

*Department of Medicine  
Temple University School of Medicine*



*Announce*

*2013 Annual Fellows and Residents Research Forum*

*Sol Sherry Awards for  
Excellence in Research*

*Wednesday, June 12, 2013*

*Medical Education and Research Building  
Luo Commons*

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**The Fellows and Residents Research Forum was initiated over 25 years ago to provide the Fellows and the Residents in the Department of Medicine with an opportunity to present their research effort. The Forum is a reflection of the ongoing research activities in the Department, and a year-end summation of the projects carried out by the Fellows and Residents.**

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## Dedication

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### Dr. Sol Sherry

1916-1993



*Sol Sherry, M.D., joined Temple University School of Medicine as professor and chairman of the Department of Medicine in 1968. In 1970, Dr. Sherry founded and served as director of the University's Specialized Center for Thrombosis Research, the largest of its kind in the United States, which was later named in his honor. He served as dean of the School of Medicine from 1984-86. He was a recipient of an honorary doctor of science degree, the University's first Distinguished Professor and was honored with the establishment of the Sol Sherry Chair in Medicine.*

*For his contributions to medical research, teaching and patient care, Dr. Sherry was the recipient of other numerous awards and honors. He was Master of the American College of Physicians and The John Phillips Memorial Medalist of the American College of Physicians; a Fellow of the Royal College of Physicians (London), and recipient of the Robert P. Grant Medal of the International Society on Thrombosis and Hemostasis--a society which he founded in 1977. Dr. Sherry also received awards from the American Heart Association, the Philadelphia County Medical Society, the Texas Heart Institute and the Swedish Society of Cardiology.*

# Distinguished Scientist Award and Lecture – 2013

**Peter N. Walsh, M.D., Ph.D.**  
**Professor of Medicine**  
**Professor, Sol Sherry Thrombosis Research Center**  
**Professor, Fels Institute for Cancer Research and Molecular Biology**  
**Professor, Biochemistry**  
**Temple University School of Medicine**

## *“Platelets, Blood Coagulation, Factor XI, Hemostasis and Thrombosis”*

Born in Chicago, Illinois, Peter N. Walsh, MD, PhD got his undergraduate degree from Amherst University in Massachusetts and his medical degree from Washington University St. Louis. He obtained a doctoral degree D.Phil from Oxford University in England. After Residency training, he was recruited by Dr. Sol Sherry to spearhead the NIH Urokinase Pulmonary Embolism Thrombolysis (UPET) trial. In 1972, he joined the Temple Department of Medicine and became one of the earliest members of the Thrombosis Research Center founded by Dr. Sherry.

With over 200 original publications and invited reviews in major front-line journals including the *New England Journal of Medicine*, *Journal of Clinical Investigation*, *Journal of Biology Chemistry* and *Blood*, Dr. Walsh has made seminal contributions in the area of platelet-coagulant protein interactions. He is an acknowledged pioneer in this area of hemostasis and thrombosis. The initial concepts of hemostasis have been built on the paradigm that blood coagulation and platelets are two distinct and separate arms of the hemostatic mechanisms. It is now well established that both of these systems are closely intertwined and inseparable - that platelets play an absolute and critical role in specific coagulation reactions leading to thrombin generation. The ground breaking work on the platelet coagulant protein interactions, on the basic mechanisms and on molecular interactions have come from Dr. Walsh and his team. His work has addressed the interactions with platelets with coagulation proteins– including factors XI, IX, X, XII and the high molecular weight kininogen. His in depth studies elucidated the relationship of factor XI's domain structure to its biological function; the molecular genetics of FXI, its molecular and cellular interactions.

At Temple Medical School, Dr. Walsh organized and served as the Director of the MD-PhD Program from 1985 to 2001. He has been instrumental in training and influencing the careers of a whole generation of younger scientists and physician scientists. He served as the Co-Director of the Sol Sherry Thrombosis Research Center.

Dr. Walsh has been continuously funded from the NIH since the early 1970s – a remarkable record. He has served on NIH and American Heart Association study sections, and on the International Society for Thrombosis and Haemostasis (ISTH) Council. For his contributions Dr. Walsh has received several awards – NIH Research Career Development Award (1972-1977), International Prize from the Viviana Luckhaus Foundation, Argentina (1972), the Jane Nugent Cochems Prize (1974). He received the university wide – Temple University Research Award in 1994. He is a member of a number of prestigious societies including the American Society for Clinical Investigation, Association of American Physicians, the Inter-Urban Clinical Club, and Fellow of the American College of Physicians.

Dr. Walsh is a remarkable individual whose contributions to the field of hemostasis and thrombosis are seminal and groundbreaking. He has left an indelible mark on the field with his work on the platelet-coagulation protein interactions and through mentoring a whole generation of younger scientists.

## Acknowledgements

The Temple Department of Medicine gratefully acknowledges and thanks the following corporate exhibitors for their generous support of our program this year:

### Platinum Level:



### Gold Level:



### Silver Level:

Philips Healthcare, Division of CV Ultrasound



**Fellows and Residents Research Forum  
Wednesday, June 12, 2013  
Medical Education and Research Building**

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**12:00 – 1:45 PM      Luncheon, Poster Viewing and Poster Discussions (Luo Commons)**

**2:00 – 5:30 PM      Oral Presentations  
Fellows – Room 217  
Residents – Room 219**

**5:45 PM              Distinguished Scientist Award and Lecture – 2013 (Room 217)**

*“Platelets, Blood Coagulation, Factor XI, Hemostasis and Thrombosis”*  
**Peter N. Walsh, M.D., Ph.D.**  
**Professor of Medicine**  
**Professor, Sol Sherry Thrombosis Research Center**  
**Professor, Fels Institute for Cancer Research and Molecular Biology**  
**Professor, Biochemistry**  
**Temple University School of Medicine**

**6:15 PM              Presentation of Awards to Fellows and Residents (Room 217)**

**Reception (Luo Commons)**

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**Poster Discussions – Fellows**  
**Chair: Nathaniel Marchetti, M.D.**

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|---|---------------------|
| <b>Vijay babu Balakrishnan, M.D. (Endocrinology)</b><br><i>A Rare Case of Adult-Onset Nesidioblastosis Presenting With Peripheral Neuropathy and Asymptomatic Hypoglycemia</i>                      | <b>Abstract #1</b>  |
| <b>Ram M. Jhingan, M.D. (Endocrinology)</b><br><i>Prevalence and Characterization of Low Testosterone Occurring in Men With Chronic Prostatitis/Chronic Pelvic Pain Syndrome (CP/CPSS)</i>          | <b>Abstract #2</b>  |
| <b>Murali Pathikonda, M.D. (Gastroenterology)</b><br><i>Post-Traumatic Stress Disorder Is Strongly Associated With IBS in African Americans</i>   | <b>Abstract #3</b>  |
| <b>Sheela Dwivedi, M.D., Sabina Sharmeen, M.D. (Geriatrics)</b><br><i>Vitamin D Awareness Among Community Living Adults</i>   | <b>Abstract #4</b>  |
| <b>Patrick Boland, M.D. (Hematology/Oncology)</b><br><i>Application of Next Generation Sequencing (NGS) for Evaluation of Advanced Epithelial Cancers: A Single Institution Experience</i>          | <b>Abstract #5</b>  |
| <b>Florence Momplaisir, M.D., MSHP (Infectious Diseases)</b><br><i>Trends of HIV Testing Before and After the Introduction of Recommended Opt-Out-Testing: Southeastern Pennsylvania, 2002-2010</i> | <b>Abstract #6</b>  |
| <b>Subhasish Bose, M.D. (Nephrology)</b><br><i>Lupus-Like Glomerulonephritis in a Patient Treated With Interferon-alpha for Hepatitis C</i>   | <b>Abstract #7</b>  |
| <b>Aaron Czysz, M.D. (Pulmonary)</b><br><i>The Effect of Pulmonary Rehabilitation on Hospital Free Survival in COPD Patients</i>  | <b>Abstract #8</b>  |
| <b>Courtney L. Dostal, D.O. (Pulmonary)</b><br><i>Tobacco Cessation Therapy Helps Light Smokers Quit</i>  | <b>Abstract #9</b>  |
| <b>Nishant Goel, M.D. (Pulmonary)</b><br><i>Oxygen Use Does Not Increase the Rate of COPD Exacerbation</i>  | <b>Abstract #10</b> |
| <b>Giuseppe Guglielmello, D.O. (Pulmonary)</b><br><i>Echocardiogram Measurement of Diastolic Dysfunction in COPD Patients at 6 and 12 Months Post Lung Volume Reduction Surgery</i>                 | <b>Abstract #11</b> |
| <b>Manuel Jimenez, M.D. (Pulmonary)</b><br><i>Inpatient Economic Burden and Cost Predictors of COPD in the State of Pennsylvania</i>  | <b>Abstract #12</b> |

- Jason Krahnke, D.O. (Pulmonary)** **Abstract #13**  
*Chronic Bronchitis Symptoms in COPD Patients Vary by Geographic Climate Region and Season Across the United States*
- Jason Krahnke, D.O. (Pulmonary)** **Abstract #14**  
*COPD Patients With Chronic Bronchitis in the Southeast Climate Region of the United States are Less Likely to Be Treated With Single-Agent Bronchodilator Therapy*
- Frederick Ramos, M.D. (Pulmonary)** **Abstract #15**  
*Bronchodilator Reversibility and Frequency of Acute Exacerbation of Chronic Obstructive Pulmonary Disease*
- Frederick Ramos, M.D. (Pulmonary)** **Abstract #16**  
*Unilateral Re-Expansion Pulmonary Edema Following Robotic Mitral Valve Surgery*
- Jeffrey Stewart, M.D. (Pulmonary)** **Abstract #17**  
*Clinical Characteristics of Patients With Increased Frequency of COPD Hospitalizations*
- Zael Vazquez, M.D. (Pulmonary)** **Abstract #18**  
*Geographic Variability in Hospital Readmission Rates and Mortality Among Pennsylvania Patients With COPD*
- Kumar Vipul, M.D. (Pulmonary)** **Abstract #19**  
*Continuous Positive Airway Pressure (CPAP) Adherence Following Bariatric Surgery in Patients With Obstructive Sleep Apnea (OSA)*
- Thais Moldovan, M.D. (Rheumatology)** **Abstract #20**  
*Fulminant Myocarditis in Dermatomyositis*

## **Poster Discussions – Residents**

***Chair: Nathaniel Marchetti, M.D.***

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|---|---------------------|
| <b>Harish Jarrett, MBChB (Cardiology)</b><br><i>Management of Hypercholesterolemia Utilizing a Home Lipid Monitoring System: Preliminary Findings</i>   | <b>Abstract #21</b> |
| <b>Mara Caroline, M.D. (Cardiology)</b><br><i>Identifying Prognostic Factors for Peripartum Cardiomyopathy</i>  | <b>Abstract #22</b> |
| <b>Jonathan Gotfried, M.D. (Gastroenterology)</b><br><i>Epidemiology of Esophageal Food Impaction at an Urban Tertiary Care Center</i>  | <b>Abstract #23</b> |
| <b>Deena Midani, M.D. (Gastroenterology)</b><br><i>Pathogenesis and Outcomes of Traumatic Injuries of the Esophagus</i>   | <b>Abstract #24</b> |
| <b>Nina George, D.O. (Gastroenterology)</b><br><i>Symptom Monitoring During Lactulose Breath Testing for Small Intestinal Bacterial Overgrowth</i>  | <b>Abstract #25</b> |
| <b>Michael McCormack, M.D.</b><br><i>Non-Surgical Treatment of Coexistent Non-small Cell Lung Cancer and Pulmonary Aspergillus</i>  | <b>Abstract #26</b> |
| <b>Shari Barnett, M.D. (Pulmonary)</b><br><i>Risk of Death by Co-Morbidity Prompting Re-Hospitalization Following COPD Hospitalization</i>  | <b>Abstract #27</b> |
| <b>Alexandra Nicole Modiri M.D. (Internal Medicine)</b><br><i>Double Balloon Enteroscopy (Case Series): An Effective and Minimally Invasive Method for Removal of Retained Video Capsules</i> | <b>Abstract #28</b> |
| <b>Alexandra Nicole Modiri M.D. (Internal Medicine)</b><br><i>Age &gt; 65 Is Independently Associated With Successful Diagnostic Double Balloon Enteroscopy</i>                               | <b>Abstract #29</b> |



## **Oral Presentations – Fellows**

***Chair: A. Koneti Rao, M.D.***

***Judges: Michael Bromberg, Philip Cohen, Thomas Fekete, Susan Fisher,  
Crystal Gadegbeku, Kevin Williams***

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|----------------|---|---------------------|
| <b>2:00 PM</b> | <b>Jeffrey Stewart, M.D. (Pulmonary)</b><br><i>Clinical COPD Characteristics and Qualitative Pattern of Emphysema on High Resolution CT</i>   | <b>Abstract #30</b> |
| <b>2:15 PM</b> | <b>Roberto Caricchio (Rheumatology)</b><br><i>Differential Regulation of Pro-Inflammatory Necrosis in Males and Females by Poly (ADP-Ribose) Polymerase-1 and 17<math>\beta</math> Estradiol</i>      | <b>Abstract #31</b> |
| <b>2:30 PM</b> | <b>Marion Cole, M.D. (Hematology/Oncology)</b><br><i>Immune Cell Dysfunction in Chronic Lymphocytic Leukemia/ Small Lymphocytic Lymphoma (CLL/SLL)</i>  | <b>Abstract #32</b> |
| <b>2:45 PM</b> | <b>Aaron Czysz, M.D. (Pulmonary)</b><br><i>Predicting Improvements in Exercise Capacity and 6 MWD in COPD</i>   | <b>Abstract #33</b> |
| <b>3:00 PM</b> | <b>Subhasish Bose, M.D. (Nephrology)</b><br><i>Circulating ADMA and the Renal Tissue Expression of Its Enzymatic Machinery</i>  | <b>Abstract #34</b> |
| <b>3:15 PM</b> | <b>Jason Krahnke, D.O. (Pulmonary)</b><br><i>The 6-minute Walk Distance in COPD Patients With Advanced Emphysema Is an Independent Predictor of Death and Hospitalization</i>                         | <b>Abstract #35</b> |
| <b>3:30 PM</b> | <b>James Fischkoff, M.D. (Rheumatology)</b><br><i>Mer Expression on Microparticles Derived From THP-1 Cells and Human Monocytes</i>   | <b>Abstract #36</b> |
| <b>3:45 PM</b> | <b>Grace Shin, M.D. (Gastroenterology)</b><br><i>Bolus Retention in Hiatal Hernia Identified by High-Resolution Esophageal Manometry With Impedance: Pathophysiological and Clinical Significance</i> | <b>Abstract #37</b> |
| <b>4:00 PM</b> | <b>Frederick Ramos, M.D. (Pulmonary)</b><br><i>Gastroesophageal Reflux Disease and Exacerbations of Chronic Obstructive Pulmonary Disease</i>   | <b>Abstract #38</b> |
| <b>4:15 PM</b> | <b>Jennifer M. Matro, M.D. (Hematology/Oncology)</b><br><i>Cost Sharing and Hereditary Cancer Risk: Predictors of Willingness-to-Pay for Genetic Testing</i>  | <b>Abstract #39</b> |

- 4:30 PM**      **Brian Civic, M.D. (Pulmonary)**      **Abstract #40**  
*COPD Re-Hospitalization: A Review of Risk Factors and Outcomes Over a 20-year Period*
- 4:45 PM**      **Subhasish Bose, M.D. (Nephrology)**      **Abstract #41**  
*Dysglycemia but not Lipids Is Associated With Abnormal Urinary Albumin Excretion in Diabetic Kidney Disease: A Report From the Kidney Early Evaluation Program (KEEP)*
- 5:00 PM**      **Namrata Singh, M.D. (Rheumatology)**      **Abstract #42**  
*Abnormal Neutrophils in Systemic Lupus Erythematosus*
- 5:15 PM**      **Jinal Gangar, MBBS, MPH (Pulmonary)**      **Abstract #43**  
*Effect of Oxygen on Systemic Inflammatory Markers in COPD*

## **Oral Presentations – Residents**

*Chair: Henry Parkman, M.D.*

*Judges: Tayo Fasan, Frank Friedenberg, Steven Kelsen, Anuradha Paranjape,  
Rafik Samuel, Daohai Yu*

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| <b>2:00 PM</b> | <b>Vladimir Lakhter (Cardiology)</b><br><i>Gender Differences in Revascularization Rates of Patients Undergoing Fractional Flow Reserve in the United States</i>                         | <b>Abstract #44</b> |
| <b>2:15 PM</b> | <b>Jocelyn Edathil, M.D., Ph.D. (Internal Medicine)</b><br><i>Implementation and Initial Results of Rapid, Universal HIV Screening in an Urban Residency-Based Practice</i>              | <b>Abstract #45</b> |
| <b>2:30 PM</b> | <b>Farhan Raza, M.D. (General Internal Medicine)</b><br><i>Reviewing Narcotic Contract for Medicine Group Practice</i>   | <b>Abstract #46</b> |
| <b>2:45 PM</b> | <b>Saraswathi Arasu, D.O. (Gastroenterology) Resident</b><br><i>Relevant Symptoms in Diabetic and Idiopathic Gastroparesis</i>   | <b>Abstract #47</b> |
| <b>3:00 PM</b> | <b>Robert Hamburger (Cardiology)</b><br><i>Predictors of Mitral Regurgitation in Athletes</i>  | <b>Abstract #48</b> |
| <b>3:15 PM</b> | <b>Jonathan Gotfried, M.D. (Gastroenterology)</b><br><i>Rethinking Interval Colorectal Cancer</i>  | <b>Abstract #49</b> |
| <b>3:30 PM</b> | <b>Brendan J. Carry, M.D. (Cardiology)</b><br><i>Decreased Left Ventricular Stroke Work Index Is Associated With Increased Risk of In-Hospital Death After Mitral Valve Surgery</i>      | <b>Abstract #50</b> |
| <b>3:45 PM</b> | <b>Daniel Mueller, M.D. (Infectious Diseases)</b><br><i>Retrospective Analysis of Infectious Endocarditis at an Urban Hospital</i>   | <b>Abstract #51</b> |
| <b>4:00 PM</b> | <b>Paul L. Hermany, M.D. (Cardiology)</b><br><i>Comparative Outcomes of Pericardiocentesis in the United States by Hospital Procedure Volumes</i>  | <b>Abstract #52</b> |
| <b>4:15 PM</b> | <b>Harish Jarrett, MBChB (Internal Medicine)</b><br><i>Dealing With Complex Patients at an Internal Medicine Resident Clinic: A Retrospective Analysis and Planned Prospective Pilot</i> | <b>Abstract #53</b> |
| <b>4:30 PM</b> | <b>Chad J. Zack, M.D. (Cardiology)</b><br><i>The Effect of Inferior Vena Cava Filter Placement on In-Hospital Outcomes in Patients With Lower Extremity Deep Vein Thrombosis</i>         | <b>Abstract #54</b> |

- 4:45 PM**      **Jonathan A. Galli (Pulmonary)**      **Abstract #55**  
*Home Non-invasive Positive Pressure Ventilation Use After  
an Acute Exacerbation of COPD With Hypercapnic  
Respiratory Failure Improves Six Month Event-Free Survival*
- 5:00 PM**      **Hayan Al Maluli, M.D. (Cardiology)**      **Abstract #56**  
*The Relationship Between Mitral Regurgitation and Diastolic  
Function*
- 5:15 PM**      **Robin Deutsch, M.D. (Internal Medicine)**      **Abstract #57**  
*Diabetes Group Visits: A Medicine Group Practice Quality  
Improvement Initiative*

**A Rare Case of Adult-Onset Nesidioblastosis Presenting With Peripheral Neuropathy and Asymptomatic Hypoglycemia**

**Vijay babu Balakrishnan, MD; Ram M Jhingan MD; Daniel Rubin MD; Ajaykumar Rao MD; Andreas Karachristos MD; Rebecca Thomas MD; Elias S. Siraj, MD, FACP, FACE**

**Background:** Nesidioblastosis, or non-insulinoma pancreatogenous hypoglycemia syndrome, is a rare cause of hypoglycemia in adults. Hypoglycemia-induced peripheral neuropathy is also rare. We present a case of adult-onset nesidioblastosis presenting as peripheral neuropathy with no hypoglycemic symptoms.

**Case Presentation:** A 51 year old male with no significant past medical history was admitted with a one month history of progressive bilateral lower extremity weakness. Electromyography showed severe distal motor and sensory axonal polyneuropathy. Work up for neuropathy was negative. With suspicion of Guillain-Barre syndrome, he was managed with iv immunoglobulin with no improvement. He was also noted to have fasting hypoglycemia in the range of 40-50 mg/dl without symptoms. Work-up on three separate occasions revealed, inappropriately elevated insulin, proinsulin and c-peptide levels during hypoglycemic episodes (glucose levels of 30-50 mg/dl). Imaging studies including CT, MRI, endoscopic ultrasound and Indium-111-labelled octreotide scan did not show any pancreatic lesion. Selective intra-arterial calcium stimulation with hepatic venous sampling of insulin showed some increments in all of the three arteries with predominance in the gastro-duodenal and superior mesenteric arteries. While this may indicate insulinoma in the pancreatic head, the less than robust response was suggestive of nesidioblastosis. The patient underwent laparotomy and no lesion was found on intra-operative ultrasound or direct palpation of the pancreas. A pylorus-preserving modified Whipple's procedure with removal of the proximal two-thirds of pancreas was done. Pathology showed diffuse islet hypertrophy and hyperplasia consistent with nesidioblastosis. Postoperatively, the patient had complete resolution of hypoglycemia and significant improvement in the neuropathy.

**Discussion:** Nesidioblastosis is a cause of endogenous hyperinsulinemic hypoglycemia characterized by diffuse beta-cell hypertrophy and hyperplasia in the absence of a pancreatic tumor. Most reports in adults are following bariatric surgery. Less than 40 cases have been published in the absence of bariatric surgery.

Even though cases of peripheral neuropathy associated with other causes of hypoglycemia have been reported, to our knowledge, this is the first reported case in nesidioblastosis. Improvement of our patient's weakness supports the causal nature of hypoglycemia in the pathogenesis of peripheral neuropathy. The asymptomatic hypoglycemia in our patient has also not been reported before.

**Conclusion:** We report the first case of adult-onset nesidioblastosis presenting with peripheral neuropathy. The presentation also included asymptomatic fasting hypoglycemia.

**Prevalence and Characterization of Low Testosterone Occurring in Men With Chronic Prostatitis / Chronic Pelvic Pain Syndrome (CP/CPPS)**

**Ram Jhingan, MD; Sajad Salehi, MD; Michael Naso; Michel Pontari, MD; Elias S. Siraj, MD, FACP, FACE**

**Background:** Chronic Prostatitis / Chronic Pelvic Pain Syndrome (CP/CPPS) is a relatively common but poorly understood condition bringing men to the attention of a Urologist. There is limited evidence indicating that low testosterone (T) levels as well as androgen dysfunction or insensitivity may play a role in its pathogenesis.

**Objective:** To study the prevalence and characteristics of low T in men presenting with CP/CPPS to Urology and Endocrinology clinics of an academic medical center.

**Methods:** Our study is a retrospective study looking at 2 sets of patients. The first set includes 73 men who were diagnosed with CP/CCPS at an academic Urology Clinic. The second set includes 22 men with CP/CPPS who were diagnosed with low T (ICD code 257.2) at our Endocrinology Clinic. Clinical as well as laboratory data were collected from the records of all qualifying subjects.

**Results:** Of the 73 patients presenting to Urology Clinic with CP/CPPS, 37% had low T levels, defined as total testosterone (TT) level of < 300 ng/dl.

Of the 22 patients with CP/CPPS evaluated at Endocrinology Clinic, 85% had low T levels at baseline. The mean TT level was 240 ng/dl, mean age was 45 years and mean duration of symptoms was 5 years. The type of pain they had was testicular pain in 40%, penile/urethral pain in 32% and non-specific perineal pain in 27%. More than half of patients reported normal libido and close to 80% had normal erectile function.

After mean follow-up of 2 months with no intervention, the percentage of subjects with TT levels <300 ng/dl dropped to 33% and the mean TT level improved to 327 ng/dl ( $P < 0.001$  compared to baseline). Compared to those, whose TT did not improve on follow-up, those who improved had higher baseline TT, FSH and LH levels as well as shorter duration of disease even though none of those differences were statistically significant. About 40% of the patient's required T replacement therapy and during treatment, the average TT level went up to 404 ng/dl.

**Conclusion:** Low testosterone level seems to be more prevalent in men presenting with CP/CPPS compared to healthy controls. The mechanism and significance of this association remains unclear. The majority of those patients had normal sexual function and the low T levels seem to be transient in most of them. Though not significant, it seems those with lower TT, FSH and LH levels and longer duration of symptoms are the ones whose low T levels tend to persist and may need treatment.

**Post-Traumatic Stress Disorder Is Strongly Associated With IBS  
in African Americans****Frank Friedenber MD, MPH (Epi); Amiya Palit MD**

**Background:** IBS is more common in females and has been previously linked to sexual and physical abuse. There exists sparse data on the link between traumatic life events and IBS in African American's (AA's). Our aim was to explore the link between PTSD and IBS in an urban AA population.

**Methods:** TRIAGE(Temple Registry for Investigation of African American Gastrointestinal Disease Epidemiology) is an ongoing NIH-funded registry of AA's from a single zip code tabulation area in North Philadelphia. Using geographical mapping, complex sampling of the community was performed. Weighted data is in close agreement with published census and demographic data for the area. All participants completed a validated, computer-based interview assisted by research coordinator. Patients were considered to have IBS if they met Rome III criteria for either IBS-D or IBS-C. Subjects completed the 4-item Primary Care Post-Traumatic Stress Disorder screen (PC-PTSD) with those answering "yes" to 3 items or more considered "positive" and results consistent with symptoms of PTSD. We used validated screeners to assess for drug and alcohol dependence and used the PHQ-9 to determine depression level. Norm-based physical (PCS) and mental (MCS) component summary scores of the SF-36 v2 were calculated for those with and without IBS.

**Results:** We interviewed 419 subjects corresponded to a weighted population N = 21,264; 56.9% female, mean age  $44.2 \pm 2.1$  y. The weighted prevalence of IBS was 8.2 % (95% CI 5.0-11.4%). The prevalence of IBS was considerably higher in females (81.8 vs. 54.5%;  $P < 0.001$ ) and in those with rather than without PTSD (52.6 vs. 19.5%;  $P < 0.001$ ). Substance abuse (22.3 vs. 8.0%;  $P < 0.001$ ) and alcohol dependence (20.0 vs. 9.8%;  $P < 0.001$ ) had a significantly higher prevalence in those with PTSD. In regression analysis, female gender (OR=3.10; 2.70-3.57), age > 40 (OR=2.44; 2.14-2.79), college education (OR=4.47; 3.55-5.62), divorced status (OR=1.35; 1.16-1.60), and PTSD + (OR=2.03; 1.79-2.32) were independently associated with IBS. Mean PCS ( $42.9 \pm 10.2$  vs.  $47.6 \pm 10.2$ ) and MCS ( $39.2 \pm 11.1$  vs.  $54.6 \pm 9.9$ ) scores were substantially lower in PTSD + group.

**Conclusions:** As with white subjects with IBS, the prevalence of previous emotional and/or physical trauma is substantial in AA community. After adjustment for other important confounders those with IBS were 2-fold more likely to suffer from PTSD. PTSD was associated with adverse lifestyle choices (drug and alcohol misuse) and had a substantial impact on QOL, both in the physical and (in particular) mental domains. A screen for PTSD in all AA patients under evaluation for IBS appears justified.

**Vitamin D Awareness Among Community Living Adults**

**Sheela Dwivedi, MD and Sabina Sharmeen, MD**

**Background:** Vitamin D deficiency is a common condition which effects approximately 1/3 of the U.S. population. It is associated with osteoporosis and bone fracture and presents a serious risk for physical disability, reduced quality of life, increased mortality and health expense. Prior studies show gaps in patient awareness and health provider discussions regarding the importance and use of Vitamin D.

**Objective:** To investigate vitamin D awareness and use among community living adults.

**Methods:** A survey questionnaire was distributed to participants from January to April 2013 at two outpatient physician practices and four senior community events. The 8 question survey was used to determine participants' awareness and knowledge about sources of Vitamin D, discussions with healthcare providers, and the use of Vitamin D supplements.

**Results:** 232 participants completed the questionnaire. 86 from the outpatient offices and 146 from the senior community events. Ages ranged from 26-90 with a mean age of 64. 46% of participants were Caucasian and 35% African American. 72% participants were female. 98% of participants reported that they heard of vitamin D, 54% had discussions with their health care providers, and 49% took vitamin D supplementation.

**Conclusions:** Most survey participants were aware of Vitamin D. However, about half did not take supplements or discuss Vitamin D with their healthcare provider. Simple interventions such as providing education about vitamin D at office visits may prevent deficiency related illness and reduce the associated burden of disease.



**Application of Next Generation Sequencing (NGS) for Evaluation of Advanced Epithelial Cancers: A Single Institution Experience**

**Boland PM, Skarbnik AP, Cristofanilli M, Alpaugh RK, Olszanski AJ**

**Background:** The use of molecular targeted therapeutic agents may require the application of sophisticated diagnostic technologies for patients' selection. Next generation DNA sequencing (NGS) has the ability to identify genetic alterations (GA) including mutations, copy number alterations, insertions/deletions, and rearrangements in tumor specimens. We sought to evaluate patients with advanced and refractory epithelial tumors to detect potentially actionable molecular abnormalities. Therapeutic intervention driven by GA findings was determined solely by the patient's treating physician.

**Methods:** Tumor samples from 77 patients  $\geq$  18 years old with any solid malignancy were sequenced. NGS of 186 genes was performed by FoundationOne® using archival or newly acquired tumor tissue.

**Results:** Seventy-four patients had specimens with adequate material for DNA extraction and analysis. Characteristics: 74% female, median age 55 years (19-82). Tumor sites included inflammatory breast (50%), colon (12%), unknown primary (5%) and other (33%). At least one genetic alteration was seen in 71 (96%) patients. The most common GA included mutations in 65 (60%) samples revealing TP53 (32%), KRAS (10%), PIK3CA (8%), and APC (6%) and amplifications in 38 (35%) samples which included MYC (18%), MCL1 (14%), CCND1 (12%), and ERBB2 (7%). Copy number loss (4%), fusion (1%) and deletions (2%) were also discovered. An actionable GA was seen in 46 of 74 patients successfully tested (62%), with 54% of GAs being amplifications and 43% mutations. Patients had a median of 3 GA (range 0-7). One patient with anal cancer had a concomitant PIK3CA mutation and amplification. NGS in association with immunohistochemistry helped identify site of origin for one patient with an occult primary.

**Conclusions:** NGS identified GAs in the majority of patients with advanced epithelial cancers, including actionable abnormalities in a large fraction of this heterogeneous population. NGS shows promise in the diagnostic evaluation of advanced malignancies. Future studies should include the potential prognostic implication of genomic-driven personalized therapy.

**Trends of HIV Testing Before and After the Introduction of Recommended Opt-Out-Testing: Southeastern Pennsylvania, 2002-2010**

**Florence Momplaisir MD MSHP, Bradley Fetzer MD MPH, Michael Harhay PhD, Baligh Yehia MD MSHP MPP, Kathleen Brady MD, Judith Long MD**

**Background:** Routine opt-out HIV testing has been recommended by the Centers for Disease Control and Prevention (CDC) since 2006, with the aim of identifying HIV-infected persons early and linking them to care. Whether this new recommendation has been associated with an increase in HIV testing is unknown.

**Objective:** Evaluate HIV testing trends before and after the 2006 CDC recommendations.

**Design:** We performed a time series analysis using 2002 as the reference year.

**Patients:** 50,698 adult ( $\geq 18$  years) responding to the SEPA Household Health Survey between 2002 and 2010.

**Results:** Overall, HIV testing significantly increased after the 2006 CDC recommendations, 42.1% versus 51.4%  $p < 0.001$ . Compared to 2002, the probability of HIV testing was 3% higher in 2006 (95% CI 0.86-1.23), 17% higher in 2008 (95% CI 1.00-1.37) and 47% higher in 2010 (95% CI 1.22-1.76). Overall, testing trends increased among all demographic and socioeconomic groups but differences in testing which existed before 2006 persisted after: younger patients, racial/ethnic minorities, and patients below the federal poverty level or on Medicaid were all more likely to get tested than their counterparts. Blacks and patients seeking care in community health centers had the fastest rise in HIV testing. Compared to private clinic patients, people seeking care at community health centers had higher probability of testing in 2006 and 2008; there was no difference in 2010.

**Conclusion:** HIV testing increased after the 2006 CDC recommendation to move toward opt-out testing. Testing needs to be improved at the private clinic level since it is a major source of care delivery.

**Lupus-Like Glomerulonephritis in a Patient Treated With Interferon-alpha  
for Hepatitis C**

**Subhasish Bose, Mark Birkenbach, Avrum Gillespie**

**Introduction:** Chronic hepatitis C virus (HCV) infection and anti-viral treatment with interferon-alpha (INF-a) has been associated with the development of autoimmune diseases like systemic lupus erythematosus (SLE) and Sjogren's syndrome.

**Case Description:** 51 year old male with hepatitis C (on treatment with Ribavirin and INF-a for 1 year), presented with 1 week history of fever, malaise and generalized weakness. O/E: temperature 101F, BP 150/90, basal crackles in lungs, bilateral pitting pedal edema and patchy erythematous lesions on his legs. On initial labs, hemoglobin was 4.9. He was also noted to have acute renal failure (BUN 58, creatinine 7.6) with nephrotic range proteinuria (urine protein:urine creatinine = 4). Microscopy of urine sediment was notable for RBC and WBC cast and presence of tubular cells.

ANA, anti-dsDNA antibody, anti-proteinase3 antibody, anti-myeloperoxidase antibody, HIV 1&2 antibody and P24 antigen, hepatitis B surface antigen & core antibody and rheumatoid factor were all negative/normal. Serum C3 and C4 were low and cryoglobulin was positive. Anti-RNP antibody and anti-SSA antibody were positive.

Skin rash biopsy which was inconclusive. Kidney biopsy showed immune complex glomerulonephritis with subepithelial, subendothelial and mesangial deposits suggestive of lupus-like collagen vascular disease. There was also presence of organized glomerular capillary immune deposits and "fingerprint" type subendothelial deposits that was suggestive of cryoglobulins.

**Discussion:** Given the clinical history of interferon therapy for hepatitis C virus infection in this patient, he was treated as a therapy-induced autoimmune disease. The treatment included Cyclophosphamide and plasmapheresis. He needed intermittent hemodialysis for a duration of 3 weeks and was discharged home with close follow up. His serum creatinine on 3 month follow up is stable at around 3.0 mg/dl.

**The Effect of Pulmonary Rehabilitation on Hospital Free Survival in COPD Patients****Aaron Czynsz, Kartik Shenoy, Gerard Criner**

**Purpose:** Pulmonary Rehabilitation (PR) is adjunctive therapy for severe COPD patients; however, it is underemployed. PR increases 6 minute walk distance and cardiopulmonary exercise test wattage. The effect of PR on hospital free survival remains uncertain.

**Methods:** 970 COPD patients with hospital admission or ER visit for acute exacerbation of COPD (AECOPD) from 1/2005 through 3/2007. Baseline demographics, spirometry, comorbidities, medications and left and right heart catheterization were collected. AECOPD or hypercapnic respiratory failure (HCRF) readmissions from 1/2005 to 7/2012 were collected. 67 (6.9%) patients had PR during follow-up. A nested cohort from the 903 (93.1%) non-PR patients, matched for race, gender, age, number of comorbidities, cardiac infarction injury score (CIIS), FEV<sub>1</sub>% and home O<sub>2</sub> use yielded 53 PR and 60 non-PR patients for analysis. The original 67 PR patients had admission patterns before and after PR compared, using themselves as their own control.

**Results:** 113 patients from the nested cohort were 23.9% white, 45.1% male, age 62.2<sub>±</sub>9.0, had 2.0<sub>±</sub>1.4 comorbidities, CIIS 15.0<sub>±</sub>8.3, FEV<sub>1</sub>% 34.4<sub>±</sub>13.2, and 35.2% used home O<sub>2</sub>. Hospital free survival was compared from 30 days to 3 years. Hospital free survival did not differ. (Figure 1a) However, the subset of patients with FEV<sub>1</sub><30% (17 PR and 33 non-PR) trended towards greater 180 day hospital free survival. (Figure 1b) The original 67 PR were 14.9% white, 32.8% male, age 60.3<sub>±</sub>9.4, had 2.1<sub>±</sub>1.4 comorbidities, CIIS 14.9<sub>±</sub>8.5, FEV<sub>1</sub>% 34.1<sub>±</sub>13.2, and 37.0% used home O<sub>2</sub>. First readmission was at 451<sub>±</sub>457 days before PR, and 585<sub>±</sub>595 days after PR. 90 day readmission tended to be lower post-PR. (Figure 2)

**Summary:** COPD patients with moderate to very severe obstruction had no significant difference in hospital free survival. However, those with FEV<sub>1</sub><30% trended towards greater 180 day hospital free survival. 90 day readmission tended to be lower following PR.

**Conclusions:** This retrospective nested cohort study suggests that PR may not improve hospital free survival for all groups. The largest benefit is in patients with FEV<sub>1</sub><30%. Also, readmission occurs later post-PR compared to pre-PR. Further, more robust and prospective studies may help define these trends better.

**Tobacco Cessation Therapy Helps Light Smokers Quit**

**Courtney L. Dostal, DO; Aditi Satti, MD; Deb DeEugenio, PharmD;  
Xing Jin; Gerard J. Criner, MD**

**Introduction:** Research shows that light smokers, defined as smoking less than 10 cigarettes per day, have similar health effects as those who smoke more. Light smokers have a higher incidence of cardiovascular disease, lung cancer and COPD compared to nonsmokers, and a similar incidence as heavy smokers. Currently, public health guidelines do not provide formal recommendations for the treatment of light and intermittent smoking. It is unclear whether pharmacotherapy has a role in the treatment of light smoking because these tobacco users are not typically enrolled in clinical trials

**Methods:** All smokers interested in smoking cessation were enrolled in the Temple Lung Center smoking cessation program. The clinic consists of an initial visit with a physician and pharmacist where smoking history is reviewed and pharmacotherapy is initiated. This initial visit is followed by three weekly group sessions where medications can be adjusted, withdrawal symptoms assessed and behavioral therapy initiated. We retrospectively reviewed data from patients enrolled in the smoking cessation program and compared the demographics, co morbidities, smoking characteristics, pharmacotherapy and quit rates between heavy and light smokers.

**Results:** A total of 52 patients were enrolled in the smoking cessation program at Temple University Hospital. Of those, 31 patients were heavy smokers and 21 were light smokers. All patients were given an individualized treatment plan and prescribed a smoking cessation aid based on their individual medical history, insurance coverage and needs. Light smokers made up 40.38% of the smokers in our program. 16.13% of heavy smokers had quit smoking by 6 months compared to 38.10% of light smokers. Light smokers are similar to heavy smokers in demographics and tobacco dependence. When offered tobacco cessation counseling and pharmacologic therapy, light cigarette smokers are able to quit smoking cigarettes similar to heavy cigarette smokers.

**Oxygen Use Does Not Increase the Rate of COPD Exacerbation**

**Nishant Goel, Jinal Gangar, Helen Voelker, Richard K. Albert, A.J. Mamary, John Connett, Nathaniel Marchetti, Gerard J. Criner**

**Introduction:** Previous studies have shown that long-term oxygen use in selected hypoxemic Chronic Obstructive Pulmonary Disease (COPD) patients results in increased exercise tolerance and improved survival. However, oxygen may also foster production of free radicals that increases the risk for acute exacerbations. The independent effect of oxygen on developing future exacerbations is unclear.

**Methods:** We performed a secondary analysis of the prospectively collected COPD Clinical Research Network data that assessed azithromycin for prevention of COPD exacerbations. We compared AECOPD frequency between those prescribed and not prescribed oxygen. Independent t-tests and chi square analysis were done to assess differences between subjects receiving and not receiving oxygen at baseline. Multivariate regression analysis controlling for randomization to azithromycin group, baseline FEV<sub>1</sub> % predicted, current smoking, gender, age, inhaled medication use, and hospitalization in prior year was performed to determine the effect of oxygen on AECOPD rate.

**Results:** 1142 subjects underwent randomization. 1117 subjects were included in the primary analysis. 662 subjects (60.1% male) were prescribed oxygen therapy at baseline and 455 subjects (57.8% male) were not. As shown in Table 1 independent t-tests indicated a significant difference ( $p < 0.05$ ) in age, post bronchodilator FEV<sub>1</sub>% predicted, rate of AECOPD, and current smoking. Independent chi-square showed a significant difference ( $p < 0.05$ ) in the type of inhaled medication regimen at baseline but not in the hospitalization for AECOPD in the year prior to enrollment between groups. Stepwise multivariate regression analysis, when controlling for these significant variables and randomization to azithromycin, showed no significant difference in exacerbation rate for those on oxygen ( $p = 0.179$ ).

**Conclusion:** Oxygen use, when controlled for FEV<sub>1</sub> % predicted, hospitalizations in the past year, age, gender, current smoking and azithromycin use, is not a significant predictor of future AECOPD.

**Echocardiogram Measurement of Diastolic Dysfunction in COPD Patients at 6 and 12 months Post Lung Volume Reduction Surgery**

**G Guglielmello, P Desai, J Gonzalez, R Hamburger, N Memon, BC Mani, A Vyas, K Cucel-Lautensack, GJ Criner**

**Rationale:** Abnormal left ventricular diastolic dysfunction seems to be more frequent in patients with chronic obstructive pulmonary disease (COPD). Abnormal cardiac mechanics are thought to stem from increase in intra-thoracic pressures. Lung volume reduction surgery (LVRS) has been known to have a beneficial effect on lung function and mortality. In addition, it is shown to improve stroke volume and increase functional capacity. We aim to characterize the effects of decreased hyperinflation as seen in patients with LVRS with changes in cardiac diastolic parameters.

**Methods:** A retrospective, observational comparison of 45 patients that had undergone LVRS at our institution was performed. Echocardiogram data, particularly measures of diastolic dysfunction were compared from pre-LVRS to 6 and 12 months post – LVRS. Student's t test, paired t-test with repeated measurements and the Wilcoxon-Sign Rank test were used for data analysis. Data were expressed as mean  $\pm$  SD (standard deviation) or percent (%). P values less than 0.05 were considered significant.

**Results:** 45 patients had undergone LVRS at our program. The mean age was  $65 \pm 6$  years. 92% were Caucasian. 54% were female. The mean BMI was  $26 \pm 4$  kg/m<sup>2</sup>. See tables for pulmonary function and echocardiogram data.

**Conclusion:** No significant changes in left ventricular diastolic dysfunction parameters in patients were seen at 6 and 12 months post LVRS. The increase in contribution of left atrial contraction to diastolic filling of the left ventricle could be secondary to age, increased heart rate, or underlying COPD. The inner dimensions of the left ventricle at end of diastole are smaller at 6 and 12 months post LVRS suggesting reduced left ventricular end diastolic pressure or the effect of increased stroke volume and increased left ventricular compliance.

**Inpatient Economic Burden and Cost Predictors of COPD  
in the State of Pennsylvania**

**M. Jimenez, N. Marchetti and G. Criner**

**Background:** Acute exacerbations of chronic obstructive pulmonary disease (AECOPD) are a leading cause of hospitalization and account for the majority of the cost associated with COPD. Studies analyzing the cost of AECOPD in the US are few in number and have used data more than a decade old. This study evaluates the inpatient economic burden of COPD as well as predictors of cost over a 20 year period in Pennsylvania.

**Methods:** We identified patients discharged from non-government acute care hospitals in Pennsylvania from January 1, 1990 to December 31, 2010 using the Pennsylvania Health Care Cost Containment Council (PHC4) database. Subjects were included in the database if they had COPD as a primary ICD-9-CM diagnosis. All subsequent admissions, defined by primary ICD-9-CM diagnosis of COPD were also included. Patients were excluded if they were less than 40 years old or not Pennsylvania residents. The primary outcome of inpatient cost for COPD hospitalizations was analyzed. Univariate and multivariate regression analyses were conducted to determine predictors of inpatient cost controlling for patient demographics, severity of illness using the MediQual Atlas Admission Severity Score, length of stay and most common comorbidities at discharge.

**Results:** Overall 581,566 COPD hospitalizations were observed with a mean cost of \$19,088(+56533) and total cost of \$10.7 billion. (See table1) Inpatient mortality was 2.7% (N=15,546). The average age at discharge was 70.6(+11.6) years of age. The majority were female (54%) and of white race (85%). After analyzing the variables statistically significant on univariate analyses on a multivariate regression model, several of the co-morbidities were significantly associated with higher cost ( $P<.0001$ ): Congestive heart failure, ischemic heart disease, acute myocardial infarction, pulmonary embolism, lung cancer, cardiac arrhythmias, weight loss and anemia. Comorbidities not associated with higher cost were diabetes mellitus, cerebrovascular disorders and gastro esophageal reflux. Significant higher costs were also associated with higher severity of illness, older age and longer ICU stay.

**Conclusion:** The inpatient burden of COPD cost is substantial. A number of comorbidities were associated with increased inpatient costs of care. These data suggest that the presence of co-existing diseases can be used to identify patients prone to increased resource utilization.



**Chronic Bronchitis Symptoms in COPD Patients Vary by Geographic Climate Region and Season Across the United States**

**Jason S. Krahnke, Jinal Gangar, Kartik V. Shenoy, Helen Voelker, John Connett, Richard K. Albert and Gerard J. Criner**

**Rationale:** COPD patients with chronic bronchitis have increased morbidity and mortality. Little is known about the geographic and seasonal variation of chronic bronchitis symptoms of COPD patients in the United States.

**Methods:** We analyzed subjects with chronic bronchitis enrolled in the placebo group of the MACRO Trial. Chronic Bronchitis was defined by the presence of both cough and phlegm. SGRQ data was collected at three different time points during the study. Climate regions were assigned to the ten study sites involved in subject recruitment based on National Oceanic and Atmospheric Administration (NOAA) climate analysis and classification system. ANOVA and Factorial ANOVA were used for analysis. All data is expressed as mean  $\pm$  SD.

**Results:** 252 subjects were evaluated age  $64.5 \pm 8.6$  years, 64% males, FEV1%  $40.6 \pm 15.0$ ,  $62.7 \pm 32.1$  pack years and 37% current smokers at baseline. The Southeast climate region had the highest percentage of current smokers (63%,  $p < 0.001$ ). The average SGRQ Impact score at baseline was statistically higher in the Southeast climate region compared to other climate regions ( $47.3 \pm 18.6$ ,  $p < 0.05$ ). The average SGRQ Total, Symptom and Activity scores did not vary across geographic climate region. Subjects in the Upper Midwest and Northeast regions experienced more AECOPD per year ( $2.42 \pm 2.1$  and  $2.3 \pm 2.2$  respectively,  $p < 0.01$ ).

**Conclusion:** In this cohort of patients, chronic bronchitis symptoms varied by geographic location and season across the United States. Subjects in the Northeast and Upper Midwest regions experienced more exacerbations of COPD. Subjects in the Southeast had higher SGRQ Impact scores.

**COPD Patients With Chronic Bronchitis in the Southeast Climate Region of the United States Are Less Likely to Be Treated With Single-Agent Bronchodilator Therapy**

**Jason S. Krahnke, Jinal Gangar, Kartik V. Shenoy, Helen Voelker, John Connett, Richard K. Albert and Gerard J. Criner**

**Rationale:** COPD patients with chronic bronchitis have increased morbidity and mortality. We sought to study the differences in medical therapy used to treat patients with chronic bronchitis at various geographic climate regions across the United States.

**Methods:** We analyzed subjects with chronic bronchitis enrolled in the placebo group of the MACRO Trial. Chronic Bronchitis was defined by the presence of both cough and phlegm. Climate regions were assigned to the ten study sites involved in subject recruitment based on National Oceanic and Atmospheric Administration (NOAA) climate analysis and classification system. ANOVA was used for data analysis. All data is expressed as mean  $\pm$  SD.

**Results:** 252 subjects were evaluated age  $64.5 \pm 8.6$  years, 64% males, FEV1%  $40.6 \pm 15.0$ ,  $62.7 \pm 32.1$  pack years and 37% current smokers at baseline. At baseline and at 12 month follow-up, no subjects in the Southeast were treated with single-agent bronchodilator therapy. Additionally, there were no subjects in the Southeast treated with combination of inhaled LAMA/LABA. There was a statistically significant difference in LAMA only use at baseline with 18% of subjects receiving this therapy in the Upper Midwest ( $p=0.03$ ). There was no difference in inhaled medical therapy use among geographic climate regions at 12 months study duration.

**Conclusion:** In this cohort of subjects, patients in the Southeast climate region were less likely to be treated with single-agent bronchodilator therapy ICS, LAMA, LABA or combination of inhaled LAMA/LABA compared to other climate regions in the United States. This may reflect prescribing patterns at different institutions.

**Bronchodilator Reversibility and Frequency of Acute Exacerbation of  
Chronic Obstructive Pulmonary Disease**

**Frederick Ramos, Kartik Shenoy, Helen Voelker, John Connett, Richard Albert,  
and Gerard Criner for the NIH COPD CRN**

**Rationale:** Bronchodilator reversibility (BR) is routinely assessed in chronic obstructive pulmonary disease (COPD). To our knowledge, the association between BR and frequency and severity of acute exacerbations of COPD (AECOPD) and health impairment is unknown.

**Objective:** Determine the association between BR and exacerbation frequency and severity and symptom scores.

**Methods:** Study design is prospective cohort. Data from the NIH sponsored Azithromycin for Prevention of Exacerbations of COPD trial is utilized. Only subjects with pre- and post-bronchodilator spirometry data are included. Subjects are categorized into two groups based on the American Thoracic Society/European Respiratory Society definition of significant bronchodilator response (increase in FEV1 and/or FVC of more than 12% and greater than 200 mL from baseline after a short-acting bronchodilator).

**Results:** Of the 1,117 subjects enrolled into the parent trial, 452 had pre- and post-bronchodilator spirometry data available for review. 176 patients had significant bronchodilator response (SBR); the remainder had nonsignificant bronchodilator response (NSBR). Demographics and clinical baseline characteristics were similar between groups. There was no difference in median time to 1<sup>st</sup> AECOPD (155 days, 95% CI 111 to 211 vs 154 days, CI 128 to 208; P = 0.75) or rates of AECOPD ( $2.2 \pm 3.9$  vs  $1.8 \pm 2.1$ ; P = 0.13) between SBR and NSBR groups, respectively. Severity of AECOPD and SGRQ scores were similar in both groups.

**Conclusion:** Bronchodilator reversibility is not associated with frequency or severity of AECOPD and SGRQ scores.

(Supported by NHLBI; ClinicalTrials.gov number: NCT00325897)

**Unilateral Re-Expansion Pulmonary Edema Following  
Robotic Mitral Valve Surgery**

**Frederick Ramos, Parag Desai, Steven Dudley, and T Sloane Guy**

**Rationale:** During robotic mitral valve surgery, the right lung is collapsed to facilitate surgical exposure. To our knowledge, there are no published case-control studies comparing patients who develop unilateral pulmonary edema (UPE) after re-expansion of collapse lung versus those who do not after robotic mitral valve surgery.

**Methods:** Study design is case-control. Patient's who underwent robotic mitral valve replacement from Jan 1st, 2012 to July 3<sup>rd</sup>, 2012 are included. Patients are retrospectively categorized into one of two groups. The UPE group criteria are as follows: radiologist confirmation of right lung UPE on 1<sup>st</sup> chest radiograph after lung re-expansion, documentation of UPE as diagnosis in the patient's chart by any physician, and absence of suspicion for pneumonia, bilateral pulmonary edema, and/or alveolar hemorrhage. The remainder are allocated to control group.

**Results:** 24 patients are included. Five patients fulfill prespecified criteria for UPE. 19 patients are assigned to the control group. Preoperative demographics and clinical characteristics are similar between the two groups. UPE group has significantly longer durations of anesthesia, cardiopulmonary bypass, and operation. UPE group also has a more positive fluid balance during operation and higher pulmonary diastolic pressure at the end of the operation. Multivariate analysis reveals that the odds for developing UPE is most strongly associated with duration of cardiopulmonary bypass rather than fluid balance.

**Conclusion:** In patients undergoing robotic mitral valve replacement, the odds of developing UPE after lung reexpansion is associated with longer duration of cardiopulmonary bypass.

**Clinical Characteristics of Patients With Increased Frequency  
of COPD Hospitalizations**

**Jeffrey I. Stewart MD, Brian Civic MD, Kartik Shenoy MD,  
Albert J. Mamary MD, Gerard J. Criner MD**

**Background:** Patients who have acute exacerbations of COPD experience a more rapid decline in lung function and reduced quality of life. The clinical characteristic of this patient group needs further characterization.

**Methods:** We identified patients discharged from non-government acute care hospitals in Pennsylvania from January 1, 1990 to December 31, 2009 using the Pennsylvania Health Care Cost Containment Council (PHC4) database. Subjects were included in the database if they had a primary ICD-9-CM diagnosis of COPD, chronic bronchitis, or emphysema. All subsequent admissions with the above primary ICD-9-CM diagnosis were included. Patients were excluded if they < 40 years old, non-Pennsylvanian residents, and those with < 1 year of admission data. The number of COPD hospitalizations per person-years was calculated. Subjects were divided into 3 groups: group A if they < 1 exacerbation, group B if they had  $\geq 1$  but  $\leq 2$  exacerbations, and group C if they had > 2 COPD hospitalizations. Primary outcome was time to death from initial COPD hospitalization.

**Results:** There were 83,172 subjects who had follow-up data for a median 3 (IQ range 2-6) years. There were 31,926 (38.4%), 37,940 (45.6%) and 13,306 (16.0%) in groups A, B, and C, respectively. Patients with frequent COPD hospitalizations (group C) had a higher mortality rate compared to groups A and B ( $p < 0.0001$ ). Subjects with a greater number of COPD hospitalizations died at a younger age (group A  $77.3 \pm 9.1$  yrs, group B  $75.9 \pm 9.6$  yrs, group C  $73.4 \pm 9.6$  yrs,  $p < 0.0001$  for all groups). The percent females were greater in all groups, however, the proportion of females decreased as the frequency of COPD hospitalizations increased (group A 55.9%, group B 53.3%, group C 50.8% females,  $p < 0.0001$ ). The mean length of stay was longest for group C (group A  $5.6 \pm 5.3$  days, group B  $6.1 \pm 8.6$  days, group C  $6.3 \pm 6.2$  days,  $p < 0.0001$ ). Group C subjects also had a higher Mediqua Atlas Admission Severity Scores (group A  $1.75 \pm 0.64$ , group B  $1.84 \pm 0.66$ , group C  $1.86 \pm 0.67$ ,  $p < 0.0001$ ).

**Conclusions:** Subjects with a greater frequency of COPD hospitalizations have reduced survival and die at a younger age. This group of patients also exhibit a greater length of stay and have higher severity of illness scores.

**Geographic Variability in Hospital Readmission Rates and Mortality  
Among Pennsylvania Patients With COPD**

**Zael Vazquez MD, Kartik Shenoy MD, Victor Kim MD, Gerard J. Criner MD**

**Background:** Previous retrospective data shows that COPD patients living in isolated rural areas have an increased risk of mortality. We aimed to evaluate the differences in 30-day mortality and readmission rate after COPD exacerbation in urban versus rural environments.

**Methods:** We identified patients discharged from non-government acute care hospitals in Pennsylvania from January 1, 1990 to December 31, 2009 using the Pennsylvania Health Care Cost Containment Council (PHC4) database. Subjects were included in the database if they had a primary ICD-9-CM diagnosis of COPD, chronic bronchitis, or emphysema. Patient rural status was the primary exposure while 30-days mortality and COPD readmission rate were the primary outcomes. Patient rural status was defined by using a zip code level approximation of the rural-urban community area (RUCA) codes. These codes characterize census tracts on rural and urban status by using standard U.S Census Bureau definitions. Subjects were divided into two groups, Urban if their corresponding RUCA code was associated with an urban area, and Rural if it belonged to a rural area.

**Results:** There were 581,590 subjects who had follow-up data. There were 448,405 (77.10%) and 133,185 (22.90%) in groups Urban and Rural respectively. Patients with rural area residence had a lower mortality rate and lower readmission rates 30 days after discharge when compared to urban patients (Table 1). The severity of admission, as determined by admission to the intensive care unit, was higher in the urban group (14.45%),  $p < 0.0001$ . The mean length of stay was not statistically significant between the two groups at 6.22 days for the urban patients and 6.00 days in rural patients. Rural subjects also had a higher Mediquial Atlas Admission Severity Scores,  $p < 0.0001$ .

**Conclusions:** COPD patients living in rural areas have lower 30-days mortality compared to those living in urban areas. These patients also have lower readmission rates 30 days after discharge from the hospital.

**Continuous Positive Airway Pressure (CPAP) Adherence Following Bariatric Surgery in Patients With Obstructive Sleep Apnea (OSA)**

**K. Vipul, S. Raju, N. Raju, F. Jaffe, W. Chatila, T. Shariff,  
D.E. Ciccolella, S. Krachman**

**Rationale:** Approximately 70% of patients being evaluated for bariatric surgery have obstructive sleep apnea (OSA). Studies have demonstrated that many patients have residual OSA despite significant weight loss following bariatric surgery. The long term adherence rate for CPAP use following bariatric surgery remains unknown. We hypothesized that many patients with OSA who undergo bariatric surgery discontinue CPAP therapy on their own after weight loss.

**Methods:** We conducted a cross sectional survey among post bariatric surgery patients to assess CPAP adherence and factors that affect CPAP usage. Patients had a polysomnogram (PSG) and CPAP titration before bariatric surgery and underwent bariatric surgery 12-18 months prior to enrollment. The questionnaire included questions related to socioeconomic status, OSA symptoms, CPAP usage, perceived benefits, side effects and satisfaction with therapy.

**Results:** 31 patients (49 +/- 11 years, 11 males, 304 +/- 51 lbs., AHI 35 +/- 30 events /hour, CPAP 12 +/- 3 cm H<sub>2</sub>O) responded to the questionnaire. When diagnosed with OSA, most had symptoms of excessive daytime sleepiness (80%), witnessed apneas (67%), loud snoring (80%) and night time awakenings (82%). Patients understood the reason for PSG (100%) and the majorities were explained the health risks of OSA (93%). Ninety percent used CPAP at home prior to surgery, 67% used CPAP during hospitalization, and 77% were told to use CPAP after surgery. There was an initial perceived benefit (7.5 on a scale of 1-10) with use of CPAP. Most of the respondents thought that CPAP had a positive impact on their quality of life (85%) and overall health (89%). Weight reduction was 68 +/- 32 lbs. at 6 months and 94 +/- 38 lbs. at 12 months. Most patients were not seen by a sleep physician after bariatric surgery (64%) and did not have a repeat PSG (77%). Only half of the respondents (51%) were using CPAP at the time of survey. The majority of patients who stopped using CPAP did so within 3-6 months of surgery (76%). Almost half of the non-adherent patients stopped CPAP on their own (45%) and were not told to continue CPAP after surgery (95%). Half of the patients who discontinued CPAP (50%) continued to report sleep related symptoms.

**Conclusion:** Many patients with OSA stop CPAP on their own following bariatric surgery due to perceived resolution of their disease with weight-loss. Therefore, post-bariatric follow-up with a sleep physician is important to determine appropriate treatment in patients with OSA.

**Fulminant Myocarditis in Dermatomyositis**

**Thais Moldovan, MD**

Dermatomyositis is a chronic inflammatory myopathy. Subclinical cardiac involvement is common, but rarely becomes fulminant. The rare nature of this disease makes it an interesting diagnostic and therapeutic challenge.

A 53 years old female with a biopsy proven diagnosis of dermatomyositis for 25 years presented to the emergency department complaining of acute onset of shortness of breath, chest discomfort, malaise and vomiting. She described the discomfort as mid-sternal, dull, radiating to the back, not aggravated by exercise or food intake. On the physical examination, she seemed to be in mild discomfort, had a heliotrope rash and decrease in proximal muscle strength on both upper and lower extremities. In less than 48 hours, she had a 2-fold increase in troponin (22 at admission to 58 on day 2), and her systolic cardiac function deteriorated from 45% to 10%, with diffuse hypokinesis on transthoracic echocardiogram. At that point she received a biventricular assisted device to support her cardiac function. Endomyocardial biopsy was consistent with necrotizing eosinophilic myocarditis, a thorough work up ruled out an infectious etiology. She was immunosuppressed with steroids and rituximab, received IV immunoglobulins, and required pressors to maintain her cardiac function. This hospital course was complicated by ischemic bowel with intra-abdominal bleeding that required multiple surgical interventions and a cerebral vascular accident. After 10 weeks of hospital course, in the setting of multiple organ failure, the family decided to withdraw care.

Cardiac involvement is rare in dermatomyositis, but an important cause of death. The role of immunosuppressive therapy remains controversial. The correlation of overall severity, disease activity and cardiac manifestations is also controversial. Physicians should maintain a high index of suspicion in patients with dermatomyositis.



**Management of Hypercholesterolemia Utilizing a Home Lipid Monitoring System:  
Preliminary Findings**

**M Alkhouli, B Carry, H Jarrett, S Sirna, A Bove**

**Background:** Many patients do not achieve target lipid levels by NCEP guidelines. The current standard of care is to check lipids 6 weeks after initiation of statin therapy.

**Purpose:** We propose that home lipid monitoring is a superior method to manage hyperlipidemia.

**Methods:** Patients with LDL C > 130 mg/dL were randomized to a home measure group (H) and a usual care group (U). H-group received a hand held lipid monitoring device (Cardio-check) and reported biweekly lipid levels for 6 months via a standard phone call. They also received feedback regarding medication and dietary changes to achieve LDL goals. U-group received usual care and had follow-up lipid levels at 6 months. The primary endpoint was LDL reduction at 6, 12 and 24 weeks. Secondary endpoints were changes in HDL, Triglyceride, liver function tests, and BP at 24 weeks.

**Results:** 33 patients completed the study to date. Mean LDL decreased from 186 mg/dl to 117 mg/dl in the U group ( $P < 0.001$ ) and from 162 mg/dl to 105 mg/dl in the H group ( $P < 0.001$ ). The reduction in LDL in the H group was achieved in the first two weeks and was sustained at 24 weeks. There was no significant difference in the mean change in LDL between the two groups ( $P = 0.43$ ). There was also no difference with regards to mean changes in HDL, Triglyceride, liver function tests, or blood pressure.

**Identifying Prognostic Factors for Peripartum Cardiomyopathy**

**Mara Caroline MD**

**Abstract pending at time of print.**

**Epidemiology of Esophageal Food Impaction at an Urban Tertiary Care Center**

**Zubair Malik MD, Jonathan Gotfried MD, Samuel Ross BS, Brintha Enestvedt MD, Benjamin Krevsky MD, Frank Friedenberg MD, Jennifer Maranki MD**

**Background:** The epidemiology of esophageal food impactions EFI is poorly understood. Although there is an increasing recognition of eosinophilic esophagitis (EoE) as an etiology, prevalence estimates vary widely. We aim to identify factors associated with EFI and prevalence of EoE.

**Methods:** We conducted a retrospective study of patients presenting with EFI to Temple University Hospital who required endoscopy from 2003 – 2012. Patients were identified through our institution's endoscopy database. Charts were reviewed for endoscopic evidence and symptoms of impaction and to gather demographic/clinical data.

**Results:** We identified 102 esophageal food impactions in ninety unique patients. Seventeen patients were using PPI. Half of the impactions occurred in the distal esophagus. Of the ninety patients, 44.4% had esophageal biopsies during the initial or subsequent endoscopy. Of these patients, eosinophilic esophagitis (EoE) was found in 25%. The prevalence of EoE in this cohort was 11.1%. There was no trend ( $p>0.05$ ) in the frequency of biopsies obtained to rule out EoE or diagnosis of EoE over time.

**Conclusions:** Eosinophilic esophagitis was commonly found in patients with food impactions. At our institution there was no trend in the etiology or frequency of food impactions over time. However, despite the increasing recognition of EoE as a factor in esophageal food impactions, less than half of patients were biopsied. Further education is warranted to improve biopsy rates, in order to achieve an accurate assessment of the prevalence of EoE. Enhanced recognition and early treatment of this disorder may help reduce the incidence of these events.

**Pathogenesis and Outcomes of Traumatic Injuries of the Esophagus**

**Marc Makhani MD, Deena Midani MD, Amy Goldberg MD,  
Frank K. Friedenberg MD, MS**

Traumatic injury of the esophagus (TIE) is a relatively uncommon. The aims of this study were to use the Pennsylvania Trauma Outcome Study (PTOS) database to identify clinical factors predictive of TIE, and to report the morbidity and mortality of TIE. Cross-sectional review of patients presenting to one of twenty Level I trauma centers in Pennsylvania from 2004 to 2010. We compared clinical and demographic variables between patients with and without TIE both prior to, and after arrival in the ER. Primary mechanism of injury and clinical outcomes were analyzed.

**Results:** There were 231,694 patients and 327 (0.14%) had a TIE. Patients with TIE were considerably younger than those without this injury. The risk of TIE was markedly increased in males compared to females [OR= 2.62 (CI 1.98-3.47)]. The risk was also increased in African Americans [OR = 4.61 (CI 3.65-5.82)]. Most cases were from penetrating gunshot and stab injuries. TIE patients more frequently required intubation at the scene of arrival (10.0% vs. 1.2%,  $p < 0.001$ ). Only 34 (10.4%) TIE patients underwent an upper endoscopy; diagnosis was usually made by CT, surgery, or autopsy. TIE patients were more likely to require surgery (35.8% vs. 12.5%;  $p < 0.001$ ). There was no relation between TIE and length of ICU stay ICU ( $p = 0.14$ ). TIE patients had a substantially higher mortality than those without TIE (20.5% vs. 1.4%;  $p < 0.005$ ). In logistic regression modeling, after adjustment for age and trauma severity, TIE [OR=3.43 9 2.50-4.71] and male gender [OR=1.52 (1.46-1.59)] were independently associated with mortality. In regression analysis, for those patients with TIE, there was an association between trauma severity and mortality [OR = 1.10 (1.07-1.12)] but not for undergoing surgery within the first 24 hours of hospitalization (OR = 0.84; 0.39-1.83).

**Conclusions:** Our study on TIE is in concordance with previous studies demonstrating that this injury is rare but carries considerable morbidity (~46%) and mortality (~20%). TIE most commonly occurs in younger, Black males suffering gunshot wounds. Efforts to control gun violence in Pennsylvania are of paramount importance.

**Symptom Monitoring During Lactulose Breath Testing for  
Small Intestinal Bacterial Overgrowth**

**Nina S. George DO, Grace Shin MD, Henry Parkman MD**

**Introduction:** Lactulose breath testing (LBT) is a method to test for small intestinal bacterial overgrowth (SIBO), which presents with symptoms of bloating, gas and flatulence. Few studies have evaluated patient symptoms during LBT.

**Aim:** 1) To evaluate symptom severity during LBT in patients undergoing SIBO testing  
2) To determine whether symptoms during LBT are associated with positive LBT.

**Methods:** Patients undergoing LBT evaluation for SIBO from July to October 2012 were included. LBT was considered to be positive if one of three standard criteria were met. During the LBT, patients recorded symptom severity of bloating, nausea, fullness, distension, abdominal pain, belching, flatulence, and diarrhea on a Likert scale in fifteen-minute intervals. Patients also filled out a medical history questionnaire and the Patient Assessment of Upper Gastrointestinal Disorders-Symptom Severity Index (PAGI-SYM). Results were analyzed using T-tests and reported as mean±SEM.

**Results:** Of the 90 patients who underwent LBT, 38% of patients had positive LBT. Patients with positive LBT had increased symptoms of diarrhea at 75 minutes and flatulence at 105 minutes compared to negative LBT patients. Interestingly, compared to positive LBT, patients with negative LBT tended to have increased symptoms of bloating, nausea, fullness, distension, and belching.

**Conclusion:** Our results of symptom monitoring during LBT for SIBO showed increased symptoms of flatulence and diarrhea in patients with positive LBT, whereas patients with negative LBT tended to have increased symptoms of bloating, nausea, fullness, distension and belching. This suggests increased symptoms of diarrhea and flatulence during LBT to be associated with SIBO.

**Non-Surgical Treatment of Coexistent Non-Small Cell Lung Cancer and Pulmonary Aspergillus**

**Michael McCormack MD and Marcelo Blaya MD**

**Introduction:** The presence of pulmonary aspergillus infection can be a serious comorbidity found in patients with non-small cell lung cancer, particularly squamous cell carcinomas, due to their propensity for cavitation. In such cases, the therapeutic decisions may become difficult as treatment for each disease could be detrimental to the treatment of the other. Delay in treatment could allow for growth of NSCLC, while chemotherapy can cause immunodeficiency, allowing aspergillosis to progress.

**Case Description:** An 82 year old male presented to the hospital with a history of a persistent, productive cough and mild hemoptysis for the past six months. The patient was found to have a mass on CT, which was biopsied. The biopsy showed squamous cell carcinoma with coexisting, non-invasive aspergillus infection. Staging was subsequently completed and confirmed this to be a stage IIIA NSCLC of squamous histology. The patient was treated with Itraconazole for six weeks, followed by Voriconazole for six months. Eight weeks after starting Voriconazole, the patient was started on concurrent cytotoxic chemotherapy and radiation therapy. Two years after treatment, his cancer was in remission and no evidence of aspergillus was found.

**Conclusion:** Coexisting pulmonary aspergillus and NSCLC can be aggressively treated sequentially, with the infection being treated first in cases of non-resectable tumors. It is pertinent to determine if the aspergillus is invasive and treat the infection with the proper anti-fungals before starting chemotherapy.

**Risk of Death by Co-Morbidity Prompting Re-Hospitalization Following  
COPD Hospitalization**

**S Barnett MD, S Duffy MD, B Civic MD, A J Mamary MD, J Stewart MD,  
G J Criner MD**

**Background:** COPD hospitalizations increase short and long-term mortality; multiple COPD hospitalizations track with even higher mortality. While co-morbidities such as CAD and CHF are common in COPD, their contribution to mortality risk after a sentinel COPD hospitalization is unknown.

**Purpose:** To assess the effect of co-morbid condition prompting readmission following COPD on mortality.

**Methods:** We performed a retrospective cohort analysis of all patients hospitalized for COPD exacerbations in Pennsylvania from 1990-2010 using the Pennsylvania Health Care Cost Containment Council database. We included patients  $\geq 40$  yrs. old hospitalized for AECOPD (ICD-9 #491, 492, 496) by discharge diagnosis. Primary end-point was mortality 30 days post -readmission for the 13 most common non-COPD diagnoses (diagnoses accounting for  $>700$  admissions). Acute Respiratory Failure was excluded as it does not represent a separate disease process. The diagnoses included heart failure, pneumonia, PE, and myocardial infarction. See figures for full list. 30-day mortality for these diagnoses was compared to patients with COPD readmissions. We employed chi squared and two-tailed t-tests to analyze the data.

**Results:** 30-day mortality in patients with COPD hospitalization for acute exacerbation who were re-hospitalized for COPD exacerbation  $< 30$ days post discharge are shown in figure 1 as compared to those readmitted for co-morbid conditions. Relative risk of death after readmission was determined by diagnosis (Figure 1). Patients were over 1.5 times more likely to die within 30 days when readmitted for pneumonia or an MI rather than COPD. Patients who suffered from septicemia had the highest mortality.

**Conclusions:** Readmissions for cardiac and co-morbid disease such as MI, heart failure, pneumonia, aspiration pneumonia and PE confer the greatest risk when compared to recurrent COPD. Already great emphasis is placed on preventing COPD readmission; however, more attention should be focused on preemptive risk reduction for these co-morbidities in COPD patients.

**Double Balloon Enteroscopy (Case Series): An Effective and Minimally Invasive Method for Removal of Retained Video Capsules**

**Alexandra N. Modiri, Kian Makipour, Ronald Andari Sawaya, Peter Shue, Frank K. Friedenberg, Jennifer Maranki, Brintha K. Enestvedt, Stephen Heller, Jeffrey Tokar, Oleh Haluszka**

**Background:** The most significant complication associated with video capsule endoscopy is symptomatic retention of the video capsule. Prior case series document removal of the capsules predominantly via surgical intervention. Data on endoscopic removal of retained capsules is limited. We aimed to determine the etiologies of video capsule retention and to describe a highly efficacious and minimally invasive endoscopic method of retrieval using double balloon enteroscopy (DBE).

**Methods:** To determine the etiologies of video capsule retention and to describe a highly efficacious and minimally invasive endoscopic method of retrieval using double balloon enteroscopy (DBE).

**Results:** Of the total 1,399 patients who underwent DBE during the study time frame, nine were performed for the indication of video capsule retrieval. The mean age of these 9 patients was  $64 \pm 7$  (3 female, 6 male). Four patients failed to pass the video capsule due to an ileal or jejunal stricture due to an established diagnosis of IBD with prior surgery (1 patient with ulcerative colitis; 3 patients with Crohn's disease); two patients had a small bowel stricture due to NSAID enteropathy; 1 patient was identified to have an obstructing malignant jejunal mass and 1 patient had a small bowel stricture due to radiation enteritis. Only 1 patient reported abdominal pain due to the retained capsule. This patient was found to have an ileal stricture due to suspected Crohn's disease. All patients underwent DBE for attempted endoscopic removal of the retained capsule. Four patients underwent both upper and lower double balloon enteroscopy resulting in one successful panenteroscopy. Endoscopic removal via DBE was successful in 7 out of 9 patients (78%). The remaining two patients, both of whom had a history of prior abdominal surgery, underwent surgical removal of the retained capsule. No deaths or complications were associated with these endoscopic procedures.

**Conclusions:** The most common cause of capsule means of capsule retention in this study was underlying inflammatory bowel disease, followed by use of NSAID enteropathy. Retained video capsule is a rare but significant complication of video capsule endoscopy. DBE appears to be an effective and minimally invasive retrieval.



**Age > 65 Is Independently Associated With Successful Diagnostic Double Balloon Enteroscopy**

**Ronald Andari Sawaya, Kian Makipour, Alexandra N. Modiri, Frank K. Friedenberg, Jennifer Maranki, Brintha K. Enestvedt, Oleh Haluszka**

**Background:** Double Balloon Enteroscopy (DBE) is used to diagnose and treat both occult and overt obscure gastrointestinal (GI) bleeding. DBE is labor intensive, is only offered in a limited number of centers, and is frequently unrevealing. Factors predictive of a successful diagnostic DBE are needed to guide application of this invasive procedure. We aimed to identify independent predictors of a diagnostic DBE in a large referral population.

**Methods:** All consecutive antegrade and retrograde DBE exams performed for the evaluation of occult or obscure GI bleeding at a single academic tertiary referral center from July 2011 to November 2012 were retrospectively reviewed. The primary outcome was the presence of an endoscopic finding identified on DBE that explains the clinical bleeding (diagnostic yield). Route of DBE (antegrade vs retrograde) was determined by the clinical presentation. Data collected included patient demographics (age dichotomized at 65), body mass index (BMI), duration and time of procedure (AM or PM), fellow involvement, DBE route, and prior abdominal surgery. Multivariate logistic regression was performed to determine independent factors associated with a successful diagnostic DBE.

**Results:** There were 106 patients (mean age  $46.9 \pm 30.0$  years, 65 female) who underwent DBE (89 antegrade, 36 retrograde, 17 both routes). Negative prior video capsule endoscopy was reported in 71 patients. Bidirectional endoscopy reports were available in the chart for only 77 patients and were negative. The most common indication for DBE was unexplained iron deficiency anemia ( $n=34$ ) followed by melena ( $n=23$ ). In patients who underwent DBE for obscure gastrointestinal bleed, forty five (42.5%) DBE exams identified a presumptive source for the clinical bleeding. The most common finding was small bowel angiodysplasia ( $n=34$ , 75.6% of findings). The diagnostic yield was similar for antegrade and retrograde exams (45.1 vs. 44.4% respectively). Successful diagnostic DBE studies occurred with similar frequency in the setting of occult and overt bleeding indications ( $p>0.05$ ). In multivariate analysis, age > 65 was an independent factor associated with identifying a source of bleeding on DBE (adjusted OR =3.50; 1.47-8.35). Gender, BMI, previous abdominal surgery, duration of procedure, time of procedure (AM or PM) and fellow involvement were not significant independent predictors. The diagnostic yield in those age > 65 vs. < 65 was significant (59.5% vs. 31.3%;  $p = 0.04$ ).

**Conclusions:** In a large tertiary care referral population, DBE performed for the evaluation of previously occult GI bleeding, had a diagnostic yield of 42.5%. Age  $\geq 65$  is independently predictive of a diagnostic DBE exam and therefore DBE should be strongly considered in the evaluation of obscure bleeding in patients  $\geq 65$  years old.

**Clinical COPD Characteristics and Qualitative Pattern of Emphysema  
on High Resolution CT**

**Jeffrey I. Stewart MD, Chandra Dass MD, Robert M Steiner MD,  
Huaqing Zhao PhD, Barry J. Make MD, David Lynch MD, Edwin K. Silverman MD,  
James D. Crapo MD Gerard J. Criner MD  
and the COPDGene Investigators**

**Background:** Emphysema assessed quantitatively on high resolution computed tomography (HRCT) is associated with more severe airflow obstruction, and increased mortality in chronic obstructive pulmonary disease (COPD) patients. No study has examined the clinical impact of the various qualitative patterns of emphysema determined by HRCT. The goal of our study was to examine the relationship between the qualitative patterns of emphysema (e.g., centrilobular (CLE), paraseptal (PSE) and panlobular (PLE)) on HRCT with the clinical presentation of a cohort of COPD and smoke exposed subjects.

**Methods:** We analyzed a subset of data from the Genetic Epidemiology of COPD (COPDGene) Study. A chest radiologist blinded to all clinical and physiological data reviewed all CT scans. Subjects were divided into groups based on the presence or absence of emphysema. If present, subjects were subdivided into groups based on the qualitative pattern of emphysema; CLE, PSE, PLE or a mixture of patterns. Clinical and physiologic variables were examined for each group.

**Results:** Out of a cohort of 1115 subjects, 481 (43.1%) subjects had no emphysema evident on CT. There were 634 (56.9%) subjects with emphysema evident on CT. Of those subjects with emphysema, 77 (12.1%), 176 (27.8%), 23 (3.6%), and 358 (56.5%) subjects with PSE, CLE, PLE and mixed patterns of emphysema respectively. Subjects in the PSE group were predominately African-American (89.5%) and male (72.4%). Subjects without emphysema were predominately African-American (76.6%). The presence of PSE alone had little to no impact on lung function, quality of life scores, or exacerbation frequency. Subjects with CLE, PLE or a mixed pattern of emphysema were older, exhibited more airflow obstruction (lower FEV<sub>1</sub> and FEV<sub>1</sub>/FVC) had a worse quality of life scores, and reported a greater number of COPD exacerbations. After controlling for age, race, gender and FEV<sub>1</sub>, subjects with CLE, PLE or mixed pattern had higher BODE scores as well as higher SGRQ total, active and impact scores.

**Conclusions:** The qualitative pattern of emphysema on HRCT has important implications, independent of FEV<sub>1</sub>, on patient's symptoms and prognosis.

**Differential Regulation of Pro-Inflammatory Necrosis in Males and Females by Poly (ADP-Ribose) Polymerase-1 and 17 $\beta$  Estradiol**

**Neelakshi Jog and Roberto Caricchio**

Cell death can be divided into the anti-inflammatory apoptosis and the pro-inflammatory necrosis. Necrosis as apoptosis, is a regulated form of cell death, and Poly-(ADP-Ribose) Polymerase-1 (PARP-1) and Receptor-Interacting Protein (RIP)1 are two of the mediators. We previously showed that absence or inhibition of PARP-1 protects mice from immune mediated nephritis. Surprisingly, this protection showed a sex-bias, with only male mice being protected. Several studies have shown that the response of males and females to stress differs, although the basis for this sexual dimorphism remains to be determined. We hypothesized that these differences may be due to an inherent difference in the cell death program between the two sexes. We show here that in an immune mediated nephritis model, females show increased apoptosis compared to males. Treatment of males with estrogens inhibited necrosis but induced apoptosis to levels similar to those observed in females. Although PARP-1 was activated in both males and females, absence or inhibition of PARP-1 reduced necrosis only in males. Inhibition of RIP1 with Necrostatin-1 did not show sex bias. We demonstrate here that males and females are prone to different types of cell death. Our data also suggest that estrogens and PARP-1 are two of the mediators of sex-bias in cell death. We therefore propose that clinical targeting of cell death should differ based on sex and could lead to better treatments for each gender.

**Immune Cell Dysfunction in Chronic Lymphocytic Leukemia/Small Lymphocytic Lymphoma (CLL/SLL)**

**Marion Cole, Alexander MacFarlane IV, Mowafaq Jillab, Mitchell R. Smith, Adam D. Cohen, Kerry Campbell**

Immunologic environment influences lymphoma progression. Shifts of natural killer (NK) and T cells and tumor expression of inhibitory ligands may allow host detection evasion. To better understand CLL/SLL immune dysfunction, we examined NK and T cells in 31 CLL/SLL patients.

Serial blood samples ( $\leq 3$ ) were collected from 31 untreated patients and 15 healthy age-matched controls (HC). Peripheral blood lymphocytes (PBL) were analyzed by multiparameter flow cytometry. NK cell-mediated natural and antibody-dependent cytotoxicity were assessed by CD107a degranulation assay following PBL co-culture with rituximab, 721.221 EBV-transformed lymphoma cells, or both. Parameter differences were analyzed with Wilcoxon rank-sum test.

Patients displayed decreased cytolytic CD56<sup>dim</sup> NK cell degranulation with tumor, both +/- rituximab. Patient CD56<sup>dim</sup> NK cells were more immature ( $\downarrow$ CD57,  $\downarrow$ NKG2D,  $\uparrow$ CD27,  $\downarrow$ KIR) than those from HC. NK cell expression of NKp44, CD69, CD62L, CD137, granzyme B, perforin, PD-1, and tumor-induced NK cell IFN $\gamma$ , did not differ. Patients had increased total T cells with decreased CD4:CD8 ratio. Patient Treg frequency and T cell PD-1 expression was higher than HC.

After a median of 16.5 months (1-37), 7/ 31 patients were progressors (Blood 2008). Compared to non-progressors, progressor CD56<sup>bright</sup> NK cells expressed more CD69, granzyme B, perforin, CD16, and KIR.

Patients displayed more immature NK cells; associated with deficits in NK cell degranulation against tumor. Progressors displayed more CD56<sup>bright</sup> NK cell phenotype aberrancies. Our findings suggest a possible block in NK cell differentiation or loss of more mature cells in CLL/SLL. They support therapeutic strategies aimed at augmenting NK and/or T cell function.

**Predicting Improvements in Exercise Capacity and 6 MWD in COPD**

**Aaron Czysz and Gerard Criner**

**Purpose:** Pulmonary rehabilitation (PR) is recommended for patients with moderate to severe COPD. The NETT cohort represents one of the largest investigations of COPD patients whose maximal exercise capacity (MEC) and 6 minute walk distance (6 MWD) was measured over 24 months post-PR. Improvements post-PR were only predicted by prior PR experience. It remains unclear if other baseline cardiopulmonary parameters can predict improvements in MEC and 6 MWD post-PR in COPD.

**Methods:** The NETT compared 608 LVRS and 610 medical COPD patients. Patient demographics, physical exam, past medical history, heart function, oxygen titration, lung mechanics, spirometry, lung volumes, DLCO and MEC and 6 MWD were collected at baseline, post-PR, 6, 12 and 24 months. 610 medical patients were grouped by improvement in MEC by 10 watts and 6 MWD by 54 meters. Results are presented as mean  $\pm$  SD. Fisher's exact test was used for comparison.

**Results:** 610 patients ( $66.5 \pm 5.9$  years, 64% male) had BMI  $24.9 \pm 5.4$ , FEV1%  $26.9 \pm 7.1$ , 6 MWD  $342.6 \pm 96.2$ m, PaCO<sub>2</sub>  $42.6 \pm 5.3$  mmHg and PaO<sub>2</sub>  $64.6 \pm 10.2$  mmHg. 51% used O<sub>2</sub> and 48% had a right heart catheterization. Systolic, diastolic and mean pulmonary artery pressures (PAP) were  $34.0 \pm 5.7$  mmHg,  $16.6 \pm 4.8$  mmHg and  $23.4 \pm 4.6$  mmHg respectively. Baseline and post-PR MEC was  $36.1 \pm 21.0$  W and  $39.4 \pm 22.2$  W, and 6 MWD was  $342.6 \pm 96.2$  m and  $368.9 \pm 96.4$  m. 179 patients improved MEC post-PR (Table 1) and 175 patients improved 6 MWD post-PR (Table 2). Patients that improved either MEC or 6 MWD had lower baseline performance in that test, improved the other test also (6 MWD or MEC), and had lower PAP.

**Summary:** COPD patients who improved their MEC or 6 MWD had lower baseline performance. Improvement in MEC was associated with improvement in 6 MWD and vice versa, however no distinct MEC wattage portended 6 MWD improvement. They were slightly younger and heavier. PAP were lower in groups improving both MEC and 6 MWD, but were only significant for 6 MWD. No other demographic or PFT data differentiated outcomes.

**Conclusions:** Performance on MEC and 6 MWD seem related, with improvement in one portending improvement in the other post-PR. The simpler 6 MWD can effectively measure and detect changes in exercise capacity. Higher PAP hinder improvement in MEC and 6 MWD post-PR.

**Circulating ADMA and the Renal Tissue Expression of Its Enzymatic Machinery**

**Subhasish Bose and Crystal Gadegbeku**

**Background:** Reduced nitric oxide (NO) bioavailability is considered a major pathophysiologic consequence of renal impairment contributing to endothelial dysfunction in chronic kidney disease (CKD). Asymmetric Dimethylarginine (ADMA), an endogenous competitive inhibitor of NO synthase, reaches pathophysiologic levels in patients with CKD that potentially contribute to a reduced NO state. Epidemiologic observations demonstrate that ADMA concentrations correlate with renal dysfunction and circulating levels independently predict both cardiovascular and renal outcomes. Animal models show that critical enzymes responsible for ADMA metabolism are linked to renal impairment. Although experimental models have guided towards possible regulatory defects, there is little information to confirm these abnormalities exist in humans.

**Methods:** Defining mechanisms responsible for the ADMA burden in CKD are necessary to begin to explore whether ADMA is a modifiable risk factor with therapeutic benefit. Therefore, we hypothesized that renal expression of critical enzymes implicated in ADMA metabolism predict circulating ADMA levels in patients with CKD. We have accumulated relevant clinical and laboratory data on a subset of C-PROBE research population to study our hypothesis as a pilot research project. Human renal biopsy samples of 29 patients (and growing ...) stored in C-PROBE biobank was used for analysis. The expression level of dimethylarginine dimethylaminohydrolase (DDAH)1, 2 and protein methyltransferase 1 (PRMT1) in the kidney biopsy tissue sample were correlated.

**Result:** Renal tissue PRMT1 positively correlates with ADMA and negatively correlates with eGFR. We are actively working on the statistical analysis to find out the correlation of renal tissue DDAH activity with ADMA and eGFR. We are also going to perform analysis to find out whether ADMA levels are independently linked to DDAH or not. Statistical association of proteinuria with PRMT1 and DDAH dysregulation will also be explored.

**Conclusion:** As this is pilot data with a limited number of samples, we will plan to perform post-hoc analysis to determine adequate sample size for sufficient power to predict plasma ADMA and other relationships.

**The 6-minute Walk Distance in COPD Patients With Advanced Emphysema Is an Independent Predictor of Death and Hospitalization**

**Jason S. Krahnke DO, Alice L. Sternberg ScM, Victor Kim MD,  
Malcolm M. DeCamp MD, Zab Mosenifar MD, Gerard J. Criner MD**

**Rationale:** The 6-minute walk test is widely used for assessment of functional capacity in patients with respiratory disorders. However, the 6MW distance (6MWD) that best predicts mortality and morbidity in patients with advanced emphysema is not well defined.

**Methods:** 610 subjects from the medical arm of NETT were grouped based on the mean 6MWD after pulmonary rehabilitation:  $\geq 370\text{m}$  versus  $< 370\text{m}$ . Student's t Test and Fisher's exact test were used to compare baseline characteristics. The relationships between the post rehab 6MWD, change in 6MWD at one year and the risk of death at 2 years and risk of hospitalization at 1 year were evaluated by Cox proportional hazard analysis. Survival was compared using Kaplan Meier analysis.

**Results:** The average age was  $67.3 \pm 5.9$  years, 391 (64%) males, post bronchodilator  $\text{FEV}_1$   $27.0 \pm 7.1\%$  predicted, BMI  $24.8 \pm 3.6 \text{kg/m}^2$  at baseline. Subjects in the  $< 370\text{m}$  group were significantly older, predominantly female, had lower  $\text{FEV}_1\%$ , FVC%, and DLCO%, had higher RV% at baseline and had less change in 6MWD 1 year after pulmonary rehabilitation. The  $< 370\text{m}$  group was more likely to be hospitalized 2 or more times in the year after rehab. 6MWD  $< 370\text{m}$  was an independent predictor of death (HR 1.20; 95% CI 1.13-1.27,  $p < 0.01$ ) when controlling for age, sex,  $\text{FEV}_1\%$ , and BMI.

**Conclusion:** 6MWD  $< 370\text{m}$  was an independent predictor of death and was associated with 2 or more hospitalizations per year. Additionally, patients were significantly older, predominantly female, had worse lung function and had a lower change in 6MWD 1 year after pulmonary rehabilitation.

**Mer Expression on Microparticles Derived From THP-1 Cells and Human Monocytes**

**James Fischkoff, Gaetano Zizzo, Ming-Lin Liu, Kevin Williams, Brendan Hilliard, Philip Cohen**

Mer is a receptor tyrosine kinase expressed mostly on macrophages and dendritic cells. It binds apoptotic cells and bodies via intermediary proteins GAS6 and protein S. Mer is a key receptor for clearing cell debris and inducing an M2 (non inflammatory) macrophage phenotype. Mice deficient in Mer have lupus-like autoimmunity and defective clearance of apoptotic bodies. Recent studies from our laboratory suggest that abnormalities in Mer expression may also have a role in SLE pathogenesis by impairing clearance of potentially immunogenic apoptotic debris. Microparticles (also known as microvesicles) are plasma membrane bound vesicles ranging from 50 nm to 1000 nm shed from many cell types during activation or apoptosis. Circulating microparticles may have a role in immune regulation. We found that microparticles in plasma from normal subjects expressed a low molecular weight isoform of Mer. Exposure to lipopolysaccharide or unesterified cholesterol in vitro increased the numbers of Mer-bearing microparticles detectable in culture supernatants.

To study microparticle-associated Mer further, we used THP-1 cells. We found that these monocytoid cells produced Mer-expressing microparticles which also expressed a smaller molecular isoform of Mer. THP-1 cells were stained with fluorescent CFSE and viewed under microscopy. When GAS6 is added to a concentrated solution of Mer expressing microparticles we observed clumping of the microparticles, which implies that they bind one another via Mer. Mer containing microparticles in SLE patients may interfere with uptake of cell debris and may have other important immunomodulatory effects.



**Bolus Retention in Hiatal Hernia Identified by High-Resolution Esophageal Manometry With Impedance: Pathophysiological and Clinical Significance**

**Grace Shin MD, Abhinav Sankineni MD, Henry Parkman MD**

Esophageal acid retention in a hiatal hernia (HH) may play a role in gastroesophageal reflux.

**Aims:** To compare pressure profiles and symptoms in patients with HHs with bolus retention (BR) in the HH to those with bolus clearance (BC) through the HH using high resolution esophageal manometry with impedance.

**Methods:** Manometry studies were analyzed for symptoms and pressure profiles during swallows. Impedance was used for visualizing retention in the HH. A symptom questionnaire and esophageal biopsy reports were reviewed.

**Results:** The BR group had more heartburn ( $p=0.004$ ) and wheezing ( $p=0.04$ ) compared to the BC group ( $n=18$ ). The BR group had larger sized HHs ( $p=0.016$ ). HH size itself did not correlate with increased symptoms, but correlated with coughing ( $r=0.35$ ;  $p=0.01$ ). Patients with BR had lower LES pressure ( $p=0.0001$ ), LES-CD gradient ( $p=0.002$ ), residual LES pressure ( $p=0.017$ ), amplitude of distal esophageal contractions ( $p=0.020$ ), and distal contractile integral ( $p=0.001$ ). Multiple regression analysis revealed symptoms of heartburn were correlated with BR but not size of the HH. Esophageal biopsies showed 52% of patients with BR had esophagitis compared to 18% in patients with BC ( $p=0.058$ ).

**Conclusions:** BR was seen in 66% of HH, and was associated with lower LES and esophageal contractile pressures compared to those with BC. The BR group reported more heartburn and wheezing. Although BR was associated with larger HHs, analysis within each size subgroup showed the similar results. Thus, bolus retention likely generates increased reflux episodes, leading to more symptoms and esophagitis.

**Gastroesophageal Reflux Disease and Exacerbations of  
Chronic Obstructive Pulmonary Disease**

**Frederick Ramos, Jason Krahnke, Sarah Harnden, John Connett, Richard Albert,  
and Gerard Criner for the NIH COPD CRN**

**Rationale:** Additional study of the frequency and severity of AECOPD in a controlled and prospective group of patients at risk for exacerbation with and without GERD is needed.

**Objectives:** In COPD patients, compare the frequency and severity of AECOPD in those with and without GERD.

**Methods:** Study is a retrospective review of prospectively collected data. Data from the NIH sponsored Azithromycin for Prevention of Exacerbations of COPD trial is utilized. GERD positive group include patients who at baseline have self-reported GERD and/or taking anti-reflux therapy (PPI, H2 blockers, and/or antacids). The remainder of patients are allocated to the GERD negative group.

**Results:** Of the 1,117 subjects enrolled into the parent trial, 568 patients are assigned into the GERD positive group and the remainders are GERD negative. GERD positive group have less males, higher BMI, and better FEV<sub>1</sub>. Median times to 1<sup>st</sup> AECOPD are 191 days (95% CI 157 to 229) and 241 days (95% CI, 211 to 284) in GERD positive vs. negative groups (P <0.05), respectively. Rate of AECOPD (1.78 ± 2.11 vs. 1.52 ± 2.63; p = 0.02) and rate of AECOPD requiring hospitalization without intensive care unit level of care or intubation (0.4 ± 1.07 vs. 0.37 ± 2.13; p = 0.02) are higher in GERD positive group.

**Conclusion:** GERD is associated with increased frequency of AECOPD and exacerbation requiring hospitalizations without ICU/intubation.

(Supported by NHLBI; ClinicalTrials.gov number: NCT00325897)

**Cost Sharing and Hereditary Cancer Risk: Predictors of Willingness-to-Pay for Genetic Testing**

**Jennifer M. Matro MD, Karen J. Ruth PhD, Yu-Ning Wong MD, Katen C. McCully MPH, Christina M. Rybak, Michael J. Hall MD, MS**

**Background:** The increasing availability of genetic testing (GT) in cancer (CA) care has been paralleled by increasing cost-sharing practices by payors that are intended to reduce overuse of health care services. Patients referred for hereditary cancer risk assessment may be subject to financial deterrents such as high out-of-pocket (OOP) costs. Little is known about what factors may influence a high-risk patient's willingness-to-pay (WTP) for GT.

**Methods:** The Gastrointestinal Tumor Risk Assessment Registry includes individuals referred for evaluation of genetic CA risk based on personal and/or family hx. At enrollment, participants complete a survey collecting detailed demographic, CA hx, and psychosocial items related to CA risk. Baseline data on 406 participants were available; 21 who did not respond to WTP items were excluded. WTP items included intention for: GT only if paid by insurance; GT even if paid by self; and amount WTP (7 levels, \$25 to \$2000). Multivariable models examined predictors of WTP (self vs only if paid by insurance) (model 1, logistic), and predictors of amount WTP (model 2, ordinal logistic, 5 levels). All statistical tests are two-sided ( $\alpha=0.05$ ).

**Results:** Most participants were women (73%), white (92%) and aged 45-64 (58%). 51% had  $\geq 4$  yr college degree; 22% had household income  $> \$75,000$ ; 42% had hx of GI CA; 56% had  $> 1$  1<sup>st</sup> degree relative (FDR) with colorectal CA (CRC). Overall, 82 (21.3%) were willing to have GT only if paid by insurance, and 303 (78.7%) were WTP OOP. Of those WTP, 271 (89%) stated an amount. Independent predictors of WTP (model 1) were: 1) expectation of positive result, 2) confidence to control CA risk, 3) fewer perceived barriers to CRC screening and 4) benefit of guiding screening (all  $p<0.05$ ). Subjects WTP a higher amount (model 2) were male, more educated, and had greater CA worry, fewer FDR with CRC (all  $p<0.05$ ), and more positive attitudes toward GT ( $p<0.01$ ).

**Conclusion:** Patients who are WTP some OOP costs for GT anticipate benefits to control of CA risk afforded by GT. Women and less educated patients may face greater barriers from high co-pays. Identifying patient-level factors associated with WTP for genetic services is increasingly important as GT is integrated into routine CA care.

**COPD Re-Hospitalization: A Review of Risk Factors and Outcomes  
Over a 20-Year Period**

**Brian Civic MD, Jeffery Stewart MD, Kartik Shenoy MD, Gerard Criner MD**

**Introduction:** Acute exacerbation of COPD is a common cause of hospital admission and presents a large burden to the health care system. However, little data exists on the outcomes of COPD patients readmitted within 30 days of the index COPD Hospitalization.

**Methods:** We identified COPD patients discharged from hospitals in Pennsylvania from January 1, 1990 to December 31, 2009 using the Pennsylvania Health Care Cost Containment Council database. Subjects were included if they had a primary diagnosis of COPD, chronic bronchitis, or emphysema. All subsequent admissions were also included. Patients were divided into two groups based on re-hospitalization for COPD within 30-days post discharge. Primary outcome was 30-day readmission following a COPD admission. Secondary outcomes were mortality at 30, 90, 180, and 365 days post discharge, likelihood of readmission to the ICU and use of positive pressure ventilation.

**Results:** There were 277,125 COPD patients that criteria and 32,343 patients had re-hospitalizations within 30-days. Patients that were re-hospitalized were more likely to be African-American, have more comorbidities, higher MediQual Admission Severity Scores, longer length of stay, and a higher likelihood of ICU care. They had a higher likelihood of mortality at 30, 90, 180, and 365 days and a shorter time to death compared to those not readmitted within 30 days.

**Conclusion:** COPD patients readmitted within 30 days of discharge are at increased risk of short and long-term mortality and variables identified in this study may help predict which patients are at the highest risk for readmission.

**Dysglycemia but not Lipids Is Associated With Abnormal Urinary Albumin Excretion in Diabetic Kidney Disease:  
A Report From the Kidney Early Evaluation Program (KEEP)**

**Subhasish Bose, Andrew S Bombback, Nehal N Mehta, Shu-Cheng Chen, Suying Li, Adam Whaley-Connell, Joseph Benjamin and Peter A McCullough**

**Background:** The relationship between glycemic control and lipid abnormalities with urinary albumin-creatinine ratio (ACR) in chronic kidney disease (CKD) patients with diabetes mellitus (DM) is unknown. We sought to investigate the association of dyslipidemia and glycemic control with levels of albuminuria in the National Kidney Foundation (NKF) Kidney Early Evaluation Program (KEEP) participants with DM and CKD stage 3 or higher.

**Methods:** We performed a cross-sectional study of 6639 eligible KEEP patients with DM and CKD Stage 3 to 5 from June 2008 to December 2009. Multivariate logistic regression was used to evaluate the association of lipid parameters (per 10 mg/dl change in serum level) and glycosylated hemoglobin (HbA1c) values with three degrees of albuminuria normo (<30 mg/g), micro (30 to 300 mg/g) and macro (>300 mg/g).

**Results:** 2141 KEEP participants were included. HbA1c levels were strongly associated with micro-albuminuria (compared to normo-albuminuria) and macro-albuminuria (compared to normo-albuminuria and microalbuminuria). Each 1.0% increase in HbA1c increased the odds of micro-albuminuria by 32% (OR 1.32, 95% CI 1.23-1.42) and the odds of macro-albuminuria (vs. microalbuminuria) by 16% (OR 1.16, 95% CI 1.05-1.28). Only increases in serum HDL were associated with decreased odds of micro-albuminuria; otherwise, the association between other components of the serum lipid profile with urinary ACR did not reach statistical significance.

**Conclusion:** In this cross-sectional study of 2141 KEEP participants with DM and CKD stages 3–5, overall glycemic control but not lipids were associated with abnormal urinary albumin excretion, a marker of increased risk for progressive disease.

**Abnormal Neutrophils in Systemic Lupus Erythematosus**

**Namrata Singh, Philip L. Cohen, Mariana J. Kaplan and Michael F. Denny**

Recently the role of innate immunity in the pathogenesis of systemic lupus erythematosus (SLE) has expanded. An abnormal population of neutrophils called low density granulocytes (LDGs) has been described in SLE patients. We developed techniques to isolate these LDGs from the blood of SLE patients and determined that while LDGs express surface markers consistent with a mature neutrophil, their nuclear morphology resembles an immature phenotype, suggesting that neutrophil differentiation may be disrupted. Our research focuses on the developmental origins of these cells.

Somatic alterations were detected by microarray cytogenetic analysis of genomic DNA extracted from LDGs and neutrophils from 13 female SLE patients, as well as neutrophil samples from 9 healthy female donors, and the copy number state and heterozygosity was assessed across the genome. SLE normal density neutrophils and healthy donor neutrophils had similar levels of copy number variations (CNVs), while LDGs had a two-fold increase in the number of CNVs relative to either autologous neutrophils or healthy controls and the alterations were more prevalent in 6 of the 13 patients. Moreover, the genomic alterations occurred preferentially on certain chromosomes.

In conclusion, a subset of SLE patients had LDGs that harbor an elevated level of genomic alterations that is consistent with genetic damage or instability. Whether the inflammatory environment in SLE patients promotes these genetic alterations remains to be determined.

**Effect of Oxygen on Systemic Inflammatory Markers in COPD**

**Jinal Gangar, Nishant Goel, Helen Voelker, A. James Mamary, Richard K. Albert, John Connett, Nathaniel Marchetti, Gerard J. Criner for the COPD Clinical Research Network**

**Introduction:** Systemic inflammation and oxidative stress are characteristics of COPD. There are no long-term controlled trials exploring the effects of oxygen therapy on inflammatory markers in COPD.

**Methods:** We performed a sub-analysis of the prospective data from the MACRO trial<sup>1</sup> that assessed efficacy of azithromycin in preventing COPD exacerbations. We reviewed prescribed medication lists that asked patients if they used oxygen. Independent t-tests were done to assess differences in inflammatory markers between subjects using oxygen compared to those not using oxygen over time. A subsequent multivariate regression analysis controlling for azithromycin treatment randomization, oxygen use, age, gender and FEV<sub>1</sub> % predicted was performed for each significant inflammatory marker at baseline, 3, 12 and 13 months.

**Results:** Of 1,117 subjects enrolled, serum CRP, IL-6 and IL-8, TNFR and YKL-40 were available on 888, 1036, 1037 and 225 patients respectively. Basic demographics and patient characteristics of the two groups are shown in Table 1. Independent t-tests indicated CRP to be higher in the oxygen group ( $p < 0.05$ ) at baseline and month 13 (Table-2). There were no differences for the other markers at any study time points. In multivariate linear regression modeling, after controlling for azithromycin treatment group, age, current smoking status and FEV<sub>1</sub> % predicted ( $p=0.143$  at baseline and  $p=0.62$  at 12 months), oxygen use was not a significant predictor of CRP levels.

**Conclusion:** Serum CRP levels are higher in COPD patients using oxygen than those who are not. However, this difference is not significant after controlling for age, smoking status and FEV<sub>1</sub>% predicted. Thus, we conclude that high CRP levels were due to sicker patients in oxygen group and non-specific inflammatory biomarkers such as IL-6, IL-8, TNFR and YKL-40 are not affected by oxygen use in COPD.

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**Gender Differences in Revascularization Rates of Patients Undergoing Fractional Flow Reserve in the United States**

**Vladimir Lakhter, Yevgeniy Brailovsky, Chad J. Zack, John Gaughan, Alfred A. Bove, Howard A. Cohen, Riyaz Bashir**

**Background:** Recent studies have shown that female patients have higher fractional flow reserve (FFR) values for a given severity of coronary stenosis. However, gender differences in the coronary revascularization rates following FFR assessment are unknown.

**Methods:** The nationwide inpatient sample (NIS) database was used to identify all patients who underwent FFR in the United States between January 2009 and December 2010. We used propensity score matching in order to compare revascularization rates amongst men and women undergoing FFR measurements.

**Results:** Amongst 3695 patients who underwent FFR, 1235 matched pairs of men and women were identified. The overall revascularization rates were lower in women than men (40.1% vs. 52.8%,  $p < 0.01$ ). Women were less likely than men to undergo percutaneous (35.2% vs. 45.6%,  $p < 0.01$ ) or surgical revascularization (5.2% vs. 7.4%,  $p = 0.03$ ) following FFR.

**Conclusion:** In this large observation study, we found that coronary revascularization rates are significantly lower in women who undergo FFR. This data corroborates the earlier finding that women have higher FFR values for the same amount of stenosis compared to men.



**Implementation and Initial Results of Rapid, Universal HIV Screening in an Urban Residency-Based Practice**

**Jocelyn Edathil, Ian Sheffer, Vikin Lalan, Rebecka Ly, Patrick Mulhall, Wisna Jean, Alex Lane, Cole Liberator, Chandan Vangala, Gina Simoncini**

The incidence of HIV infection in the community served by our practice, is considerably higher than the national and local average and a significant number of these cases are undiagnosed. As part of a curriculum-based quality improvement project, residents and faculty identified HIV screening as an opportunity for practice improvement. Beginning in March 2012, the continuity Temple Internal Medicine Residency practice began to offer the OraQuick rapid HIV test. Positive results triggered disclosure by the patient's physician along with a faculty preceptor and/or social worker. Patients who tested positive were scheduled for one week follow-up in our office to receive results of confirmatory testing, supportive counseling and linkage to care with an HIV provider.

Survey of 47 medicine residents revealed that although 98% of residents felt comfortable with asking patients to be screening for HIV, only 40% offered HIV screen to a majority of patients. During the 6 month period following implementation, 121 patients were screened, and 2 new cases of HIV identified. The 18-35 age group was the mostly frequently screened demographic group. Also, more females opted for tested than males. Both newly diagnosed patients had two risk factors for HIV. One patient was MSM and had known history of unprotected sex. The other newly diagnosed patient had known history of both STD and unprotected sex.

Though implementation was ultimately successful, we identified a number of barriers, including administrative and operational setbacks. These included financial cost, education of the housestaff and medical assistants. While we consider our program a success, there is continued need for refinement of our project, our continued focus will be education to both patients and staff to avoid 'testing fatigue' so we identify new cases of HIV at an earlier stage.

**Reviewing Narcotic Contract for Medicine Group Practice**

**Farhan Raza and Elizabeth Lee**

**Background:** Narcotic contract is established to improve practice of narcotic prescription for non-cancer pain and prevent abuse.

**Methods:** We reviewed 102 patients on narcotics for non-cancer patients in medicine group practice. Chart review was performed to identify patients who had a narcotic contract on file. Resident surveys were performed to identify the comfort level and obstacles in dealing with pain issues of patients.

**Results:** Out of 102 patients, 27 (26%) had a narcotic contract. 60% patients were on long-acting or combination opioids (40% were on short-acting only). On resident survey, 46.1 % residents considered the current narcotic contract good and 24% found the patient encounter stressful (72% found them neutral, 4% were satisfied). Major issues residents had with current narcotic policy were dealing with violation (32%), "Do not fill" scripts with current 4+1 system (28%) and deciding when to initiate a narcotic medicine (24%). If a violation occurred, 56% residents gave a warning, 16% placed patients on probation and 16% wanted immediate termination of contract. To improve these issues, we changed the format of narcotic contract in to an easy-to-read bullet form and categorize different issues including refills and violations. We emphasized residents to document pain control, improvement in functional activity, side effects and drug-seeking behavior in patients on every visit.

**Conclusion:** Making the narcotic contract easier and objective can help to improve narcotic prescriptions for non-cancer pain and prevent abuse. However, we need to perform patient surveys to identify any areas that may improve patient satisfaction.

**Relevant Symptoms in Diabetic and Idiopathic Gastroparesis**

**Saraswathi Arasu and Henry Parkman**

Understanding the relevant symptoms of gastroparesis is important to treat this disorder. The Gastroparesis Cardinal Symptom Index quantifies severity of nine gastroparesis symptoms. However, several GCSI symptoms might be interrelated.

**Aims:** 1) Identify important symptoms of gastroparesis through relevance scores; 2) Compare relevant symptoms in diabetic (DG) to idiopathic gastroparesis (IG); 3) Determine the relationship of individual symptoms by correlating their severity and relevance scores.

**Methods:** Outpatients with gastroparesis filled out the Patient Assessment of Upper GI Symptoms and a Symptom Relevance Questionnaire.

**Results:** 50 patients (12 DG, 38 IG) with delayed gastric emptying participated prospectively. Symptom relevance for the DG/IG group ordered: nausea, upper abdominal pain, stomach fullness, postprandial fullness, loss of appetite, early satiety, and bloating. Symptom severity for the DG/IG group ordered: stomach fullness, early satiety, postprandial fullness, nausea, loss of appetite, upper abdominal pain, and bloating. When severity of individual symptoms was compared for the DG/IG group, strong correlation was seen relating early satiety to postprandial fullness ( $r=0.83$ ), abdominal distention to bloating ( $r=0.78$ ), postprandial fullness to bloating ( $r=0.72$ ), and stomach fullness to postprandial fullness ( $r=0.72$ ). Better correlations were seen in DG than in IG.

**Conclusions:** Symptoms relevant to gastroparesis include nausea, upper abdominal pain, stomach fullness, postprandial fullness, loss of appetite, early satiety, bloating. Stomach fullness, postprandial fullness, and bloating severity and relevance scores were highly correlated, suggesting these symptoms measure similar characteristics, particularly in DG. Thus, core symptoms for both groups are narrowed to include nausea, early satiety, upper abdominal pain, postprandial fullness or bloating.

## Predictors of Mitral Regurgitation in Athletes

Robert Hamburger, Alfred Bove, John Panidis, Francis Burt

**Background:** Previous studies have compared cardiac morphology between strength and endurance athletes, but there are few studies that have examined predictors of valvular regurgitation in this population. This study aims to evaluate predictors of mitral regurgitation in asymptomatic high school and collegiate athletes.

**Methods:** 144 high school and collegiate athletes in 9 different sports underwent transthoracic echocardiography. Left ventricular end diastolic diameter (LVIDd), interventricular septal wall thickness (IVS), posterior wall thickness (PW), and relative wall thickness (RWT) were calculated and were indexed for BSA. Valvular regurgitation was graded as 0 to 4 in severity. Binary logistic regression was used to assess predictors of mitral regurgitation.

**Results:** Of 144 athletes studied, 54.9% of patients had tricuspid regurgitation, 19.4% had mitral regurgitation, and 2.8% had aortic insufficiency. Relative wall thickness was associated with decreased odds of mitral regurgitation, with each 0.07 increase in RWT accounting for a 0.52 decrease in odds of MR (95% CI 0.32 to 0.85,  $p=0.009$ ). Differences were best exemplified by comparison of soccer and football players, where soccer players had a larger mean left ventricular end diastolic index ( $29.2 \pm 3$  vs.  $24.9 \pm 2.6$ ) and lower relative wall thickness ( $0.33 \pm 0.06$  vs.  $0.38 \pm 0.08$ ) with a higher prevalence of MR (45.8% vs. 8.5).

**Conclusion:** Relative wall thickness is a negative predictor for mitral regurgitation, with higher values reducing the odds of MR in athletes. Incidence of MR appears to be related to the relationship between wall thickness and chamber size rather than chamber size alone.

**Rethinking Interval Colorectal Cancer**

**Jonathan Gotfried MD, Marc Bernstein MD, Adam Erlich MD,  
Frank Friedenber MD**

**Introduction:** Increasing attention has been given to defining rates of interval colorectal cancer (ICC), those cancers diagnosed 6 – 36 months after initial colonoscopy. Recent studies have used insurance coding to collect data to determine rates. We hypothesized this methodology overestimates rates of ICC. We sought to determine the rates of ICC in our urban tertiary care center after linking our institution-wide database of colonoscopies to a cancer registry to determine ICC rates.

**Methods:** We conducted a retrospective study analyzing data in our institution-wide database of previous colonoscopies performed between 1993 – 2011. Patients who underwent colonoscopy were identified using CPT codes and linked to CRC data from the Pennsylvania Cancer Registry.

**Results:** Of the 30,910 colonoscopies performed at our institution between 1993 – 2011, 1,256 patients were diagnosed with colorectal cancer. Forty-seven patients were diagnosed with colorectal cancer between 6 – 36 months after initial colonoscopy (3.8%). Of these, twenty-eight patients had “true” ICC where initial screening was negative. The remainder (n=19) included patients whose initial colonoscopy were incomplete (bad bowel preparation), recommended for repeat colonoscopy, referred to colorectal surgeon after visualization of mass, or experienced delay to entry into PCR database.

**Conclusion:** Analysis of our institution’s colonoscopy record revealed a lower rate than published average ICC rates. Interestingly, a cohort was identified of patients who appeared to have an ICC when looking from colonoscopy to date of diagnosis. Upon further investigation, these were “false positive” ICC, a determination that would be missed when employing large database matching. Therefore, ICC rates may previously have been overestimated.

**Decreased Left Ventricular Stroke Work Index Is Associated With Increased Risk of In-Hospital Death After Mitral Valve Surgery**

**Ricardo O. Escárcega MD, Brendan J. Carry MD, Hayan Al-Maluli MD, Brian O'Murchu MD, Alfred Bove MD, Howard Cohen MD, T. Sloan Guy MD, Yoshiya Toyoda MD, Michael A. Brown MD**

**Background:** Left ventricular ejection fraction (LVEF) is an imprecise indicator of left ventricular function in patients with chronic severe mitral regurgitation. We sought to identify if left ventricular stroke work index (LVSWI), an invasively measured hemodynamic marker of LV performance, could better predict adverse cardiovascular events in patients undergoing mitral valve surgery

**Methods:** We included only patients undergoing mitral valve surgery for mitral regurgitation who underwent preoperative invasive assessment of LV function from 6/2006 to 6/2012. We divided our cohort into 2 groups based on the preoperative LVSWI (<30 g m/beat m<sup>2</sup> and >30 g m/beat m<sup>2</sup>). Our primary endpoint was all cause in-hospital mortality.

**Results:** 58 patients fulfilled our inclusion criteria. There was no significant difference between groups' baseline characteristics. Mean LVEF did not differ significantly between the two groups (p=0.384), nor did cardiac output (p=0.137). Patients with LVSWI <30 had a significantly lower cardiac index (1.81 vs. 2.70 p<0.001). In-hospital death occurred in 16% of patients in the lower LVSWI group. There were no post-operative deaths in the higher stroke work index group (5 v 0, p=0.036).

**Conclusions:** Patients with LVSWI <30 g m/beat m<sup>2</sup> were at increased risk of death after mitral valve surgery compared to those patients with LVSWI >30 g m/beat m<sup>2</sup> (16% vs 0%). LVEF did not predict patients with poor hemodynamic LV performance as measured by LVSWI. We believe LVSWI may add to preoperative risk stratification of patients undergoing mitral valve surgery.

**Retrospective Analysis of Infectious Endocarditis at an Urban Hospital**

**Daniel Mueller MD and Rafik Samuel MD**

**Background:** Infectious endocarditis (IE) is a disease that causes significant morbidity and mortality. Nearly 40% of patients die within one year of diagnosis<sup>1</sup>. A contemporary, multinational study of the presentation, etiology, and outcome of patients infected with endocarditis has been described previously<sup>2</sup>, but these results are centered on the general (world) population. It is unknown whether these parameters are similar in an urban, socioeconomically disadvantaged patient population. In addition, less is known about how specific co-morbidities and risk factors (such as intravenous drug use, vascular access for dialysis, and pacemakers) contribute to the pathogenesis of IE. This study intends to better characterize IE in an urban patient population.

**Methods:** Over 1800 echocardiograms performed between September 2006 and March 2012 were evaluated retrospectively in patients over age 18 years for the presence of vegetations on one or more valves. Echocardiograms were either transthoracic or transesophageal.

**Results:**

Pending data analysis at time of print.

**Comparative Outcomes of Pericardiocentesis in the United States by  
Hospital Procedure Volumes**

**Paul L. Hermany MD, Chad J. Zack MD, Howard A. Cohen MD,  
Alfred Bove MD, PhD, Riyaz Bashir MD**

**Background:** The effect of hospital procedure volume of pericardiocentesis on in-hospital mortality is unknown.

**Methods:** The Nationwide Inpatient Sample (NIS) was used to identify patients who underwent pericardiocentesis in the United States from January 2005 to December 2010. Hospitals were separated into quartiles based on per annum pericardiocentesis volumes (group A -  $\leq 6$  pericardiocentesis/year, group B - 7-13 pericardiocentesis/year, group C - 14-25 pericardiocentesis/year and group D -  $\geq 26$  pericardiocentesis/year). Propensity scores were for the comparison of the matched patient data between each quartile.

**Results:** Amongst a total of 5,784 patients, the overall in-hospital mortality during the six-year study period was 15.3%. The in-hospital mortality rates for group A, group B, group C and group D were 19.5%, 14.8%, 14.6% and 12.8%, respectively ( $p < 0.001$ ). A linear trend in mortality improvement across quartiles was observed ( $p < 0.001$ ) (Figure 1).

**Conclusion:** This observational study showed that patients undergoing pericardiocentesis in high-volume centers had lower in-hospital mortality than those treated in low-volume centers. A linear trend for improvement in mortality with increasing center volume was observed.



**Dealing With Complex Patients at an Internal Medicine Resident Clinic: A Retrospective Analysis and Planned Prospective Pilot**

**H Jarrett, J Gotfried, R Andari, V Kulasekaran**

**Background:** Defining patient complexity has important implications in appropriate healthcare delivery and resource utilization in primary care. Complexity defined by physicians has been shown to be an alternative and reliable measure when compared to validated co-morbidity indices. Using information from a previous resident survey we created a pilot project that seeks to address the key determinants of complexity among 6 select patients.

**Methods:** Graduating residents were surveyed to identify complex patients from their clinic cohort. The narratives were sorted into domains of complexity commonly used in current literature. These were medical decision-making, co-ordination of care, personal characteristics, mental health, socioeconomics and multiple medical problems. The results were used to create a pilot project that seeks to utilize available resources within the clinic and create a one-day visit format for 6 patients identified by residents as high risk based on previous encounters. Time will be allocated with the resident physician, pharmacist and social worker. Nutrition and other counseling will be offered through a registered nurse and follow up will focus on continued outreach through telemedicine and home nursing. The patients' encounter and any interventions will be discussed at a multidisciplinary group meeting on a monthly basis and preset objective markers of improvement will be followed during the pilot.

**Results:** From the survey, 241 out of 1446 patients were identified. Statistically significant findings included male sex with behavioral issues ( $p= 0.014$ ), mental health ( $p= 0.03$ ) and socioeconomic factors ( $p= 0.047$ ) among young patients. Medical decision-making was the most common reason for qualifying a patient as high risk (41.5%).

**Discussion:** Our retrospective analysis allowed us to better understand and potentially identify complex patients at our practice. Multi-disciplinary approaches have been reportedly beneficial in complex patients and we hypothesize that our one-day visit format will help allow the patient to utilize important resources available at the clinic. We are planning close monitoring for a 6-month period and will analyze subjective and objective measures that may indicate improvement in health and complexity during this time.

**The Effect of Inferior Vena Cava Filter Placement on  
In-Hospital Outcomes in Patients With Lower Extremity Deep Vein Thrombosis**

**Chad J. Zack, Riyaz Bashir, John Gaughan, Alfred A. Bove**

**Background:** The use of inferior vena cava (IVC) filter placement in the management of patients with acute proximal deep vein thrombosis (DVT) is controversial and their impact on outcomes are unknown.

**Methods:** We used the Nationwide Inpatient Sample (NIS) database from 2005 to 2010 to identify patients admitted with a principal discharge diagnosis of caval or proximal lower extremity DVT. Patients who underwent IVC filter placement (group A) were compared to those who did not (group B) We used propensity score matching with 52 variables including the Elixhauser comorbidities, patient demographics, and hospital characteristics for matched comparisons between the two groups.

**Results:** Among a total of 90,599 patients with lower extremity proximal or caval DVT, 17.3% (15,638) received an IVC filter. After matching, a cohort of 29,234 patients was identified for comparison of which 14,617 underwent IVC filter placement and 14,617 did not. The in-hospital mortality was not significantly different between the two groups (group A 1.5 % vs. group B 1.4%;  $p= 0.59$ ). Those who received an IVC filter had significantly higher hospital charges ( $\$46,893 \pm 49,742$  vs.  $\$30,527 \pm 41,244$ ;  $p < 0.001$ ) and length of stay ( $6.5 \pm 5.9$  vs.  $5.8 \pm 4.6$ ;  $p < 0.001$ ) compared to those who did not undergo IVC filter placement.

**Conclusions:** In this observational study, we found that IVC filter placement did not impact mortality was associated with increased resource utilization in patients with a primary diagnosis of lower extremity DVT.

**Home Non-invasive Positive Pressure Ventilation Use After an Acute Exacerbation of COPD With Hypercapnic Respiratory Failure Improves Six Month Event-Free Survival**

**Jonathan A. Galli**

**Rationale:** Non-invasive positive pressure ventilation (NPPV) has been shown to be an effective in hospital treatment for acute hypercapnic respiratory failure in COPD. The benefit from using home NPPV for chronic hypercapnic respiratory failure is less well understood.

**Objectives:** To evaluate the effect of home NPPV use in patients following a hospitalization for AECOPD with acute hypercapnic respiratory failure on hospital readmission rate and mortality for a 180-day period after an index admission.

**Methods:** We conducted a retrospective, single-center, chart review on patients hospitalized in 2011 with a primary or secondary discharge diagnosis of AECOPD (ICD-9 code 491.21), a PaCO<sub>2</sub> level > 45 mmHg on arterial blood gas, and used bilevel NPPV during hospitalization. 166 patients were included in the analysis and were divided into two groups: patients who used NPPV post discharge and patients who did not use NPPV post discharge.

**Results:** Patients in the NPPV post discharge group demonstrated superior event-free survival as compared to the no-NPPV post discharge group ( $\chi^2 = 23.8$ ,  $p < 0.0001$ ). The NPPV post discharge group had a statistically significant reduction in hospital readmissions (40% versus 75%,  $p < 0.0001$ ) and in ICU admissions (8% versus 32%,  $p = 0.0001$ ) throughout the 180-day period from the index admission.

**Conclusions:** COPD patients who used NPPV following an admission for AECOPD with hypercapnic respiratory failure had lower readmission rates, reduced readmissions requiring intensive care unit through 180 days, and higher event-free survival compared to patients who did not use NPPV after discharge.

**The Relationship Between Mitral Regurgitation and Diastolic Function**

**Arnold B. Meshkov, Hayan Al Maluli, Deepakraj Gajanana, Alfred Bove**

**Background:** Left ventricular (LV) dysfunction may be difficult to detect in mitral regurgitation (MR). Transthoracic echo (TTE) provides parameters of diastolic function. Increased E velocity is associated with worsening MR, and elevated E/e' ratio with elevated mean left atrial pressure (LAP).

**Methods:** 206 patients undergoing TTE found to have MR. Standard measurements were made, plus volumetric MR volume/fraction (RV/RF). Patient data below.

**Results:** RV and RF have a significant relationship with E, E/A, and E/e' by univariate analysis ( $p < .0001$ ). By multivariate analysis, E/A and E/e' were independent of RV, RF, LV mass, and LA dimension ( $p > .05$ ) but not LVEF ( $p = .03$  and  $.002$ ). E was related to RV only ( $p = .02$ ), and e' to E only ( $p < .0001$ ). Patients with LVEF  $> 50\%$  ( $n=107$ ) have lower E velocity (1.4 vs. 1.9), E/e' (14.1 vs. 17.8), RV (218.1 vs. 249.9), RF (66.2% vs. 74.0%), and higher e' velocity (7.8 vs. 3.2). ( $p = .0001$ ). 37/107 (34.6%) with LVEF  $> 50\%$  had E/e'  $> 15$ , 32.7% e'  $< 6$  cm/sec, and 32.7% a pseudonormal pattern (grade II diastolic dysfunction).

**Conclusions:** TTE markers of elevated LAP, impaired LV relaxation, and more severe MR are largely independent markers of LV dysfunction and MR severity in MR patients and a wide range of LVEF and LV mass. A significant percentage of patients with MR and LVEF  $> 50\%$  have abnormal E/e' ratios, diminished e' velocity, and pseudonormal patterns. These markers may be important in further research and help optimize the timing of surgical intervention.

**Diabetes Group Visits: A Medicine Group Practice Quality Improvement Initiative**

**Robin Deutsch MD and Rajeeve Subbiah MD**

Evidence suggests that group visits for diabetic patients can be effective in improving health outcomes, patient satisfaction, and patient education. As part of a quality improvement project, a series of group visits for diabetic patients cared for by Temple University Hospital's Medicine Group Practice was organized by internal medicine residents. Interdisciplinary visits were conducted, with collaboration from providers within nursing, pharmacy and nutrition. Topics discussed included difficulties of living with diabetes, pathophysiology of diabetes and its complications, disease management targets, adhering to a diabetic diet, insulin administration, foot care, and physical activity. Blood pressure and blood glucose readings were obtained and patient questionnaires were administered to assess patient knowledge and satisfaction with the group visit experience. Both physicians and providers found the group visits to be an effective and satisfying way to provide patient education within a supportive group setting. The intervention was limited by a small sample size, short duration, and resident availability. Suggestions for making diabetic group visits a sustainable initiative within the Medicine Group Practice include identifying a non-resident coordinator based in the outpatient setting.