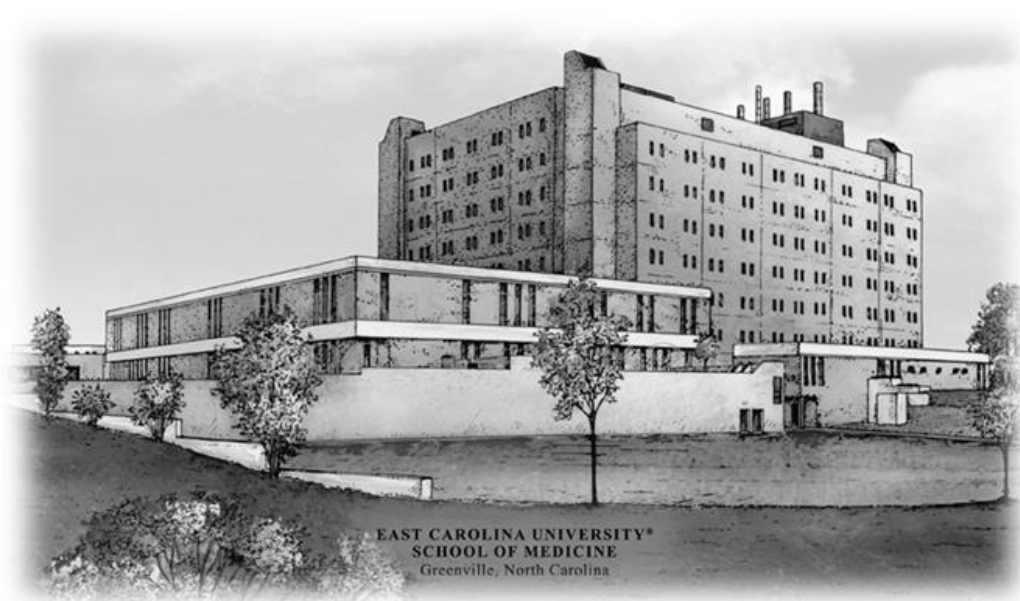




*The Department of Internal Medicine  
Brody School of Medicine  
East Carolina University*

*Presents the*

**31<sup>st</sup> Annual  
Yash P. Kataria  
Internal Medicine  
Research Day  
March 30, 2017**



# **31<sup>st</sup> Annual Yash P. Kataria Internal Medicine Research Day 2017**

***Thursday, March 30<sup>th</sup>, 2017  
9:30 AM – 4:00 PM  
East Carolina Heart Institute***

**Paul Bolin, Jr., MD**  
*Professor and Chair  
Department of Internal Medicine*

**Research Day Advisory Committee**  
*Badih Kabchi, MD, Co-Chair  
Arjun Mohan, MD Co-Chair  
Cindy Kukoly  
Cathy Munson  
Nan Leffler  
Bobbie Harris*

*Join us in thanking our sponsors for their support of Research Day.*



**GRIFOLS**





The Brody School  
of Medicine

# Department of Internal Medicine

## 31st Annual Yash P. Kataria Internal Medicine Research Day

Thursday, March 30th, 2017

9:00am	<b>Refreshments - ECHI Atrium &amp; Conference Room</b>	<i>Poster Presentations available for viewing</i>
9:30am	<b>Welcome - ECHI Auditorium</b>	<i>Paul Bolin, Jr., MD Department of Internal Medicine</i>
9:35am	<b>Administrative Comments - ECHI Auditorium</b>	<i>Arjun Mohan, MD &amp; Badih Kabchi, MD Co-Chairs, Research Committee</i>

***First Oral Session, ECHI Auditorium***  
**Moderator:**

9:45am	<b>OP1</b>	<b>AN INTERVENTION STUDY TO REDUCE BLACK-WHITE TREATMENT DISPARITIES IN EARLY STAGE NON-SMALL CELL LUNG CANCER</b>	<i>P Walker, S Cykert, L Edwards, R Arya, P Dilworth-Anderson</i>
10:00am	<b>OP2</b>	<b>EFFICACY OF ANTI-PD-1 INHIBITORS IN NSCLC PATIENTS WITH KRAS AND T790M MUTATIONS</b>	<i>N Sharma, PR Walker, G Stroud, C Cherry, S Cherukuri, T Parent, J Hardin</i>
10:15am	<b>OP3</b>	<b>EFFICACY AND SAFETY OF INSULIN ASPART 30 AND INSULIN DEGLUDEC/ASPART VERSUS BASAL INSULIN IN PATIENTS WITH TYPE 2 DIABETS: A META-ANALYSIS</b>	<i>BM Mishriky, RJ Tanenberg, DM Cummings</i>
10:30am	<b>OP4</b>	<b>SEQUENCE OF STEREOTACTIC ABLATIVE RADIOTHERAPY AND IMMUNE CHECKPOINT BLOCKADE IN THE TREATMENT OF METASTATIC LUNG CANCER</b>	<i>R Pinnamaneni, A Hegde, S Cherukuri, C Cherry, G Stroud, M Bowling, H Arastu, C Leinweber, PR Walker</i>
10:45am	<b>OP5</b>	<b>ROSIGLITAZONE REPRESSES PULMONARY GRANULOMA FORMATION AND ALVEOLAR MACROPHAGE INFLAMMATORY ACTIVATION</b>	<i>M McPeek, A Malur, BP Barna, L Dobbs, MJ Thomassen</i>

11:00 am

***Keynote Address: ECHI Auditorium***

**“The Clinical Mycology Laboratory: Guiding Therapeutic Choices”**

***Barbara Dudley Alexander, MD***  
*Director, Transplant Infectious Diseases Service*  
*Head, Clinical Mycology Laboratory*  
*Director, Medical Microbiology & Transplant ID Fellowship Programs*  
*Professor of Medicine and Pathology*  
*Duke University*

12:00pm

*ECHI Conference Room  
Lunch followed by  
Poster Session (12:00 – 1:45pm)*

*Second Oral Session, ECHI Auditorium  
Moderator:*

- |         |             |  |   |
|---------|-------------|--|---|
| 1:45pm  | <b>OP6</b>  | <b>TRENDS IN AGGRESSIVENESS OF CANCER CARE AT THE END OF LIFE WITH IN RURAL POPULATION IN EASTERN NORTH CAROLINA</b>   | <u>P.Namireddy</u> , S.Macherla, JT. McClain, M.Muzaffar                                |
| 2:00pm  | <b>OP7</b>  | <b>THE LIPID RAFT PROTEIN PROHIBITIN DISPLAYS SYSTEMIC ANTI-INFLAMMATORY AND CARDIO-PROTECTIVE EFFECTS DURING SEPSIS</b>   | <u>CE Psaltis</u> , BJ Kilburg-Basnyat, KA Thayne, EJ Anderson, KM Gowdy                |
| 2:15pm  | <b>OP8</b>  | <b>THE ROLE OF HIGH-DENSITY LIPOPROTEINS IN PULMONARY IMMUNITY</b>   | <u>MJ Yaeger</u> , S Reece, B Kilburg-Basnyat, B Luo, M Fessler, MJ Thomassen, KM Gowdy |
| 2:30pm  | <b>OP9</b>  | <b>MANDATORY DOCUMENTATION OF TIDAL VOLUME ADJUSTED FOR PREDICTED BODY WEIGHT ON THE RESPIRATORY FLOW SHEET IMPROVES COMPLIANCE WITH LOW TIDAL VOLUME VENTILATION STRATEGY: A 5-YEAR TERTIARY CARE CENTER EXPERIENCE</b> | <u>M Dauterive</u> , F Houshmand, M Mazer, A Mohan                                      |
| 2:45pm  | <b>OP10</b> | <b>OUTCOMES OF ERCC1 HIGH LOCALLY ADVANCED ESOPHAGEAL CANCER PATIENTS TREATED WITH NON-PLATINUM VS PLATINUM BASED CHEMORADIATION.</b>  | <u>M Yogarajah</u> , CRG Stroud, AM Hegde, P Walker;                                    |
| 3:00pm  | <b>OP11</b> | <b>INAPPROPRIATE PROTON PUMP INHIBITOR USE IN MEDICAL INPATIENTS: A COMPARISON BETWEEN ACADEMIC AND HOSPITALIST SERVICE AT VIDANT MEDICAL CENTER</b>   | <u>N Gollol-Raju</u> , S Jayananda, G Harvin, W Leland, L Matarese                      |
| 3:15pm  | <b>OP12</b> | <b>MODIFIED GLASGOW PROGNOSTIC SCORE IN A NORTH AMERICAN POPULATION OF METASTATIC LUNG CANCER PATIENTS: BASELINE CHARACTERISTICS FROM THE SNAP TRIAL</b>   | <u>Stroud CRG</u> , Walker P  |
| 3:30 pm | <b>OP13</b> | <b>ANALYSIS OF SELECT ANTINUCLEAR ANTIBODIES IN SYSTEMIC LUPUS ERYTHEMATOSUS BY ENZYME IMMUNOASSAY: GENDER AND ETHNIC COMPARISON</b>   | <u>EL Treadwell</u> , P Garrett, R Ethridge, JV Cresenzo, J Christie                    |

3:45pm

*Closing Remarks and Award Presentations*  
**Paul Bolin, Jr., MD, Chair Department of Internal Medicine**  
**Yash P. Kataria, MD, Pulmonary and Critical Care, Professor Emeritus**

***Poster Presentations, ECHI Conference Room  
Research***

- PR1 IDENTIFICATION OF BIOMARKERS IN LUNG CANCER PATIENTS TREATED WITH IMMUNOTHERAPY TARGETING IMMUNE CHECKPOINT REGULATORS.** D Atwell, M Yogarajah, EJ Sanderlin, G Stroud, PR Walker, LV Yang
- PR2 COLONIC ENDOTHELIAL CELLS CONTRIBUTE TO INTESTINAL INFLAMMATION THROUGH THE PROTON- SENSOR GPR4 IN THE DSS- INDUCED COLITIS MOUSE MODEL.** E Sanderlin, K Lertpiriyapong, Q Cai, H Hong, V Bakthavatchalu, J Fox, JZ Oswald, C Justus, E Krewson, D O'Rourke, N Leffler, L Yang
- PR3 PROTON-SENSOR GPR4 ALTERS CYTOSKELETAL DYNAMICS AND PERMEABILITY OF VASCULAR ENDOTHELIAL CELLS** EA Krewson, LV Yang
- PR4 SMAD3 MEDIATES NOTCH INDUCED STEMNESS AND EPITHELIAL TO MESENCHYMAL TRANSITION IN COLORECTAL CANCER CELLS** A Clark, A Khan, G Sigounas
- PR5 NOTCH SIGNALLING MODULATES CHEMORESISTANCE IN COLORECTAL CANCER VIA EFFECTS ON DNA BASE EXCISION REPAIR PROTEINS** AH Khan, A Clark, G Sigounas
- PR6 RESVERATROL EXTENDS LIFESPAN AND DELAYS GERMLINE AGING THROUGH THE ACTIVATION OF BOTH SIR-2.1/ SIRTUIN AND MPK-1/ ERK** DS Yoon, Myon-Hee Lee
- PR7 DEVELOPMENT OF PERSONALIZED CANCER THERAPEUTIC VACCINE** D Wang, K Posekany, SE Eubanks, DA Weidner, DK. Liles, JE Wiley
- PR8 ACUTE MYELOID LEUKEMIA WITH T (2;6) (Q21; P25) AND HIGH LEVELS OF CD41 AND CD71 IN THE MYELOID BLASTS** D Wang, SE Eubanks, DA Weidner, DK Liles, JE Wiley
- PR9 COMPARISON OF A COMPUTER-BASED INTRAVENOUS INSULIN PROTOCOL WITH STANDARD PAPER PROTOCOL IN TERMS OF SAFETY AND EFFICACY IN MANAGEMENT OF DKA PATIENTS IN COMMUNITY HOSPITALS: A PILOT STUDY** M Azad, S Hardee, V Lin, R Tanenberg
- PR10 CEREBRAL AIR EMBOLISM AFTER CENTRAL VENOUS CATHETER REMOVAL – A CASE SERIES REVIEW** M Hafiz, T Neal, AR Naqash
- PR11 ARTERIAL CONTINUOUS RENAL REPLACEMENT THERAPY: A COMPLICATION OF THE PAST?** S Awadallah, R Sarsour, M Mazer, M Barchman
- PR12 EVALUATION OF TIMELY ANTIBIOTIC ADMINISTRATION IN ADULT PATIENTS WITH FEBRILE NEUTROPENIA AT VIDANT MEDICAL CENTER** J Baskett, E Kolychev, C Alligood
- PR13 TOCILIZUMAB FOR THE MANGEMENT OF IMMUNE MEDIATED ADVERSE EVENTS SECONDARY TO PD-1 BLOCKADE** Stroud CRG, Cherry CR, Naqash AR, Sharma N, Walker PW
- PR14 INCIDENCE AND IMPACT OF THROMBOEMBOLIC EVENTS IN LUNG CANCER PATIENTS TREATED WITH NIVOLUMAB.** AM Hegde, G Stroud, C Cherry, M Yogarajah, S Cherukuri, P Walker

- PR15 IMMUNE RELATED ADVERSE EVENTS (IRAE): A UNIQUE PROFILE DEPENDENT ON TUMOR TYPE.** N Sharma, P Atluri, PR Walker, G Stroud, P Gibbs
- PR16 NONCONVENTIONAL RESPONSES AND SURVIVAL BENEFIT OF IMMUNOTHERAPY IN ADVANCED LUNG CANCER** M Yogarajah, BS Kuszyk, CRG Stroud, CR Cherry, PR Walker
- PR17 POPULATION-BASED STUDY OF RACIAL DIFFERENCES IN OUTCOMES OF YOUNG BREAST CANCER PATIENTS** J McClain, M Muzaffar, C Mosquera, P Namireddy
- PR18 CLINICAL OUTCOMES AND CHALLENGES IN THE MANAGEMENT OF MULTIPLE MYELOMA IN EASTERN NORTH CAROLINA** S Addepalli, D Brigham, D Liles
- PR19 SUSTAINED VIROLOGIC RESPONSE WITH DIRECTLY ACTING ANTIVIRALS IN HIV COINFECTED HEPATITIS C PATIENTS AND ITS EFFECT ON LIVER FIBROSIS** D Lebron, A Stang, D Siraj, A Lagasca
- PR20 A RETROSPECTIVE STUDY TO LOOK AT HIV PATIENTS WITH PNEUMOCYSTIS JIROVECI PNEUMONIA AND THE EFFECTS OF HAART THERAPY** P Shah, J Polak, N Fadul
- PR21 IMPROVING THE PERCENTAGE OF HEMODIALYSIS PATIENTS CONSENTING TO HEPATITIS B VACCINATION** SA Ali, CB Locke, CR Christiano

***Poster Presentations, ECHI Conference Room  
Clinical Vignette***

<b>PV1</b>	<b>A FASCINATING CASE OF ANTI GLOMERULAR BASEMENT MEMBRANE DISEASE WITH CO-EXISTING ANTI NEUTROPHIL CYTOPLASMIC ANTIBODY FOLLOWING AORTIC DISSECTION.</b>	<u>SA Ali</u> , WA Davila, RI Obi
<b>PV2</b>	<b>NAIL-PATELLA SYNDROME, AN UNCOMMON CAUSE OF HEMATURIA/PROTEINURIA.</b>	<u>SA Ali</u> , A Rice, W Badwan
<b>PV3</b>	<b>ONE WAY TO AVOID YARDWORK</b>	<u>P. Shah</u> , <u>A. Stang</u> , D. Markham, and N. Fadul
<b>PV4</b>	<b>POTT'S DISEASE – AN UNUSUAL CAUSE OF BACK PAIN IN THE UNITED STATES</b>	<u>A. Stang</u> , P. Shah, and N. Fadul
<b>PV5</b>	<b>AN UNUSUAL CASE OF POST-TRAUMATIC WOUND INFECTION</b>	<u>D Lebron</u> , A Stang, P Cook
<b>PV6</b>	<b><i>NOCARDIA BRASILIENSIS</i> INFECTION IN AN IMMUNOCOMPETENT PATIENT</b>	<u>D Lebron</u> , A Stang, A Lagasca
<b>PV7</b>	<b>NON-STAPHYLOCOCCAL AND NON-STREPTOCOCCAL SKIN INFECTIONS</b>	<u>J Hussain</u> ; N Patel; C Phillips
<b>PV8</b>	<b>ACANTHOSIS NIGRICANS AND HYPERPIGMENTATION ARISING IN PATIENT WITH TYPE B INSULIN RESISTANCE AND SYSTEMIC LUPUS ERYTHEMATOSUS</b>	RH Jonas, <u>SE Nichols</u> , WA Burke
<b>PV9</b>	<b>A CASE OF HEREDITARY HEMOCHROMATOSIS – THE CLUES WERE IN THE ENDOCRINE SYSTEM</b>	<u>G Johnston</u> , B Simpson, F Cook
<b>PV10</b>	<b>CONTRASTING CASES OF TYPE B INSULIN RESISTANCE RESPONDING TO AN IMMUNOSUPPRESSIVE PROTOCOL</b>	<u>Averneni M</u> , Azad MR, Giordano J, Kalia-Reynolds MS, Cook FJ, Houston C
<b>PV11</b>	<b>MEDIASTINAL PARATHYROID ADENOMA IN A PATIENT WITH TERTIARY HYPERPARATHYROIDISM</b>	<u>S Shaik</u> , B F Simpson, F Cook
<b>PV12</b>	<b>CARDIAC METASTASIS AS INITIAL SITE OF RECURRENCE IN RECTAL CANCER</b>	<u>P.Namireddy</u> , S. Macherla, JT.McClain, M. Muzaffar
<b>PV13</b>	<b>RARE MANIFESTATIONS OF KAPOSI SARCOMA</b>	<u>DA Uddin</u> , BU Patel
<b>PV14</b>	<b>A RARE CASE OF CNS MARGINAL ZONE LYMPHOMA, MUCOSAL ASSOCIATED LYMPHOID TISSUE (MALT)-TYPE INVOLVING THE DURA WITH POSSIBLE ENT METASTASIS.</b>	<u>P Moore</u> , D Liles, A Weil, H Arastu
<b>PV15</b>	<b>ROTHIA MUCILAGINOSA PNEUMONIA IN AN IMMUNOCOMPETENT PATIENT DIAGNOSED BY BRONCHOSCOPY AND FINE NEEDLE ASPIRATION</b>	<u>A El-Bakush</u> , M Rizwan, B Kabchi, M Bowling
<b>PV16</b>	<b>A CASE OF CHYLOTHORAX AND CHYLOUS ASCITIS IN AN HIV PATIENT WITH KAPOSI SARCOMA</b>	<u>A El-Bakush</u> , M Al-Janabi, S Chalise, V Ramsammy
<b>PV17</b>	<b>CONSOLIDATING A RARE CONSOLIDATION</b>	<u>S Marco</u> , D Thompson, R Talento, A Mohan



<b>PV18</b>	<b>IMPLICATION OF STEROID THERAPY IN SECONDARY OPPORTUNISTIC PNEUMONIA</b>	<u>AJ Choe</u> , BU Patel, K Malik, C Brown, L Hobgood
<b>PV19</b>	<b>FAMILIARITY BIAS DELAYING DIAGNOSIS OF PROSTATIC NEUROENDOCRINE CARCINOMA</b>	<u>AJ Choe</u> , JM Garber, A Vigg
<b>PV20</b>	<b>SINUS OF VALSALVA ANEURYSM RUPTURE: A RARE PRESENTATION OF RARE DISEASE</b>	<u>M Rizwan</u> , A EL-Bakush, I Osman, S Awadallah, T Pancoast
<b>PV21</b>	<b>RECOVERY AFTER PROLONGED / EXTREME HYPOGLYCEMIC COMA</b>	<u>SN Chalise</u> , MG Al-janabi, MZ Rizwan, ZU Rehman
<b>PV22</b>	<b>FEVER OF UNKNOWN ORIGIN, MULISYSTEM INFLAMMATION AND POLYARTHRALGIA: A CASE REPORT FOR ADULT ONSET STILL DISEASE</b>	<u>D. Langston</u> , N. Nehus, J. Stahl
<b>PV23</b>	<b>AN UNUSUAL CAUSE OF INTERMITENT MELENA</b>	<u>H Movahed</u> , A Raina, MM Abdelfatah, S Kachru, H Khalid
<b>PV24</b>	<b>A CASE OF COLONIC LEIOMYOMA, AN UNCOMMON COLON POLYP</b>	<u>H Movahed</u> , MM Abdelfatah, S Sanaka, H Khalid
<b>PV25</b>	<b>LEIOMYOSARCOMA INVOLVING THE PANCREAS DIAGNOSED BY ENDOSCOPIC ULTRASOUND FINE- NEEDLE ASPIRATION</b>	E Gochanour, M Abdelfatah, <u>A Hamed</u> , W Leland
<b>PV26</b>	<b>ENDOSCOPIC ULTRASOUND-GUIDED FIDUCIAL PLACEMENT IN RECURRENT POST-RESECTION GASTRIC ADENOCARCINOMA</b>	E Gochanour, M Abdelfatah, <u>A Hamed</u> , W Leland
<b>PV27</b>	<b>CORTICAL BLINDNESS DUE TO CONTRAST-INDUCED NEUROTOXICITY AFTER CARDIAC CATHETERIZATION</b>	<u>GA Koromia</u> , AN Tomdio, JR Powell
<b>PV28</b>	<b>FREE FLOATING RIGHT ATRIAL THROMBUS PRESENTING AS NEW ONSET ATRIAL FIBRILLATION</b>	<u>B Sivasambu</u> , D Kabirdas



In 2008, the annual departmental research day program was dedicated and renamed the **Yash P. Kataria Internal Medicine Research Day** to honor the many contributions of Dr. Yash P. Kataria and to support the educational and research program in the Department of Internal Medicine at the Brody School of Medicine at ECU.

Dr. Kataria is Professor Emeritus of Medicine at BSOM and continues to contribute actively to the clinical, educational and research mission of the pulmonary and critical care division at BSOM. He was the first pulmonologist in eastern NC and helped to establish the pulmonary specialty at BSOM 30 years ago and has been an integral force since the inception of the medical school. Yash was the first division chief of pulmonary medicine at BSOM and successfully recruited and established a clinical and active laboratory research program. Yash was the section head of pulmonary at BSOM /PCMH from 1978-1995, Vice Chair of the Dept. of Medicine 1987-1992 and Interim Chair 1986-87. Yash is of course known regionally, nationally and internationally for his passion in translational research with a particular focus on sarcoidosis. He has authored over 70 publications, has received the Trudeau Award from the American Lung Association, Lifetime Achievement Award by the NC Thoracic Society, on many occasions been listed on the “Best Doctors” list, has been a reviewer and/or on editorial board for numerous specialty journals.

Over his 30 year career, he has cared for thousands of patients with sarcoidosis and he arguably has one of the largest sarcoid cohorts in the US. Yash is revered by his patients and families. Yash has literally trained hundreds of medical students and house staff and is cherished by them as a role model and outstanding teacher at the bedside and in clinics. Yash has been a fixture in the international sarcoid community and has contributed actively at a leadership level at ACCP, ATS and WASOG. Scientifically, Yash is perhaps best known for promulgating a paradigm shift in our understanding of sarcoid immunology. While it was accepted dogma in the 70s that sarcoidosis was a disease of “depressed immunity” and anergy, Yash proposed and championed the concept that it is a pro-inflammatory disease with involvement of activated T-cells, cytokines, etc. Yash and his group also proposed that the active “sarcoid factor” was localized to the cell walls of alveolar macrophages and monocytes or an “autologous kveim” model (this remains an intriguing hypothesis!).

One of the missions of the medical school is community service in which medical school faculty plunged deeply. Yash lived in and loved Greenville where he raised two lovely children.

He was actively involved in the J. H Rose Attendance Area Foundation Advisory Committee; also served as a Member Board of Academic Boosters Club, Rose High School, Greenville, NC and President, Parent Teacher Association, Greenville Middle School, Greenville, NC. He also helped to develop support groups for patients with sarcoidosis & COPD and played leadership roles in the local American Lung Association of NC. We are honoring Dr. Kataria by dedicating our annual Internal Medicine Research Day, which he started in 1987, to the **Yash P. Kataria Internal Medicine Research Day**. We will continue to build on the tradition of encouraging research by inviting leading guest speakers and facilitating scholarship and interaction by our trainees and faculty.

## ***Keynote Address:***

### ***“The Clinical Mycology Laboratory: Guiding Therapeutic Choices”***

***Barbara Alexander, MD***

***Director, Transplant Infectious Diseases Service***

***Head, Clinical Mycology Laboratory***

***Director, Medical Microbiology & Transplant ID Fellowship Programs***

***Professor of Medicine and Pathology***

***Duke University***



**Barbara D. Alexander, MD, MHS** is Professor of Medicine (with tenure) and Pathology, Director of Transplant Infectious Disease (ID) Services, and Head of the Clinical Mycology Laboratory at Duke. Dr. Alexander completed graduate studies at Duke where she honed her skills as a medical mycologist prior to receiving her medical degree from East Carolina University. She returned to Duke for internal medicine residency, ID and medical microbiology fellowships and obtained a Masters in Health Science in Clinical Research. Dr. Alexander has served on the Board of Directors for the Infectious Diseases Society of America and is currently Associate Deputy Editor for the Clinical Infectious Diseases journal and Chair of the Clinical and Laboratory Standards Institute Subcommittee on Antifungal Tests.

Dr. Alexander is an NIH-funded researcher, currently serving as Principal Investigator for the NIH NIAID T32 multidisciplinary, institutional physician scientist training program in Transplant ID. She has established a highly effective mentoring environment which to date has resulted in 9 competitive NIH-funded training awards for mentees and the successful launch of the recipient's academic careers. Her research efforts have led to standardized methods for susceptibility testing and interpretive breakpoints and epidemiologic cutoff values for fungi, FDA approval of new diagnostic tests and antifungal agents, as well as pivotal national epidemiologic investigations of fungal disease in transplant and immunocompromised host populations. She has also successfully collaborated with basic scientists to probe the molecular basis for fungal virulence and host susceptibility to invasive aspergillosis and candidemia. She has created two invaluable biorepositories, serving as Co-PI of the NIH-funded AsTeC Databank and Repository and PI of the Transplant Registry and Specimen Bank, which contain human data, specimens, and clinical isolates for research use.

Dr. Alexander has lectured nationally and internationally, has authored over 150 articles, book chapters, white papers and publications for mass distribution, and is considered a thought leader in the field of transplant ID and fungal infections.

## The Keynote Address - Celebrating 31 Years

- |   |  |
|---|--|
| <p><b>1987 Morris Reichlin, MD</b><br/> <i>Professor of Medicine<br/>           University of Oklahoma, School of Medicine</i></p>  | <p><b>2003 Jeffrey P. Engel, MD</b><br/> <i>Division Head, General Communicable Disease Control<br/>           State Epidemiologist, Division of Public Health<br/>           NC Department of Health and Human Services</i></p>                                   |
| <p><b>1988 Jesse Roth, MD</b><br/> <i>Director, Intramural Research<br/>           National Institute of Diabetes and Digestive and<br/>           Kidney Diseases, NIH</i></p>                         | <p><b>2004 Helen Burstin, MD, MPH</b><br/> <i>Director of the Center for Primary Care, Prevention and<br/>           Clinical Partnerships, Agency for Healthcare Research<br/>           and Quality</i></p>  |
| <p><b>1989 Roy Patterson, MD</b><br/> <i>Professor and Chair<br/>           Department of Medicine<br/>           Northwestern University Medical School</i></p>  | <p><b>2005 Marschall S. Runge, MD, PhD</b><br/> <i>Chair, Department of Medicine<br/>           University of North Carolina at Chapel Hill<br/>           President , UNC Physicians</i></p>  |
| <p><b>1990 Edward W. Hook, MD</b><br/> <i>Professor and Chair<br/>           Department of Medicine<br/>           University of Virginia, Health Sciences Center</i></p>                               | <p><b>2006 Jose Caro, MD</b><br/> <i>Vice President, Endocrine Research and Clinical<br/>           Investigation<br/>           Lilly Corporate Center, Indianapolis</i></p>  |
| <p><b>1991 Albert F. LoBuglio, MD</b><br/> <i>Director, Comprehensive Cancer Center<br/>           Director, Division of Hematology/Oncology<br/>           University of Alabama at Birmingham</i></p> | <p><b>2007 William Stratford May, MD, PhD</b><br/> <i>Chair, Hematology and Oncology<br/>           Director, Shands Cancer Center<br/>           University of Florida</i></p>  |
| <p><b>1992 Raj K. Goyal, MD</b><br/> <i>Harvard Medical School<br/>           Chief Gastroenterology Division<br/>           Beth Israel Hospital</i></p>   | <p><b>2008 Phillip A. Bromberg, MD</b><br/> <i>Bonner Professor of Medicine<br/>           Scientific Director of the Center for Environmental<br/>           Medicine, Asthma and Lung Biology<br/>           University of North Carolina at Chapel Hill</i></p> |
| <p><b>1993 Richard E. Kerber, MD</b><br/> <i>Professor of Medicine<br/>           Associate Director Cardiovascular Division<br/>           The University of Iowa College of Medicine</i></p>          | <p><b>2009 Randy L. Jirtle, PhD</b><br/> <i>Professor of Radiation Oncology and Pathology<br/>           Duke University Medical Center</i></p>  |
| <p><b>1994 James S. Louie, MD</b><br/> <i>Chief, Division of Rheumatology<br/>           Department of Medicine<br/>           Harbor-UCLA Medical Center</i></p>                                       | <p><b>2010 Robert M. Lust, PhD</b><br/> <i>Interim Associate Dean, Research and Graduate Studies<br/>           Chair, Department of Physiology<br/>           East Carolina University, Brody School of Medicine</i></p>  |
| <p><b>1995 Matthew I. Gilmour, B.SC., PhD</b><br/> <i>Center for Environmental Medicine and Lung Biology<br/>           University of North Carolina at Chapel Hill</i></p>                             | <p><b>2011 David C. Goff Jr., MD, PhD</b><br/> <i>Chair, Department of Epidemiology and Prevention<br/>           Division of Public Health Services<br/>           Wake Forest University School of Medicine</i></p>  |
| <p><b>1998 O. Michael Colvin, MD</b><br/> <i>William Singleton Professor of Cancer Research<br/>           Director, Duke Comprehensive Cancer Center</i></p>   | <p><b>2012 Vinay Kumar, MBBS, MD, FRCPath</b><br/> <i>Donald N Pritzker Professor and Chair<br/>           Department of Pathology<br/>           University of Chicago</i></p>  |
| <p><b>1999 Jerry Palmer, MD</b><br/> <i>Professor of Medicine<br/>           Director, Diabetes Research Center<br/>           University of Washington</i></p>   | <p><b>2013 Paul W. Nobel, MD</b><br/> <i>Chair, Department of Medicine<br/>           Director, Women's Guild Lung Institute<br/>           Cedars-Sinai, Los Angeles, California</i></p>  |
| <p><b>2000 Thomas Feldbush, PhD</b><br/> <i>Vice Chancellor for Research and Graduate Studies<br/>           Dean, Graduate School<br/>           East Carolina University</i></p>                      | <p><b>2014 Vishva Dixit, MD</b><br/> <i>Vice President<br/>           Early Discovery Research<br/>           Genentech, Inc.</i></p>  |
| <p><b>2001 William B. Applegate, MD, MPH</b><br/> <i>Professor and Chair<br/>           Department of Internal Medicine<br/>           Wake Forest University School of Medicine</i></p>                | <p><b>2015 Jerry R. Mendell, MD</b><br/> <i>Curran-Peters Chair in Pediatric Research<br/>           Professor of Pediatrics and Neurology<br/>           Nationwide Children's Hospital and The Ohio State University</i></p>                                     |
| <p><b>2002 William Roper, MD, MPH</b><br/> <i>Dean, School of Public Health<br/>           University of North Carolina at Chapel Hill.</i></p>   | <p><b>2016 Manoocher Soleimani, MD</b><br/> <i>James F Heady Professor of Medicine<br/>           Department of Medicine, Nephrology and Hypertension<br/>           University of Cincinnati</i></p>  |

## ***W. James Metzger, Jr., MD Award***

The W. James Metzger, Jr., M.D. award is presented to the most outstanding presentation by a junior faculty member in the Department of Internal Medicine. A peer-review process selects the winner. The recipient of the award receives a certificate and has his/her name engraved on a plaque that is displayed in the Department of Internal Medicine Library. The recipient also receives recognition on the Department of Internal Medicine web site.

Dr. Metzger, a native of Pittsburgh, Pennsylvania, was a graduate of Stanford University and Northwestern University Medical School, Chicago, Illinois. He completed his residency and research fellowship in Allergy-Clinical Immunology at Northwestern University. After serving in the United States Air Force, he came to Greenville in 1984 to join the East Carolina University School of Medicine. During his tenure at East Carolina University, Dr. Metzger rose to the rank of Professor of Medicine. He was Section Head of the Section of Allergy-Immunology and held the appointments of Vice Chairman of Research, Department of Internal Medicine; Executive Director, the Center for Asthma, Allergy, and Immunology; Assistant Vice Chancellor for Clinical Research; Assistant Dean for Clinical Research; and Director, Clinical Trials Office. He was the recipient of the East Carolina University Award for Excellence in Research and Creative Activity and the Distinguished Research Professor of Medicine. His research was published in the New England Journal of Medicine, Nature, and other journals. Dr. Metzger had mentored numerous faculty and fellows.

In August 2000 Dr. Metzger accepted a position as Professor of Allergy, Asthma and Immunology at the National Jewish Medical and Research Center and was a faculty member at the University of Colorado Medical School, Denver, Colorado. He died on November 11, 2000 at the age of 55. Dr. Metzger represented excellence in research.

### **2001 Recipients:**

**Carlos A. Estrada, MD, MS**  
**Paul Mehlhop, MD**

### **2003 Recipient:**

**Lisa Staton, MD**

### **2004 Recipient:**

**Cassandra Salgado, MD**

### **2005 Recipient:**

**Barbara J. Muller-Borer, PhD**  
Cardiology

### **2006 Recipient:**

**Timothy P. Gavin, PhD**  
Human Performance

### **2007 Recipient:**

**Christopher Newton, MD**  
Endocrinology

### **2008 Recipient:**

**Li Yang, PhD**  
Hematology/Oncology

### **2009 Recipient:**

**Li Yang, PhD**  
Hematology/Oncology

### **2010 Recipient:**

**Sunil Sharma, MD**  
Pulmonary

### **2011 Recipient:**

**Sunil Sharma, MD**  
Pulmonary

### **2012 Recipient:**

**Maria Ruiz-Echevarria, PhD**  
Hematology/Oncology

### **2013 Recipient:**

**Moahad Dar, MD**  
Endocrinology

### **2013 Recipient:**

**Moahad Dar, MD**  
Endocrinology

### **2014 Recipient:**

**Mark Bowling, MD**  
Pulmonary

### **2015 Recipient:**

**Hsaio Lai, MD**  
Nephrology

### **2016 Recipient:**

**Geoffrey Stroud, PharmD**  
Pharmacy-LJCC

# **ABSTRACTS**

## **In Presentation Order**

OP = Oral Presentation

PR = Poster Research

PV = Poster Vignette

## OP1

### AN INTERVENTION STUDY TO REDUCE BLACK-WHITE TREATMENT DISPARITIES IN EARLY STAGE NON-SMALL CELL LUNG CANCER

P Walker, S Cykert, L Edwards, R Arya, P Dilworth-Anderson

**Background:** Racial disparities in the treatment of non-small lung cancer (NSCLC) continue to exist leading to poorer outcomes in African-Americans (AA) compared to Caucasians (C). Our previous multi-institutional prospective cohort study of 386 patients identified a surgical rate in early stage NSCLC of 66% C but only 55% AA ( $p = 0.05$ ; OR 0.75; 95% CI 0.57-0.99). (Cykert *et al JAMA 2010*) To further strengthen our data, a 3 year retrospective chart review for all patients with early stage NSCLC at the 3 academic institutions involved in this current intervention study was undertaken. 714 patients with early stage NSCLC were reviewed. Baseline surgical rates 69% for C and 66% for AA. Combined stereotactic body radiation therapy (SBRT) with surgery C 80% and AA 76%.

**Methods:** Patients with a stage I or II NSCLC were identified and prospectively randomized to each institution's standard of care approach or to an 'Intervention' component utilizing a trained navigator to enhance patient communication and treatment understanding.

**Results:** 244 patients were prospectively recruited. Mean age 65.7 years; 54% women; 89 (34%) AA. The intervention group showed an overall surgical rate of 74% (74.8% C, 71.4% AA;  $p = 0.6$ ). Combined treatment of either surgery or SBRT increased an ablative treatment to 91.9% for C and 94.1% AA patients ( $p = 0.5$ ). Logistic regression was performed comparing the intervention group to the baseline group. Results showed that overall treatment improved for both C and AA, the surgical and overall treatment disparity between C and AA was no longer present, while age, COPD, and clinical stage remained significant predictors of treatment.

**Conclusions:** Early results from a multifaceted intervention designed to enhance patient communication and treatment understanding removed the surgical and overall early lung cancer treatment disparity between AA and C.

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## OP2

### EFFICACY OF ANTI-PD-1 INHIBITORS IN NSCLC PATIENTS WITH KRAS AND T790M MUTATIONS

N Sharma, PR Walker, G Stroud, C Cherry, S Cherukuri T Parent, J Hardin

**Background:** Immune checkpoint blockade (ICB) has revolutionized the treatment paradigm of progressive NSCLC with its astounded durable benefit when compared to cytotoxic agents. In the era of personalized medicine, there exists a need to identify effective predictive biomarkers to detect potential immune responders. Immune modulating interventions with cytotoxic or biologic agents can maximize clinical responses from ICB in potentially less immunogenic tumors. KRAS mutations are a negative prognostic factor for survival and lack targeted therapies. T790M mutations tend to be resistant to first and second line EGFR TKIs. The efficacy of ICB agents in this cohort of patients remains to be studied.

**Methods:** We reviewed data of 83 patients with recurrent or metastatic lung cancer treated with nivolumab from June 2015-Dec 2016. The patients were further assessed for tumor pathology, mutation status and progression free survival on nivolumab. The mutation status was checked on either tissue biopsy or serum samples submitted for proteomic veristat/genestrat assay.

**Results:** Of the 83 patients treated with nivolumab, 65 patients were found to have NSCLC. 11 patients were found to have KRAS mutation which was further subdivided as: 6 patients with KRAS G12C, 4 with KRAS G12V, 1 with KRAS G12D. 2 patients were found to have T790M mutation. 9/11(81%) patients with KRAS mutation died. Patients with KRAS G12C mutation were found to have survival ranging from 6 – 33 weeks, KRAS G12V with survival range of 4-52 weeks. 2/2 patients with T790M mutation were surviving at 35 and 55 weeks respectively.

**Conclusion:** KRAS mutations tend to have a shorter progression free survival with ICB as compared to mutations like T790M. T790 M mutation is associated with higher immunogenicity, which causes more avid stimulation of antigen specific T-cells (Ofuzi *et al*), thus better response to ICB. Further studies are required to recognize the subsets with poor response to immune therapy which may require a different strategic approach to maximize outcome.

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### OP3

#### EFFICACY AND SAFETY OF INSULIN ASPART 30 AND INSULIN DEGLUDEC/ASPART VERSUS BASAL INSULIN IN PATIENTS WITH TYPE 2 DIABETES: A META-ANALYSIS

BM Mishriky, RJ Tanenberg, DM Cummings

**Introduction:** Current guidelines for Type 2 diabetes (T2D) recommend antidiabetic medications in a sequential order. Commonly used options include basal insulin either glargine or detemir (Basal), insulin aspart 30 (BIAsp), insulin degludec/aspart (IDegAsp).

**Methods:** We searched MEDLINE (until 12/2016) for randomized trials comparing BIAsp, IDegAsp, and basal insulin to each other in T2D.

**Results:** We included 16 articles (BIAsp vs basal = 7, IDegAsp vs BIAsp = 5, and IDegAsp vs basal = 4). Results are shown in Table 1. When BIAsp was compared to basal, BIAsp caused a statistically significant reduction in hemoglobin A1c (A1c), a higher % achieving A1c <7%, and a higher % of mild and nocturnal hypoglycemia. When IDegAsp was compared to BIAsp, IDegAsp caused a higher % of patients achieving A1c <7% without hypoglycemia and a lower % of nocturnal hypoglycemia. When IDegAsp was compared to basal, IDegAsp caused a significantly lower % of nocturnal hypoglycemia.

**Conclusion:** We conclude that when compared to basal, BIAsp caused a more significant drop in A1c (-0.25%) but with a higher incidence of mild hypoglycemia (60% vs 48%). When IDegAsp was compared to basal, there was no significant difference in outcomes. There was no significant difference in the incidence of severe hypoglycemia in all the analyses.

Table 1	BIAsp vs Basal	IDegAsp vs BIAsp	IDegAsp vs Basal
<b>Results are MD [95% CI]</b>			
Δ in A1c (%)	<b>-0.25[-0.38, -0.13]</b>	0.02[-0.08, 0.13]	-0.01[-0.12, 0.10]
<b>Results are RR [95% CI]</b>			
% A1c <7.0%	<b>1.23[1.06, 1.42]</b>	0.99[0.88, 1.11]	1.15[0.96, 1.37]
% A1c <7.0% with no hypo	0.98[0.85, 1.14]	<b>1.45[1.22, 1.74]</b>	1.16[0.77, 1.74]
% all hypo	<b>1.29[1.13, 1.47]</b>	0.92[0.84, 1.01]	1.09[0.98, 1.21]
% severe hypo	1.38[0.75, 2.55]	0.63[0.32, 1.26]	0.52[0.08, 3.21]
% Noct hypo	<b>1.46[1.19, 1.80]</b>	<b>0.63[0.49, 0.80]</b>	<b>0.55[0.32, 0.96]</b>

Hypo: Hypoglycemia; Noct: Nocturnal

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### OP4

#### SEQUENCE OF STEREOTACTIC ABLATIVE RADIOTHERAPY AND IMMUNE CHECKPOINT BLOCKADE IN THE TREATMENT OF METASTATIC LUNG CANCER

R Pinnamaneni, A Hegde, S Cherukuri, C Cherry, G Stroud, M Bowling, H Arastu, C Leinweber, PR Walker

**Background and Objectives:** Monoclonal antibodies targeting immune checkpoint proteins have recently been shown to elicit robust and durable responses in patients with advanced lung cancer. However, with response rates ranging from 15-20%, immune-modulatory strategies are needed to improved outcomes. Stereotactic ablative radiotherapy (SABR) may be a promising immunomodulatory strategy given its synergistic effects without added toxicity. Several pre-clinical trials combining SABR and immunotherapy have shown improvement in progression free and overall survival. Given this, it has been our multidisciplinary programmatic approach to bring in SABR in patients receiving immunotherapy for a potential immune boost.

**Methods:** This is a retrospective study evaluating the overall survival (OS) of all lung cancer patients who received Nivolumab with SABR at our institution. We included lung cancer patients of all pathologic subtypes who received Nivolumab. We identified patients who received SABR, to sites of symptomatic metastatic disease within 30 days preceding (Before) or during (Sandwich) Nivolumab treatment.

**Results:** Out of 76 lung cancer patients treated with Nivolumab, 22 received RT- 10 Before and 12 Sandwich. At a median follow up time of 10.6 months (mo), median OS for patients with no RT was 4.8 mo, Before was 5.2 mo and Sandwich was not reached (NR) (p = 0.06). The 1 year OS for the Sandwich arm was 52.1%. When compared to no RT, the before arm had a statistically insignificant reduction in mortality (HR 0.59, 95% CI 0.25 – 1.41, p = 0.24). The Sandwich arm had a statistically significant reduction in mortality (HR 0.37, 95% CI 0.14 – 0.94, p= 0.04).

**Conclusion:** There is an improvement in OS when SABR is administered as a Sandwich approach during Nivolumab treatment, likely due to SABR-induced neoantigen release, increased PDL1 expression and subsequent abscopal effect. Further prospective studies are needed to evaluate optimal sequencing, dose and site of RT with immunotherapy.

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## OP5

### ROSIGLITAZONE REPRESSES PULMONARY GRANULOMA FORMATION AND ALVEOLAR MACROPHAGE INFLAMMATORY ACTIVATION

M McPeck, A Malur, BP Barna, L Dobbs, MJ Thomassen

**Background:** Sarcoidosis is a debilitating inflammatory condition characterized by granulomatous lesions in the affected organ. We have previously developed a murine model of chronic granulomatous inflammation elicited by multiwall carbon nanotubes (MWCNT). Previous studies have shown the MWCNT model shares several characteristics with pulmonary sarcoidosis, including decreased expression and activity of peroxisome proliferator activated receptor- $\gamma$  (PPAR $\gamma$ ) and elevated expression of CCL2 and osteopontin, two proteins thought to promote granuloma formation. PPAR $\gamma$  is a ligand activated transcription factor known to regulate pro-inflammatory macrophage activation. Interestingly, macrophage specific PPAR $\gamma$ -knockout mice demonstrate more robust granuloma formation and inflammatory cytokine production compared to wild-type animals following MWCNT instillation. These observations suggest that PPAR $\gamma$  has a crucial role in the regulation of pulmonary granuloma formation. We hypothesized that the PPAR $\gamma$  specific ligand rosiglitazone (Avandia) would limit granulomatous inflammation and reduce pro-inflammatory alveolar macrophage activation following MWCNT instillation. **Methods:** C57Bl/6 wild type mice were given a rosiglitazone laden diet (6mg/kg/day) three days prior and continuing until 10 or 20 days post MWCNT instillation. Alveolar macrophages and whole lung tissue were collected and evaluated for inflammatory gene expression and histological changes in granulomatous lesions using a previously developed scoring system. **Results:** Animals instilled with MWCNT receiving rosiglitazone laden diet for 10 days demonstrated a 90% reduction in CCL2 and 75% reduction in osteopontin mRNA expression compared to mice receiving control diet ( $n \geq 3$ /group,  $p < 0.001$ ). The frequency and severity of granulomatous lesions were also evaluated but did not demonstrate a significant change 10 days following MWCNT instillation ( $n = 5$ /group). However, those animals which received rosiglitazone laden diet for 20 days following MWCNT instillation were found to have significantly less granulomatous lesions when evaluating their frequency and severity ( $n = 6$ /group,  $p = 0.01$ ). **Conclusions:** These data suggest that PPAR $\gamma$  activation can limit alveolar macrophage inflammatory gene expression and may serve as a novel target to limit pulmonary granuloma formation.

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## OP6

### TRENDS IN AGGRESSIVENESS OF CANCER CARE AT THE END OF LIFE WITH IN RURAL POPULATION IN EASTERN NORTH CAROLINA

P.Namireddy, S.Macherla, JT. McClain, M.Muzaffar

**Background:** To determine the aggressiveness of cancer care at the end of life, and to identify any disparities based socioeconomic factors such as race, gender, family support, and marital status.

**Methods:** This retrospective data examined 401 patients with metastatic solid-organ tumors who died between January 2011 and May 2014, within a rural population in Eastern North Carolina. Aggressiveness of end-of-life care was calculated by a composite measure adopted from Earle et al. Scores range from 0 to 7 with higher scores indicating more aggressive end-of-life care.

**Results:** Among the 401 patients, 217 (54%) were white and 178 (44%) were black. The mean composite score of aggressiveness for white patients was 1.180 and for black patients it was 1.865. ( $p < 0.001$ ).

In the 30 days prior to death, a higher proportion of black patients had greater than 2 ED visits (28 vs 13%), greater than 2 hospital admission (23% vs 13%), any ICU admission (29% vs 16%), chemotherapy in the last 14 days (30% vs 20%), greater than 14 hospitalized days (35% vs 21%), and in-hospital deaths (46% vs 32%) compared to white patients. In the 30 day prior to death, more white patients enrolled in Hospice compared to black patients (53% vs 45%). We observed 72% of black patients compared to 52% white patients had at least one indicator of aggressive care.

In addition to racial differences, trends in mean composite score were observed in males vs females (1.538 vs 1.425), married vs not married (1.348 vs 1.631), and those with family support vs no family support (1.368 vs 1.894).

**Conclusions:** Patients tended to receive more aggressive care if they were black, male, not married at the time of death, or had no family support. Special focus and access to palliative care should be aimed at these groups

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## OP7

### THE LIPID RAFT PROTEIN PROHIBITIN DISPLAYS SYSTEMIC ANTI-INFLAMMATORY AND CARDIO-PROTECTIVE EFFECTS DURING SEPSIS

CE Psaltis, BJ Kilburg-Basnyat, KA Thayne, EJ Anderson, KM Gowdy

**Background:** Sepsis, a systemic inflammatory response to infection, is a leading cause of mortality worldwide. Maintaining cardiac function during sepsis is critical to improve patient outcomes. Prohibitin (PHB), a lipid-raft protein, has multiple roles in mitochondrial structure, metabolism, differentiation, inflammation and cell death. However, PHB's role in sepsis has been unexplored.

**Methods:** Using an *in vivo* model of sepsis, we intraperitoneal (i.p.) injected C57Bl/6J mice with 12mg/kg lipopolysaccharide (LPS). Following LPS, mice were given 12µg/kg recombinant prohibitin (rPHB) i.p. Cardiac function was measured via echocardiogram. Blood was used for systemic immune cell characterization by flow cytometry. HL1 cells (mouse atrial cardiomyocyte lineage) either overexpressing PHB or deficient in PHB exposed to TNF-α/IL-1β were used to measure mitochondrial function and pro-inflammatory cytokines.

**Results:** Systemic LPS decreased cardiac function but increased blood neutrophils (PMNs) (CD45<sup>+</sup>Ly6G<sup>+</sup>) and PMN expression of CD11b. However, rPHB restored LPS decreases in cardiac contractility and decreased CD11b expression. When cardiomyocytes were dosed with TNF-α/IL-1β there was a significant increase in pro-inflammatory cytokine expression, mitochondrial ROS, decreased mitochondrial respiration, ATP production, and total calcium retention capacity. However, when cardiomyocytes incubated with TNF-α/IL-1β were either treated with rPHB or over-expressed PHB, mitochondrial dysfunction and increased pro-inflammatory cytokine expression were mitigated.

**Conclusions:** We have found that PHB decreases systemic inflammation during sepsis by decreasing neutrophil maturation/recruitment and restores cardiac contractility. PHB significantly blunts pro-inflammatory cytokine expression and improves mitochondrial function in cardiomyocytes. These findings illustrate PHB's cardio-protective effects and its diverse roles in enhancing mitochondrial function and regulating innate immunity. Future studies will investigate the exact mechanism of PHB on mitochondrial function and innate immunity.

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## OP8

### THE ROLE OF HIGH-DENSITY LIPOPROTEINS IN PULMONARY IMMUNITY

MJ Yaeger, S Reece, B Kilburg-Basnyat, B Luo, M Fessler, MJ Thomassen, KM Gowdy

**Background:** High-Density Lipoproteins (HDL) have traditionally been shown to be biologically protective against metabolic and cardiovascular disease. Recently, studies have reported an inverse correlation between levels of serum HDL and severity of lung diseases. However, how HDL communicates with the lung is still unknown. Therefore, we hypothesize that HDL is critical in preventing pulmonary injury through modulation of cholesterol receptors during pulmonary inflammation. This will be tested utilizing exposure to aerosolized lipopolysaccharide (LPS), a standard model of acute pulmonary injury that induces neutrophil influx to the lungs.

**Methods:** C57BL/6J mice were pretreated with either phosphate buffer solution (PBS), low-density lipoprotein (LDL) or HDL retro-orbitally before exposure to aerosolized LPS. 24hrs after exposure, mice were necropsied and lung tissue was utilized for bronchoalveolar lavage (BAL), differential cell counts, cholesterol assay, protein assay, and real time-PCR analysis.

**Results:** LPS exposure significantly increased markers of pulmonary injury and neutrophils in the BAL when compared to unexposed mice. Exposure also significantly increased the expression of scavenger receptor B-1 (SR-BI) in the lungs. When mice were pretreated with HDL there were significantly less neutrophils ( $5.2 \pm 2.4 \times 10^5$  cells/mL) in the airspace after LPS exposure when compared to mice pretreated with PBS ( $10.7 \pm 2.4 \times 10^5$  cells/mL). Cholesterol and protein, a marker of microvascular injury, assays on BAL fluid had no statistical difference between PBS, LDL, or HDL treated mice after LPS exposure. Real time RT-PCR was used to measure gene expression of the cholesterol receptors, SR-BI, CD36, ABCG1, ABCA1 and LDLr. All cholesterol receptors were found to have significant decrease in expression in ABCA1, ABCG1, Cd36, SR-BI, and Ldlr when compared to PBS or LDL treated mice.

**Conclusions:** Mice pretreated with HDL were found to have a decrease in pulmonary neutrophil influx and a suppression of cholesterol receptor activity after LPS exposure. These data indicate that HDL mitigates pulmonary immune cell influx and decreases cholesterol transport during lung inflammation.

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## OP9

### MANDATORY DOCUMENTATION OF TIDAL VOLUME ADJUSTED FOR PREDICTED BODY WEIGHT ON THE RESPIRATORY FLOW SHEET IMPROVES COMPLIANCE WITH LOW TIDAL VOLUME VENTILATION STRATEGY: A 5-YEAR TERTIARY CARE CENTER EXPERIENCE

M Dauterive, F Houshmand, M Mazer, A Mohan

**Rationale:** The ARDSnet trial showed significant improvement in outcomes with lower lung-protective tidal volumes. Subsequently, low tidal volume (Vt) ventilation has been advocated in almost all mechanically ventilated patients. Unfortunately, many ICUs continue to report to poor compliance with low Vt strategy. In 2010 we amended the respiratory flow sheet to include data fields for predicted body weight (PBW) and Vt expressed as ml/kg PBW. We noted a dramatic improvement in compliance with low Vt from 40% to 70%. This current project was designed to assess the long-term effect of this intervention.

**Methods:** Unannounced audits of the respiratory flow sheet were performed at repeated points of the day. Data points collected included ventilator mode and Vt expressed as ml/kg PBW. We divided ventilator modes into three generic groups. Group 1: Pressure Support Ventilation; Group 2: Adaptive Pressure Ventilation/Pressure-Controlled Mandatory Ventilation and Group 3: all other modes of Volume – targeted ventilation. Data was analyzed for mean, median, standard deviations & rates of compliance with low Vt, pre-defined as equal to or less than 8 ml/kg PBW. Additionally, one-way ANOVA was used to compare the different modes.

**Results:** 176 patients (448 ventilator readings) were evaluated; 97 in Group 1, 61 in Group 2, and 18 in Group 3. Overall compliance with low Vt strategy was 85.8% across all modes. The mean Vt for the cohort was  $6.242 \pm 1.99$  ml/kg PBW. There was no statistically significant difference between the Vt of Group 1 ( $6.26 \pm 2.27$  ml/kg PBW), Group 2 ( $6.30 \pm 1.65$  ml/kg PBW) and Group 3 ( $5.87 \pm 1.50$  ml/kg PBW). The percent of patients compliant with low Vt ventilation was more in Group 3 (94.4%) than in Group 1 (84.5%) or Group 2 (85.2%) but this difference was not significantly different.

**Conclusion:** Mandatory documentation of Vt expressed as ml/kg PBW improves compliance with a low Vt strategy in a sustained manner over a five year period. The overall long-term adherence with low Vt strategy remains good at 85.8%, with no significant difference between different modes of ventilation. Given the simple nature of our intervention, mandatory documentation of tidal volume expressed as Kg/PBW should be considered for all mechanically ventilated patients.

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## OP10

### OUTCOMES OF ERCC1 HIGH LOCALLY ADVANCED ESOPHAGEAL CANCER PATIENTS TREATED WITH NON-PLATINUM VS PLATINUM BASED CHEMORADIATION.

M Yogarajah, CRG Stroud, AM Hegde, PR Walker;

**Background:** ERCC1 is a DNA excision repair enzyme which repairs the DNA adduct damage caused by platinum and hence high levels of ERCC1 has been associated with platinum resistance. Thus utility of platinum as a first line chemotherapy in esophageal cancers with high ERCC1 levels is controversial. SWOG S0356 trial noted a significantly low 2 year overall survival of 37% for platinum based CRT in ERCC1 high esophageal carcinomas, yet no studies have identified the alternative first line chemotherapy. Our Program utilized combined irinotecan  $65\text{mg}/\text{m}^2$  on D1 and D8 and nab-paclitaxel  $100\text{mg}/\text{m}^2$  with concurrent radiation therapy of 50.4Gy for ERCC1 high esophageal cancers at the treating physician's discretion. We compared the differences in survival with non-platinum versus platinum CRT.

**Methods:** Retrospective analysis from 2011 to 2016 identified 25 locally advanced esophageal cancer patients in whom ERCC1 levels were checked. Out of this 25 patients 23 had high ERCC1 levels and 2 had low ERCC1 levels. Patients with low ERCC1 were excluded. Patients with high ERCC1 levels received either non-platinum or platinum CRT as neo-adjuvant, adjuvant or definitive chemotherapy.

**Results:** Patient characteristics: Male 69.5%, female 30.5%, squamous 43.4%, adenocarcinoma 52.1%, other 4.5%, operable 39%, non-operable 61%. Non-platinum therapy was utilized for 69.5% and platinum based therapy for 30.5% of the patients. Kaplan-Meier analysis for survival showed clear separation of the curves around 2 years. Median overall survival of non-platinum doublet was not reached during a median follow up of 22 months. Overall survival at 2 years was 57%. The median overall survival for the platinum doublet was 22 months and the 2 year overall survival was 42%. ( $p = 0.22$ ). Hazard ratio (HR) 0.48(95% CI 0.14-1.58  $p = 0.23$ ). This statistical non significance was due to small sample size.

**Conclusions:** Abraxane and irinotecan showed improved overall survival in the ERCC1 high group when compared with platinum based therapy demonstrated both in our population and the SWOG 0356 trial.

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## OP11

### INAPPROPRIATE PROTON PUMP INHIBITOR USE IN MEDICAL INPATIENTS: A COMPARISON BETWEEN ACADEMIC AND HOSPITALIST SERVICE AT VIDANT MEDICAL CENTER

N Gollol-Raju, S Jayananda, G Harvin, W Leland, L Matarese

**Background.** Proton pump inhibitors (PPI) are one of the most commonly prescribed medications in the United States. PPIs are often overprescribed and used for inappropriate conditions, both in primary care setting as well as in hospital settings. Potential adverse effects linked to short term and long term PPI use have been well documented in literature.

**Objective.** To compare the rate of inappropriate PPI prescription in hospitalized medical patients in academic teaching service and hospitalist non-teaching service at Vidant Medical Center (VMC), Greenville, NC.

**Method.** Retrospective chart review of consecutive medicine patients discharges during October 1<sup>st</sup>, 2014 to December 30<sup>th</sup>, 2014. Inclusion criteria was all patients aged 18 years and above. Exclusion criteria was patients already on an acid suppressing medication at the time of admission and patients who had spent time in the intensive care units.

**Results.** In the academic group, out of 519 patients, 74 patients did not meet inclusion criteria. In the remaining 445 patients, 40% (178) of patients were already on a PPI at admission out of which 50 patients (28.1%) had no documentation of reason for the PPI use. In the remaining 267 patients, 48 patients (18%) were inappropriately prescribed PPI's during their hospital course. In the hospitalist group, out of 541 patients, 56 patients did not meet inclusion criteria. Of the remaining 485 patients, 36.7 % (178) of patients were already on a PPI at admission out of which 39 patients (22%) had no documentation of reason for the PPI use. In the remaining 307 patients, 71 patients (23.13%) were inappropriately prescribed PPI's during their hospital course. In both the groups, 'gastro-intestinal prophylaxis' was the most common reason for inappropriate PPI prescription. Further statistical analysis is being conducted to determine if there is any statistically significant difference in the inappropriate PPI use between the two groups.

**Conclusion.** PPIs are frequently inappropriately prescribed to Medicine inpatients by both academic teaching service as well as non-academic hospitalist service at VMC. Lack of documentation of reason for PPI use at the time of initial hospitalization is widely prevalent in both the groups. Interventions are being planned to curtail this inappropriate practice.

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## OP12

### MODIFIED GLASGOW PROGNOSTIC SCORE IN A NORTH AMERICAN POPULATION OF METASTATIC LUNG CANCER PATIENTS: BASELINE CHARACTERISTICS FROM THE SNAP TRIAL

Stroud CRG, Walker P

**Introduction:** There is a growing body of evidence that implicates inflammation as a mechanism of disease progression and reduced survival in patients with advanced cancer. Specifically, elevated c-reactive protein (CRP) levels have been associated with a severe symptom burden including pain, dyspnea, fatigue, nausea/vomiting, impaired quality of life, and inferior overall survival. There is a significant body of evidence supporting the use of the mGPS in both Europe and Asia but the significance of the mGPS in a North American population has not been completely elucidated. We present preliminary data from a group of patients from Eastern North Carolina.

**Methods:** Serum albumin and CRP were drawn at baseline and patients were followed for clinical course and overall survival. Patients with a dx of cancer were included regardless of stage. Clinicopathological features were abstracted from the chart. Statistical comparisons were done by chi-squared test.

**Results:** Two-hundred and twenty seven patients were eligible. Of these, 110 had either stage IV NSCLC (N= 97) or extensive stage small cell lung cancer (n=13). Median CRP was 21.9 mg/L (0.01 - 329.5). Median serum albumin was 3.4 g/dl (2.3-4.6). The number of patients with mGPS of 0, 1, and 2 were 27 (24.5%), 37 (33.6%) and 46 (41.8%), respectively. As compared to the population from Europe, the chi squared statistic was 10.1229 (p = 0.0063). There was no significant association between mGPS and race (p = 0.2277) or gender (p=0.0607).

Stage IV NSCLC and ES- SCLC			
	mGPS		
	0	1	2
Simmons (N = 390)	26.4%	46.9%	26.6%
TOC (N = 110)	24.5%	33.6%	41.8%
Chi squared statistic is 10.1229 (p = 0.0063)			

**Discussion:** Lung cancer patients in Eastern North Carolina possess a strikingly poor inflammatory signature with significant implications for quality of life and survival.

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**ANALYSIS OF SELECT ANTINUCLEAR ANTIBODIES IN SYSTEMIC LUPUS ERYTHEMATOSUS BY ENZYME IMMUNOASSAY: GENDER AND ETHNIC COMPARISON**

EL Treadwell, P Garrett, R Ethridge, JV Cresenzo, J Christie

**Background:** Antinuclear antibodies (ANAs) are routinely used in the diagnosis of systemic lupus erythematosus (SLE), and may be associated with specific clinical diseases. Various methods have evolved over the past 50 years with enhanced sensitivity. Our objective was to determine if an enzyme immunoassay was sensitive and specific for detecting commonly used ANAs for the diagnosis of SLE in a previously classified SLE population. Our population was predominant female as expected in this disease.

**Methods:** Serum was obtained by informed consent from 292 SLE patients and controls consecutively seen in our rheumatology clinic at the Brody School of Medicine and Vidant Medical Center over a 3 year period. Our study population consisted of 111 African American (AA) and 28 European (EU) SLE females, 11 AA and 5 EU SLE males, controls that included 85 AA females (AAFs), 32 EUFs, 13 AA males (AAMs), 7 EUMs and 1 of different ethnicity. ANA's for native or nDNA were determined by the Varelisa enzyme immunoassay (ELISA) method and ANAs for Sm, RNP, SS-A (Ro), SS-B (La), Scl-70, and Jo-1 by an Immunoconcepts Method. Patients were diagnosed with SLE using the 1997 revised American College of Rheumatology criteria. Patient's disease activity was determined using the SLE disease activity index (SLEDAI) and physician global assessment method.

<b>RESULTS:</b>	<b>nDNA</b>	<b>Sm</b>	<b>RNP</b>	<b>SS-A</b>	<b>SS-B</b>
	n (%)	n (%)	n (%)	n (%)	n (%)
AAFs (n=111)	35 (32)	27 (24)	41 (24)	42 (24)	28 (25)
EUFs (n=28)	5 (18)	1 (10)	2 (7)	5 (18)	9 (32)
AAMs (n=11)	5 (45)	1 (10)	5 (45)	3 (27)	5 (45)
EUMs (n=5)	0	0	1 (20)	1 (20)	0

*Nineteen AAFs had Jo-1 ANAs(17%) and all others combined had 7 of Scl-70.*

**SUMMARY:** Both types of ELISA showed sensitivity and specificity for detecting ANAs in our SLE population as others have reported. AAFs showed a considerable positivity for all antibodies in SLE, which may suggest a common pathway for production of all antibodies in connective tissue disorders. The ELISA should continue to be useful for continued investigation and diagnosis of patient with SLE and related disorders.

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## PR1

### IDENTIFICATION OF BIOMARKERS IN LUNG CANCER PATIENTS TREATED WITH IMMUNOTHERAPY TARGETING IMMUNE CHECKPOINT REGULATORS.

D Atwell, M Yogarajah, EJ Sanderlin, G Stroud, PR Walker, LV Yang

**Background:** Lung cancer is the second most common cancer diagnosed in both men and women and currently accounts for approximately 27% of cancer related deaths. Monoclonal antibodies targeting CTLA-4 and PD-1 are capable of inducing durable responses in a minority of patients.

Unfortunately, these agents are associated with significant economic burden and clinical toxicity. For this reason it is our goal to identify biomarkers in the few patients that have undergone the treatment with successful results.

**Methods:** First the plasma, mononuclear cells, granulocytes and erythrocytes were separated from a patient blood sample through a Ficoll gradient centrifugation. This was followed by an antigen specific magnetic bead binding separation to separate out lymphocytes expressing CD4, CD8 and CD19 antigens. From the isolated cells, the RNA was then extracted and cDNA was reverse transcribed from it and then followed up with real-time PCR to determine the expression levels of genes of interest in the cells.

**Results:** As compared to healthy donors, a significant reduction in CD8+ T-cells was observed in lung cancer patients prior to immune checkpoint blockade. With the exception of one patient, incremental increases in this population of cells were observed after initiation of immunotherapy. At baseline, granulocyte counts were elevated in cancer patients when compared to that of healthy donors. CD19+ B-cell levels were comparable to healthy donors at baseline, with a sharp increase with prolonged duration of immunotherapy seen in one patient. Total mononuclear cells were lower compared to healthy donors, at baseline, but increased with continued treatment. At baseline, other mononuclear cells were lower than in healthy donors with an increase observed in patients with prolonged treatment.

**Conclusion:** Immune checkpoint blockade induces relative changes in B and T cell populations that suggest an immune-responsive phenotype. Additional candidate biomarkers include relative expression of immune-regulatory genes in leukocyte subpopulations in response to immunotherapy. Genes of interest include PD-1, CTLA-4, G2A, GPR4, OGR1 and TDAG8. Further cell separations will be necessary to determine the effects of immune checkpoint blockade on lung cancer patients.

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## PR2

### COLONIC ENDOTHELIAL CELLS CONTRIBUTE TO INTESTINAL INFLAMMATION THROUGH THE PROTON-SENSOR GPR4 IN THE DSS-INDUCED COLITIS MOUSE MODEL.

E Sanderlin, K Lertpiriyapong, Q Cai, H Hong, V Bakthavatchalu, J Fox, JZ Oswald, C Justus, E Krewson, D O'Rourke, N Leffler, L Yang

Intestinal vasculature during intestinal inflammation is pathogenic and potentiates inflammatory bowel disease (IBD). Acidosis (increased proton concentration in tissue) has been shown to induce endothelial cell (EC) inflammatory responses. Indeed, inflammation and tissue acidosis co-exist in IBD. GPR4 is a proton-sensing G protein-coupled receptor that can be activated by extracellular acidosis through several histidine residues and subsequently signal through downstream G-protein pathways. Recently, GPR4 has been shown to be activated by acidosis and can increase the expression of numerous inflammatory and stress response genes in ECs and has functionally increased EC-leukocyte adhesion. Subsequently, genetic and small molecule approaches for the inhibition of GPR4 activity have reduced endothelial cell inflammation. In this study, we examined the role of GPR4 in intestinal inflammation using a dextran sulfate sodium (DSS)-induced colitis mouse model. We observed that GPR4 mRNA expression was increased in mouse and human IBD tissues when compared to control intestinal tissues. To determine the function of GPR4 in intestinal inflammation, wild-type and GPR4-deficient mice were treated with 3% DSS for acute and chronic time points for the induction of colitis. Our results showed that the severity of colitis was decreased in GPR4-deficient DSS-treated mice in comparison to wild-type DSS-treated mice. Clinical parameters, macroscopic disease indicators, and histopathological features were less severe in the DSS-treated GPR4-deficient mice than the DSS-treated wild-type mice. Inflammatory gene expression, endothelial adhesion molecule expression, leukocyte infiltration, and isolated lymphoid follicle (ILF) formation were reduced in intestinal tissues of DSS-treated GPR4-null mice. In summary, our results suggest GPR4 potentiates intestinal inflammation as the absence of GPR4 ameliorates intestinal inflammation in the DSS-induced colitis mouse model. Use of GPR4 antagonists could prove a valuable therapeutic in the reduction of intestinal inflammation.

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### PR3

#### PROTON-SENSOR GPR4 ALTERS CYTOSKELETAL DYNAMICS AND PERMEABILITY OF VASCULAR ENDOTHELIAL CELLS

EA Krewson, LV Yang

An artery occlusion caused by stroke or myocardial infarction leads to an ischemia insult which causes the area downstream of the blockage to become acidic. The way in which endothelial cells (ECs) lining the affected blood vessels respond to an acidic microenvironment during ischemia and reperfusion remains unclear. We investigated the proton-sensor GPCR, GPR4, which is prominently expressed in endothelial cells (ECs). We have previously reported that acidic activation of GPR4 induces the transcription of several inflammatory molecules and endoplasmic reticulum stress related genes in ECs. The purpose of this study is to identify the functional response of acidosis-induced GPR4 activity using Human Umbilical Vein Endothelial Cells (HUVECs) as an in-vitro model system. GPR4 was overexpressed (HUVEC/GPR4) or knocked down (GPR4 shRNA) using several genetic constructs in ECs. To create an acidic microenvironment, cells were treated with media buffered to pH 6.4, thereby activating GPR4. As a control, cells were treated with media buffered to physiological pH 7.4. Permeability of HUVEC cell monolayers were assessed by quantifying gap formation. In addition, cytoskeletal dynamics were also examined. We used Rhodamine Phalloidin to investigate actin stress fiber formation and immunocytochemistry to monitor focal adhesion dynamics. Our in-vitro results show GPR4 activation altered the cytoskeletal phenotype and augmented the gap area of HUVEC monolayers. We also observed the formation of actin stress fibers in response to acidic conditions compared to physiological controls. In addition, we initiated tissue ischemia using a tourniquet cuff system in C57/Bl6 (WT) and GPR4<sup>-/-</sup> mice. Our in-vivo approach consisted of applying pressure to the upper leg of the GPR4<sup>-/-</sup> and WT mice for 3 to 4 hours, followed by 20 to 21 hours of blood reperfusion before dissection. Our in-vivo results demonstrate less leukocyte-infiltrated exudate in the area surrounding the affected skeletal muscle in GPR4<sup>-/-</sup> compared to WT mice. These data suggest that the proton-sensor GPR4 alters cytoskeletal dynamics, thus leading to an increase in vascular permeability in response to an acidic microenvironment.

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### PR4

#### SMAD3 MEDIATES NOTCH INDUCED STEMNESS AND EPITHELIAL TO MESENCHYMAL TRANSITION IN COLORECTAL CANCER CELLS

A Clark, A Khan, G Sigounas

**Background:** Late stage colorectal cancer (CRC) remains a challenging disease to treat due to several factors including stemness and epithelial to mesenchymal transition (EMT). Dysfunctional signaling pathways in CRC contribute to these phenomena, including the Notch and Transforming Growth Factor-Beta (TGF- $\beta$ ) pathways. These pathways integrate external signals by cross-talking with one another to fine-tune cellular responses. We previously found that constitutively active Notch1 upregulated the expression of Smad3. Therefore, we hypothesized that the TGF- $\beta$  pathway, through Smad3, mediates the Notch-induced stemness and EMT observed in these cells.

**Methods:** To test our hypothesis we used the human colorectal carcinoma cell line HCT-116 and its derivative cell lines ICN1 (expressing constitutively active Notch1), and sh59 (Notch1 knockdown). Cells were treated with TGF- $\beta$ , DAPT (a  $\gamma$ -secretase inhibitor), or SIS3 (a Smad3 inhibitor). Western blot analysis was performed to determine the cross-talk between the Notch and TGF- $\beta$  pathways and to assess the effects of Smad3 stimulation and inhibition on Notch and its downstream targets. The role of Smad3 on colosphere formation was also determined using the aforementioned cell lines.

**Results:** Drug efficacy was confirmed with down regulation of phosphorylated Smad3 (P-Smad3) by 40% in SIS3 treated cells (P<0.05), and upregulation of P-Smad3 by 24% through TGF- $\beta$  stimulation (P<0.01). Treatment with SIS3 effectively inhibited key stemness and EMT markers such as CD44 and Slug by 42% and 35% respectively (P<0.01). Hes1 (an indicator of Notch activity) was also downregulated in these cells by 61% (P<0.01). Additionally, Smad3 inhibition induced a 2.2-fold and 1.9-fold decrease in Notch1 and Notch3 respectively (P<0.05). Both DAPT and SIS3 treatment induced downregulation of Hes1 by 2.3-fold and 3-fold respectively (P<0.01). SIS3 treatment induced a 2.5-fold decrease in colosphere formation in cells expressing constitutively active Notch1 (P<0.01). This effect was even more prominent in Notch1 null cells with a 92-fold decrease (P<0.005).

**Conclusions:** These results indicate a key role of TGF- $\beta$  signaling in Notch1-induced tumorigenesis. They also suggest a potential use of Notch1 inhibitors in combination with Smad3 inhibitors to effectively target aggressive CRC tumors.

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## PR5

### NOTCH SIGNALLING MODULATES CHEMORESISTANCE IN COLORECTAL CANCER VIA EFFECTS ON DNA BASE EXCISION REPAIR PROTEINS

AH Khan, A Clark, G Sigounas

**Background:** Approximately 1.2 million cases of colorectal cancer (CRC) arise each year, and 40-50% of CRC patients will reach metastasis. The Notch pathway is known to be dysregulated in CRC, and its relationship with DNA repair mechanisms, which contribute to drug resistance, is currently being established. Previously, we observed a decrease in DNA base excision repair (BER) enzymes and drug resistance upon Notch 1 targeting. We have also observed that Notch 1 signaling is associated with promoting cancer stemness and epithelial to mesenchymal transition in CRC via upregulation of the Notch 3 receptor. Thus, we hypothesized that targeting Notch 3 will increase drug sensitivity in CRC via signaling effects on proteins associated with the DNA BER mechanism.

**Methods:** In order to assess our hypothesis, the colon cancer cell line HCT 116 was transduced with a small hairpin messenger RNA construct that effectively knocked down the Notch 3 receptor, creating the Sh-N3 cell line. Culturing and Western blot analyses were conducted using standard methodology. Drug resistance was analyzed by treating cells with cisplatin or cytarabine, potent DNA damaging agents, and cytotoxicity was assessed.

**Results:** Notch 3 targeted (Sh-N3) cells resulted in 1.5-fold lower plating efficiency compared to their counterpart controls ( $p < 0.01$ ). Western blot analysis showed that Notch 3 targeting led to a decrease in poly (ADP-ribose) polymerase (PARP1) expression by 34% in comparison to the parental cell line control ( $p < 0.05$ ), while apurinic/apyrmidinic endonuclease (APE1) expression was decreased by 47% ( $p < 0.05$ ). Sh-N3 cells treated with 20  $\mu\text{g}/\text{mL}$  of cisplatin for 48 hours showed a 2-fold increase in cell death compared to the controls ( $p < 0.001$ ). Additionally, cytotoxicity in Notch 3 null cells treated with 0.64  $\mu\text{g}/\text{mL}$  of cytarabine at 48 hours displayed a 1.7-fold increase compared to the controls ( $p < 0.001$ ). Microscopic observations confirmed these cytotoxicity results.

**Conclusions:** This study further reinforces the importance of Notch signaling in drug resistance, and highlights the potential use of Notch 3 inhibitors in conjunction with DNA BER protein inhibitors to effectively target chemoresistant CRC cells.

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## PR6

### RESVERATROL EXTENDS LIFESPAN AND DELAYS GERMLINE AGING THROUGH THE ACTIVATION OF BOTH SIR-2.1/SIRTUIN AND MPK-1/ERK

Dong Suk Yoon, Myon-Hee Lee

**Background:** Chemicals can change the lifespan and also delay the onset of age-associate disease. Resveratrol (RSV) has been emerged as a highly effective longevity chemical. Although several studies showed that RSV extends lifespan through Sirtuin, the findings remain controversial.

**Results:** Using *C. elegans*, we found that RSV-mediated longevity requires both SIR-2.1/Sirtuin and MPK-1/ERK. Specifically, the longevity largely depends on MPK-1/ERK in RSV(-). However, in RSV(+), the longevity is regulated by both SIR-2.1/Sirtuin and MPK-1/ERK in an inversely proportional manner. In addition to somatic aging, the number of germ cells is gradually reduced during aging. Intriguingly, RSV delayed age-associated germ cell loss through SIR-2.1 and MPK-1. We also found that RSV can promote the formation of MPK-1-associated tumors in *C. elegans* germline.

**Conclusions:** our results provide insights into the understanding of controversial effects of RSV on the longevity but also propose the effects of RSV on germline aging and tumorigenesis in other organisms.

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## PR7

### DEVELOPMENT OF PERSONALIZED CANCER THERAPEUTIC VACCINE

D Wang, K Posekany, SE Eubanks, DA Weidner, DK. Liles, JE Wiley

**Background:** Our lab previously developed a novel method to exhibit  $\alpha$ Gal antigens on human cells by brief incubation with polyethylene glycol (PEG) and  $\alpha$ Gal<sup>+</sup> xenogeneic erythrocytes. We tested this method using fresh cells from blood, bone marrow, and tissue from 13 patients with hematologic malignancies (AML, PML, CLL, NHL and ALL). Our method was successful in all samples with viable cells. This method overcomes many technical obstacles to producing autologous  $\alpha$ Gal<sup>+</sup> cells from patient samples.

**Methods:** Autologous monocytes were incubated with autologous serum and  $\alpha$ Gal<sup>+</sup> human peripheral blood mononuclear cells obtained through cell fusion. Phagocytosis was detected by flow cytometry. AML patient's bone marrow mononuclear cells were cultured to obtain mature dendritic cells (DC) that secrete the immunostimulatory cytokine IL-12. IL-12 intracellular expression was detected by dual-color flow cytometry.

**Results:** Cells modified to exhibit  $\alpha$ Gal are recognized by autologous serum anti- $\alpha$ Gal antibodies and monocytes. Thus,  $\alpha$ Gal expression allows humoral and cellular responses that cause antigen presenting cells, primarily dendritic cells and monocytes to recognize and phagocytose 'self' cells. This supports the premise that  $\alpha$ Gal<sup>+</sup> tumor cells can be used to load monocyte-derived immature dendritic cells (MoDC) and produce fully mature DC that may have potential as DC vaccines. Importantly, monocyte derived dendritic cells from AML patient respond to IFN- $\gamma$  by producing IL-12, indicating the immune competent potential of the AML patient's MoDC.

**Discussion:** The primary goal of this study is to demonstrate pre-clinical proof-of-concept findings in order for us to develop therapeutic cancer vaccine for personalized immunotherapy. Our method to easily modify hematologic cells to exhibit  $\alpha$ Gal is established and reproducible. Solid tumor cells should also be easily modified to exhibit  $\alpha$ Gal. In this study, the cancer therapeutic vaccine is based on autologous DC, incorporating ways to stimulate the immune response and improve the cytotoxicity of autologous T cells that are specific for tumor associated antigens while retain the T cell repertoire for pathogen immune response which is critical in cancer patients.

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## PR8

### ACUTE MYELOID LEUKEMIA WITH T (2;6) (Q21; P25) AND HIGH LEVELS OF CD41 AND CD71 IN THE MYELOID BLASTS

D Wang, SE Eubanks, DA Weidner, DK Liles, JE Wiley

**Background:** This is a report of 2 unusual translocations in an 70 year old African American female, diagnosed with the relapsed acute myeloid leukemia (AML), Cytogenetic analysis of GTG banded metaphases from unstimulated cultures revealed an abnormal clone characterized by an apparently balanced translocation between chromosomes 5 and 14 and what may be a reciprocal unbalanced (2;6) translocation in all cells analyzed. Both of these rearrangements are not commonly reported in hematological disorders. Thus diagnostic and prognostic correlations are not known. The apparent neoplastic clone can however be monitored for post-treatment residual diseases and clinical/karyotypic disease progression in future analysis.

**Methods:** Peripheral blood mononuclear cells (PBMC) were isolated and immunophenotyped using a 15 panel 4-color flow cytometry analysis including CD3, CD4, CD5, CD8, CD10, CD11c, CD14, CD15, CD16, CD19, CD20, CD25, CD33, CD34, CD38, CD41, CD45, CD56, CD63, CD64, CD71, CD83, CD86, CD138, CD152, HLA-DR, TCR-V $\beta$ 12, Glycophorin A, TdT. The phenotyping is particularly focused on the markers that are relevant to AML.

**Results:** CD33 is 56.6%, CD14 is 1.4%, HLA-DR is 17.2%, CD11c is 41.8%. CD33 positive cells have lower expression of CD45. Out of CD33 positive cells, CD4 is 1.3%, HLA-DR is 72.6%, CD11c is 41.8%, CD13 is 79.0%, CD16 is 1.6%, CD20 is 0.5%, CD38 is 85.7%, CD71 is 87.8%, and CD41 is 86.2%. Out of CD33 negative cells, CD4 is 38.0%, HLA-DR is 11.7%, CD11c is 24.5%, CD13 is 6.2%, CD16 is 11.0%, CD20 is 5.7%, CD38 is 57.9%, CD71 is 6.9%.

**Conclusions:** CD41, also known as integrin- $\alpha$  chain 2b, participates cell-surface mediated signaling. CD71, also known as transferrin receptor protein 1, is required for iron import from transferrin into cells by endocytosis. While these translocations are not common in AML patients they may serve a two-fold purpose in this patient. They can be utilized longitudinally during therapy as a marker of MRD (minimal residual disease) or early relapse. In addition, precision immunotherapy directed towards CD41 and CD71 molecules could prove to be a therapeutic target.

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**PR9**

**COMPARISON OF A COMPUTER-BASED INTRAVENOUS INSULIN PROTOCOL WITH STANDARD PAPER PROTOCOL IN TERMS OF SAFETY AND EFFICACY IN MANAGEMENT OF DKA PATIENTS IN COMMUNITY HOSPITALS: A PILOT STUDY**

M Azad, S Hardee, V Lin, R Tanenberg

**BACKGROUND AND OBJECTIVES:** Literature has shown both safety and efficacy of computer-based insulin infusion protocols among hospitalized patients for hyperglycemia in various settings (i.e. post-surgery, MICU, ER) but to the best of our knowledge, there is no published literature on safety and efficacy of computer-based insulin infusion protocols in hospitalized DKA patients.

**METHODS:** Patients admitted with DKA to 6 community hospitals in Eastern North Carolina between 12/2014 and 4/2016 were identified retrospectively. 40 and 42 consecutive patients treated with standard paper protocol (PP) and with software program (SP) were included in the paper arm and software arm respectively. Pertinent clinical and demographic variables were collected by chart review and analyzed to compare the outcomes.

**RESULTS:** Among the PP patients (n=40, 45% female) 70% were Type 1 DM, mean baseline values were: age 38 years, BMI 27.14, HbA1c 10.96, 1st serum glucose 582, venous pH 7.22, anion gap 25.10. Among the SP patients (n=42, 52% female), 62% had Type 1 DM, mean baseline values were: BMI 25.72, HbA1c 11.28, 1st serum glucose 536, venous pH 7.25, anion gap 25.18. There was no statistically significant difference between the two groups' baseline variables. The mean time to resolution of DKA (AG <12) was not statistically significant between the two groups (21.73 hrs vs 20.52 hrs; p>0.05). There were no hypoglycemic events in the SP group during the insulin infusion, but there were 4 patient-episodes of hypoglycemia in the PP group (RR=5.2, p=0.28, NNT= 20). The mean total time on insulin infusion was significantly higher for the SP group (18.8 hrs vs 30.1 hrs, p=0.004).

**CONCLUSIONS:** The difference in incidence of hypoglycemia between the two groups indicates that SP is a safer approach for managing insulin infusions for DKA patients. Also the SP appears to no less efficacious than a standard paper protocol. Although a higher initial cost is associated with implementing the infrastructure, fewer negative clinical outcomes prove benefit of its use even in small community hospitals. Larger prospective and multicenter studies are needed to validate these findings.

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**PR10**

**CEREBRAL AIR EMBOLISM AFTER CENTRAL VENOUS CATHETER REMOVAL – A CASE SERIES REVIEW**

M Hafiz, T Neal, AR Naqash

**Background and objectives:** Cerebral air embolism (CAE) is a rare but well described complication of central venous catheter (CVC) use. Events related to CVC insertion are widely described compared to those from removal. CVC removal may result in CAE through paradoxical or retrograde mechanisms. The former occurs through right-to-left (R to L) shunts, most commonly, atrial septal defect (ASD) and patent foramen ovale (PFO). The mechanism for CAE occurring in the absence of a shunt is presumed to be retrograde rise of air due to a lower density. Despite availability of data on the best practice for CVC removal, errors do occur. Our meta-analysis focuses on the most common manifestations and risk factors for CAE following CVC removal. Methods: MEDLINE/PubMed search identified 44 relevant cases of age > 18 years between years 2000-2016 using the keywords “cerebral air embolism,” and “CVC removal.” Percentages were calculated after excluding missing data.

**Results:** Median age was 63 (18-95 years) with majority being males (62.8 %). Right internal jugular (RIJ) was the most common site for CVC insertion (79.4%). The inciting event for CAE in majority cases (81.8 %) was CVL removal by physician/nurse, while only 18.2% were cases in which patients accidentally or intentionally pulled the CVC. Only 40 % patients were appropriately positioned using a proper technique i.e. supine or Trendelenburg. The most commonly reported clinical findings were decline in consciousness (90.5%), limb weakness (69.2%) and seizures (33.3%). No specific pattern of cortical involvement or parenchymal or venous sinus air distribution on CT/MRI imaging could be identified. 17.5 % patients had fatal outcomes. No difference in symptoms or outcomes was observed in paradoxical versus retrograde CAE (p>0.05). Hyperbaric oxygen was used in 9% of the cases.

**Conclusion:** Though CVC removal is considered a benign procedure, serious consequences can occur. Ensuring a protocol based approach is critical. Early identification of clinical signs of CAE can help in prevention of long-term morbidity and mortality.

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## PR11

### ARTERIAL CONTINUOUS RENAL REPLACEMENT THERAPY: A COMPLICATION OF THE PAST?

S Awadallah, R Sarsour, M Mazer, M Barchman

**Purpose:** After experiencing a serious safety event at our tertiary care institution in which continuous renal replacement therapy (CRRT) was performed through a vas cath inadvertently placed in an artery, we sought to establish a protocol to prevent such sentinel events. Since critically ill patients frequently have hypotension requiring vasopressor support, inadvertent arterial placement of dialysis access can occur despite use of ultrasound guidance during insertion.

**Methods:** As a quality improvement project, we attempted to confirm proper venous placement of dialysis catheters using pressure measurements made from various locations in the circuit in 10 patients requiring CRRT. A pressure transducer was attached to the venous port of the vas cath to measure central venous pressure (CVP) as well as for pressure waveform analysis. The same data was then collected from the pigtail (the 'third' lumen) of the vas cath. After connecting the vas cath to the CRRT machine (NxStage), "venous" pressures as reflected by flow sensors prior to initiating CRRT were documented. After initiating CRRT the venous pressures at target blood flow rate (BFR) were recorded. Finally, the CVP was measured via the pigtail while CRRT was running at target BFR.

**Results:** All 10 patients had venous waveforms which confirmed proper venous access placement. The CVP pressures ranged from 5-21 mmHg for vas cath placed in the internal jugular vein. The CVP pressures remained the same at target BFR. Using linear mixed methods, there was no co-relation between venous pressures measured on CRRT machine before and after the initiation of CRRT (p value 0.17).

**Conclusion:** Although measuring CVP via the vas cath prior to initiating CRRT is an extra step, it is not time consuming or costly. This simple procedure ensures that CRRT is performed through proper venous access, and identifies inadvertent arterial catheter placement which can have potentially serious consequences. The venous waveform will also quickly confirm proper placement. In general, the nursing staff relies on venous pressures as 'measured' by the CRRT machine, however our results demonstrate, these values do not correspond with the actual vessel pressure, and are not reliable for identifying proper placement of the vas cath.

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## PR12

### EVALUATION OF TIMELY ANTIBIOTIC ADMINISTRATION IN ADULT PATIENTS WITH FEBRILE NEUTROPENIA AT VIDANT MEDICAL CENTER

J Baskett, C Alligood, E Kolychev

**Background:** The American Society of Clinical Oncology and a Surviving Sepsis Campaign guideline panel recommend administering the first dose of empiric antibiotics within an hour of a febrile neutropenia diagnosis. There is a lack of data on time to antibiotic administration in patients with febrile neutropenia at Vidant Medical Center.

**Methods:** Adults ages 18 to 88 with febrile neutropenia (defined as absolute neutrophil count (ANC) less than 500/mm<sup>3</sup> and a single oral temperature greater than or equal to 38.3°C or greater than or equal to 38.0°C for over 1 hour) between July 1, 2014 and June 30, 2016 were evaluated. The primary endpoint was the percentage of patients that received empiric antibiotics within one hour of febrile neutropenia diagnosis. Secondary endpoints included immunocompromising condition, time of febrile neutropenia diagnosis, time to antibiotic administration, cultures, vasopressor requirement, length of stay, and in-hospital mortality.

**Results:** Seventy encounters from 62 patients met inclusion for assessment. Antibiotics were administered within an hour in eight (11.4%) instances and after an hour in 62 (88.6%) instances. The median length of stay was lower in patients who received gram negative coverage before gram positive coverage regardless of time to antibiotics (4 days vs. 40 days if antibiotics administered within an hour, 7 days vs. 9 days if antibiotics administered after an hour). In-hospital mortality was higher in patients who received antibiotics within one hour of diagnosis compared to one hour after (2 of 8 patients, 25% vs. 6 of 62 patients, 9.7%).

**Conclusions:** Gram negative organism coverage within an hour of diagnosis of febrile neutropenia suggests decreased length of stay. Improvement in clinical approach to treatment and re-evaluation of current practices is imperative.

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## PR13

### TOCILIZUMAB FOR THE MANGEMENT OF IMMUNE MEDIATED ADVERSE EVENTS SECONDARY TO PD-1 BLOCKADE

Stroud CRG, Cherry CR, Naqash AR, Sharma N, Walker PW

**Background:** Immune checkpoint inhibitors are poised to revolutionize the management of a growing number of malignancies. Unfortunately, the management of steroid-refractory immune mediated adverse events (irAEs) is based on a paucity of randomized data and limited to single center experiences. Our initial experience with the IL-6 receptor antagonist tocilizumab showed clinical improvement in a wide variety of irAEs. As a result, we adopted the use of tocilizumab for the management of steroid-refractory irAEs.

**Methods:** The character and clinical course of irAEs were abstracted from the medical record and analyzed. The dose of tocilizumab was 4 mg/kg given IV over 1 hour. C-reactive protein was drawn at first nivolumab infusion and at q 2 weeks (and with irAEs) thereafter. Clinical improvement was defined as either: documentation of resolution of symptoms or hospital d/c within 7 days.

**Results:** Of the initial 87 patients that were treated with nivolumab, 34 required tocilizumab (39.1%). All pts were on corticosteroids. The majority (88.2%) were lung cancer patients. The index grade 3/4 irAE was pneumonitis in 35.3%, cytokine release syndrome/SIRS in 35.3%, cerebritis in 14.7% and one case each of hypophysitis, colitis, pancreatitis, hepatitis and immune mediated coagulopathy. Median time between first nivolumab and initiation of tocilizumab was 76 days (range 1-429). Median CRP at initial tocilizumab dose was 100.5 mg/L (2.0 -350.4). Clinical improvement was noted in 27/34 pts (79.4%). 52.9% of pts required a single dose, while 35.3% required two, 8.8% required three and 1 pt required 4 doses. Twenty seven doses were given in the inpatient setting (49.1%). Median time to discharge was 4 days (range 1-27). Seventy four percent of pts were discharged home. For the 55 doses of tocilizumab that were delivered there was a cost savings of \$147,174.94 (WAC) during the 18 month period versus infliximab 5 mg/kg IV dose.

**Conclusions:** Tocilizumab is a therapeutic option for the management of steroid refractory irAEs secondary to immune checkpoint blockade. However, randomized trials are needed to better elucidate the relative efficacy and safety of these agents.

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## PR14

### INCIDENCE AND IMPACT OF THROMBOEMBOLIC EVENTS IN LUNG CANCER PATIENTS TREATED WITH NIVOLUMAB.

AM Hegde, G Stroud, C Cherry, M Yogarajah, S Cherukuri, P Walker

**Background and Objectives:** Lung cancer has one of the highest incidences of thromboembolic events (TEE) ranging from 8.4 -13.2%. Cisplatin based chemotherapy in lung cancer is a well-established risk factor for TEE (11.8%). The incidence of TEE in lung cancer patients (pts) treated with nivolumab (nivo) is unclear. The objective of this study was to evaluate the incidence of TEE, risk factors and its impact on overall survival in lung cancer pts treated with nivo.

**Methods:** This was a retrospective cohort study that included all lung cancer pts treated with nivo from April 2015 to October 2016 at our institution. Medical records were reviewed for incidence, timing, CTCAE grade, type and site of TEE, risk factors and patient demographics. Cox proportional hazard model was used to identify independent predictive factors for TEE. Risk factors with  $p < 0.15$  in univariate analysis were included in multivariate model using a stepwise approach. Kaplan Meier method was used to estimate overall survival (OS).

**Results:** The cumulative incidence (CI) of TEE over a median follow up of 10.8 months after starting nivo was 18.4% (14/76 pts). Of the 14 pts who had TEE, 8 had deep vein thrombosis (DVT), 7 had pulmonary embolism (PE), 1 had concurrent DVT/PE and 2 had arterial thrombosis (AT). 28.6% (4/14) of pts experienced recurrent TEE resulting in 18 total episodes. Median time to TEE after starting nivo was 2.9 months (95% CI 1.9 - 8.4). Gender was the only covariate included in multivariate analysis that showed a significant association with TEE (Female vs Male HR 3.1, 95% CI 1.02 – 9.5,  $p = 0.045$ ). At a median follow up of 31.8 months since diagnosis of lung cancer, pts who had TEE before receiving nivo had worse OS (HR 2.1, 95% CI 1.002- 4.682,  $p = 0.049$ ). TEE occurring after nivo had no impact on OS (HR 0.89, 95% CI 0.42 – 1.87,  $p = 0.77$ ).

**Conclusions:** The CI of TEE is significantly high at 18.4% in lung cancer pts treated with nivo. However, it had no impact on OS. Further studies are needed to determine the role of prophylactic anticoagulation in this high risk population.

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## PR15

### EFFICACY OF ANTI-PD-1 INHIBITORS IN NSCLC PATIENTS WITH KRAS AND T790M MUTATIONS

N Sharma, PR Walker, G Stroud, C Cherry, S Cherukuri T Parent, J Hardin

**Background:** Immune checkpoint blockade (ICB) has revolutionized the treatment paradigm of progressive NSCLC with its astounded durable benefit when compared to cytotoxic agents. In the era of personalized medicine, there exists a need to identify effective predictive biomarkers to detect potential immune responders. Immune modulating interventions with cytotoxic or biologic agents can maximize clinical responses from ICB in potentially less immunogenic tumors. KRAS mutations are a negative prognostic factor for survival and lack targeted therapies. T790M mutations tend to be resistant to first and second line EGFR TKIs. The efficacy of ICB agents in this cohort of patients remains to be studied.

**Methods:** We reviewed data of 83 patients with recurrent or metastatic lung cancer treated with nivolumab from June 2015–Dec 2016. The patients were further assessed for tumor pathology, mutation status and progression free survival on nivolumab. The mutation status was checked on either tissue biopsy or serum samples submitted for proteomic veristat/genestrat assay.

**Results:** Of the 83 patients treated with nivolumab, 65 patients were found to have NSCLC. 11 patients were found to have KRAS mutation which was further subdivided as: 6 patients with KRAS G12C, 4 with KRAS G12V, 1 with KRAS G12D. 2 patients were found to have T790M mutation. 9/11(81%) patients with KRAS mutation died. Patients with KRAS G12C mutation were found to have survival ranging from 6 – 33 weeks, KRAS G12V with survival range of 4-52 weeks. 2/2 patients with T790M mutation were surviving at 35 and 55 weeks respectively.

**Conclusion:** KRAS mutations tend to have a shorter progression free survival with ICB as compared to mutations like T790M. T790 M mutation is associated with higher immunogenicity, which causes more avid stimulation of antigen specific T-cells (Ofuzi et al), thus better response to ICB. Further studies are required to recognize the subsets with poor response to immune therapy which may require a different strategic approach to maximize outcome.

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## PR16

### NONCONVENTIONAL RESPONSES AND SURVIVAL BENEFIT OF IMMUNOTHERAPY IN ADVANCED LUNG CANCER

M Yogarajah, BS Kuszyk, CRG Stroud, CR Cherry, PR Walker

**Background:** Objective response rates (ORR) utilizing RECIST or WHO criteria have been traditionally used as clinical endpoints to assess efficacy of cytotoxic chemotherapy. However in the era of immunotherapeutic agents, response rate assessment can be misleading due to nonconventional responses resulting in premature discontinuation of treatment. Wolchok et al proposed immune-related response criteria (irRC) to assess immune responses in melanoma. He also noted that stable disease which is not indicative of antitumor activity could be a potential surrogate marker of better clinical outcome. Brahmer et al reported nonconventional pattern of responses with Nivolumab in lung cancer.

**Methods:** A retrospective chart review was done to assess differences in responses utilizing both RECIST v1.1 and irRC criteria in lung cancer patients treated with Nivolumab. Patients who received minimum of 4 cycles of Nivolumab were included in the study. The CT scans were reviewed by a senior radiologist. We reviewed 64 patients treated with Nivolumab between 4/30/2015 to 6/21/2016 and 30 patients were found eligible.

**Results:** Patient characteristics. Male 53%; median age 61 years; squamous 47%; adeno 40%; small cell 13%; Median cycles of Nivolumab 6. Response rates utilizing both criteria was essentially similar with only 2 patients showing dis-concordant responses (6.6%). We utilized RECIST responses criteria for further analysis. Partial response (PR) 2/30; stable disease (SD) 12/30; progressive disease (PD) 15/30 and not evaluable (NE) 1/30. ORR 6.6%. Kaplan–Meier curve was used to analyze difference in survival between patient with PR+SD and PD. The median survival for PD was 9 months and PR+SD was not reached at median follow up of 1 year. Overall survival at 1 year for PD 33% and PR+SD 60% (p = 0.048). Hazard ratio for PD was 3.060 (p = 0.60).

**Conclusions:** Patients with stable disease had a better survival and should be considered as responders though traditionally not included in the ORR. However irRC did not help in differentiating nonconventional immune responses in lung cancer patients.

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## PR17

### POPULATION-BASED STUDY OF RACIAL DIFFERENCES IN OUTCOMES OF YOUNG BREAST CANCER PATIENTS

J McClain, M Muzaffar, C Mosquera, P Namireddy

**Background:** Racial disparity as it relates to breast cancer mortality is well-studied, but studies evaluating differences exclusively among young patients are limited. We sought to examine socioeconomic and clinical factors which could predict outcomes in women under 35 with breast cancer based upon race, as well as to determine whether variation in outcomes changed over the 22-year study period.

**Methods:** Using the SEER database, we identified young African-American and white females aged 20-35 with invasive breast cancer diagnosed in the United States from 1990-2012. We performed univariate descriptive and survival analysis. Variables included patient age, race, stage of disease, hormone receptor status, surgery type, and year of diagnosis.

**Results:** 18,999 women were identified. 80.8% of patients were white and 19.1% were black. 31.2% were diagnosed in 1990-2000 and 68.7% were diagnosed in 2001-2012. 5-year DSS was 79.1% among all patients diagnosed from 1990-2000 and 84.2% among patients diagnosed from 2001-2012 ( $p < 0.0001$ ). From 1990-2000 and 2001-2012, white patients had significant difference in 5-year DSS compared to black patients (80.9% vs 71.3% and 86.3 vs 75.7% respectively). While the 5-year DSS for white patients improved from 80.9% to 86.3% ( $p < 0.0001$ ), the 5-year DSS improvement for black patients from 1990-2000 to 2001-2012 did not reach statistical significance (71.3% vs 75.7%,  $p = 0.24$ ).

**Conclusions:** Racial disparity among breast cancer patients is also an issue in young females, as young white patients have superior disease-specific survival compared to African-Americans collectively and in each time-period studied. Absolute disease-specific survival has improved from 1990-2000 to 2001-2012 for both races. However, the statistically significant difference in improvement of disease-specific survival seen among white patients was not demonstrated in African-American patients. Continued attention to racial disparity in breast cancer outcomes is needed with additional studies examining potential differences in treatment, disease characteristics and biology, and accessibility to health care, with a particular focus on young cancer patients. With continued research, hopefully new treatment approaches will be developed to reduce this disparity.

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## PR18

### CLINICAL OUTCOMES AND CHALLENGES IN THE MANAGEMENT OF MULTIPLE MYELOMA IN EASTERN NORTH CAROLINA

S Addepalli, D Brigham, D Liles

**Background and objectives:** Multiple Myeloma is a relatively common malignancy in our community in Eastern NC, especially in African American population. While there have been several advances in treatment of this cancer, it is unclear if there has been optimal utilization of all the current treatment strategies and what barriers exist to this. Our study seeks to identify any unique clinical and epidemiological features of this disease in our population which may help us to manage these patients better. **Methods:** Multiple Myeloma data for Eastern NC from the Cancer registry for 2013-2015 was reviewed; the demographics, clinical features, FISH/ Cytogenetic features, clinical outcomes of the patients enrolled on MMRF CoMMpass study at our institution were reviewed and analyzed to identify any unusual characteristics and specific issues in management of patients with Multiple Myeloma in our community. **Results:** The median age at diagnosis of Myeloma based on SEER data was 69 years. There was a higher proportion of younger patients in our dataset, 40% of our patients were under the age of 60 years and 11% of patients were under the age of 40 years which may point to environmental and genetic factors in this population and needs to be studied further. Usually about 20% of patients with Multiple Myeloma are reported to have light chain myeloma while 30% patients had light chain myeloma in our dataset. More patients in our database had a higher stage of disease, ISS stage III at diagnosis, 72% as compared to 39% described in literature. The benefits of Autologous Stem Cell Transplant (ASCT) in management of Multiple Myeloma is well established but only 22% of the patients had as part of their management. This appears to be secondary to multiple factors including comorbidities, socioeconomic factors such as financial concerns, difficulty with access to treatment and availability of care givers. **Conclusions:** There are disproportionately higher number of younger patients with Multiple Myeloma in Eastern NC, especially with Light Chain Myeloma. The environmental and genetic factors responsible for this need to be studied further. Many patients have a high tumor burden at diagnosis. Improvement in access to care, enhancement of provider education, collaboration with regional oncologists and study of Novel drug combinations to achieve deeper and more durable responses may help improve outcomes for this treatable malignancy.

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## PR19

### SUSTAINED VIROLOGIC RESPONSE WITH DIRECTLY ACTING ANTIVIRALS IN HIV COINFECTED HEPATITIS C PATIENTS AND ITS EFFECT ON LIVER FIBROSIS

D Lebron, A Stang, D Siraj, A Lagasca

**Background:** Hepatitis C virus (HCV) is an important cause of chronic hepatitis with inflammation and fibrosis resulting in end stage liver disease and hepatocellular carcinoma. Direct acting antivirals (DAAs) are newer agents that result in high rates of sustained virologic response (SVR). We hypothesized that treatment with DAAs is as successful in HCV/HIV coinfecting patients as it is in HCV monoinfected patients, and that fibrosis regression can be observed after completion of therapy in both groups.

**Methods:** We retrospectively reviewed data from patients who received treatment for HCV from 2014-2016 at the Infectious Diseases clinic and collected demographic characteristics, HCV genotype and viral load, DAA regimen, SVR rates, and whether or not fibrosis improved at 12 or 24 weeks after treatment completion defined as one METAVIR stage improvement in FibroSure™ score, a noninvasive biochemical test to estimate fibrosis. In those with HIV, HIV viral load, CD4 count, HIV antiretroviral regimen were also examined.

**Results:** Out of 41 patients in each group, 24 had completed therapy in the monoinfected group and 26 in the coinfecting group. In the HCV monoinfected group, 22 (92%) achieved SVR. Of the two HCV monoinfected patients (8%) who failed to achieve SVR, lack of adherence to the drug regimen was felt to be the culprit. In the HCV/HIV coinfecting group, 26 (100%) achieved SVR. In the monoinfected group, 10/17 (59%) demonstrated an improvement in FibroSure™ score, and 7/17 (41%) had no change. In the coinfecting group, 2/9 (22.2%) patients demonstrated an improvement in FibroSure™ score, 4/9 (44.4%) had no change, and 3/9 (33%) demonstrated an increase in FibroSure™ score.

**Conclusions:** In this small, real-world cohort, HCV/HIV coinfecting patients treated with DAAs had higher SVR rates than HCV monoinfected patients. Treatment failures in the monoinfected group were all linked to nonadherence, whereas, 100% of the coinfecting patients achieved SVR, which is likely related to the fact they were regularly engaged in routine HIV care. Although the small sample size precludes any definitive conclusions, fibrosis regression based on FibroSure™ was observed in more patients from the monoinfected group than in the coinfecting group.

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## PR20

### A RETROSPECTIVE STUDY TO LOOK AT HIV PATIENTS WITH PNEUMOCYSTIS JIROVECI PNEUMONIA AND THE EFFECTS OF HAART THERAPY

P Shah, J Polak, N Fadul

**Background and objectives:** Pneumocystis jirovecii pneumonia is the most frequent and severe respiratory infection in HIV patients. There is a 20% mortality rate at 3 months. There have been conflicting data regarding when to start HAART therapy in patients with Pneumocystis jirovecii pneumonia. The recommendations are to initiate HAART within two weeks of PJP treatment. There have been reports that starting HAART early can help the outcome of patients with Pneumocystis jirovecii pneumonia and there have been data showing early initiation of HAART can worsen the outcome. Since there has been conflicting data, the goal of this study is to evaluate which group of HIV patients and Pneumocystis jirovecii pneumonia will benefit from early initiation of HAART.

**Methods:** This is a retrospective study of patients admitted with PJP pneumonia between January 1, 2010 to December 31st, 2015 at Vidant Medical Center

**Results:** Age: Minimum is 28 years old and maximum age is 64 years old 70% of the patients were males and 30% were females. The following comorbidities were present at the time of PJP diagnosis: Hypertension (30%), chronic Kidney disease (7.5%) and COPD (17.5%). Median PO2 was 92. About half of the patients were started on HAART during their admission About 53% of the patients were not newly diagnosed HIV, however they were off medications when admitted to the hospital.

**Conclusion:** Pneumocystis jirovecii pneumonia is a serious illness that is seen in HIV patients. The majority of patients were previously diagnosed with HIV but were not on HAART. Even though the data is still prelim, majority of the patients did leave the hospital with a small percentage of patients deteriorating in the hospital. Further analyses are ongoing to evaluate the final outcomes of initiating HAART therapy in the hospital vs. initiating HAART therapy outpatient.

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**IMPROVING THE PERCENTAGE OF HEMODIALYSIS PATIENTS  
CONSENTING TO HEPATITIS B VACCINATION**

SA Ali, CB Locke, CR Christiano.

**BACKGROUND AND OBJECTIVES:** Hemodialysis (HD) patients should be routinely evaluated for hepatitis B and it is recommended that all be vaccinated. HD vintage of more than two years is known to be a risk factor for hepatitis B transmission. Previous research found that 4% of HD patients have occult hepatitis B infection and 2.3% were HBV-DNA positive. The response rate to HBV vaccine in this population varies widely ranging from 40% to 90%. We reviewed hepatitis B labs and vaccination records of all ECU HD patients who were educated about vaccination by our dialysis nursing staff. Of 139 patients: none were actively infected with hepatitis B, 128 responded to vaccination, four did not respond and refused re-vaccination, and seven refused vaccination. To increase our unit's vaccination rate we implemented a physician led education protocol covering the pros and cons of hepatitis B vaccination.

**METHODS:** A second year nephrology fellow contacted the refusing patients face-to-face or by phone. Of the 7 non-vaccinated patients, five were contacted by phone and two in person. All four non-responders were contacted by phone. Education was provided which covered: the risk of hepatitis B transmission in people on dialysis, vaccine availability, and pros and cons of vaccination. Also, the physician connected with the patient's by sharing his personal decision to receive the hepatitis B vaccine.

**RESULTS:** Five out of 7 (71.4%) patients agreed to be vaccinated. Two of the five patients contacted by phone refused vaccination, while all patients contacted in person agreed to receive the vaccine. All four (100%) non-responders agreed to be revaccinated when educated by the physician. Physician led education increased the percentage of consenting or immune HD patients from 95% to 98.6%.

**CONCLUSIONS:** Physician led education increased the hepatitis B vaccination rate at ECU Dialysis. Minimal time was needed to educate about vaccination and could occur during routine monthly rounds. An increase in hepatitis B vaccination rates and therefore immunity improves the safety of the individual HD patient, as well as the safety of the dialysis unit as a whole. We believe the approach of physician led education will also improve influenza and pneumonia vaccination rates.

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## PV1

### **A FASCINATING CASE OF ANTI-GLOMERULAR BASEMENT MEMBRANE DISEASE WITH COEXISTING ANTI-NEUTROPHIL CYTOPLASMIC ANTIBODY FOLLOWING AORTIC DISSECTION.**

SA Ali, SJ Radhakrishnan, WA Davila, RI Obi.

**LEARNING OBJECTIVE:** About 30% of patients with anti-glomerular basement membrane (GBM) disease have coexisting anti-neutrophil cytoplasmic antibody (ANCA) positivity. The occurrence of this disease after aortic dissection has not been reported in literature. We describe this case of a "double positive serology" presenting with rapidly progressive glomerulonephritis and diffuse alveolar hemorrhage (DAH) after an aortic dissection.

**CASE INFORMATION:** A 45 year old female with hypertension presented with sudden chest and back pain. Upon examination, she was tachypneic despite being on supplemental oxygen. Chest CTA confirmed type A aortic dissection extending to the upper pole of left kidney. After successful repair she was discharged home. Five weeks later, the patient returned with hemoptysis and dyspnea. Creatinine increased from baseline of 1 mg/dL to 2.2 mg/dL and dysmorphic RBCs were present on urine microscopy. Bronchoscopy confirmed DAH. Renal biopsy showed 75% glomeruli with cellular crescents in the same stage. Immunofluorescence stain revealed 2+ linear GBM staining. Anti-GBM and p-ANCA titers were elevated. Patient was treated with plasma exchange, steroids and IV Cyclophosphamide over 3 months. This led to symptom resolution and laboratory normalization with the last creatinine being 0.98 mg/dL.

**SUMMARY:** This clinical presentation and the renal biopsy findings support an anti-GBM disease with coexisting p-ANCA positivity. Anti-GBM disease and ANCA-associated vasculitis are diseases characterized by circulating antibodies. The principal target for the anti-GBM antibody is the alpha-3 chain of type IV collagen. Type IV collagen is also present in the sub intimal membrane of the aorta. We postulate that the aortic dissection exposed the hidden antigenic domain of type IV collagen resulting in antibody formation. This resulted in anti-GBM disease presenting a few weeks later. Based on this case, aortic dissection could be considered a risk factor for developing anti-GBM disease in the future.

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## PV2

### **NAIL-PATELLA SYNDROME, AN UNCOMMON CAUSE OF HEMATURIA/PROTEINURIA.**

SA Ali, A Rice, W Badwan.

#### **LEARNING OBJECTIVES:**

The nail-patella syndrome (NPS) is due to mutations of the LMX1B gene and manifests as abnormalities in limbs, eyes and kidneys. Renal manifestations happen in 30 - 40% of cases, usually presenting as microscopic hematuria or intermittent microalbuminuria. NPS is relatively rare, with an incidence of 1 per 50,000. Some patients with proteinuria will develop nephrotic syndrome and infrequently (1 to 5% of patients) progress to end stage renal disease.

#### **CASE INFORMATION:**

A 39 year old female with a history of NPS was referred to us for proteinuria. She also reported NPS in her four children, father and grandmother. She has had chronic joint pain in her hands, feet, knees, back and elbows. She is missing the nail beds on her thumbs and index fingers. The nails on the remaining 6 digits grew, but would easily break off. On examination, her nails looked dysplastic and discolored with triangular lunulae and the nails that she has have abnormal ridging and splitting. There were reduced creases on her distal interphalangeal joints. Her patellae seemed hypoplastic. Microscopic hematuria without proteinuria was found on evaluation of her urine.

#### **SUMMARY:**

In patients with microscopic hematuria and/or intermittent microalbuminuria, examination must include careful inspection of the nails, hands (abnormal in 100% of cases) and knees. Angiotensin converting enzyme inhibitor or angiotensin receptor blocker can decrease protein excretion rate and slow the progression of NPS nephropathy. NPS nephropathy does not recur after renal transplant. NPS is autosomal dominant and patients should be provided with genetic counseling.

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## PV3

### ONE WAY TO AVOID YARDWORK

P Shah, A Stang, D Markham and N Fadul

**Learning Objectives:** Identification of an unusual gram-negative rod as a cause of bacteremia and pneumonia in an immunocompetent person

**Case:** A 73-year-old male presented to the hospital with 3 weeks of dry cough with subjective fever and chills, followed by 1 day of left pleuritic chest pain and dyspnea. His past medical history included hypertension, gout, lumbar spinal stenosis, and osteoarthritis. He denied illegal drug use, recent hospitalizations, recent travel, sick contacts, or animal exposures. He does all the yard work at home. Lung exam revealed diffuse crackles and decreased breath sounds in the left base. Laboratory studies showed leukocytosis with a left shift. Chest radiography revealed a left lower lobe consolidation, which was confirmed on computed tomographic scan of the chest. For septic shock with respiratory failure, the patient was intubated, placed on mechanical ventilation and vasopressor support, and transferred to the intensive care unit. He was empirically treated with vancomycin, azithromycin, and piperacillin-tazobactam. Blood cultures from admission grew a glucose-nonfermenting, gram-negative rod in both sets. The patient clinically improved, and he was extubated after 3 days. Repeat blood cultures on hospital day 3 showed continued growth in 1 out of 4 bottles. Piperacillin-tazobactam was continued for 14 days after clearance of his bacteremia, which occurred on hospital day 5. His isolate was sent to the North Carolina state lab and eventually identified as *Herbaspirillum seropedicae*.

**Summary:** *Herbaspirillum* species are glucose-nonfermenting, gram-negative rods associated with plants. In the last 10 years, they have become recognized as a rare cause of disease in humans, primarily affecting patients with cystic fibrosis, cirrhosis, or cancer. Only one other case report describes disease in an immunocompetent adult, which also manifested as pneumonia with bacteremia. *Herbaspirillum* species can be misidentified in automated systems for bacterial identification, but with new molecular identification techniques, this organism may be increasingly identified as a pathogen.

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## PV4

### POTT'S DISEASE – AN UNUSUAL CAUSE OF BACK PAIN IN THE UNITED STATES

A Stang, P Shah and N Fadul

**Learning Objectives:** Review the presentation, diagnosis, and management of Pott's disease in the United States

**Case:** A 45-year-old, male healthcare technician presented to the hospital with worsening back pain over 6 months. His past medical history included latent tuberculosis infection (LTBI), treated with 9 months of isoniazid, and recent diagnosis of HIV infection, for which he was on antiretroviral therapy. His home medications included darunavir, ritonavir, emtricitabine, and tenofovir. On presentation, his vital signs were within normal limits, and his physical exam was unremarkable except for tenderness to palpation over the thoracic spine. CT and MR imaging revealed abnormalities suspicious for tuberculous spondylitis: Multilevel thoracic vertebral destruction with relative disc sparing, paraspinal and epidural abscesses, cord compression, and nodular pulmonary densities in the upper lobes bilaterally. The patient was admitted, placed on airborne isolation, and had sputum induced for acid-fast staining and culture. He also underwent T7-T9 laminectomy with evacuation of epidural abscess. Isoniazid, pyrazinamide, rifampin, and ethambutol were initiated, and his HIV medication was changed to avoid drug-drug interactions. Acid-fast bacilli were seen on sputum smear, and *Mycobacterium tuberculosis* was detected by nucleic acid amplification testing. Sputum and operative cultures from the epidural lesion eventually also grew TB, which was found to be fully susceptible to all first-line drugs.

**Summary:** Pott's disease (tuberculous spondylitis) is an uncommon cause of back pain in the US. Risk factors include HIV and prior TB infection. Neurological complications can occur due compression of the cord or cauda equina due to bony deformity, spinal abscess, or granulation tissue. Medical management is similar to that of pulmonary TB. Surgery may be need for cord compression, spinal instability or poor response to chemotherapy. Late diagnosis is a major factor determining outcome. A high index of suspicion must be maintained to diagnose Pott's disease in a timely manner to avoid neurologic complications, particularly considering the low incidence in developed countries and the often insidious and nonspecific nature of its presentation.

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## PV5

### AN UNUSUAL CASE OF POST-TRAUMATIC WOUND INFECTION

D Lebron, A Stang, P Cook

*Lichtheimia corymbifera* is one of the angioinvasive molds from the order of Mucorales, which can cause human infections. These molds are ubiquitous in the environment, found as saprophytes in soil. Mucormycosis may cause rhinocerebral, pulmonary or disseminated disease in hosts with significant immunocompromise due to uncontrolled diabetes, solid organ transplantation, and malignancy. More rarely, these molds can cause skin/soft tissue infections in immunocompetent hosts, particularly in the post-traumatic setting in which soil contamination may be present.

A 41-year-old woman without known medical history suffered a motor vehicle accident in which she was the unrestrained driver and was ejected 60-100 feet. The patient presented with acute blood loss anemia requiring transfusions and an initial lactic acidosis from hypoperfusion. She sustained splenic injury, multiple fractures (clavicle, ribs, lumbar and sacral vertebrae, pelvis, right tibia), and multiple contaminated lacerations to her left leg and back. Two weeks after admission, her left leg and back wounds developed a necrotic appearance and required debridement of subcutaneous tissue and fascia. Tissue cultures from both operative specimens grew *Lichtheimia corymbifera*. In addition to surgical debridement and negative pressure wound therapy, she was treated with amphotericin B deoxycholate 1 mg/kg daily for seven days followed by oral posaconazole 400 mg twice daily for 21 days. The patient had full recovery.

Local acidosis and insufficient host response due to soft tissue damage combined with a high fungal burden from soil contamination have been proposed as factors accounting for mucormycosis occurring in immunocompetent hosts in the post-traumatic setting. Mucormycetes should be kept in mind as potential agents of post-traumatic soft tissue infection, prompting cultures and histologic examination, as early diagnosis improves outcome. Surgical debridement is of primary importance, since these fungi can invade blood vessels, leading to tissue necrosis and poor penetration of antifungal agents. The drug of choice is amphotericin B and posaconazole or in combination as salvage therapy. With appropriate treatment, prognosis of cutaneous mucormycosis is better than that of other forms of mucormycosis.

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## PV6

### NOCARDIA BRASILIENSIS INFECTION IN AN IMMUNOCOMPETENT PATIENT

D Lebron, A Stang, A Lagasca

*Nocardia* species are aerobic actinomycetes which are ubiquitous in the environment and have been considered important pathogens associated with immunosuppression including organ transplantation, hematological malignancies and corticosteroid therapy. Underlying lung disease is also considered an important risk factor. The most common clinical presentation is pulmonary, followed by cutaneous, cerebral and, less commonly, disseminated disease. The diagnosis requires a high level of suspicion and management can be challenging due to identification of new species and antimicrobial resistance.

A 62-year-old previously healthy man presented with low-grade fever, shortness of breath and chest pain for one week prior to evaluation. Initial chest radiograph demonstrated a right lower lobe infiltrate and a small pleural effusion. After failing an initial course of antibiotic therapy with amoxicillin/clavulanate, he was admitted to the hospital due to worsening respiratory symptoms and cardiac arrhythmias. Computed tomographic scan of the chest revealed a right loculated pleural effusion for which he required chest tube placement. He received levofloxacin empirically until *Nocardia brasiliensis* was isolated from pleural fluid acid-fast bacilli culture and also identified by molecular sequencing. Patient was treated with trimethoprim/sulfamethoxazole for a total of 6 months with full resolution of symptoms.

*Nocardia* species are considered important opportunistic pathogens commonly seen in immunocompromised patients but should also be considered in immunocompetent individuals. Treatment will vary according to species and antimicrobial susceptibilities, but trimethoprim/sulfamethoxazole continues to be the drug of choice. Adequate specimen collection for cultures is imperative for diagnosis in order to provide appropriate therapy, as pulmonary nocardiosis requires a minimum of 6 months of therapy depending on the degree of underlying immunosuppression and presence or absence of central nervous system disease. Patients should be monitored for at least 1 year after completion of therapy to detect late relapses.

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## PV7

### NON-STAPHYLOCOCCAL AND NON-STREPTOCOCCAL SKIN INFECTIONS

J Hussain, N Patel, C Phillips

Most clinicians are not aware of uncommon etiologies of skin infection and end up empirically treating them as staphylococcal and streptococcal infection. The failure of skin infections to respond to empiric antistaphylococcal and antistreptococcal therapy should alert the clinician to consider alternative diagnoses, including fungal and mycobacterial etiologies. We present three cases of skin infection that failed treatment with prolonged courses of different antibiotics, prompting an alternate diagnosis to be sought. In the first case; a 28-year-old female presented with a subcutaneous swelling on her abdomen. Incision and drainage was performed, but the wound did not heal. Three months later she developed another lesion on her left thigh prompting punch biopsy for cultures, which grew *Cryptococcus neoformans*. The second case; an 85-year-old female presented with a nodular lesion on the right foot for six months. She was treated with topical antibiotics without any improvement. A shave biopsy was obtained. The purulent drainage and tissue was sent for cultures which grew *Exophiala oligospermia*. The third case; an 87-year-old African-American female from North Carolina without any travel history, with a large erythematous plaque on the right forearm of 24 years. She failed treatment with different topical and oral antibiotics on multiple occasions. Punch biopsy was obtained and the cultures yielded *Mycobacterium tuberculosis* complex.

Primary cutaneous cryptococcosis, *Exophiala oligospermia* skin infection and cutaneous *mycobacterium tuberculosis* infection, are rare. Many of the times, these infections are misdiagnosed and treated as staphylococcal and streptococcal skin and soft tissue infection without clinical improvement. They usually have very indolent course and patients may present because of cosmetic issues or secondary bacterial infections on these skin lesions. These case reports illustrate the important message that fungal and mycobacterial infection should be strongly considered in differential diagnosis. Cultures should be obtained to look for fungal and mycobacterial etiologies, when cutaneous infections are chronic, unresponsive to antistaphylococcal and antistreptococcal antibiotics and lack organisms on gram staining or growth on routine bacterial cultures.

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## PV8

### ACANTHOSIS NIGRICANS AND HYPERPIGMENTATION ARISING IN PATIENT WITH TYPE B INSULIN RESISTANCE AND SYSTEMIC LUPUS ERYTHEMATOSUS

RH Jonas, SE Nichols, WA Burke

A 43 year-old Jamaican female with a past medical history of untreated systemic lupus erythematosus (SLE) presented for severe hyperglycemia. The rare disorder of type B insulin resistance was hypothesized based on the patient's extreme hyperglycemia despite intensive insulin therapy. High titers of insulin receptor antibodies confirmed the diagnosis. Additionally, our patient had marked facial acanthosis nigricans and extensive hyperpigmentation on the remainder of her body, which is typical of type B insulin resistance. Type B insulin resistance characteristically presents with hyperglycemia, acanthosis nigricans, hyperpigmentation, and the presence of an underlying connective tissue autoimmune disease, with SLE being the most common.

Research suggests that at very high levels, insulin interacts with insulin-like growth factor (IGF) receptors, which induces epidermal cell growth and thus acanthosis nigricans. Acanthosis nigricans is a classic manifestation of insulin resistance in type two diabetes mellitus (T2DM), with the distribution typically being on the neck, axillae and groin. However, in individuals presenting with type B insulin resistance, the distribution is periocular, perioral and labial. Our patient's distribution followed this pattern with additional hyperpigmentation on the chest and extremities. Our patient was diagnosed with diabetes mellitus three months prior to admission, around the same time as the development of facial acanthosis nigricans. This is consistent with the timing seen in the literature of similar cases.

Our patient's presentation fits with previous case studies. We present this case to add to the literature of this rare disorder. Previous cases demonstrate improvement of the acanthosis nigricans upon disappearance of the insulin receptor antibody. Our patient is currently on an NIH immunotherapy protocol for type B insulin resistance. We hope to follow the progression of the acanthosis nigricans and hyperpigmentation to assess its course in parallel with the treatment and resolution of the patient's type B insulin resistance.

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## PV9

### A CASE OF HEREDITARY HEMOCHROMATOSIS – THE CLUES WERE IN THE ENDOCRINE SYSTEM

G Johnston, B Simpson, F Cook

**Learning Objectives:** Hemochromatosis is a hereditary disorder characterized by excess intestinal absorption of iron resulting in an overload of total body iron stores. Numerous downstream effects occur due to deposition of iron in multiple organs. This case illustrates the importance of being alert for this **rare** underlying cause of **common** endocrinopathies.

**Case Information:** A 68 year old white male presented with typical chest pain with troponin elevation and ST depressions on EKG. He endorsed several months of progressive fatigue, dyspnea, and unintentional weight loss. Exam was notable for signs of volume overload and absence of obesity (BMI 21). On admission, he was found to be hyperglycemic to 243 mg/dL with HgA1c of 7.1%. He was diagnosed with type 2 diabetes within the last year, but had no family history of diabetes. He also had no other risk factors for heart disease. Around the same time, he was also diagnosed with hypogonadism. He was treated for NSTEMI, and a cardiac MRI confirmed dilated cardiomyopathy, severe global hypokinesis with EF of 14%, ascites, and a dark liver, suspicious for iron deposition. Subsequent iron studies and genetic testing confirmed the diagnosis of hemochromatosis (homozygous for the C282Y mutation). His serum labs revealed elevated transaminase levels, undetectable LH and FSH, and a very low total testosterone of 15 ng/dL. He ultimately required insulin injections for glycemic control. Therapeutic phlebotomy was not tolerated due to anemia. He is to start chelation therapy. His most challenging problem is heart failure.

**Summary:** This case illustrates that the widespread effects of hemochromatosis have an insidious onset and can present quite late in life, which is unusual for a genetic disease. Iron accumulation is gradual over many years before significant clinical manifestations occur. The initial clues in this patient were the unexpected onset of diabetes and hypogonadotropic hypogonadism secondary to iron deposition in the pancreas and pituitary gland respectively. This diagnosis has implications for family members, who should be screened due to the high prevalence of C282Y heterozygotes (10%) and the opportunity for secondary prevention of clinical disease.

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## PV10

### CONTRASTING CASES OF TYPE B INSULIN RESISTANCE RESPONDING TO AN IMMUNOSUPPRESSIVE PROTOCOL

Averneni M, Azad MR, Giordano J, Kalia-Reynolds MS, Cook FJ, Houston C

**Learning objectives:** **1)** Recognize that Type B Insulin Resistance (TBIR) is a rare syndrome in which high-titer autoantibodies exhibit antagonistic activity against the insulin receptor, leading to extreme insulin resistance. **2)** Know that remission of TBIR can be achieved using the NIH treatment protocol which combines rituximab, cyclophosphamide, and pulsed corticosteroids.

**Case descriptions:** **1)** A 68 year old African American woman with mixed connective tissue disease presented with weight loss, diabetes mellitus, alopecia, hirsutism, and acanthosis nigricans. Hyperglycemia persisted despite use of metformin and 1,500 units of insulin daily. The combination of hyperinsulinemia, high adiponectin, low triglycerides, and high molar ratio of insulin to C-peptide (9:1) reflected impaired insulin receptor function and impaired clearance of insulin. Serum analysis confirmed the presence of anti-insulin receptor antibodies. After two cycles of the NIH protocol, euglycemia off all diabetes medications was achieved. Using maintenance azathioprine, full remission was attained 12 months after diagnosis and has been sustained for an additional 12 months. **2)** A 42 year old Jamaican woman with systemic lupus erythematosus presented with weight loss, diabetes mellitus, alopecia, and diffuse acanthosis nigricans. Hyperglycemia persisted despite treatment with metformin and 6,500 units of insulin daily. She had severe hyperinsulinemia, normal adiponectin, low triglycerides, and a very high molar ratio of insulin to C-peptide (50:1). Serum analysis was intensely positive for anti-insulin receptor antibodies. After two cycles of the NIH protocol, she achieved euglycemia on metformin monotherapy. She remains euglycemic on maintenance azathioprine, with full remission pending.

**Summary:** The triad of hyperinsulinemia, normal/high adiponectin, and low triglycerides in an individual with acanthosis and autoimmune disease has been proposed as a working clinical definition for TBIR. Our cases suggest that higher antibody titers correlate with increasing disease severity. Even in our more severe case, the NIH immunosuppressive protocol was successful.

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## PV11

### MEDIASTINAL PARATHYROID ADENOMA IN A PATIENT WITH TERTIARY HYPERPARATHYROIDISM

S Shaik, B F Simpson, F Cook

**Learning Objective:** Consider mediastinal parathyroid adenoma in the setting of persistent hypercalcemia following removal of all localized cervical parathyroid tissue for tertiary hyperparathyroidism.

**Case Information:** A 64 year old African American female with end stage renal disease on hemodialysis presented with fluid overload, severe hypercalcemia, and calciphylaxis. She was status post parathyroidectomy two months prior, at which time three parathyroid glands were removed but a right inferior gland was not located. Pathology showed three hypercellular parathyroid glands. Pre-operative total serum calcium was 12.4 mg/dL and intact PTH was 2840 pg/mL; post-operative total calcium was 10.1 mg/dL and intact PTH was 1079 pg/mL. A CT of the chest 2 days post op showed a 3 cm anterior mediastinal mass. On the current admission corrected total calcium was 12.8 mg/dL (normal 8.5-10.5) and intact PTH was 1145.5 pg/mL (normal 13.8-85.0) despite medical treatment with cinacalcet 90 mg po qhs. Hypercalcemia persisted despite hemodialysis with a low calcium bath and addition of calcitonin 200 units SC bid. A radionuclide parathyroid scan with SPECT/CT demonstrated a large superior anterior mediastinal/substernal mass which accumulated radiotracer activity in a pattern consistent with parathyroid adenoma and which corresponded to the finding on CT of the chest. The patient underwent transcervical parathyroidectomy with upper sternal split with auto-transplant of parathyroid tissue in the left sternocleidomastoid pocket. Pathology showed a 8.0 g parathyroid gland (normal weight 18-161 mg) with no malignancy. Post-operatively intact PTH was <6.3 pg/mL. Hypocalcemia due to hungry bone syndrome occurred after surgery and gradually improved on large doses of calcium and calcitriol. At the time of discharge the patient's corrected total calcium was 7.9 mg/dL.

**Summary:** Following unsuccessful parathyroid surgery for secondary or tertiary hyperparathyroidism, missed glands are most commonly found in the anterior mediastinum. In this case a very large mediastinal parathyroid mass proved to be the main source of PTH, raising the question of whether pre-op parathyroid scan with SPECT/CT should be done routinely prior to initial surgical therapy.

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## PV12

### TRENDS IN AGGRESSIVENESS OF CANCER CARE AT THE END OF LIFE WITH IN RURAL POPULATION IN EASTERN NORTH CAROLINA

P Namireddy, S Macherla, JT McClain, M Muzaffar

**Background:** To determine the aggressiveness of cancer care at the end of life, and to identify any disparities based socioeconomic factors such as race, gender, family support, and marital status.

**Methods:** This retrospective data examined 401 patients with metastatic solid-organ tumors who died between January 2011 and May 2014, within a rural population in Eastern North Carolina. Aggressiveness of end-of-life care was calculated by a composite measure adopted from Earle et al. Scores range from 0 to 7 with higher scores indicating more aggressive end-of-life care.

**Results:** Among the 401 patients, 217 (54%) were white and 178 (44%) were black. The mean composite score of aggressiveness for white patients was 1.180 and for black patients it was 1.865. ( $p < 0.001$ ). In the 30 days prior to death, a higher proportion of black patients had greater than 2 ED visits (28 vs 13%), greater than 2 hospital admission (23% vs 13%), any ICU admission (29% vs 16%), chemotherapy in the last 14 days (30% vs 20%), greater than 14 hospitalized days (35% vs 21%), and in-hospital deaths (46% vs 32%) compared to white patients. In the 30 day prior to death, more white patients enrolled in Hospice compared to black patients (53% vs 45%). We observed 72% of black patients compared to 52% white patients had at least one indicator of aggressive care. In addition to racial differences, trends in mean composite score were observed in males vs females (1.538 vs 1.425), married vs not married (1.348 vs 1.631), and those with family support vs no family support (1.368 vs 1.894).

**Conclusions:** Patients tended to receive more aggressive care if they were black, male, not married at the time of death, or had no family support. Special focus and access to palliative care should be aimed at these groups to achieve higher quality of life at the end of life.

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## PV13

### RARE MANIFESTATIONS OF KAPOSI SARCOMA

DA Uddin, BU Patel

**Learning Objectives:** The primary purpose of this case is to discuss rare manifestations of disseminated Kaposi Sarcoma and to bring attention to a relatively uncommon entity known as Kaposi Sarcoma Herpes Virus Inflammatory Cytokine Syndrome.

**Case Information:** A 27 year old male HIV/AIDS with Kaposi Sarcoma on HAART regimen and status post 12 cycles of doxorubicin presented with acute abdominal distension. He underwent a paracentesis which demonstrated milky-white fluid consistent with chylous ascites with a triglyceride level of 1770. Later, he developed acute hypoxic respiratory failure requiring intubation. An abdominal CT demonstrated progressive development of right sided pleural effusion and new large volume ascites consistent with chylothorax and chylous ascites requiring a peritoneal and right chest tube drain. He was successfully extubated but continued to have respiratory distress with development of large left chylothorax requiring a left chest tube placement. He decompensated further and went into PEA arrest with ROSC in 10 minutes. After discussion with the family of the poor prognosis, he was transferred to palliative care and died.

**Summary:** Our case demonstrates rare manifestations of AIDS related Kaposi Sarcoma and pushes us to consider the different treatment options when thoracentesis and paracentesis are not sufficient in managing chylous pleural and peritoneal effusions. Conservative treatment includes pharmacological therapy with octreotide, a new sympathomimetic drug etilefrine and dietary treatment with TPN. Interventional treatment includes lymphangiography with stent placement or embolization and surgical intervention but this is associated with a high morbidity. We also suspect that our patient had Kaposi Sarcoma Herpes Virus Inflammatory Cytokine Syndrome. He had many of the symptoms fatigue, edema, cachexia, gastrointestinal disturbance, neuropathy and laboratory abnormalities of cytopenias and hypoalbuminemia and an elevated CRP. Bone marrow biopsy didn't show involvement of Kaposi's sarcoma, lymphoproliferative disorder, myelodysplastic syndrome or other malignancy essentially ruling out KSHV-Associated Multicentric Castleman disease. It is important to consider KSHV ICS among the differential diagnoses especially in patients with progressive disseminated Kaposi sarcoma despite therapy to streamline treatment regimens to include antiviral drugs such as ganciclovir, zidovudine to target HHV-8 and rituximab against B cells producing cytokines.

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## PV14

### A RARE CASE OF CNS MARGINAL ZONE LYMPHOMA, MUCOSAL ASSOCIATED LYMPHOID TISSUE (MALT)-TYPE INVOLVING THE DURA WITH POSSIBLE ENT METASTASIS.

P Moore, D Liles, A Weil, H Arastu

**Learning objective(s):** CNS and dural extranodal marginal zone MALT lymphomas are infrequent accounting for only a few case reports in the literature. This lymphoma subtype is most commonly associated with middle-aged to older individuals with a predilection for the female population.

**Case information:** We present a case study of a 22-year-old woman who presented with headaches distinctly dissimilar from prior migraines. Initial CT imaging showed a 4.2cm mass thought to be a large meningioma. Brain MRI showed a 4.3 x 2.4cm dural mass arising from the posterior aspect of the right petrous ridge causing moderate mass effect on the fourth ventricle, displacing across midline with no obstructive hydrocephalus. The patient subsequently underwent total gross resection via right suboccipital craniotomy, with the mass still assumed to be a meningioma. However, the histopathology of the resected mass yielded a low-grade B-cell MALT lymphoma. Expression of lymphocytes showed variability of B-cell CD45 and CD20. Furthermore, it displayed T-cell CD45, CD43, CD3, and CD5 expression without discernible co-expression of CD20 and CD5, CD23, Cyclin D1 or BCL6. A staging PET/CT scan showed prominent hypermetabolic soft tissue in the upper nasopharynx, which appeared to represent obstructive adenoid tissue. Paradoxically, the patient had previously undergone tonsillectomy and adenoidectomy. She was thereafter evaluated by ENT surgery and scheduled to undergo adenoidectomy, with pathology of the specimen to be analyzed and determined. To cover other common possible etiologies, the patient was tested for HIV and Hepatitis B, which returned negative, as these both are associated with the development of Non-Hodgkin's Lymphoma (NHL).

**Summary:** We present this case as a rare subtype of indolent lymphoma that involves the dura in a patient who is much younger than the majority of the case reports in the literature. In addition, the presentation often mimics that of a meningioma, as it did with this particular case. Because of the rarity of this category of lymphomas, there are currently no guidelines for therapy. Lymphoma should be on the differential of solitary mass lesions of the dura.

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## PV15

### ROTHIA MUCILAGINOSA PNEUMONIA IN AN IMMUNOCOMPETENT PATIENT DIAGNOSED BY BRONCHOSCOPY AND FINE NEEDLE ASPIRATION

A El-Bakush, M Rizwan, B Kabchi, M Bowling

**Learning Objectives:** *Rothia mucilaginosa* is a gram-positive coccus that is part of the normal flora of the mouth and upper respiratory tract. It causes disease in immunocompromised patients, particularly those with malignancy and neutropenia. Other risk factors include alcohol abuse, HIV infection, diabetes mellitus, chronic liver disease, prosthetic valves and endovascular catheters. We present a case of *R. mucilaginosa* pneumonia that occurred in an immunocompetent female with no other risk factors.

**Case:** A 54-year-old female with no past medical history presented with sharp left sided back pain and vomiting for 10 days. Poor appetite and weight loss, both over the previous year. She is a current smoker with a 150 pack-years smoking history. She was seen in the Emergency D and treated with a five-day course of moxifloxacin. Exam with normal vital signs, decreased breath sounds of the left lower chest, otherwise normal. Labs: Normal. A chest CT scan showed a left lower lobe round area of consolidation 50 mm x 52 mm with a central lucent focus, left lower lobe bronchi filled with fluid, concerning for an endobronchial obstructing lesion. Enlarged left pre-vascular and hilar lymph nodes. She underwent electromagnetic navigational bronchoscopy: the airways were patent with normal mucosa, and several fine needle aspirations (FNA) and transbronchial biopsies were taken. The FNAs pathology showed no malignant cells; cultures grew *R. mucilaginosa*. She was treated with a two-week course of amoxicillin-clavulanic acid. A repeat chest CT scan 6 weeks later showed complete resolution of the initial findings.

**Summary:** *R. mucilaginosa* can cause bacteremia, endocarditis, meningitis, peritonitis, pneumonia, osteomyelitis, and skin infections in immunocompromised hosts, but it is rarely reported to cause disease in immunocompetent individuals. Literature review published by Maraki and Papadakis found a total of 20 cases of *R. mucilaginosa* pneumonia which almost all occurred in patients with an underlying disease, mainly a malignancy. The site of isolation was sputum, bronchoalveolar lavage, brushing, or blood. In our case the patient was healthy, presented with signs and symptoms concerning for a lung mass and the diagnosis was made by cultures of the FNA which to our knowledge was not previously reported. She was treated successfully with antibiotics.

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## PV16

### A CASE OF CHYLOTHORAX AND CHYLOUS ASCITES IN AN HIV PATIENT WITH KAPOSI SARCOMA

A El-Bakush, M Al-Janabi, S Chalise, V Ramsammy

**Learning Objectives:** Chylothorax and chylous ascites are uncommon complications of Kaposi's sarcoma, however they rarely occur together. We report a case of chylothorax and chylous ascites in a patient with Kaposi's sarcoma and AIDS that was not associated with TB or MAC.

**Case:** A 26-year-old male with AIDS complicated by disseminated Kaposi's sarcoma of the skin, mucus membranes, lungs and colon, who is on HAART and chemotherapy presented with worsening shortness of breath and increasing abdominal girth for 10 days. Physical exam: Cachectic male with multiple skin lesions, in respiratory distress. Heart Rate 130/minute, Respiratory Rate 45/minute, BP 90/60 mmHg, afebrile. Chest: Decreased breath sounds bilateral mid and lower zones. Abdomen: Distended, non-tender, with positive shifting dullness and fluid thrill. Labs: Hb 6.1 g/dl, WBC 0.1 k/ul with <10% bands, platelets 284 k/ul. BUN 67 mg/dl, Creatinine 3.53 mg/dl (up from 0.8), CD4 count was 56, viral load was undetectable. CT scan chest and abdomen: Bilateral pleural effusions, patchy nodular densities in the lungs, and ascites. He had a thoracentesis and a paracentesis. Pleural fluid was exudate and the pleural fluid triglyceride level was 660 mg/dl, peritoneal fluid had lymphocytes and triglycerides greater than 11000 mg/dl. Adenosine deaminase in the ascetic fluid was negative, quantiferon gold was negative. He was intubated and was treated with drainage of the chylothorax and the ascites multiple times, also total parenteral nutrition and a trial of octreotide. His clinical course worsened and complicated by septic shock from a pneumonia, unfortunately he eventually died.

**Summary:** Most cases of chylothorax with chylous ascites in patients with Kaposi's sarcoma were reported to be associated with an infection like tuberculosis (TB) and *Mycobacterium avium* complex (MAC). A few cases were reported without being associated with the infections. Bargout and Barker reported a case. We are reporting another case as well

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## PV17

### CONSOLIDATING A RARE CONSOLIDATION

S Marco, D Thompson, R Talento, A Mohan

**Learning Objectives:** Granulomatosis with Polyangiitis (GPA) is the most common Anti-Neutrophil Cytoplasmic Antibody (ANCA) associated vasculitis. While the pathogenicity is not completely understood, the heterogeneity of clinical presentation combined with a very high morbidity and mortality if untreated, makes physician awareness and understanding of this complex disease paramount. Our case exemplifies the clinical complexity of GPA, delineates the rapidity of disease progression and identifies a unique radiographic presentation of this rare disease. **Case Information:** A previously healthy 47 year old caucasian female presented to an emergency department with bilateral hearing loss, sinus pressure and fevers for two months. She saw her primary care provider four weeks earlier for non-productive cough and sinus pressure. Outpatient chest x-ray showed no acute cardiopulmonary disease and blood work was only notable for paraprotein gap. She failed outpatient antibiotics and ultimately was referred to an otolaryngologist where computed tomography (CT) of her head revealed mastoiditis. She developed joint pain, hearing loss and progressive fevers, culminating in her presentation to the emergency department. In stark contrast to her workup several weeks earlier, chest x-ray now showed bilateral nodular opacities. Serum chemistry was notable for profound acute kidney injury and elevation of inflammatory markers. CT of the chest revealed bilateral nodules with central cavitation but also showed a very dense left sided consolidation concerning for pneumonia versus lung cancer. A multi-disciplinary discussion in addition to a thorough literature review ultimately led to renal biopsy. Renal histology revealed temporal heterogeneity and necrotizing glomeruli consistent with pauci-immune glomerulonephritis. Serology revealed an elevated proteinase 3 antigen and cytoplasmic ANCA. Rituximab and Steroids were started for a diagnosis of GPA and two months later she completed induction therapy without complication. She was seen in pulmonary clinic with marked improvement in her clinical status and chest X-ray. **Summary:** Our case highlights a well-known challenge in medicine; the necessity of physicians to understand and identify ANCA-associated vasculitis early, in order to initiate treatment and prevent significant morbidity and mortality. Our case describes a unique presentation of GPA and extrapolates on the difficult decision making points necessary to arrive at this often delayed diagnosis.

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## PV18

### IMPLICATION OF STEROID THERAPY IN SECONDARY OPPORTUNISTIC PNEUMONIA

AJ Choe, BU Patel, K Malik, C Brown, L Hobgood

**Learning Objectives:** We aim to discuss the impact of short-term high dose steroids on the occurrence of opportunistic infection in patients with diffuse alveolar hemorrhage (DAH) and vasculitis.

**Case Information:**

*Pulmonary Cryptococcosis in setting of Pulmonary-Renal Syndrome:* An 84-year-old man with heart failure with preserved ejection fraction presented with acute kidney injury and hypoxic respiratory failure with hemoptysis. He was diagnosed with community-acquired pneumonia (CAP) and acute decompensated heart failure. Respiratory cultures were unimpressive/negative. With no improvement following eight days of diuresis and antibiotics, further work up revealed p-ANCA positive pauci-immune glomerulonephritis; solumedrol (125mg IV q6H) was initiated. On day ten he showed respiratory improvement, but experienced altered mental status and hypoxic/hypercapnic respiratory failure on day thirteen, leading to intubation on day fourteen. Bronchoscopy with bronchoalveolar lavage (BAL) showed DAH and grew *Cryptococcus neoformans*.

*HSV Pneumonia in setting of DAH and Sarcoidosis:* A 59-year-old woman with sarcoidosis presented with septic shock from CAP and sarcoidosis flare. She was treated with antibiotics, vasopressors, and prednisone 40 mg daily. Bronchoscopy performed on day six suggested DAH. She showed improvement on day eight; however, she decompensated on day ten requiring intubation for hypoxic/hypercapnic respiratory failure. Steroids were escalated to solumedrol 1g IV daily for three days, but she progressed to acute respiratory distress syndrome requiring ECMO. Repeat bronchoscopy with BAL showed inflamed mucosa and bloody secretions before growing HSV.

**Summary:** Although long term steroid therapy is well known to cause immunosuppression, opportunistic infections, and reactivation of latent infections, our cases suggest that even short-term high dose steroids can result in similar complications. Internists must have a broad differential when approaching patients who acutely decompensate following a short course of high dose steroids.

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## PV19

### FAMILIARITY BIAS DELAYING DIAGNOSIS OF PROSTATIC NEUROENDOCRINE CARCINOMA

AJ Choe, JM Garber, A Vigg

**Learning Objectives:** We illustrate the need for vigilance against familiarity bias through a case of delayed diagnosis of prostatic neuroendocrine carcinoma in a middle-aged male with rapidly progressive urinary tract symptoms initially attributed to benign prostatic hyperplasia (BPH) and prostatitis.

**Case Information:** A 55-year-old male without prior urological history presented with dysuria and was empirically treated for a urinary tract infection; however, the next day he went to the emergency department for worsening urinary retention. CT scan showed a markedly enlarged (10x11x12 cm), heterogeneous appearing prostate and several small, sclerotic pelvic bone lesions noted to be possible metastases. With a normal PSA at 1.68 ng/mL, the patient was diagnosed with BPH and prostatitis and was started on tamsulosin and antibiotics again. Symptom progression prompted referral to urology for further management of BPH and insertion of an indwelling catheter for worsening retention. During outpatient urological workup, development of severe constipation and sepsis presumed to be secondary to prostatitis prompted hospital admission and eventual transfer to a tertiary care center for further management. Repeat CT prior to transfer revealed further pelvic mass enlargement, and a second PSA check was normal. Given his constipation and a large palpable rectal mass on physical exam, flexible sigmoidoscopy was performed for evaluation of suspected colorectal malignancy. However, this did not reveal an intra-rectal mass. An MRI of the pelvis for further mass characterization showed an enlarged prostate (13.4x11 x17.5 cm) with no significant internal enhancement, a fluid density suggestive of prostatic abscess, and re-demonstration of pelvic bone lesions suspicious for metastases. Subsequent biopsy revealed a highly aggressive stage IV prostatic neuroendocrine carcinoma six weeks after the original label of BPH with significant growth of the tumor during that time.

**Summary:** Familiar symptoms lead physicians down comfortable diagnostic pathways: most men over the age of 50 presenting with hesitancy, straining, dribbling, and dysuria have BPH. However, clinicians must guard against familiarity bias, which can impede consideration of other diagnostic possibilities.

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## PV20

### SINUS OF VALSALVA ANEURYSM RUPTURE: A RARE PRESENTATION OF RARE DISEASE

M Rizwan, A EL-Bakush, I Osman, S Awadallah, T Pancoast

**Introduction:** Aneurysm of aortic sinus also called sinus of Valsalva (SV) is extremely uncommon. Rupture of aneurysm occurs in about 35% of cases. Most deaths are due to rupture. Early diagnosis is critical as delay in surgery will be fatal.

**Case Presentation:** 20 year old male with history of small perimembranous ventricular septal defect (VSD) presented to ED with nausea and vomiting. Patient's vitals were stable, saturating 100% on room air. Physical examination was notable for systolic murmur. He was admitted with acute gastroenteritis and pre-renal acute kidney injury. Soon after he developed acute pulmonary edema requiring intubation. EKG showed left ventricular hypertrophy. Transthoracic echocardiogram (TTE) showed 60% ejection fraction and ruptured sinus of valsalva aneurysm (SVA). Transesophageal echocardiogram (TEE) confirmed the diagnosis revealing SVA of non-coronary cusp with severe shunting from aorta to right atrium. Surgery was performed after resuscitation and large SVA was closed with autologous pericardium. Postoperatively he was placed on extracorporeal membrane oxygenation (ECMO) for severe hypoxemia. Next day his chest xray improved remarkably and ECMO was weaned off. Later it was noticed that his pupil were dilated. Head CT scan demonstrated severe cerebral edema with herniation. He was declared brain dead and mechanical ventilator support was discontinued.

**Discussion:** SVA is very rare and is found in 0.09% of general population and 0.1-3.5% of all congenital heart defects. Associated congenital defects include perimembranous VSD, bicuspid aortic valve, coarctation and aortic regurgitation. Acquired SVA is less common and caused by syphilis, TB, fungal or bacterial endocarditis. SVAs are more common in Asian males. Unruptured aneurysm are usually asymptomatic. Rupture can cause acute dyspnea, gradual shortness of breath, chest pain or fatigue. Bounding pulse, low diastolic blood pressure, continuous murmur with diastolic accentuation and palpable thrill are usual signs. Rupture most commonly occur in right ventricle or right atrium but can occur into pericardium, pleura or left ventricle. Diagnosis is usually made with TTE, TEE, MRI or aortography. Unruptured SVA can be treated with transcatheter devices or surgically. Once diagnosis of rupture is made optimal management is emergent surgical repair.

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## PV21

### RECOVERY AFTER PROLONGED / EXTREME HYPOGLYCEMIC COMA SN Chalise, MG Al-janabi, MZ Rizwan, ZU Rehman

**LEARNING OBJECTIVES:** Severe hypoglycemia with coma and posturing usually has poor outcome. There are case reports of recovery after 4 days of coma from hypoglycemic injury, but recovery after 10 days has not been reported. **CASE INFORMATION:** 47 year old woman with DM on insulin, found unresponsive with dried vomitus, fecal and urinary incontinence. She had seizure like activity. Her finger stick blood sugar (FSBS) was low. She was given dextrose, glucagon and diazepam in the field. Her FSBS became 111mg/dl, but she remained unresponsive. In ED, her HR was 95 with BP of 105/68, GCS 3T and was decorticating. Labs showed WBC 15.8, K 1.9, negative toxicology screen and normal CT brain. At arrival to ICU, her FSBS was 20 mg/dl and <10mg/dl on chemistry panel. She was started on D25 drip and antibiotics for presumed sepsis. LP was normal. EEG done twice, did not show epileptiform activity. Insulin level 31.9(high) and C peptide 0.11(low) consistent with exogenous insulin induced hypoglycemia. Blood cultures grew Klebsiella and urine culture grew E. Coli which were treated. Despite no sedation and aggressive supportive care, she continued to be unresponsive with posturing but intact brainstem reflexes. MRI brain showed no acute changes. Neurology opined that there was no chance of meaningful recovery. Palliative team discussed end of supportive care. Family wanted to take time to decide about terminal care. On day 7, patient became responsive to painful stimuli but remained non-communicative. On day 10, she started communicating and was successfully extubated. Her neurological status slowly improved to orientation x3 and was able to have full conversation. She was discharged to skilled nursing facility. **SUMMARY:** Cognitive impairment will start when blood sugar drops around 50mg/dl. Lower level will lead to aberrant behavior, focal neurological deficits, decorticate or decerebrate features, seizures and eventually coma. Neuronal death will start at glucose of <20mg/dl. If treatment is delayed for 6-8 hours, damage is irreversible and patient may never regain consciousness. Our patient is unique that she recovered from extremely low glucose and after prolonged coma. While treating hypoglycemic coma, we should keep in mind that recovery from very severe prolonged hypoglycemic coma is still possible and patient should be given ample time to recover.

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## PV22

### FEVER OF UNKNOWN ORIGIN, MULTISYSTEM INFLAMMATION AND POLYARTHRALGIA: A CASE REPORT FOR ADULT ONSET STILL DISEASE

D Langston, N Nehus, J Stahl

**Objective:** Recognizing and diagnosing Adult Onset Still Disease

**Case Information:** We describe a thirty-three year old male patient who presented to the ED with persistent daily fevers for the past six weeks and painful polyarthralgia that made ambulation and his occupation as a construction worker extremely difficult. He also reported a rash that was migratory, developing on his shoulders, chest and abdomen that would persist for several days, resolve and then spread to another location.

Examination showed a healthy, well-built Hispanic male with a fever of 39.2°C, a macular rash across his abdomen and right shoulder and markedly tender knees, ankles and right shoulder without synovial effusions and good range of motion of the joint.

The workup showed a high neutrophilic leukocytosis, markedly elevated erythrocyte sedimentation rate, C-reactive protein and ferritin levels with elevated liver enzymes but a normal lactic acid. Blood and urine cultures were negative and a chest X-ray showed no pulmonary involvement. Hepatitis and HIV screens were negative and rheumatoid factor and antinuclear antibody tests were negative.

The patient met the Yamaguchi Criteria for the diagnosis of Adult-Onset Still Disease (his presentation satisfied 4 major criteria and 2 minor criteria after infection, malignancy and other rheumatologic disease were excluded).

The patient was started on nonsteroidal anti-inflammatory medications with good effect.

**Summary:** Adult Onset Still Disease (AOSD) is a rare, multisystem inflammatory disease that must be considered when evaluating a patient who presents with fever of unknown origin and all other causes including infection, malignancy and rheumatologic diseases have been excluded.

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## PV23

### AN UNUSUAL CAUSE OF INTERMITTENT MELENA

H Movahed, A Raina, MM Abdelfatah, S Kachru, H Khalid

#### LEARNING OBJECTIVES

Pancreatic metastases are rare. Common primary sites with potential to metastasize to pancreas include renal cell carcinoma (RCC), lung, breast, colon, and melanoma. The mean time of pancreatic metastasis from RCC is reported to be longer than 10 years in most studies. This may be asymptomatic or manifest as abdominal pain, gastrointestinal bleeding, jaundice, pancreatitis, and weight loss. Surgical resection of isolated pancreatic metastasis is generally recommended and type of surgery depends on location of the metastasis.

#### CASE INFORMATION

A 68 year old male presented with diarrhea for 6 months and intermittent melena for 2 weeks. He denied associated abdominal pain, nausea, or vomiting. His hemoglobin was 9.1 g/dl on admission with no evidence of hemodynamic instability. An esophagogastroduodenoscopy (EGD) raised concern for a possible periampullary ulceration without any obvious bleeding. To better evaluate, the exam was repeated with a side-viewing duodenoscope. This revealed a large ulcerated ampullary mass which was biopsied. A subsequent endoscopic ultrasound (EUS) of the area showed a hypoechoic mass at the ampulla, a very hypoechoic pancreatic head with hyperechoic strands, and a hypoechoic mass in the pancreatic body. Fine Needle Aspiration (FNA) samples along with a cell block of the pancreatic body mass were obtained. Pathology from all the samples showed clear cell adenocarcinoma. His past medical history was noted to be significant for RCC, diagnosed 17 years prior to presentation and treated with left nephrectomy. This mass was therefore confirmed to be RCC metastasis.

#### SUMMARY

This case highlights the rare potential for RCC to metastasize to the pancreas, despite a long disease-free interval, manifesting as gastrointestinal symptoms. A high index of suspicion should prompt further evaluation with a side viewing scope in the event of a negative forward viewing endoscopy, reducing the risk of missing the diagnosis.

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## PV24

### A CASE OF COLONIC LEIOMYOMA, AN UNCOMMON COLON POLYP

H Movahed, MM Abdelfatah, S Sanaka, H Khalid

#### LEARNING OBJECTIVES

Polyps arising in the gastrointestinal (GI) tract most commonly arise from epithelium. The non-epithelial polyps including the polyps with smooth muscle origin like leiomyomas are commonly found in stomach and small intestine. Leiomyomas are rare in the colon and comprise only 3% of all GI tract leiomyomas. When found, sigmoid and transverse colon are the most commonly encountered sites. They are commonly asymptomatic but depending on their size they have the potential to cause bleeding, mechanical obstruction, or perforation. The treatment is complete removal of the lesion and recurrence is extremely rare. The traditional treatment is surgical resection, although with new advances in endoscopic techniques and devices, endoscopic removal is an alternative option depending on the size and depth of the leiomyoma. Surgical approach with wide margin resection remains the mainstay of the treatment for larger leiomyomas or in polyps where malignancy is a concern.

#### CASE INFORMATION

A 60 year old male presented to our facility for screening colonoscopy. He was found to have a 9 mm sessile polyp which was removed by snare cautery polypectomy. Microscopic examination of polyp revealed spindle cell proliferation in the submucosa with plumb cigar-shaped nuclei and abundant pink cytoplasm. No necrosis or mitotic activity was seen. The spindle cells were strongly positive for actin and desmin and were negative for CD 117 and CD 34. The proliferation index was less than 2%. The polyp was reported to be submucosal leiomyoma with no evidence of malignancy. Slides were reviewed again by pathologist and complete removal of polyp was confirmed.

#### SUMMARY

Leiomyomas are rare in colon, may resemble adenomatous polyps endoscopically, and whenever encountered, complete resection is the treatment of the choice. Complete removal of polyp could be achieved endoscopically or surgically based on size and depth of polyp. In case of endoscopic removal, complete removal of polyp needs to be confirmed by pathologist.

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## PV25

### LEIOMYOSARCOMA INVOLVING THE PANCREAS DIAGNOSED BY ENDOSCOPIC ULTRASOUND FINE-NEEDLE ASPIRATION.

E Gochanour, M Abdelfatah, A Hamed, W Leland

**Learning Objective:** Soft tissue sarcomas are rare tumors that usually affect the extremities but can occasionally present as retroperitoneal masses<sup>1</sup>. Pancreatic leiomyosarcoma (PLMS) is an exceptionally uncommon neoplasm that accounts for only 0.1% of all pancreatic malignancies<sup>2, 3</sup>. Endoscopic ultrasound fine-needle aspiration (EUS-FNA) has proven to be a safe and effective method for diagnosing neoplasms within or adjacent to the gastrointestinal tract<sup>2</sup>. We report the third case of leiomyosarcoma involving the pancreas and extending into the porta hepatis that was successfully diagnosed using EUS-FNA cytology<sup>4, 5</sup>.

**Case Information:** A 60-year-old Caucasian male presented with three episodes of back and abdominal pain. There was no associated nausea, vomiting, fevers or weight loss. Physical exam unremarkable. Contrast-enhanced CT abdomen and pelvis showed a 5 cm, poorly defined, enhancing mass involving the pancreas and growing towards the porta hepatis. Metastatic liver lesions were noted. EUS confirmed a large hypoechoic pancreatic head mass that seemed to grow inside the porta hepatis. EUS-FNA was performed. On cytopathological evaluation, malignant cells with abnormal, large lobulated nucleoli, wispy cytoplasm with indistinct cell borders were noted. Cells were immunopositive for vimentin, smooth muscle actin, and desmin. The final diagnosis was consistent with a high-grade leiomyosarcoma with metastasis to the liver.

**Summary:** Leiomyosarcomas can originate from organs like the pancreas and kidneys. It is challenging to determine the primary organ of leiomyosarcoma. However, remote primary tumor site with isolated metastatic leiomyosarcoma to the pancreas has been reported in only one patient<sup>8</sup>. Almost 10% of PLMS are asymptomatic at the time of diagnosis. Clinical presentation of these tumors is nonspecific<sup>1, 7, 9</sup>. Mean age at the time of diagnosis is 55 years (15-85) with similar distribution between males and females. PLMS have a 43.9% five-year survival rate<sup>10</sup>. Median survival in the largest case series of nine patients, four of whom had complete resection, was 13 months<sup>6</sup>. The role of neoadjuvant radiotherapy or chemotherapy is not completely established<sup>11</sup>. Early diagnosis and surgical resection with free tumor margins are the keys to long-term survival in this patient population<sup>7</sup>

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## PV26

### ENDOSCOPIC ULTRASOUND-GUIDED FIDUCIAL PLACEMENT IN RECURRENT POST-RESECTION GASTRIC ADENOCARCINOMA

E Gochanour, M Abdelfatah, A Hamed, W Leland

**Learning Objective:** Gastric cancers are one of the most common malignancies worldwide<sup>1</sup>. In the last decade, endoscopic ultrasound (EUS) guided interventions has been rapidly evolving for use in diagnosing and staging gastric neoplasms<sup>2</sup>. EUS guided fiducial placement is a cutting-edge, expanding technique in the treatment of gastric cancer. Only three studies with a total of 11 patients have looked at the feasibility of placing EUS-guided fiducials for the treatment of gastric cancer<sup>3-4</sup>. We present a case of successful EUS guided fiducial placement for recurrent gastric cancer.

**Case Information:** 53-year-old male, former smoker, with a family history of colon cancer. He initially presented with one year of progressive fatigue and weakness and was found to have iron deficiency anemia. EGD was significant for a 4 cm diameter mass in the prepyloric region. Pathology showed invasive adenocarcinoma. CT abdomen revealed a 3.9 x 3.6 cm concentric thickening of the wall of the prepyloric region and duodenal bulb without gastric outlet obstruction or metastatic disease identified. Patient was started on chemotherapy followed by a partial gastrectomy with Billroth II reconstruction. 1.5 years later the tumor returned. The decision was made to pursue IGRT after endoscopic ultrasound guided fiducial placement in the recurrent mass. Two hypoechoic lesions were identified during EUS. Fine needle aspiration (FNA) with suction was performed on both lesions and on-site cytopathology confirmed the atypical cells. Five gold fiducials were placed successfully. Patient was subsequently started on IGRT with successful results. No immediate or early complication of the fiducial placement were observed in our patient.

**Summary:** Despite recent advancements, gastric cancer continues to be associated with poor prognosis and high mortality. Novel treatment options include the use of EUS-guided fiducials followed by IGRT. Fiducials, when used in conjunction with chemotherapy, can be used for more focused image guided radiation therapy (IGRT), limiting radiation injury to the healthy gastric tissues, which will result to better tolerance to the treatment. To the best of the authors' knowledge, this is the first case in the literature describing EUS-guided fiducial placement in a patient with recurrent gastric cancer and previous surgery.

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## PV27

### CORTICAL BLINDNESS DUE TO CONTRAST-INDUCED NEUROTOXICITY AFTER CARDIAC CATHETERIZATION

GA Koromia, AN Tomdio, JR Powell

#### Learning Objectives

Cortical blindness is a rare complication after cardiac catheterization and may be due to contrast-induced neurotoxicity. Although dramatic, blindness tends to resolve completely with supportive care.

#### Case Report

A 45 year old female with a PMH of stage 3b CKD, hypertension and diabetes presented to the hospital with new onset bilateral lower extremity edema, shortness of breath, PND, orthopnea, elevated BNP and creatinine. A transthoracic echo revealed an ejection fraction of 45-50% with a mildly dilated left ventricular cavity. Due to associated atypical chest pain, she underwent regadenoson nuclear myocardial perfusion scan, which revealed mild ischemia. Cardiac catheterization was performed and a total of 440ml of iodinated contrast was used. Two stents were deployed to the proximal left circumflex artery and balloon angioplasty was performed at the proximal PDA. Shortly after catheterization, the patient reported bilateral vision loss with some residual light perception. A CT scan of her head and brain MRI showed occipital contrast staining. No other acute abnormalities were identified. The patient was managed supportively for suspected contrast-induced neurotoxicity (CIN). Her vision recovered to baseline after 40 hours.

#### Discussion

This case describes a rare complication of contrast administration. Prospective analyses have shown that 1% of patients may suffer visual disturbances of which 0.2% include complete blindness. CIN selectively affects the occipital lobes due to the effect of high osmolar contrast on the most dependent parts of the body. These agents have direct neurotoxic effects and the risk appears to be increased by impaired renal function, larger doses of contrast media, use of hyperosmolar iodinated contrast agents, and increased length of time in supine position. This rare complication is important for physicians taking care of patients after cardiac and coronary intervention, and raises a clinical dilemma in those patients who may require further interventions requiring the use of intravascular contrast. Reassurance is an important step in supportive care as blindness is usually transient with recovery of vision to baseline reported in hours to five days.

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## PV28

### FREE FLOATING RIGHT ATRIAL THROMBUS PRESENTING AS NEW ONSET ATRIAL FIBRILLATION

B Sivasambu, D Kabirdas

**Learning Objectives:** Free floating right atrial thrombus is a rare echocardiographic finding. The management of an incidentally found thrombus remains a dilemma for physicians.

**Case Information:** 79 year old African-American female with hypertension, chronic kidney disease stage III and hyperthyroidism presented with upper respiratory symptoms and fatigue of 1-2 week duration. Vitals showed a pulse rate of 140 /min and Blood pressure of 100/90 mm Hg. Physical examination was unremarkable. EKG showed atrial fibrillation with ventricular rate of 140-150bpm. Despite rate controlling medications, she continued to have uncontrolled ventricular rate. Rhythm control strategy was planned and she underwent Transesophageal echocardiogram prior to performing electrical cardioversion. Transesophageal echocardiogram showed a long, linear, serpiginous and highly mobile mass inside the right atrial cavity that prolapsed into the Inferior vena cava and tricuspid valve intermittently consistent with Free Floating Thrombus in the right atrium. Given large size and the mobility increased concern for significant embolic potential. Left ventricular ejection fraction was reduced at 30-35%.

**Summary:** Patient was at the verge of hemodynamic compromise due to rapid ventricular rate and left ventricular dysfunction which could be worsened by acute pulmonary embolism. This necessitates urgent management of the thrombus with options including thrombolysis, systemic anticoagulation, thrombus extraction and surgical embolectomy. Thrombolysis was not favored in the context of her current hemodynamic stability and increased risk of bleeding. Given age and associated comorbidities, thrombus extraction and surgical embolectomy were less attractive in a high risk surgical candidate. Hence medical management was opted and patient was anticoagulated with intravenous heparin bridge to long term Coumadin therapy. She did well and follow up echocardiogram in one month showed resolution of free-floating thrombus. Right atrial thrombus poses a clinical dilemma with respect to therapeutic approach given myriad available treatment options which needs to be tailored to the individual patient.

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