. MAGNETIC RESONANCE IMAGING/ULTRASOUND FUSION TARGETED BIOPSY WITH PROSTATE CANCER UPSTAGING AT RADICAL PROSTATECTOMY

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Presented By: Kamyar Ghabili Amirkhiz, MD

Introduction: Magnetic resonance imaging (MRI)/ultrasound fusion targeted biopsy (TB) has demonstrated favorable detection rates of clinically-significant prostate cancer compared with systematic biopsy (SB). However, the predictive role of TB vs SB in upstaging at radical prostatectomy (RP) remains undefined. We sought to determine the prognostic value of TB vs SB in upstaging to ≥T3a at RP.

Methods: We retrospectively queried an institutional database to identify men who underwent SB and TB followed by RP between April 2015 and June 2017. Upstaging was regarded as pathological stage ≥T3a after RP with clinical stage ≤T2c. Clinical and pathological variables were compared based on organ confinement status. Binary logistic regression was performed to identify clinical, radiological, and TB vs. SB pathologic features associated with the presence of upstaging from biopsy to RP.

Results: Upstaging was identified at RP in 39/95 (41%) patients. Patients with upstaging at RP had elevated prostate-specific antigen (median 9 vs. 6.3, P=0.007), higher proportion of positive TB cores (0.8 vs. 0.6, P=0.01) and maximum percent TB core involvement (85% vs. 75%, P=0.01), and higher rate of perineural invasion (PNI) on SB (28% vs. 9%, P=0.02). Moreover, compared with organ-confined disease, upstaging was more detected in greater biopsy grade groups on TB (P=0.01) and SB (P=0.02), and among patients with prostate imaging reporting and data system (PI-RADS) score 5 on MRI (P=0.007). On multivariable analysis including TB tumor involvement, PI-RADS score, total biopsy grade groups, PNI on SB (OR 5.27, 95%CI 1.27-21.77, P=0.02) and clinical T1c (OR 4.16, 95%CI 1.21-13.51, P=0.02) remained significantly associated with an increased risk of upstaging at RP.

Conclusion: PNI on SB is a significant predictor of upstaging to ≥T3a at RP, whereas no TB pathological features yielded a significant association. SB maintains an important role in the prediction of non-organ confined disease in patients with prostate cancer.
**Introduction:** Extended sextant systematic prostate biopsies (systematic biopsy) have the inherent risk of under-sampling prostate cancer. Fusion guided multiparametric magnetic resonance imaging (mpMRI) biopsies have been employed to better represent the disease and guide treatment. Currently, systematic biopsies are still performed at the time of fusion guided biopsies to aid in diagnosing prostate cancer. We sought to determine if due to heightened suspicion of cancer and/or visualization of mpMRI there were any discrepancies between systematic biopsies done at the time of a Fusion Biopsy (WFB) as compared to those done without (NFB).

**Methods:** From a prospectively collected database, we performed a review of age, race, clinical stage, PSA, Gleason Score and time until repeat systematic biopsy as part of fusion guided biopsy. Patients were stratified into groups based on time between NFB and WFB (< 6 months, < 1 year and < 2 years).

**Results:** 69 patients with a previous NFB underwent WFB within our designated time intervals. Cancer detection rates between the NFB and WFB results were similar at 6 months, 1 year and 2 years (80 vs 90%, 87.5 vs 87.5% and 65 vs 69%). Detection rates of GS ≥ 3+4 were higher with WFB within 12 months compared with WFB from 12-24 months (72.7 vs 40.9%, p=0.03 OR 3.85 (1.09-13.66). Of the patients who were upgraded (n=24), 54.2% (n=13) went from benign pathology to a diagnosis of prostate adenocarcinoma. Of all NFB GS 3+3 (n=31), 29% were restaged to higher risk disease on WFB. Rates of WFB upgrading were similar within 6 months, 1 year and 2 year, 40%, 33.33% and 31.91%). Patients who were upgraded on WFB compared to those who were not upgraded were of similar age (67.0 ± 6.53 vs 66.50 ± 6.47), race (17.4% African-American vs 13%), PSA (7.60 ± 5.61 vs 7.50 ± 4.39) and prostate volume on MRI (51.30 ± 26.87 vs 59.26 ± 38.52).

**Conclusion:** A 12 core extended sextant systematic biopsy done at the time of a fusion biopsy was over 3.5 times more likely to detect GS ≥ 3+4 when done within 1 year compared to a standard systematic 12 core biopsy. There continued to be a 34.7% rate of disease upgrading in all time periods.

**Funding:** Intramural Research Program of the National Cancer Institute, NIH and NIH Medical Research Scholars Program.
**Poster #220**

**DOES AFRICAN-AMERICAN RACE IMPACT ONCOLOGIC OUTCOMES FOLLOWING PRIMARY CRYOTHERAPY FOR PROSTATE CANCER? A MATCHED STUDY FROM THE CRYO-ON-LINE DATABASE (COLD) REGISTRY.**

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Presented By: Alireza Aminsharifi, MD, PhD

**Introduction:** African-American (AA) men have the highest incidence and disease-specific mortality from prostate cancer of any racial group. While encouraging oncological and functional outcomes have been reported with prostate cancer cryotherapy little is known about how ethnicity can potentially affect the oncological outcome of primary cryotherapy. We report the oncological outcome of primary cryotherapy in African American (AA) patients through a matched pair analysis.

**Methods:** A 1:2 (AA: non-AA) cohort of patients was designed based on The Cryo-On-Line Data (COLD) Registry. The two arms were matched regarding patient age, prostate-specific antigen (PSA) level, Gleason score and prostate volume. The oncological outcome was defined in terms of biochemical recurrence (BCR) rates using both the American Society for Radiation Oncology (ASTRO) and Phoenix criteria. The results of “for-cause” post-treatment biopsies as well as the BCR-free survival rates were also analyzed between the two groups.

**Results:** The 1:2 cohort of AA: non-AA men in this study included 109:218 individuals. Median age (69:71 years, p=0.71), median PSA level (6.5:6.8 ng/mL, p=0.95), median prostate volume (32:30 cc, p=0.31), distribution of Gleason scores (p=0.97) and prostate cancer risk groups (p=0.12) were statistically similar. Median postoperative follow-up period was also comparable between the two groups (AA: 32months vs. non-AA: 27 months; p=0.52). The BCR rates were similar between AA men versus non-AA men using both ASTRO (31% vs. 22%, P=0.08) and Phoenix (14% vs. 17%, P=0.52) definitions. Likewise, the rates of a positive “for-cause” prostate biopsy were similar between the two groups (25% for AAAs versus 36% for non-AAs) (P=0.44). Furthermore, 5- year BCR-free survival rates were comparable for AA versus non-AA patients according to both ASTRO (53% vs. 61%, P= 0.07) and Phoenix (74% vs. 71%, P= 0.37) criteria.

**Conclusion:** Despite often having more aggressive disease and poorer outcomes compared to men with other ethnicities, men of African-American descent can feel assured that cryotherapy as a treatment modality for primary, clinically localized prostate cancer may provide similar oncological outcome.

**Funding:** None
Poster #221

DRUG RESPONSE VARIABILITY BETWEEN LUMINAL AND BASAL PROSTATE CANCER TUMORS

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Presented By: Robert Den, MD

Introduction: Prostate cancer (PCa) is a genomically heterogeneous disease which has been subtyped into molecularly distinct subtypes. Over the past several years, multiple drugs have demonstrated improvements in overall survival in men with advanced prostate cancer, prompting further investigations of these drugs. However, characterizing drug response in the localized disease setting and in the context of PCa molecular subtypes needs further investigation. Here in a large prospective cohort of men with adverse pathology we explore the heterogeneity of patient drug response between basal, luminal and neuroendocrine prostate cancer subtypes.

Methods: Whole transcriptome RNA expression profiles of 9,640 radical prostatectomy (RP) samples from prospective use of the Decipher test were obtained from the GRID registry database. Patients were subtyped into basal, luminal A, luminal B and neuroendocrine subtypes using the PAM50 and small cell gene expression signatures. Drug response scores (DRS) predicting patient sensitivity for 89 oncology drugs were determined using in vitro drug sensitivity and microarray data from the NCI-60 panel. Pearson’s chi squared test was used to determine significant differences in drug sensitivity among PCa subtypes.

Results: Applying the subtype signatures to the cohort we classified 43% of samples as basal, 26% as luminal A, 30% as luminal B and 2% as neuroendocrine. DRS was highly variable across the subtypes (Table1). Basal tumors showed a distinct drug response profile where basal tumors were more sensitive to kinase inhibitors (e.g., cabozantanib, dasatinib, erlotinib), mTOR inhibitors (e.g., everolimus, temsirolimus), DNA repair inhibitors (e.g., olaparib, mitoxantrone) and alkylating (e.g., cisplatin, carboplatin) chemotherapy. Luminal A and B were more sensitive to steroid inhibition (e.g., abiraterone, tamoxifen) and anti-microtuble (e.g., docetaxel, paclitaxel, vinorelbine) chemotherapy, whereas neuroendocrine had highest DRS for anti-proliferative agents (e.g., mitomycin, cytabarine, carmustine, topotecan). Significant differences in average DRS scores in subtypes were observed for all 89 drugs (p<0.001).

Conclusion: Prostate cancer subtypes in the localized disease setting have distinct drug response profiles suggesting that subtyping and DRS scores may be useful for selecting candidates for systemic therapy trials.
EVALUATION OF DIRECTED ANTIMICROBIAL PROPHYLAXIS FOR TRANSRECTAL ULTRASOUND GUIDED PROSTATE BIOPSY (TRUSP). A PROSPECTIVE TRIAL

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Presented By: Mohamed Hendawi, MD

Introduction: To evaluate the effectiveness of targeted antimicrobial prophylaxis in transrectal ultrasound guided prostate biopsy (TRUSP).

Methods: A prospective, non-randomized cohort study. Rectal swab cultures plated on non-selective blood agar and on selective MacConkey agar supplemented with ciprofloxacin identified ciprofloxacin-susceptible and -resistant gram-negative bacteria (CS-GNB and CR-GNB). Patients with CS-GNB received ciprofloxacin while those with CR-GNB received directed prophylaxis. Patients were followed up by completing phone call questionnaires on 7, and 30 days after biopsy.

Results: 48 patients (Oct 2014-Mar2015) were enrolled, Follow up was lost for 3 patients. All 48 patients had completed the study questionnaire prior to their procedure. Median age (62 y), median BMI (28) and median time from antibiotics to procedure (148 minutes),5(10.4%) patients had CR-GNB; while 43 had CS-GNB cultures. 7 (14.6%) patients had an infection following prostate biopsy, with 1 urosepsis and 6 UTI infections. Culture was positive for E.coli in 6 patients and for enterococcus in one patient. Previous history of UTI, fluoroquinolone (last 2 years) use, or being hospitalized (last year) was independent of post-biopsy infections. There was no significant difference between patients who got infections and patients who didn’t in terms of age, BMI, time from antibiotics to procedure and Charlson-Romano comorbidities index score. Infectious complications were not higher in patients whose biopsy result was positive for cancerous changes. 7 (16%) of our patients were African American (AA), 1 was Hispanic, and the majority (40) were of white race. 2 (28%) patients out of the 7 patients who got infections were AA which may point out to the racial disparities in GI Microbiome, and antibiotics response. 3 out of the 5 CR-GNB cultures were acquired from non-Caucasian. only 20(41%) of our patients reported that they took their enema prior to the procedure. There was no significant difference in infections rate between CS-and CR-GNB patients (P=0.148, 95%:.0.7-3.03).

Conclusion: Overall the Targeted antimicrobial prophylaxis failed to reduce the rate of infectious complications following transrectal prostate biopsy at our institution, which necessitate the validation of the method with multi-center large cohort clinical trial that account for racial, geographic, institutional differences, and resistance mechanisms.
Poster #223
NATIONAL TRENDS IN THE MANAGEMENT OF PATIENTS WITH POSITIVE SURGICAL MARGIN AT THE TIME OF RADICAL PROSTATECTOMY
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¹Department of Urology, Yale University School of Medicine, New Haven, CT; ²Department of Therapeutic Radiology, Yale University School of Medicine, New Haven, CT
Presented By: Kamyar Ghabili Amirkhiz, MD

Introduction: The optimal management approach for patients with positive surgical margins (PSM) at the time of radical prostatectomy (RP) has not been definitively assessed. To better understand contemporary patterns of care, we sought to examine time trends and determinants of adjuvant therapy in a large national sample of men with prostate cancer (PCa) treated with RP.

Methods: We queried the National Cancer Database (NCDB) to identify men with clinically-localized PCa diagnosed from 2010 to 2014 who were found to have PSM at RP performed as initial primary definitive treatment. We used descriptive statistics to examine subsequent management strategies, assessed as no adjuvant therapy as part of the initial planned course of management, receipt of adjuvant radiation therapy (RT), and receipt of adjuvant RT in combination with androgen deprivation therapy (ADT). Binary logistic regression models were constructed to identify patient, tumor, and facility features associated with receipt of adjuvant therapy.

Results: During the study period, we identified 44,523 patients with PSM. Of those, 5,179 (11.6%) men received any adjuvant RT (+/- ADT), while only 1,380 (3%) received adjuvant RT with ADT. Use of adjuvant RT did not change over the study period (p=0.61). On multivariable analysis men of uninsured status (p=0.003), Medicaid insurance (p=0.001), and patients treated in non-academic facilities (p<0.001) were more likely to receive adjuvant RT. In addition, use of adjuvant RT was associated with higher pre-treatment PSA (p<0.001), pathologic stage (p<0.001) and Gleason grade group (p<0.001), decreasing distance from the treatment center (p<0.001), and shorter duration between diagnosis and RP (p<0.001). Receipt of adjuvant ADT with RT was associated with clinical and pathologic features; however, not with sociodemographic factors.

Conclusion: The majority of patients experiencing PSM at the time of RP did not receive adjuvant RT, and rates of adjuvant therapy have remained stable over time. In addition to adverse clinical and pathologic features, sociodemographic and facility factors were significantly associated with receipt of adjuvant RT; however, the addition of ADT appears largely driven by disease characteristics.
Introduction: MRI-TRUS fusion biopsy (FBx) use in the diagnosis of prostate cancer (PCa) results in a more accurate assessment of disease burden and has increasingly been incorporated into urologic practice. In addition, with more men choosing active surveillance (AS) and the reports of increased PCa aggressiveness with obesity, we wanted to study the impact of obesity on the risk of PCa progression in men on AS diagnosed and followed by MRI and MRI-TRUS FBx.

Methods: A retrospective review was performed on a prospectively maintained database of all men who underwent MRI-TRUS FBx at our institution from January 2007 to May 2015. Patient demographics, clinical data, imaging, pathology, treatment and outcomes were recorded. Patients who enrolled on AS were stratified by BMI into normal weight (BMI 18.5-24.9), overweight (BMI 25.0-29.9), and obese (BMI ≥ 30.0). Statistical analysis was performed using SPSS software.

Results: 204 men were enrolled in AS. Within the AS cohort, 51 (25%) had a normal weight, 101 (49.5%) were overweight, and 52 (25.5%) were obese. Age, BMI, PSA and mean estimated progression free survival time are described for each of these groups in Table 1. The overall rate of progression was 32.8%. Of the patients who progressed, 18 (26.9%) were normal weight, 32 (15.7%) were overweight and 17 (25.4%) were obese. On multivariate analysis, BMI was not a risk factor for AS progression, HR=1.00 (p=0.99, 95% CI=0.95-1.06).

Conclusion: There is evidence of increased risk of aggressive PCa specific death in obese patients. However, we demonstrate that in patients diagnosed by FBx, obesity does not confer an additional risk of progression on AS. This may be due to the improved characterization of cancer volume and grade by MRI-TRUS fusion biopsy. Further study is required to determine risk factors for AS progression in patients undergoing FBx.

Table 1: Patient Characteristics of Men on Active Surveillance

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<td>6.7 (6.0)</td>
<td>7.0 (4.2)</td>
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<td><strong>Estimated Progression Free Survival Time, months</strong></td>
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<td>Mean (Std. Deviation)</td>
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Poster #225
EVALUATING THE ROLE OF CONTRAST-ENHANCED TRANSRECTAL ULTRASOUND (CETRUS) AFTER HIFU FOCAL THERAPY
Akbar Ashrafi, BHB, MBChB, FRACS¹; Masakatsu Oishi¹; Matthew Winter¹; Mittul Gulati²; Suzanne Palmer³; Manju Aron³; Marianna Stern¹; Daniel Park¹; Inderbir Gill¹ and Andre Abreu¹
¹USC Institute of Urology, Los Angeles, California; ²Department of Radiology, Keck Medical Center of USC, Los Angeles, California; ³Department of Pathology, Keck Medical Center of USC, Los Angeles, California
Presented By: Akbar Ashrafi, BHB, MBChB, FRACS

Introduction: The optimal surveillance strategy after focal high-intensity focused ultrasound (HIFU) therapy for prostate cancer remains controversial. Contrast-enhanced ultrasound is an imaging technique utilizing microbubble contrast agents to demonstrate blood flow and tissue perfusion. This study reviewed the utility of contrast-enhanced transrectal ultrasound (CETRUS) in the follow up of patients after focal HIFU hemiablation for prostate cancer.

Methods: Our institutional-review board approved database was used to identify patients who have had follow up CETRUS imaging after HIFU focal therapy between December 2015 and August 2016. A peripheral 20 gauge IV cannula was placed, a 0.3 cc bolus dose of the ultrasound contrast agent was injected and flushed with 10cc of normal saline solution for each CETRUS injection. We reviewed baseline demographic and clinical characteristics, and follow up CETRUS and mpMRI prostate imaging, PSA and prostate biopsy results.

Results: Follow up CETRUS was performed on 12 patients after HIFU hemiablation. Median age was 62. Median IPSS score was 11. Median SHIM score was 15. Mean prostate volume was 32 10.6cc. Ten patients had Gleason score 7. An ablation zone was evident on CETRUS for all 12 patients following HIFU hemiablation (Figures 1). After a median follow up of 13 months, all patients had a reduction in PSA with a mean reduction of 71%. Seven patients had prostate biopsy, of whom only 1 had clinically significant disease on the treated lobe, which was detected by CETRUS. In this case, CETRUS was able to detect new perfusion and localize the recurrent cancer. An additional case of a patient with suspicious MRI and normal CETRUS post HIFU was also seen. Follow up 18-core biopsy showed necrosis only with no evidence of recurrent prostate cancer.

Conclusion: We demonstrate the potential utility of CETRUS in follow up after HIFU. CETRUS was able to demonstrate the thermal ablation zone post HIFU focal therapy in all patients. In selected cases, CETRUS may be able to identify patients who will benefit from repeat biopsy or those in whom biopsy can be deferred. Further optimization of technique and long-term outcomes are needed.
THE UTILIZATION OF HORMONE THERAPY AND CHEMOTHERAPY IN MEN WITH METASTATIC PROSTATE CANCER ACCORDING TO INSURANCE STATUS

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Lahey Hospital and Medical Center, Burlington MA
Presented By: Jared Schober, MD

Introduction: Previous studies have documented an increased risk of presenting with metastatic prostate cancer (mPCa) for men with no insurance or suboptimal coverage. Treatment options for mPCa have significantly expanded during the past decade, including the first-line use of docetaxel in selected men with newly-diagnosed mPCa. However, hormone therapy remains the mainstay of treatment. In this study, we sought to describe treatment patterns of mPCa over the past decade, specifically the utilization of hormone and chemotherapy, according to insurance status.

Methods: The National Cancer Database (NCDB) was queried to identify men with mPCa at presentation, defined as clinical M1 disease, between 2004-2014. Treatments codes for hormone therapy and single drug chemotherapy were categorized and compared between years of diagnosis according to the following groups: private insurance, Medicare, Medicaid, and no insurance. Descriptive statistics were performed.

Results: A total of 49,586 men met inclusion criteria. The percentage of men receiving hormone therapy steadily increased over time, regardless of insurance status. The largest increase in utilization was observed in men without insurance: 66% in 2004, to 82% in 2014 (Table 1). Comparatively, for those with private insurance, hormonal treatment increased from 79% to 85%. The use of single agent chemotherapy among all patients was steadily low, between 2-5%, until the final year of analysis (2014). Between 2013 and 2014, chemotherapy utilization rose dramatically in all men, particularly those with private insurance (5% to 24%).

Conclusion: The utilization of hormone therapy for mPCa has increased significantly over the last decade, with almost 80% of all patients receiving hormone therapy as a component of their primary treatment plan. This improvement in delivery and adherence to guideline-driven care was seen in men with and without insurance. As of 2014, single agent chemotherapy use has started to increase, but still constitutes a minority of patients. In the context of recent publications documenting level 1 evidence for use of upfront docetaxel, this utilization trend will likely continue and our study can serve as a marker for baseline utilization.

<table>
<thead>
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<th>Table 1. Percentage of patients receiving therapy according to insurance</th>
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<td>Medicaid</td>
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<td>No Insurance</td>
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<td>Single Drug Chemotherapy</td>
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<tr>
<td>Medicaid</td>
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<tr>
<td>No Insurance</td>
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</table>
UPGRADING ON CONFIRMATORY MRI FUSION BIOPSY IN CANDIDATES FOR ACTIVE SURVEILLANCE
Saum Ghodoussipour, MD; Nima Nassiri, MD; Michael Lin-Brande, BA; Ankeet Shah, MD; Massakatsu Oishi, MD, PhD; Toshitaka Shin, MD; Suzanne Palmer, MD; Manju Aron, MD; Jie Cai, MD; Osamu Ukimura, MD; Inderbir Gill, MD, and Abreu Andre, MD
University of Southern California
Presented By: Nima Nassiri, MD

Introduction: Concerns over clinical understaging have led some to advocate repeat biopsy after an initial diagnosis of low risk prostate cancer (CaP). In this study, we evaluate the role of confirmatory prostate biopsy using magnetic resonance imaging (MRI) ultrasound fusion after an initial diagnosis of Gleason (Gl) 6 prostate cancer on systematic ultrasound guided biopsy. Our primary objective was to identify the rate of Gl score upgrading after confirmatory MRI fusion biopsy. Secondary objectives included differences in disease characterization when using ultrasound only or MRI-guided biopsy.

Methods: Using an IRB approved prostate biopsy database, we identified 242 patients who were referred to our institution for a diagnosis of Gl 6 CaP from 2011 to 2017. We included men initially diagnosed by ultrasound guidance biopsy, who then underwent repeat MRI fusion biopsy within one year of initial diagnosis. Multiparametric 3 Tesla MRI were obtained and reviewed by an experienced uroradiologist. The Koelis (Urostation) fusion software was used. Fusion biopsy included 12 systematic cores with an additional two cores per PIRADS 3 or greater MRI lesion. Features of the initial and repeat biopsy were compared and differences calculated using Fisher’s exact test. All pathology slides were reviewed by an experienced uropathologist.

Results: Of the 242 patients referred for Gl 6 CaP, 133 had been diagnosed with systematic ultrasound guided biopsy. Of these patients, 32 underwent confirmatory MRI fusion biopsy within one year. Median age was 66.5 years, 75% were Caucasian, 9% Hispanic, 3% Asian and 3% African American. After repeat biopsy, 8 (25%) patients had a negative biopsy, 14 (44%) had Gleason 6 disease and 10 (31%) had upgrading to Gl 7 disease. There was no significant difference in median PSA at the time of repeat biopsy (4.77 vs 4.91, p=0.29) or median cancer length in the core (5 vs 1.5mm, p=0.14). There was a significantly higher number of cores taken (14 vs 12, p<0.0001), median positive cores (3 vs 2, p=0.003) and percent involvement of each core (30% vs 8.5%, p=0.009).

Conclusion: Confirmatory MRI fusion biopsy after an initial diagnosis of prostate cancer on systemic ultrasound guided biopsy identified a significant number (31%) of patients with higher risk disease. Repeat biopsy with MRI fusion also better characterized the disease in terms of total cores and percent core involvement.

Funding: None
**Poster #228**

**A GERM LINE GENETIC TEST FOR PROSTATE CANCER RISK (PGS-33) TOGETHER WITH FAMILY HISTORY ARE ASSOCIATED WITH LETHAL PROSTATE CANCER**

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¹Department of Urology, University of California San Diego, San Diego, CA; ²Department of Urology, University of Texas Health Science Center San Antonio, San Antonio, TX; ³Department of Urology, University of California San Diego, San Diego, CA.; ⁴Department of Medicine, University of California San Diego, San Diego, CA.; ⁵Program for Personalized Cancer Care, NorthShore University Health System, Evanston, IL

Presented By: Stephen T. Ryan, MD

**Introduction:** Prostate specific antigen (PSA) based prostate cancer (PCa) screening may be improved by focusing screening efforts on men at higher-risk. We investigated family history together with a germ-line marker of PCa risk (PGS-33) in a cohort of men that died of PCa. Our goal was to determine if family history together with PGS-33 could help identify a group of men at risk for lethal PCa.

**Methods:** After University of California San Diego IRB approval, 100 men were prospectively enrolled after presenting to the oncology clinic with metastatic PCa. Baseline clinical characteristics and saliva were collected on all patients. DNA was harvested from saliva and genotyped at 33 PCa associated single nucleotide polymorphisms. PGS-33 was calculated based on genotype and weighted by odds ratio (OR) and allele frequency. Based on previous studies, a PGS-33 of 0.6 without a family history indicated the lowest risk group for PCa. A PGS-33 of >1.3 or a family history of PCa indicated the highest risk.

**Results:** 53 patients who were initially enrolled in the study died from PCa. 12 (22%) men had a family history and 19 (36%) men had a PGS-33 >1.3. There was no association between the PGS-33 score and a family history of PCa (PGS 1.5 vs. 1.3, p=0.53). Only three patients (5%) qualified as low risk for PCa by genetic testing (PGS <0.6) and a negative family history. 27 (51%) patients would have been identified as a high PGS-33 or a family history of PCa. 37 (69.8%) of the 53 men that died of PCa did not undergo regular PSA testing.

**Conclusion:** PGS-33 together with family history could help identify a group of men early in life who are at risk of dying from PCa. This may have benefited the 70% of men in this study who did not undergo regular PSA testing.
Introduction: The use of alvimopan in enhanced recovery after surgery protocols has proven to be beneficial by limiting postoperative surgical morbidity and length of stay (LOS) for patients undergoing gastrointestinal surgery. We sought to determine the benefits of alvimopan in men undergoing retroperitoneal lymph node dissection (RPLND) for testicular cancer.

Methods: A prospective pilot study was completed on 14 consecutive RPLND's performed from May to July 2017 by a single surgeon. All 14 patients were managed using an alvimopan program (Alvimopan 12 mg PO prior to OR and then BID until bowel movement (BM), Gabapentin 300 mg TID, Acetaminophen 1,000 mg q6H). These patients were compared with the 33 prior consecutive RPLND's by the same surgeon from January to May 2017. Primary endpoints were LOS and date of first BM. Secondary endpoints included intravenous (IV) narcotic use.

Results: Baseline patient demographics, tumor characteristics and operative details were comparable between the two groups (Table 1). Overall, 31/47 (65.9%) patients received pre-operative chemotherapy. Twenty-nine received standard induction chemotherapy and 2 received induction and salvage high dose chemotherapy. A total of 11 additional procedures were performed concomitantly in 9 patients, which included thoracic procedures (4), nephrectomy (3), pelvic lymph node dissection (2), duodenal resection (1), and vascular procedures (1). Overall, median LOS for those in the alvimopan group was similar to the control group (3 vs. 4 days, p=0.12). Twenty-five (53%) patients of the total cohort had a BM prior to discharge from the hospital (8 with alvimopan and 17 in the control). There was no difference in the time to return to bowel function between the study and the control groups (2.87 vs. 3.05 days, p=0.93). IV narcotic use was 5mg less in the alvimopan group (11.3 vs. 16.1mg, p=0.05).

Conclusion: The use of alvimopan did not significantly decrease LOS or improve time to return of bowel function in men undergoing RPLND. There was a significant reduction in IV narcotic use in the alvimopan arm, which may be secondary to the multimodal approach for postoperative pain control.

Funding: None
Poster #230
THE EFFECT OF RACE ON PATHOLOGIC OUTCOMES OF RETROPERITONEAL LYMPH NODE DISSECTION IN MEN WITH GERM CELL TUMORS
Adam Calaway, MD; Clint Cary; Richard Bihrlle and Richard Foster
Indiana University, Indianapolis, Indiana
Presented By: Adam C. Calaway, MD

Introduction: While several studies have evaluated the relationship between race and survival in patients with germ cell tumors, few have investigated the impact that racial disparity may have on histologic findings at the time of retroperitoneal lymph node dissection (RPLND). Thus, we assessed the association between race and RPLND findings in patients with germ cell tumors at our institution.

Methods: Patients included underwent either a primary or post-chemotherapy retroperitoneal lymph node dissection (PCRP LND) between 1990-2016. Patients with an unknown or missing race variable were excluded. Additionally, patients without a diagnosis of either pure seminoma or mixed germ cell tumor were excluded. Continuous variables were assessed with Kruskal-Wallis test and categorical variables were assessed using Fisher’s exact test.

Results: A total of 2,940 patients met inclusion criteria. Of these, 70 (2.3%) were Hispanic, 32 (1.1) were African/American, 12 (0.4) were Asian, and 2,826 (96.2) were White. There were no differences in age at RPLND between races, p=0.28. A total of 1,106 patients underwent a primary RPLND, while 1,772 underwent a PCRP LND. Patients of Hispanic or Asian race were less likely to undergo a scrotal ultrasound prior to orchiectomy compared to African American or White men, p=0.01. There were no differences in clinical stage at presentation by race, p=0.54. African-American men demonstrated a higher percentage of teratoma present in the retroperitoneal specimen at primary RPLND compared with the other races, p=0.25. African-American men were more likely to harbor residual cancer at the time of PCRP LND compared to White, Asian, or Hispanic men, p=0.05.

Conclusion: Distribution of tumor histology is similar between all racial groups undergoing primary RPLND. In patients undergoing post-chemotherapy RPLND, residual germ cell cancer was increased in African Americans compared to other analyzed groups. Whether these differences reflect distinct biologic characteristics or disparities in initial treatments patterns or access to care warrants further investigation.

Funding: None
Poster #231
RETROPERITONEAL LYMPH NODE DISSECTION (RPLND) AS AN ALTERNATIVE LOCAL CONTROL STRATEGY FOR LOW-VOLUME, CLINICAL STAGE II TESTICULAR SEMINOMA: A SURVEY OF PATIENTS
Jason Warncke, MD¹; Amanda Saltzman, MD¹; Siamak Daneshmand, MD² and Nicholas Cost, MD¹
¹University of Colorado, Department of Surgery, Division of Urology, Aurora, CO; ²University of Southern California, Department of Urology, Los Angeles, CA
Presented By: Jason Warncke, MD

Introduction: In the setting of low-volume, retroperitoneal-only metastatic seminoma (clinical stage [CS] II) current consensus guidelines recommend radiation therapy (RT) or chemotherapy. The excellent oncologic outcomes from RT or chemotherapy must be balanced against the risk of serious long-term effects. Retroperitoneal lymph node dissection (RPLND) for low-volume CSII seminoma may provide an alternative to RT or chemotherapy for local control and reduce the exposure to long-term side effects while preserving the high rate of cure. The objective of this study was to determine the willingness of patients with testicular seminoma to participate in such a clinical trial.

Methods: A nationwide survey was emailed to patients who are members of the Testicular Cancer Society. The survey was developed collaboratively by a group of urologic oncologists, GU medical oncologists and radiation oncologists. It was refined by expert review after cognitive interviews and pilot testing by 10 seminoma patients to ensure that questions were clear and responses were comprehensive. Responders with non-testicular primary sites and/or non-classic, non-pure seminoma were excluded. Logistic regression analysis was performed to identify factors associated with patient willingness to enroll in the above-described clinical trial.

Results: A total of 237 patients with testicular cancer responded to our survey, which included 193 patients (81.4%) with testicular seminoma. 148 patients (76.7%) reported that they would be willing to enroll in such a clinical trial. On univariate logistic regression, age at the time of diagnosis, stage diagnosis, initial management after orchiectomy, and whether a patient relapsed did not impact willingness to enroll (Table 1).

Conclusion: Our nationwide survey of patients with testicular seminoma found that the vast majority would be willing to participate in a clinical trial of RPLND as an alternative local control strategy for low-volume CSII testicular seminoma. This information helps estimate the proportion of eligible patients that would enroll in a currently open Phase II study on this topic, and will aid in designing a future Phase III clinical trial comparing RPLND to RT.

Table 1. Univariate logistic regression analysis of factors associated with patient willingness to enroll in clinical trial

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Poster #232
DECISION ANALYSIS DEFINING OPTIMAL MANAGEMENT OF CLINICAL STAGE 1 HIGH-RISK NONSEMINOMATOUS GERM CELL TESTICULAR CANCER (CS1 NSGCT) WITH LYMPHOVASCULAR INVASION (LVI)

Svetlana Avulova, MD; Clayton Allen, MD; David Penson, MD, MPH; Alicia Morgans, MD, MPH and Kelvin Moses, MD, PhD
Vanderbilt University Medical Center, Nashville, TN
Presented By: Svetlana Avulova, MD

Introduction: The risk of recurrent disease for men with CS1 NSGCT with LVI after orchiectomy is 50%. All treatment options are associated with a 99% chance of disease specific survival and include surveillance (S), retroperitoneal lymph node dissection (RPLND) and 1 cycle of BEP (BEPx1). Practice patterns are currently guided by expert opinion and vary by institution. We performed a decision analysis using updated data describing long-term complications for men with CS1 NSGCT with LVI to compare treatment values.

Methods: We performed a decision analysis using previously defined utilities (defined via standard gamble) for varying post-treatment states of living ranging from 0 (death from disease) to 1 (alive in perfect health) and updated outcome probabilities. Using the rollback decision analysis method, we quantified the values of S, RPLND, and BEPx1. We performed sensitivity analyses using a range of orchiectomy cure rates and utility values.

Results: The values of active treatment with RPLND (0.97) or BEPx1 (0.97) were equivalent and superior to S (0.88). A sensitivity analysis using a range of orchiectomy cure rates (50-100% rate of cure) failed to find a cure rate that favored S over active treatment of either type. Varying the utility values for cure after S from 0.92 (previously defined utility) to 1 (perfect health), failed to find a viable utility state favoring S over active treatment. An orchiectomy cure rate of ≥82% would be required for S to equal active treatment.

Conclusion: We demonstrate that in order for active surveillance to be superior to active treatment, a state of perfect health must be attained with an orchiectomy cure rate of at least 82%, which is impossible in a high risk CS1 NSGCT patient population. These patient specific treatment values should be taken into account when counseling patients regarding optimal approach to treatment.

Figure:
Assuming the utility value for cure after surveillance was 1, at what cure rate for orchiectomy (c) would active surveillance be equivalent or preferred to active treatment?
Due to time limitations, authors who do not have a time and date listed will not be presenting their abstracts at this meeting. See Abstracts section for complete text.

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- **Alphabetic Index of Authors**
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</table>
The following urologic oncology fellowship programs have earned the credentials of the Society of Urologic Oncology:

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www.massgeneral.org/urology
suonet.org/fellowships/Combined%20Harvard%20Urologic%20Oncology%20Fellowship%20Overview.pdf

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my.cleveland clinic.org/services/urology-kidney/for-medical-professionals/educational-opportunities/urology-fellowships

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ccr.cancer.gov/labs/lab.asp?labid=92

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www.urology.wisc.edu/education-training/fellowship-in-urologic-oncology

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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.
<table>
<thead>
<tr>
<th>Date Range</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2017 – April 2018</td>
<td>Online registration process. Please register at: <a href="http://www.auanet.org/secured/oncology/applicant.cfm">www.auanet.org/secured/oncology/applicant.cfm</a></td>
</tr>
<tr>
<td>April 24, 2018</td>
<td>Registration deadline for both applicants and programs.</td>
</tr>
<tr>
<td>May 1, 2018</td>
<td>Preference list phase begins.</td>
</tr>
<tr>
<td>May 25, 2018</td>
<td>Deadline for receipt of all online preference lists.</td>
</tr>
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<td>(You will receive email instructions on how to submit your list.)</td>
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<tr>
<td>May 28 – June 11, 2018</td>
<td>The Match is performed, using all possible safeguards to ensure accuracy and confidentiality.</td>
</tr>
<tr>
<td>June 13, 2018</td>
<td>Match results sent out via email</td>
</tr>
</tbody>
</table>
Mark Your Calendars

2018 SBUR/SUO Joint Meeting
May 19, 2018
Hilton San Francisco Union Square
San Francisco, California

2018 SUO Spring Meeting at the AUA
May 19, 2018
Hilton San Francisco Union Square
San Francisco, California

19th Annual Meeting of the SUO
November 28 – November 30, 2018
Sheraton Grand Phoenix
Phoenix, Arizona