



# Medical Student Training in Aging Research (MSTAR) Program

Research Abstracts (2016-2017)

---

Icahn School of Medicine at Mount Sinai

## MEDICAL STUDENT TRAINING IN AGING RESEARCH (MSTAR) PROGRAM AT ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI

### Program Leadership



**Melissa D. Aldridge, PhD, MBA**



**Rainier P. Soriano, MD**

**The Program:** The Medical Student Training in Aging Research (MSTAR) Program, established in 1994, provides an enriching 12-week experience in aging-related research under the mentorship of top experts in the field. Aging-related research crosscuts many areas of scientific investigation from basic sciences, to clinical research, to health services research. Students gain a wealth of experiences they might not otherwise have during medical school, especially early in their training when most scholars participate in the program. Many former MSTAR scholars have pursued successful and varied careers in geriatrics and aging-related research. They have joined the growing number of dedicated scientists, innovative thinkers, and talented physicians whose specialized knowledge and skills in aging are increasing in demand as our population ages.

Program highlights include classes in research methodology, opportunities for research presentations and publications, clinical geriatrics experiences, information on medical careers and informal social gatherings and networking with fellow scholars and mentors.

**Sponsor:** The National Institute on Aging (NIA)

**Administered by:** The National Institute on Aging (NIA) and The American Federation for Aging Research (AFAR)

**Website:** <http://www.afar.org/research/funding/MSTAR>



# A COMPARISON OF ANALGESICS ON PHYSICAL FUNCTION IN OLDER VETERANS WITH OSTEOARTHRITIS

**A. Birnbaum, T. Runels, A. Bean and U. Hwang MD MPH**

*GRECC, James J. Peters VAMC; Brookdale Department of Geriatrics & Palliative Medicine,*

*Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai*

**Introduction:** Older adults with osteoarthritis experience chronic pain that affects their physical function. Analgesics, such as NSAIDs and Opioids, are often measured by their capacity to reduce pain, while improvement in physical function has been overlooked.

**Objective:** To compare the effectiveness of NSAIDs and opioids on improving physical function in older veterans with osteoarthritis.

**Methods:** Multicenter, prospective longitudinal survey (4/15-7/17) of veterans 50+ years of age with hip/knee osteoarthritis, recently prescribed an analgesic (opioid or NSAID) or a control medication (any non-analgesic prescription). Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scoring rubric was used to measure a physical function score and a composite score (physical function, pain, and stiffness) at two timepoints: baseline (within 30 days of prescription) and 30-Day follow up. WOMAC scores were compared within treatment groups using Wilcoxon signed-rank test. Between treatment groups, likelihood of reaching a clinically important improvement in physical function ( $\geq 5$  point drop on 68-point physical function WOMAC subscore) were compared using logistic regression.

**Results:** 475 subjects (mean age=66) were scored using WOMAC. Opioid subjects (n=132) had an improvement of function (2.1 points,  $p < 0.01$ ), NSAID subjects (n=189) saw no improvement ( $p = 0.46$ ), and control subjects (n=154) saw no improvement ( $p = 0.28$ ). When compared to controls, subjects prescribed opioids were more likely to have a clinically important improvement in physical function (OR=2.38, 95% CI= [1.34, 4.24],  $p < 0.01$ ). NSAID subjects had no significant change in likelihood (OR=1.59 [0.91, 2.77],  $p = 0.11$ ).

**Conclusion:** Physical function should be used to assess effectiveness of analgesics. Preliminary results suggest opioids have an impactful short-term effect on improved physical function.

# ALTERATIONS IN EXPRESSION AND LOCALIZATION OF GLUR2/3 IN THE DUTCH MOUSE MODEL OF ALZHEIMER'S DISEASE

**Erin Bresnahan, Merina Varghese, Allison Sowa and Dara Dickstein PhD**

*Icahn School of Medicine at Mount Sinai, New York, NY; Department of Neuroscience, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** Alzheimer's disease (AD) is a neurodegenerative illness in which amyloid plaques and neurofibrillary tangles accumulate in the brain, causing deficits in memory and cognition. The TgAPPE693Q ("Dutch") mouse model of AD is ideal for studying the effects of soluble amyloid beta oligomers as these mice overexpress oligomeric soluble amyloid beta but never form insoluble plaques. We have previously shown that Dutch mice develop significant cognitive decline as well as decrease in neuronal complexity and shorter post-synaptic density (PSD) length on mushroom synapses in hippocampal neurons compared with wild type (WT) mice.

**Objective:** We aimed to further investigate the methods by which the amyloid oligomers may be causing these synaptic changes by using biochemical and ultrastructural analyses to detect and quantify GluR2/3 expression at the synapse.

**Methods:** Tissue from 9 mice, expressing either the Dutch mutant or WT amyloid precursor protein, was ImmunoGold labeled for GluR2/3, and then imaged in 8 sets of 5 serial sections per animal, using an electron microscope (EM). Using the dissector method on the EM images, synapse density, PSD length and spine head diameter were measured and synapses containing ImmunoGold particles were counted with particle localization noted and compared between Dutch and WT groups. Western Blotting was performed on tissue from Dutch and WT mice, probing for NR2B, GluN2B, and PSD95.

**Results:** Blinded analysis is still underway, but we expect there will be a lower density of synapses containing ImmunoGold particles in the Dutch group, in particular on mushroom spine types, as we have already noted other synaptic defects in this model at mushroom spines. We also expect there may be lower levels of some of the synaptic proteins in Dutch mice.

**Conclusions:** These results will contribute to a better understanding of the pathway to synaptic dysfunction, which could lead to identification of therapeutic targets for AD prevention or treatment.

## NIH RESEARCH FUNDING FOR PALLIATIVE MEDICINE 2011-2015: PRELIMINARY RESULTS

**Elizabeth E. Brown, BA, R. Sean Morrison, MD and Laura P. Gelfman, MD, MPH**  
*Icahn School of Medicine at Mount Sinai, New York, New York; Brookdale Department  
of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New  
York, New York*

**Introduction:** Palliative medicine is growing rapidly, with increasing demand as the U.S. population ages. To support this demand, an increase in the palliative care evidence base and NIH funding for palliative care research is required.

**Objective:** To examine NIH funding for palliative care research from 2011-2015 and compare with the funding from 2006-2010.

**Methods:** To compile a current list of palliative care researchers, we conducted a three-part search: 1) a PubMed search for keywords “palliative care,” “hospice,” “end of life,” and “end-of-life care” in original research manuscripts published in major internal medicine and key sub-specialty journals from 2013-2015, and subsequent abstraction of first and last authors from identified manuscripts, 2) abstraction of first and last authors from all original research published in five major palliative care journals from 2013-2015, and 3) a compiled list created of editorial board members of major palliative care journals and members of key palliative care initiatives. Pooled names were cross matched with the NIH RePORTER database to create a list of NIH grants awarded to identified researchers from 2011-2015.

**Results:** The three-part search resulted in a list of 2,120 U.S. palliative medicine researchers who published original palliative care research from 2013-2015. Compared to 2006-2010, the number of palliative care authors increased by 1,281 (153%). The compiled list of 1,319 original research manuscripts were published from 2013-2015— 832 (63%) in major palliative care journals and 487 (37%) in sub-specialty and major general medicine journals. Compared to 2006-2010, 329 (208%) more papers were published in non-palliative care journals.

**Conclusions:** The increase in palliative care researchers and palliative care research published in non-palliative care journals demonstrates rapid growth of palliative medicine research. Nevertheless, there is a continued need for dedicated NIH investment in palliative care research to develop an evidence base to support high quality care for patients with serious illness and their families.

# EVALUATION OF PHYSICIAN AND PARAMEDIC PERSPECTIVES ON THE MOUNT SINAI COMMUNITY PARAMEDICINE PROGRAM

**Deepa K. Chellappa, Linda V. DeCherrie, MD, Ramiro Jervis, MD, Luisa Ortiz, Cyndi Gonzalez and Kevin G. Munjal, MD**

*Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, New York; Brookdale Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** Despite access to home-based primary care (HBPC) and urgent care, patients in the Mount Sinai Visiting Doctors (MSVD) program frequently use the Emergency Department, leading to unnecessary hospitalization, fragmented care, and increased cost. Community Paramedicine (CP) programs address these issues by allowing paramedics to function outside of their customary role and involving primary care physicians in acute care. Though many different CP programs exist, physician and paramedic impressions of CP have not been widely studied.

**Objective:** This study examines initial physician and paramedic perspectives on the newly implemented Mount Sinai Community Paramedicine program using encounters between September 2015 and February 2016.

**Methods:** 36 CP physicians and 26 paramedics were sent an initial postencounter survey as well as a five-month final survey. In each encounter, when MSVD patients call their primary care provider with an urgent need, the provider may request a CP assessment. The paramedic arrives at the patient's home and through telemedicine, communicates the patient's status and coordinates care with the physician to determine whether an ED visit is warranted.

**Results:** In the initial survey, 89% of physicians (n=32) rated the intervention as "very helpful" or "helpful" to their practice and physicians were more likely to rate the CP intervention as helpful if they were confident in the paramedic's clinical assessment (P=0.03). 87% (n=23) of paramedics felt comfortable leaving the patient at home after the assessment. Furthermore, of the 36 patient encounters, only 5 patients (22%) were transported to the ED.

**Conclusions:** This study demonstrates a high degree of satisfaction among physicians and paramedics with the newly implemented CP intervention, with most finding it a helpful addition to their practice. Furthermore, CP interventions may be useful in preventing transport to the ED by addressing urgent symptoms in the patient home. Further research will include a chart review to determine 30-day utilization and clinical outcomes for patients who receive a CP intervention.

# PREVALENCE AND CORRELATES OF PTSD IN OLDER WORLD TRADE CENTER FIRST RESPONDERS

**Connie Chen BA, Clyde Schechter MD, Olivia Diab BA, Robert H. Pietrzak PhD and Adriana Feder MD**

*Dept of Psychiatry, Icahn School of Medicine at Mount Sinai, NY, NY; Dept of Family and Social Medicine, Albert Einstein College of Medicine of Yeshiva University, Bronx, NY; Dept of Psychiatry, Yale University School of Medicine, New Haven, CT; National Center for Posttraumatic Stress Disorder, VA Connecticut Healthcare System, West Haven, CT*

**Introduction:** Posttraumatic stress disorder is highly prevalent and persistent in World Trade Center (WTC) first responders, yet no known studies have characterized PTSD in any group of older aged responders. In this study, we evaluated prevalence and correlates of PTSD, including subthreshold PTSD, in a subset of WTC responders of age  $\geq 60$  years. Subthreshold PTSD is defined as presence of substantial PTSD symptoms, but below threshold for formal PTSD diagnosis, and has been shown to be more common in older adults.

**Objective:** Our study aims to inform PTSD assessment and treatment for older disaster responders.

**Methods:** We conducted a cross-sectional study of 905 WTC responders age  $\geq 60$  years who completed a Web-based survey between 6/2012-12/2014. The survey included the PTSD Checklist-Specific Version (PCL-S), a self-report measure used to determine probable full and subthreshold PTSD. Additionally, (1) demographic, (2) number of WTC-related trauma exposures, and (3) psychosocial potential predictors of PTSD were measured. We identified correlates of full and subthreshold PTSD from these three predictor categories using multinomial logistic regression.

**Results:** Mean age was 66.3 years (SD=5.0, range=60.0-87.3). Prevalence of full PTSD was 16.2% and prevalence of subthreshold PTSD was 26.2%. Black race, Hispanic ethnicity, medical conditions post-9/11, WTC exposures, and coping by avoidance and substance use correlated with both full and subthreshold PTSD. Non-traditional responder status and social coping correlated with subthreshold PTSD only. Both subthreshold and full PTSD groups were more likely to screen positive for depression and reported higher work, family, and social life impairment, but also greater posttraumatic growth.

**Conclusions:** In older WTC responders, subthreshold PTSD was more prevalent than full PTSD, but associated with similar risk correlates and disease burden. Efforts to treat older, trauma-exposed disaster responders should incorporate assessment of subthreshold PTSD, which has a significant but overlooked presence and burden in this population.

# MALNUTRITION RISK AND POST-OPERATIVE OUTCOMES IN GERIATRIC ELECTIVE SURGERY PATIENTS

Sida Chen; Jeffrey Aalberg, MS and Celia Divino, MD

*Department of Surgery, Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** Although malnutrition has been acknowledged as a geriatric syndrome, it remains difficult to manage, in part due to its complexity. Data shows that patients with malnutrition tend to be older, but surgical research rarely studies the geriatric population in isolation. Past studies on malnutrition produced mixed results, with some reports showing malnutrition risk was associated with negative post-operative outcomes but failing to reach significance.

**Objectives:** This study aims to determine if malnutrition risk negatively affects post-operative outcomes of elective procedures in the geriatric population at Mount Sinai's Hospital System.

**Methods:** 1147 patients who underwent elective general surgery procedures from January 2010 to December 2016 were reviewed. The Malnutrition Universal Screening Tool (MUST) was used to assess nutritional status and separate patients into no risk, moderate risk and high-risk categories. Statistical analysis was used to determine association of demographic and nutritional variables with infection rate, complication rate, and LOS. Multivariate analysis was run for infection rate, complication rate and LOS.

**Results:** The average patient age was 74, with 590 (51.4%) being female. Univariate analysis was significant for higher infection rates, higher complication rates, and longer LOS in patients with higher malnutrition risk scores. Logistic regression tests were significant for higher infection rates in moderate [(OR = 3.83)  $p < 0.005$ ] and high-risk patients [(OR = 4.45)  $p < 0.005$ ], and higher complication rates in moderate [(OR = 2.14)  $p < 0.005$ ] and high-risk patients [(OR = 3.28)  $p < 0.0001$ ]. Linear regression tests were significant for increased LOS in patients with moderate risk malnutrition scores only [(Parameter = 2.28)  $p < 0.05$ ].

**Conclusions:** Geriatric patients with malnutrition risk were shown to have worse post-operative outcomes than no risk patients. At risk patients may benefit from nutritional intervention.



# CLARIFYING THE ROLE OF HEPATIC STELLATE CELLS IN AGE-RELATED LIVER FIBROSIS BY THEIR DEPLETION IN NOVEL MURINE MODELS

Sophia Chiu, James Carter, F Parvin-Nejad, Youngmin A. Lee & Scott Friedman  
*Division of Liver Diseases, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** The liver has traditionally been viewed as protected from senescence due to its remarkable regenerative capacity. However, emerging evidence indicates that aging contributes to liver disease, in part by enhancing the rate of hepatic fibrosis following injury due to nonalcoholic, alcoholic fatty liver disease, and viral hepatitis. Hepatic stellate cells (HSCs) are the major cell type driving fibrogenesis in chronic liver injury. However, their contribution to liver regeneration and hepatocyte turnover are unclear.

**Objective:** We aimed to characterize two HSC-specific reporter lines to evaluate their suitability for HSC depletion using a novel murine model in which CD8<sup>+</sup> T-cells are administered to kill any cell expressing green fluorescent protein (GFP). Our overall goal is to elucidate the role of HSCs in liver homeostasis and hepatocyte regeneration during aging by comparing the impact of their depletion in young and old mice.

**Methods:** We evaluated two candidate mouse reporter lines for HSC depletion, PDGFR $\beta$ -eGFP and LRATcre-ZsGreen. PDGFR $\beta$ -eGFP specifically expresses GFP in HSCs. To deplete HSCs, we created a transgenic mouse model (PDGFR $\beta$ -eGFP-H2dd) in which only HSCs that express GFP are susceptible to killing by engineered CD8<sup>+</sup> T-cells. Following HSC depletion, we evaluated changes in hepatocyte proliferation by staining for Ki67 in CD8<sup>+</sup> T-cell-treated (n=3) versus untreated mice (n=3). In addition to a PDGFR $\beta$ -eGFP mouse, we also explored the specificity of another candidate HSC-specific promoter (lecithin acyltransferase, or LRAT) that drives the reporter protein ZsGreen, (i.e. LRAT-ZsGreen reporter mice). In the LRATcre-ZsGreen model, we characterized LRAT expression not only in liver, but also as extrahepatic tissues by comparing endogenous LRATcre-specific ZsGreen expression between LRATcre<sup>+</sup> mice (n=2) and LRATcre<sup>-</sup> mice (n=1).

**Results:** In the PDGFR $\beta$ -eGFP depletion model, we confirmed >99% depletion of desmin<sup>+</sup> HSCs by immunofluorescence and tracked transplanted T-cell expansion in the peripheral blood via flow cytometry. In HSC-depleted mice the number of Ki67<sup>+</sup> cells were reduced/increased to Ki67<sup>+</sup> cells compared to non-depleted mice based on computer morphometry of at least 30 fields per animal. In the LRAT-ZsGreen model, ZsGreen reliably identified desmin<sup>+</sup> HSCs in the liver with approximately colocalization. We also identified promiscuous LRATcreZsGreen expression in various extrahepatic tissues including lung, pancreas, brain, gut, and testis, which has not been previously reported.

**Conclusions:** GFP-specific CD8<sup>+</sup> T-cells efficiently deplete 99% of HSCs while sparing other cell populations within the liver. LRATcre-ZsGreen also reliably identifies desmin<sup>+</sup> HSCs in the liver. However, significant extrahepatic expression of LRATcre-ZsGreen may lead to unwanted depletion of cells in other tissues. These findings advance our ability to establish a platform for assessing the contribution of HSCs to age-related loss of hepatocyte regeneration.

# **SURGICAL RESECTION OF SMALL INTESTINAL NEUROENDOCRINE TUMORS IN ELDERLY PATIENTS IMPROVES SURVIVAL: A SURVIVAL, EPIDEMIOLOGY, AND END RESULTS (SEER) STUDY**

**Edward Cytryn, BA; Jeffrey Aalberg, MS; Daniel Dolan, MD and Celia Divino, MD**  
*Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, New York; Department of Surgery, Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** The incidence of small intestinal neuroendocrine tumors (siNETs) in the US has been increasing over the past 20 years. The vast majority of these are diagnosed in older adults with a median age near 68, however, there is little in the current literature that outlines a definitive direction of treatment in these patients.

**Objective:** The aim of this study was to determine whether elderly patients with siNETs who undergo surgery have different cancer-specific and overall survival outcomes than those who do not. We hypothesized that patients who underwent surgery would have better survival outcomes.

**Methods:** We identified patients 65 years and older diagnosed with siNETs from 1998-2014 in the Surveillance, Epidemiology, and End Results (SEER) Database. To determine the risk factors associated with survival we performed chi-square tests. Differences in survival outcomes between patients who underwent surgery and those who did not were examined using a multivariable inverse weighted propensity scored Cox Proportional-Hazard model.

**Results:** We found 4,796 patients with siNETs, 3,940 (82.2%) of whom underwent cancer-directed surgery. In univariate analysis, surgery was found to be significantly associated with an increase in 1 and 5-year overall survival ( $p < .0001$ ). Age, primary site, histologic type, grade, and stage were also found to be significantly associated with increased 1 and 5-year overall survival. After inverse weighted propensity scoring, patients who underwent surgical resection were found to have a significantly reduced hazard of cancer-specific death (HR: 0.486; 95% CI: 0.431-0.548;  $p < .0001$ ) as well as overall death (HR: 0.654; 95% CI: 0.606-0.705;  $p < .0001$ ).

**Conclusion:** Elderly patients who underwent surgical resection of siNETs had better cancer-related and overall survival than patients who did not. Though surgery can be contraindicated in elderly patients, the results of this study provide support for the surgical management of siNETs and suggest this intervention as the standard of treatment.

# 30-DAY FUNCTIONAL OUTCOMES OF EMERGENT GERIATRIC SUBDURAL HEMATOMA

**Brian Deutsch, BS and Michael Leitman, MD**

*Department of Surgery, Department of Geriatrics and Palliative Medicine  
Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** Elderly people have a unique propensity for incurring subdural hematomas (SDH) due to their greater rate of fall-related injuries, anatomical strain of bridging veins in the brain, and increased likelihood of general surgical risk factors. Age has often been implicated in increasing risk of morbidity and mortality, but one aspect of morbidity that is often overlooked is the loss of functional independence.

**Objective:** To assess how craniotomy following SDH affects functional loss of geriatric patients.

**Methods:** This is a retrospective study of 1395 functionally independent geriatric (age $\geq$ 65) patients who underwent craniotomy following SDH. These patients were compared to a cohort of patients under the age of 65. Multivariate regression was used to analyze the effects of age on mortality, functional independence, and complications including ventilator dependence, return to the operating room, and 30-day readmission. Loss of functional independence was defined by a patient being discharged to a care facility or passing away.

**Results:** Age was found to not have an effect on mortality (Odds Ratio [OR] 95% Confidence Interval [CI]: 0.83 -1.49,  $p=0.47$ ) or the incidence of having any complication (OR 95% CI: 0.65-1.003;  $p=0.054$ ), but it had a significant negative effect on independent status (OR 95% CI: 0.50-0.77,  $p<0.0001$ ).

**Conclusions:** Older patients are more likely to be discharged to care facilities than their younger counterparts despite having similar complication and mortality rates. Being able to anticipate the need for additional support and care for patients at risk of losing functional independence will better help families and physicians plan the long-term care of the patient.

## EVALUATING THE AGREEMENT BETWEEN SELF-REPORTED AND DOCUMENTED ANALGESIC USE IN OLDER VETERANS

**Alex Domanski, Dorian Gittleman, MPH Lee Stefanis, Ula Hwang, MD, MPH**  
*Geriatric Research, Education and Clinical Center, James J. Peters VAMC Brookdale  
Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount  
Sinai, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai*

**Introduction:** Recent studies using pharmacy claims data demonstrate higher rates of adverse events with opioids when compared to NSAIDs for treating chronic, non-malignant pain in older adults. The validity of these results, however, relies on reimbursement data as an indicator of analgesic exposure, despite evidence in the literature of the contrary.

**Objective:** We compared health record documented versus self-reported analgesic use in older veterans to estimate their agreement and evaluate administrative data as a proxy for analgesic exposure.

**Methods:** From 3/2015 until 5/2016, we conducted a prospective telephone survey of veterans from 4 VA hospitals 50 years of age and older with at least 2 inpatient or outpatient diagnoses of knee or hip arthritis. Eligible subjects were analgesic-free (based on prescription records) for at least 180 days prior to starting a new analgesic (opioid, NSAID, cyclooxygenase 2 inhibitor [coxib], other [e.g., acetaminophen, capsaicin, etc.]) or control (filling a non-analgesic prescription). We surveyed subjects within 30 days of prescription filling and linked self-reported analgesic lists to medical record analgesic prescriptions. We compared the two sources by calculating  $k$  coefficients, sensitivity, and specificity for analgesic classes. Self-reported survey data were used as the reference standard.

**Results:** A total of 595 subjects were surveyed and linked to medical record data. Mean age was 66y ( $\pm 8.9$ y), 93% were male. Agreement between self-reported analgesics versus medical record analgesic prescriptions over 30 days was fair ( $k=0.26$ ). This varied based on drug class: opioids ( $k=0.56$ ), NSAIDs ( $k=0.41$ ), other ( $k=0.37$ ). Sensitivity was higher for opioids (0.71) than for NSAIDs (0.57) or other (0.39), while specificity across drug classes was similar (0.89, 0.84, 0.93 respectively).

**Conclusions:** Discordance exists between health record documented and self-reported analgesic use in older veterans. Caution should be exercised when interpreting the results of pharmacoepidemiologic safety studies that use administrative data to measure analgesic exposure.

# IMPACT OF AGE ON SEX-BASED DIFFERENCES ON CARDIOVASCULAR RISK BETWEEN PATIENTS UNDERGOING PCI: RESULTS FROM A LARGE SINGLECENTER REGISTRY WITH OVER 18,000 PATIENTS

Claire M. Eden, BA; Usman Baber, MD, MSc; Melissa Aquino MSc, Jason C. Kovacic, MD; Pedro Moreno, MD; Srushti Shah, MD; Pooja Vijay, MD; Nitin Barman, MD; Joseph Sweeny; Prakash Krishnan, MD; George Dangas, MD, PhD; Annapoorna S. Kini, MD; Roxana Mehran, MD; Samin K. Sharma, MD  
*Department of Cardiology, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** Compared to men, women have been shown to experience more adverse events following percutaneous coronary intervention (PCI). Studies have attributed this disparity to the typical clinical profile of women undergoing PCI; women are older, have more baseline comorbidities, more frequently present with unstable coronary syndrome, have higher rates of depression and lower functional status than men receiving such therapies. Whether or not these differences are uniform or attenuate with advancing age remains unknown.

**Methods:** We conducted a retrospective analysis of 18,378 patients undergoing PCI at a large tertiary care center in New York (Mount Sinai) between 2009-2014. Patients were divided into age categories: <60; 60-80; and >80 years. Baseline clinical and procedural characteristics were compared between men and women across age strata. One-year rates of death or MI (MACE) were calculated using the Kaplan-Meier method and compared using the log-rank test. Adjusted associations for MACE within each age stratum were examined using Cox regression.

**Results:** Women made up 32% (n=5917) of the total population and within the two younger age brackets, women were older with a higher frequency of diabetes and anemia compared to men. Men and women above the age of 80 did not significantly differ in age or prevalence of diabetes. Men older than 80 had higher rates of anemia than women (59.8% versus 51.2% P=0.0001). There was no significant difference in risk profile between men and women over 80. Variation in angiographic phenotype between men and women remained constant across all age groups.

**Conclusions:** Sex-based differences in clinical risk factors are highest in younger PCI patients with less variability observed among those > 80 years of age. Concordant patterns of adverse events are also observed between men and women with increasing age with the largest gradient in risk present among those < 60 and no significant differences in elderly patients.

## DETECTION OF DELIRIUM IN OLDER EMERGENCY DEPARTMENT PATIENTS: STANDARDIZING SCREENING USING 3D-CAM

Rebecca Ellis, George Loo, Lynne Richardson, MD Laura Rivera, Jeremy Sze, Ula Hwang, MD MPH

*Icahn School of Medicine at Mount Sinai, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, NY, NY*

**Introduction:** Delirium affects up to 20% of older ED patients, is missed up to 79% of the time by ED clinicians, and is associated with numerous adverse outcomes. A brief, structured screening tool such as the Confusion Assessment Method (CAM) or the 3D-Confusion Assessment Method (3D-CAM) would be helpful to accelerate and standardize ascertainment of delirium in the ED.

**Objective:** We hypothesized that rates of delirium detection would be greater with the use of CAM and even greater with the use of 3D-CAM when compared to clinician recognition of delirium among a cohort of older ED patients.

**Methods:** This was a prospective sample of older (age 65+), English and Spanish speaking Mount Sinai ED patients that were surveyed between January and December 2015. Research assistants administered surveys that included the CAM, 3D-CAM, and questions that may identify older adults at risk for adverse outcomes. We compared rates of delirium detection using the CAM, the 3D-CAM, and clinician documentation of CAM in the medical record.

**Results:** Out of the 1138 patients surveyed, 146 (12.8%) were found to have delirium using the 3D-CAM, 21 (1.8%) were found to have delirium using the CAM (all of whom were found to have delirium using the 3D-CAM), and no patients had delirium documented by the ED clinician. Furthermore, regression analyses identified delirium (detected by 3D-CAM) as being significantly more prevalent among patients with older age ( $P=0.000$ ), Hispanic ethnicity ( $P<0.0001$ ), Spanish as preferred language ( $P=0.0001$ ), vision impairment ( $P<0.0001$ ), and higher pain levels ( $P=0.0200$ ).

**Conclusions:** Delirium is a common occurrence in older adults in the ED, and the vast majority of delirium in the ED goes undetected or undocumented. Using 3D-CAM has the potential to improve delirium screening in ED settings due to its quick, structured, and easy-to-use framework.

## PROMIS PHYSICAL FUNCTION 10-ITEM SHORT FORM FOR OLDER ADULTS IN AN EMERGENCY SETTING

**Conner Fox, Sandra Rodriguez, Laura Rivera, George Loo, Ula Hwang**  
*Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY; Brookdale Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** Functional status in older adults serves as a strong predictor of hospital use and mortality and offers insight into older adults' independence and quality of life. The NIH developed the PROMIS Physical Function questionnaire in an effort to improve and standardize patient-reported outcomes measurements. The PROMIS Physical Function 10-Item Short Form (PROMIS PF-10a) has yet to be validated for older adult populations.

**Objective:** By comparing the PROMIS PF-10a with the Katz Index of Activities of Daily Living (ADLs), we evaluated the validity of the PROMIS PF-10a for measurement of function in older adult populations.

**Methods:** In this six-month prospective observational study of patients age 65+ presenting at the Mount Sinai ED, participants completed both the Katz ADLs and the PROMIS PF-10a during their emergency visit, then again after eight weeks. We analyzed convergence of the two measurement tools across scoring distributions and stratification thresholds.

**Results:** 357 patients were included at baseline. The PROMIS PF-10a and Katz ADLs positively associate with one another, but do not correlate strongly. The PROMIS PF-10a identified impairment in 3.34 times as many patients as did the Katz ADLs. PROMIS and Katz ADL scores were convergent within impairment strata. Discrepancy lay in PROMIS items concerning vigorous physical function.

**Conclusions:** The PROMIS PF-10a captures physical function data in addition to the data concerning ADLs. Longitudinal data remains for analysis. Further research should be conducted for full validation of the PROMIS PF-10a for use in older adults.

# QUALITY OF LIFE AFTER LAPAROSCOPIC CHOLECYSTECTOMY IN OLDER ADULTS

**Amy Garvey, BA, Navin Bhatia, MD and Celia Divino, MD**

*Division of General Surgery, Department of Surgery, Icahn School of Medicine at Mount Sinai, New York, New York.*

**Introduction:** The current standard of practice for treating gall stones is cholecystectomy. This procedure usually relieves symptoms, but is associated with postoperative gastrointestinal symptoms, such as pain, indigestion, and/or diarrhea, in some patients. In addition, every surgery carries inherent risks, which increase in elderly patients. The procedure and possible postoperative gastrointestinal symptoms can impact quality of life for older patients; however, this data is limited.

**Objective:** This project aims to determine the incidence of long-term gastrointestinal symptoms following cholecystectomy by focusing on how quality of life is impacted for geriatric patients.

**Methods:** Patients were recruited into the study from one academic medical center in New York City beginning March 2016. Each patient was surveyed preoperatively and post-operatively, once 2-4 weeks following the survey and 3 months following the surgery. Two surveys were used, a validated SF12 survey which captured information on how the patient's quality of life was impacted both physically and mentally, and a survey designed by the research team which examined the symptoms the patient was experiencing.

**Results:** The study currently has 53 total participants, with 45 non-geriatric patients and 8 geriatric patients. The non-geriatric patients are 73.3% female with an average age of 39.9 years, while the geriatric patients are 62.5% female with an average age of 75.1 years. Preliminary results indicate that while cholecystectomy largely provides relief in older adults, some patients experience postoperative pain, indigestion, and/or diarrhea that lasts at least several months. In order to determine the proportion of patients affected with statistical significance, more patients and longer follow-up is needed.

**Conclusion:** We expect to conclude that surgeons who are offering the procedure should counsel patients on possible risks that extend beyond surgical recovery, including long-term pain, indigestion, and/or diarrhea, which, depending on the severity, can limit physical activities and negatively impact mental health.



## DO FALL RISK FACTORS DIFFER BY AGE IN HOSPITALIZED ADULT PATIENTS?

**A. Hazan, N. Egorova PhD, R. Freeman MSN RN NE-BC, R. M. Leipzig MD PhD**  
*Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, New York*

**Background:** Falls can be major events in hospitalized patients. The Morse score is commonly used to identify patients at risk of falling. At Mount Sinai Hospital (MSH), a more accurate enhanced falls risk algorithm (EFRA) was developed using Morse scores, Braden score components, lab values, medications and demographics.

**Objective:** To determine if the EFRA identified risk factors contribute similarly to fall risk in patients of older age.

**Methods:** Data were collected from EPIC data warehouse on 171,515 hospitalizations of 109,873 patients at MSH from July 2011-September 2015. Exclusions were patients <18 years old, on Psychiatric, Pediatric and ED services. Risk factor values were obtained within 12hrs of admission. The distribution, significance, and contribution to pooled risk of the EFRA's significant risk factors were analyzed by age group: <65, 65-74, 75-84 and >85.

**Results:** The rates of falls for the respective age groups were: 2.29, 3.04, 3.25, and 3.61 falls per 1000 hospital days ( $p < 0.0001$ ). Distribution of risk factors among age groups and significance of factors within age groups differed. High Morse score and low red blood cell count contributed most to the pooled risk of every age group. Male sex and antiepileptic drug use also contributed significantly to all age groups except for those >85, where Braden scale scores for nutrition and friction and shear had higher contributions.

**Conclusion:** EFRA risk factors for falling differ for older adults. Our next steps will be to re-derive the EFRA algorithm for each age group to determine whether its accuracy in identifying older adults at highest risk of falling can be improved.

# AGING AND IN JAIL: A RETROSPECTIVE ANALYSIS OF PEOPLE 55 AND OLDER IN NEW YORK CITY JAILS

**Zina Huxley-Reicher, Fatos Kaba, Rachael Bedard**

*Icahn School of Medicine at Mt. Sinai, Department of Geriatrics and Palliative Medicine, Correctional Health Services, NYC Health and Hospitals, Department of Medical Education, Icahn School of Medicine at Mount Sinai*

**Introduction:** The number of older adults (defined as >55 due to accelerated aging) in prison in the US has increased 300% from 1990-2009. Jails and prisons are struggling to meet the health needs of older patients.

**Objective:** This study was designed to characterize the demographics; health conditions and care needs of people >55 incarcerated in the NYC jail system.

**Methods:** We conducted a retrospective analysis of data from the jail system's EMR looking at all patients in the census from 2015-2017. We compared patients >55 to patients <55 across multiple categories including top charge, demographics and diagnoses, using bivariate analysis.

**Results:** Overall there were 158,692 patients in the jail system census during the study period, of which 11081 (7%) were >55. Our results demonstrate that patients >55 are more likely to report being homeless, more likely to be incarcerated for misdemeanors rather than felonies, hospitalized more times, prescribed more medication, more likely to have had a mental health diagnosis or serious mental illness designation, have a higher prevalence of Hepatitis C, HIV, osteoarthritis, CAD, HTN, Cirrhosis, COPD, and anemia than their younger counterparts.

**Conclusion:** This suggests that the >55 population at NYC jails may warrant characterization as a "special population" in correctional health deserving of targeted interventions to maximize safety and minimize harms for criminal justice involved older New Yorkers.

# FRIED FRAILTY SCALE: PREDICTING MORTALITY AFTER ORTHOTOPIC LIVER TRANSPLANTATION

**Maryna Khromava, BS; Sang Kim, MD and Samuel DeMaria, Jr. MD**

*Icahn School of Medicine at Mount Sinai, New York, NY; Department of Anesthesiology,  
The Mount Sinai Medical Center, New York, NY, USA*

**Introduction:** Frailty is a concept that describes a patient's decreased physiologic reserve to tolerate stress and subsequent vulnerability to adverse outcomes. Recent findings indicate frailty predicted mortality independent of liver disease severity among the Orthotopic Liver Transplantation (OLT) waitlist patients. Frailty of the OLT waitlist patients has been evaluated through the Fried frailty scale (FFS), previously used and validated in literature. Currently, all candidates are prioritized for a liver transplant using the laboratory-based Model for End-Stage Liver Disease (MELD) score, calculated from blood values including INR, creatinine, bilirubin and sodium. This MELD score, however, lacks components to assess the patient's overall physical health status and may not reflect all the risk factors for perioperative morbidity and mortality. Establishing an objective tool to assess frailty and to predict outcomes based more than on MELD scores can assist in determining which patients would benefit most from liver transplantation.

**Objective:** To determine how the pre-operative FFS score for patients undergoing OLT predict post-transplant patient mortality. The primary outcome was 30-day post-transplant mortality. The secondary outcomes were ICU length of stay (LOS), hospital LOS, and discharge to home or a rehabilitation center.

**Methods:** From July 2015–July 2017, we determined frailty of 50 liver transplant candidates, using the Fried frailty scale (FFS) with one score for 1) unintentional weight loss of  $\geq 10$  lbs in past year, 2) exhaustion, 3) low grip strength, 4) slow walking speed, and 5) low physical activity. Patients with FFS scores  $\geq 3$  were identified as frail, with 1-2 FFS scores as pre-frail, and with a zero FFS score as robust. Patient's information was accessed electronically to record appropriate pre- and post-operative data.

**Results:** The overall prevalence of frailty in the group (ages 46-74/median 64, MELD 28) was 32%. FFS scores did not correlate with age and with gender (men FFS 1.9, women FFS 1.7,  $p=0.28$ ). Patients deceased 30-day post-transplant had higher frailty scores (FFS 2.5) than those alive (FFS 1.9). The ICU LOS was higher in frail and pre-frail patients (3 and 3.3 days, respectively) than in robust patients (1 day). The hospital stay was the highest in frail patients (14.9 days), followed by pre-frail (11.6 days) and robust patients (7 days). Finally, patients who were discharged to a rehabilitation center had a slightly higher frailty score (FFS 2.3) than those who were discharged home (FFS 1.7).

**Conclusions:** The FFS score encompasses frailty measurements which reflect patient's functional health status and can serve as a predictor of post-operative OLT outcomes. In our study, higher FFS scores were associated with mortality after OLT, with longer ICU and hospital LOS, and with a discharge to a rehabilitation center rather than home.

**MODIFIED FRAILTY INDEX ASSOCIATED WITH CLAVIEN-DINDO IV  
COMPLICATIONS IN ROBOT-ASSISTED RADICAL PROSTATECTOMIES:  
A RETROSPECTIVE STUDY**

**Isaiah Levy, BS, Mark Finkelstein, BS, Khawaja Hassan Bilal, BS and Michael  
Palese, MD**

*Icahn School of Medicine at Mount Sinai, New York, NY; Department of Urology, Icahn  
School of Medicine at Mount Sinai, New York, NY*

**Introduction:** Elderly patients over the age of 65 comprise over 40% of all surgical patients in the United States. The prevalence of frailty in these elderly patients is higher (25.5 to 56.1%) compared to non-operative counterparts (6.9%). Frailty has been shown to be predictive of worse outcomes for prostatectomies; however it is not known whether frailty is associated with complications and mortality in patients undergoing robot-assisted radical prostatectomies (RARP).

**Objective:** To determine the effect of frailty on patient outcomes including Clavien-Dindo IV (CDIV) (intensive care unit-level) complications and 30-day mortality for RARP patients in comparison to other predictive indices using the modified frailty index (mFI).

**Methods:** Patients undergoing RARP from 2008 to 2014 were queried using the ACS-NSQIP database. The mFI was developed using the Canadian Study of Health and Aging Frailty Index as a model. The mFI was compared with other associative indices such as the American Society of Anesthesiology (ASA) classification and the Charlson Comorbidity Index (CCI). Rates of CDIV complications and 30-day mortality were analyzed based on mFI score using SAS version 9.22.

**Results:** 23,883 patients undergoing RARP were queried. RARP patients with the highest frailty score ( $\geq 3$ ) had an adjusted odd for CDIV complications of 8.61 (CI: 2.50-29.59,  $P < 0.001$ ) in comparison with non-frail RARP patients. These odds were higher than the ASA and CCI. Additionally, a variable combining mFI and ASA had fair sensitivity and specificity for predicting 30-day mortality in RARP patients (C-statistic = 0.71,  $P < 0.0001$ ).

**Conclusion:** Increasing mFI scores is associated with worsening outcomes for patients undergoing RARP. A combined mFI and ASA variable can be used to predict 30-day mortality for RARP patients better than mFI or ASA alone.

# IMPACT OF UNTREATED DEPRESSION ON HEALTH CARE COSTS IN PATIENTS WITH ADVANCED HIV/AIDS

Tracey Liu and Melissa Garrido, PhD

*Geriatric Research, Education and Clinical Center, James J. Peters VAMC Brookdale  
Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount  
Sinai*

**Introduction:** One-quarter of individuals with HIV in the United States are age 55 and older, of which an estimated half are affected by depression, a commonly undertreated condition. Among older HIV infected adults, 89% have one or more comorbidities, placing them at increased risk for hospitalization and ICU admission.

**Objective:** Our study will explore how depression affects hospitalization costs and ICU admissions in critically ill HIV infected older adults, and how treatment moderates that.

**Methods:** We analyzed a subset of data, n=319 adults 50 years or older with HIV admitted to and discharged from a VA hospital in 2011. Patients with index hospitalizations less than 48 hours, dementia or delirium diagnoses during index hospitalization, and hospitalizations primarily for chemotherapy or acute psychiatric care were excluded. Bivariate tests were performed using Stata.

**Results:** In our data set (mean age 60 .3 years, SD=6.7), 217 have no depression, 102 have diagnosed depression at the time of hospitalization, and of those with depression, 61 were treated with at least psychotherapy or antidepressants during hospitalization. There was no significant difference in mean total direct hospitalization costs (\$17,799, \$15,242, \$15,688) or risk of admission to ICU (18.9%, 12.2%, 11.5%) between patients without depression, with untreated depression, and with treated depression during hospitalization, respectively. A diagnosis of depression was significantly associated with antidepressant administration during hospitalization ( $p<0.001$ ), but not significantly associated with receipt of psychotherapy. The number of comorbidities between patients without depression (1.78) and with depression (2.94) was positively associated with depression ( $p<0.001$ ).

**Conclusion:** Results do not show a statistical difference in hospitalization costs or risk of ICU admission between HIV patients without depression, with untreated depression, and with treated depression. This study also confirms the findings of previous studies which show that increased comorbidities is positively associated with depression.

# EXTENT OF PERITUMORAL EDEMA SURROUNDING MENINGIOMAS PREDICTS FUNCTIONAL OUTCOMES AFTER RESECTION IN OLDER PATIENTS: A QUANTITATIVE ASSESSMENT OF RISK

**Joshua Loewenstern, BA; Amit Aggarwal, MD; Margaret Pain, MD;  
and Raj K. Shrivastava, MD**

*Department of Neurosurgery, Icahn School of Medicine at Mount Sinai; Department of Radiology, Icahn School of Medicine at Mount Sinai*

**Introduction:** A disproportionately higher incidence of meningioma exists in older adults, affecting up to 0.1% vs. 0.03% of younger adults. In older patients, surgical resection is associated with increased risk of complications and functional deficits. Thus, there is a need for pre-operative prognostic markers that can determine which older patients may be at the highest risk when deciding whether or not to resect the tumor. For instance, peritumoral edema (PTE), which is seen in two-thirds of meningiomas and has been implicated with poorer surgical outcomes and increased difficulty of resection, may represent such a pre-operative risk marker.

**Objective:** To assess whether PTE can be linked to post-resection outcomes to help determine appropriate care plans for older patients.

**Methods:** Medical records of 112 older patients (age  $\geq$  60 years) with an intracranial meningioma and evidence of PTE on MRI were reviewed. Extent of PTE, measured as a ratio of edema to tumor volume (Edema index, EI) using image-processing software, was correlated with post-resection outcomes including surgical complications, tumor recurrence, and functional decline (as measured by Karnofsky Performance Status, KPS). Other pre-operative factors were included as covariates in multivariate analyses of EI on outcomes.

**Results:** Median EI was 1.65 (IQR = 1.34-2.56). EI was associated with a decrease in KPS at 6 months, 1 year, 2 years, and most recent follow-up. On multivariate analysis, EI predicted lower KPS at each follow-up interval ( $p$ 's  $<$  0.05). Other pre-operative factors such as presentation with a seizure or prior stroke additionally increased the likelihood of lower KPS at 2 years (OR = 3.06) and last follow-up (OR = 5.55), respectively.

**Conclusions:** Pre-operative PTE may represent a significant marker for risk of poorer functional outcomes and provide a quantitative measure that can assist patient care teams in determining the best treatment for older meningioma patients.

# INSURANCE AND SEX ARE ASSOCIATED WITH TIMING OF DEEP BRAIN STIMULATION SURGERY AND CLINICAL OUTCOMES IN PARKINSON'S DISEASE

**Zoe I. Luscher and Ritesh Ramdhani, MD**

*Department of Neurology, Mount Sinai Hospital, New York, NY*

**Introduction:** Deep Brain Stimulation (DBS) is a standard therapy for Parkinson's disease (PD) and is covered by commercial insurance, Medicare, and Medicaid. According to prior research, Medicaid insurance status and female sex may deter DBS use. It is unknown whether these variables further impact timing of surgery within a patient's disease trajectory or impact clinical outcome.

**Methods:** We conducted a retrospective cohort study of 69 PD patients who underwent DBS surgery at the Mount Sinai Hospital. We examined patient insurance status and sex at the time of surgery and how they relate to age at disease onset, age at surgery, illness duration at surgery, off-medication UPDRS III motor scores at surgery, on-medication UPDRS III (at surgery, 6 months, 12 months, and follow-up closest to 10 months), and Levodopa Equivalent Daily Dose (LEDD, at surgery, 6 months, and 12 months).

**Results:** Females were older than males at surgery with a longer disease duration. Females had more severe on-medication UPDRS III scores at 6 months after initial DBS programming. Medicare patients were older at disease onset and surgery than patients covered by other insurance. Medicaid patients had a longer illness duration and more severe off-medication UPDRS III scores at surgery relative to other insurance groups. Medicaid and Medicare patients both had more severe on-medication UPDRS III scores than commercially insured patients at surgery. These differences did not exist 6 months after initial DBS programming, but at 12 months Medicaid patients had more severe on-medication UPDRS III scores than commercially insured patients. At the 10-month time point, Medicaid patients had more severe on-medication symptoms than patients with other insurances.

**Conclusion:** Patients in groups that underutilize DBS (females, Medicaid patients) presented for surgery later in the course of their illness than other groups and may have different outcomes.

# MIMICKING DIETARY RESTRICTION: ASSESSING EFFECTS OF FENOFIBRATE-PHENYL-BUTYRATE COMBINATION THERAPY IN A C. ELEGANS MODEL OF ALZHEIMER'S DISEASE

**Anthony Mell, B.S., Dr. Charles V. Mobbs, PhD**

*Department of Neuroscience, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** It has been demonstrated that dietary restriction (DR) is protective against all forms of proteotoxicity. One drug shown to mimic the protective effects of DR in two animal models is Fenofibrate. Fenofibrate activates the transcription factor Ppar-alpha and when organisms are subject to genetic inhibition of Ppar DR has no effects. Another promising drug is Phenylbutyrate which has been shown to mimic DR effects through the inhibition of histone acetyltransferase affecting Creb-binding protein.

**Objective:** We hypothesize that the combination of Fenofibrate and Phenylbutyrate could grant protective effects against Alzheimer's.

**Methods:** On a well plate 6 conditions were created using axenized CL 2006 worms which have the human gene AB42 spliced into their genome. This gene causes Alzheimer's in humans and paralysis in C. elegans. The conditions created in the well plate were worms with DMSO, .08 um, .8 um, and 8 um Fenofibrate, and combinations of 8 um Fenofibrate and 8 um Phenylbutyrate, and .08 um of Fenofibrate and 8 um Phenylbutyrate. The conditions were blinded to the scorer by a lab colleague. The worms were videotaped beginning on the 5th day after the drugs were administered and the worms were scored as either alive, paralyzed, or dead based on the scoring criteria validated by previous experiments.

**Results:** The control worms did not develop the paralysis phenotype as expected, consequently it was impossible to determine the effect of the drugs. The combination of fenofibrate and phenylbutyrate appeared to increase paralysis in worms which may signify a toxic relationship, but it is impossible to conclude this from this study.

**Conclusions:** This study should be repeated in order to better understand the effect of fenofibrate and the relationship between fenofibrate and phenylbutyrate. Further study of this mechanism could elucidate other potential relationships that could be valuable for future studies.



# DEPRESSION AND ANXIETY AND THEIR ASSOCIATION WITH PHYSICAL HEALTH OUTCOMES AMONG OLDER VETERANS WITH COPD

Rio O'Mary, BA, Jessica Lum, MA, Melissa M. Garrido, PhD

*Geriatric Research, Education and Clinical Center, James J. Peters VAMC Brookdale  
Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount  
Sinai*

**Introduction:** Veterans are disproportionately affected by chronic obstructive pulmonary disease (COPD). Anxiety and depression are associated with worse health outcomes among patients with other chronic physical illnesses, but little is known about their impact on health outcomes among patients with COPD.

**Objective:** To examine whether anxiety and depression are associated with health outcomes of older patients with severe COPD

**Methods:** Retrospective cohort study of all older (65+) veterans with COPD hospitalized in a VHA acute care facility from 2012-2015 and with past-year intensive care unit (ICU) or hospital admissions (n=9,983). We used VA administrative data to examine relationships with past-year depression and anxiety and ICU admission, mechanical ventilation (MV), total hospitalization cost, and in-hospital mortality. We used a logistic regression for binary variables and a generalized linear model with a gamma distribution and log link for cost analysis.

**Results:** Of the sample, 1,397 (14%) had anxiety and 2,764 (27.7%) had depression. The median hospitalization cost was \$13,131. Of the sample, 290 (3%) died before discharge, 2,406 (24%) were admitted to the ICU and 349 (3.5%) were mechanically ventilated. In adjusted models, depression was significantly associated with fewer ICU admissions (odds ratio = 0.80, 95% confidence interval = 0.71-0.90) but not MV, costs or mortality. We did not observe a significant relationship between anxiety and any of the outcomes. ICU admission was more likely for women, younger veterans, and those with comorbid congestive heart failure.

**Conclusions:** Contrary to expectations, we found no evidence of a relationship between comorbid mental health conditions and worse physical health outcomes. Further studies should explore whether these relationships exist outside of the VHA and whether the observed relationships change when we account for receipt of mental health care.

## THE IMPACT OF OLDER AGE ON OUTCOMES OF RENAL TRANSPLANTATION

**Sara D Pasik, BA; Anthony Yang, BA; Hasan Bilal, BA; Michael Palese, MD**  
*Department of Urology. Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** The population on dialysis is aging. Many require renal transplantation. However, older adults are less likely to be put on the waitlist or are referred late, perhaps due to belief of poorer outcomes. But is age itself a predictor of these outcomes?

**Objective:** This study aims to investigate the impact of older age on outcomes of renal transplantation.

**Methods:** Patients who underwent renal transplant in NYS from November 1993 to September 2015 were identified from the Statewide Planning and Research Cooperative System (SPARCS) database. The outcomes of interest were mortality, survival, transplant-related complications, and readmission rates after one and three months. Logistic regressions were used to assess associations between older age and poorer outcomes, adjusting for The Charleston Comorbidity Index (CCI).

**Results:** In the adjusted logistic regression model, older age was a significant predictor of mortality ( $p < 0.0001$ ), death within a year of transplantation ( $p < 0.0001$ ), and 90-day readmission ( $p = 0.0009$ ). However, older age was also significant for lower risk of transplant-related complications ( $p < 0.0001$ ). Older age was not a significant predictor of 30-day readmission.

**Conclusion:** Older age is a predictor for certain poorer outcomes as well as certain improved outcomes. These varied results, as well as the heterogeneity of the older population, highlight the importance of assessing a patient using a robust set of measures rather than allowing age to be a barrier for access. Further study is warranted to identify other potential confounders and contributors.

## ASSESSING PRE-OPERATIVE VARIABLES AS PREDICTORS FOR DISCHARGE LOCATION USING NSQIP

**Lewis Paulino, BA, Jeffrey Aalberg, MPH, Celia Divino, MD FACS**

*Division of General Surgery, Department of Surgery, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** The National Quality Improvement Program has been used to identify surgical complications in many hospitals in the US. In the geriatric population, there is an availability for subacute care which are facilities with comprehensive inpatient care replacing the need for acute hospitalization. There is currently no study assessing which pre-operative variables pre-dispose someone to be sent to a subacute care facility.

**Objective:** To assess which pre-operative variables are significant in predicting discharge location in a geriatric population using the NSQIP database.

**Methods:** We used the 2015 NSQIP database, including all surgical specialties. To obtain our sample, we excluded all patients under the age of 65 and who presented to the hospital from a subacute care facility. We ran a univariate analysis of twenty-seven pre-operative variables comparing them to discharge location, whether patients were being sent home or to a subacute care facility. We then ran a multivariate analysis of the variables and discharge location to adjust for co-variates.

**Results:** 283,881 patients were eligible for inclusion in our study. Out of this sample, 17.20% (48,826) were discharged to a subacute care facility post-operatively. The univariate analysis showed that out of 27 variables, 26 were significant in predicting discharge location with 23 variables having a p-value of  $<.0001$ . After running the multivariate analysis, we observed that certain variables had a higher correlation with discharge to subacute care facilities. We recorded the odds ratios for the adjusted model and some of the most significant values included inpatient surgeries (OR=12.817), undergoing Orthopedic surgery (OR=9.507) or Neurosurgery (OR=5.043), pre-op septic shock (OR=4.336), and ASA Class of 4 (OR=4.312) and 5 (OR=7.746).

**Conclusion:** Certain pre-operative variables are good predictors of older adults to be discharged to subacute care facilities. Physicians can use this study to get a sense of where their elderly adult patients will be discharged to. However, this study does not create a predictive index for probability of elderly patients to be sent to subacute care facilities following surgery.

## CHARACTERIZING ATOPIC DERMATITIS IN THE ELDERLY

**Aishwarya Raja, BS; Lisa Zhou, BA and Emma Guttman, MD**

*Department of Dermatology, Icahn School of Medicine at Mount Sinai, New York, New York.*

**Introduction:** Atopic dermatitis (AD) is one of the most common inflammatory skin diseases characterized by eczematous skin lesions and pruritus or persisting itch. It affects about 20% of all individuals during their lifetime. Although AD primarily manifests itself in the first five years of life, it is a chronic disease that continues to affect 30% patients into adulthood. The prevalence of AD among older adults aged  $\geq 60$  years in industrialized countries is 1-3%; this amounts to over 1.5 million individuals affected in the U.S. alone. Unlike pediatric or adult subtypes, AD in older adults is not well understood.

**Objective:** To characterize the atopic dermatitis phenotype in adults aged 61 years and older and compare it to younger cohorts (18-40 and 41-60)

**Methods:** We used a database containing RT-PCR, serum, and immunohistochemistry data from 223 lesional and non-lesional biopsies taken from extremities of adults with moderate-to-severe AD (ages 18-82). Subjects from the nine previously reported IRB-approved cohorts were divided into 3 age groups (18-40, 41-60, and 61+) and compared to each other and to adult control subjects. Spearman correlation plots and heat maps indicating mean expression levels of immune and epidermal markers were generated using R statistical software.

**Results:** Lesional biopsy specimens from older adults with AD (61+) exhibited significantly different immune and epidermal changes from the other two cohorts. These included less epidermal hyperplasia, characterized by thickness and keratin 16, as compared to younger cohorts. With increasing age, there was also significantly higher induction of Th1-related cytokines and antimicrobials (e.g., CXCL9, CXCL10, CCL2, MX1, IFNGR1), less induction of Th2-related cytokines and antimicrobials (e.g., CCL26, STAT6, IL33), and less cellular infiltration (CD1b, CD83).

**Conclusions:** The skin phenotype of AD in older adults aged  $\geq 61$  is substantially different from that of adult AD. Unlike the other AD cohorts that have been studied extensively, there are no target-specific drugs for AD in the elderly. This is an area of high unmet medical need because AD arising later in life is often resistant to existing therapies. Understanding the cellular and molecular profile of AD in older adults will be crucial in developing preventive and/or personalized therapies.

# TRENDS IN OUTPATIENT PREVENTIVE HEALTH EXAMINATIONS AMONG ASYMPTOMATIC OLDER ADULTS

**Aarti Rao and Minal Kale., MD**

*Department of General Internal Medicine  
Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** In the past decade there has been increased scrutiny of the annual physical examination. In 2013, the Society of General Internal Medicine recommended against annual preventive exams in asymptomatic patients. However, limited data are available on the content of preventive health exams (PHE), particularly in older adults.

**Objective:** This study seeks to describe trends in patient characteristics, visit contents, and provider type in older adult (age >64) PHE visits.

**Methods:** We conducted a cross-sectional analysis of the 2001-2003 and 2011-2013 National Ambulatory Medical Surveys (NAMCS), for PHEs in older adults. We used chi squared tests to compare the differences in the weighted proportions of PHE visits over the 10-year interval and between provider types.

**Results:** In the 10-year interval under consideration, there was a significant increase in the number of older adults attending PHEs with physicians they had previously seen ( $P=0.03$ ). There was a statistically significant decrease in the overuse of ECG ( $P=0.008$ ), UA ( $P=0.035$ ), and cervical cancer screening ( $P<0.001$ ) by generalist physicians, whereas overuse of CBC, X-ray, and mammograms remained consistent. In comparison to PHEs conducted by specialists in 2011-2013, there was a significantly higher overuse of ECG ( $P=0.003$ ), UA ( $P=0.005$ ), X-ray ( $P=0.0008$ ), and CBC ( $P<0.001$ ) in PHEs conducted by generalists. These visits also had significantly higher delivery of depression screening ( $P<0.001$ ) and a significantly lower delivery of cervical cancer screening ( $P<0.001$ ) than those conducted by specialists.

**Conclusion:** While overall patient characteristics of PHE visits have not significantly changed over the past 10 years, visit contents have changed and differ between provider type. We will conduct further analysis to assess the delivery of health services specific to the needs of older adults, such as: injury prevention, stress management, and home health care.

# **COST COMPARISON OF ELECTIVE SURGICAL PROCEDURES BETWEEN ELDERLY AND NON-ELDERLY PATIENTS AT AN ACADEMIC MEDICAL CENTER**

**Adam Reisman BS, Kevin Farrell, Michael Leitman, MD FACS**

*Department of Surgery, Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** There is a perception that increased age is one of the drivers of increased cost for complex surgical procedures. An evaluation of the costliest elective surgical procedures among the elderly and non-elderly populations may shed light on the validity of the relationship between age and cost as well as the extent to which this relationship influences total hospital spending relative to other cost drivers.

**Objective:** To determine whether a correlation exists between patient age and hospital charges for common complex elective surgical procedures.

**Methods:** Hospital charges at an urban academic medical center were sorted by Diagnosis Related Group (DRG) for patients discharged between January 1, 2015 and December 31, 2016. Patient encounter data were separated into two cohorts ( $\geq 65$  years old and  $< 65$  years old). The total costs incurred for each elective surgical procedure were determined. The costliest elective surgical procedures were identified and the average cost per procedure was calculated for each group. A Student t-test was performed to compare the average cost per procedure in each cohort.

**Results:** After reviewing 114,448 patient encounters (33,803 elderly and 80,645 non-elderly), the 14 most costly elective surgical procedures were identified. The following 7 procedures were statistically more expensive for the elderly – cardiac valve/other major cardiothoracic procedure (delta of \$4,071.44;  $p < 0.001$ ), endovascular cardiac valve replacement (delta of \$16,418.41;  $p < 0.001$ ), percutaneous cardiovascular procedure (delta of \$469.54;  $p = 0.0017$ ), major small and large bowel procedure (delta of \$2,037.98;  $p < 0.001$ ), and spinal fusions [cervical (delta of \$2,685.30;  $p < 0.001$ ), non-cervical (delta of \$2,270.38;  $p = 0.0028$ ), non-cervical with spinal curvature/malignancy/infection (delta of \$14,625.87;  $p < 0.001$ )]. The remaining 7 procedures – transplantation [liver, heart, kidney, and bone marrow], major vascular surgery, craniotomy/intracranial procedures, and major joint replacement – were not more expensive for the elderly relative to the younger cohort.

**Conclusions:** Of the procedures that are more costly in the elderly, the cost differential between the two cohorts ranged from \$469.54 to \$16,418.41 per case. Further analysis of these procedures is required to determine the cause of these cost differences as age alone is not a reliable predictor of hospital expenditures. Additionally, major transplantation was not more costly in the elderly. This economic finding, combined with other outcome-based findings, may allow us to re-examine the maximum age for organ transplantation recipients.

## DISPARITIES IN CARE AT HOSPICES FOUND IN BLACK COMMUNITIES: RESULTS OF A NATIONAL SURVEY

**Jessica Rizzuto, MPP, Melissa D. Aldridge, PhD, MBA**

*Icahn School of Medicine at Mount Sinai, New York, New York; Brookdale Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** While hospice use is growing across the country, Black Americans choose hospice significantly less often than non-minorities. What is not known is whether hospices accessible to Black Americans provide poorer quality care compared to those accessible to the wider population potentially perpetuating this resistance to choose hospice.

**Methods:** We used data from a national cross-sectional study of a random sample of hospices (n=591, response rate 84%) in the U.S. from 2008-2009, The National Hospice Survey, linked to demographic data from the 2010 U.S. Census. Hospices in counties with a Black population of 19.6% or greater (n=148) were compared to hospices in counties with a Black population of less than 19.6% (n=443) on reported use of patient centered preferred practices. We estimated multivariate logistic regression models to determine the association between these practices and hospices located in a Black compared with non-Black community.

**Results:** Hospices located in Black communities were significantly less likely to monitor pain (OR=0.474, 95 % CI=0. 246-0.915) and symptoms (OR=0.604, 95% CI=0.365-0.997) at least every few days, compared with hospices in non-Black communities, after adjusting for hospice characteristics including ownership, size, and geographic location. Specifically, hospices in Black compared with non-Black communities were less likely to report monitoring the following at least every few days: pain (79.1% vs. 89.2%), fatigue (72.4% vs. 80.8%), nausea (74.3% vs. 85.1%), dyspnea (72.3% vs. 85.8%), depression (68.9% vs. 78.3%), delirium (71.6% vs. 81.5%) and anxiety (74.3% vs. 84.7%) (P<0.05 for each comparison).

**Conclusions:** Hospices in Black communities are less likely to engage in patient centered preferred practices for hospice care related to the frequency of pain and symptom monitoring. Given their central role in the delivery of high-quality hospice care, less frequent pain and symptom monitoring by hospices in Black communities could potentially lead to less favorable perceptions of hospice care and lower rates of hospice enrollment.

## **DIFFERENCES IN ANESTHESIA-RELATED ADVERSE OUTCOMES BETWEEN OLDER AND YOUNGER PATIENTS AT A LARGE TERTIARY CARE CENTER**

**Christopher Root, BA; Yaakov Beilin, MD; Patrick McCormack, MD, MEng;  
Christopher Curatolo, MD, ME and Jaime Hyman MD**

*Department of Anesthesiology, Perioperative and Pain Medicine, Icahn School of  
Medicine at Mount Sinai, New York, New York*

**Introduction:** Older patients are complex and have been shown to respond differently to anesthesia than younger patients. In order to provide better, safer anesthesia care to older patients, it is imperative we understand how and when complications may occur during their care.

**Objective:** To understand differences in the cause, type, timing, and outcomes of complications in older versus younger patients receiving anesthetic care.

**Methods:** This was a sub analysis of a retrospective study of all cases submitted to the Department of Anesthesiology's Performance Improvement (PI) Committee from 2007 to 2015. Materials available for review included the PI committee meeting minutes, the anesthesiology information management system, and the institutional electronic health record. For this sub analysis the data was stratified by age into patients <65 and ≥65.  $\chi^2$  tests were performed to determine significant differences between the groups.

**Results:** Of 747 cases reviewed, 461 of the patients were <65 and 261 were ≥65. We found a significant difference in the distribution of the primary complication type ( $p<0.0001$ ). Most common type for ≥65 was cardiac (34.3%), <65 was respiratory (37.5%). There were not significant differences in the root causes of the adverse events, or deviation from the standard of care. There was a significant difference in the timing of the complications ( $p<0.01$ ). Intraoperative was most common for both groups, but <65 had more complications pre-incision (24.1% vs 19.1%) and ≥65 had more complications post-operative (31.4% vs 19.6%). ≥65 also had higher mortality within 48 hours (23.1% vs 11.3%,  $p<0.0001$ ), and were less likely to return to baseline, (52.1% vs 72.7%,  $p<0.0001$ ).

**Conclusions:** Older patients are different from younger patients in the type, timing and outcomes of complications during anesthetic care. Our evidence demonstrates that anesthesia providers should anticipate cardiac complications in older patients and that older patients require a heightened vigilance in the post-operative period.



## RELATIONSHIPS BETWEEN PERCEPTIONS OF AGING AND HIV STATUS

Joseph Schnitter, BA; Dustin Suanino, MD; Peter Barbosa, PhD; Gregory Hinrichsen, PhD; Noelle Marie Javier, MD; Rosanne Leipzig, MD, PhD; and Jeffrey Weiss, PhD

*Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** The mean age of people with HIV infection in the United States has been increasing. In comparison to their HIV-negative counterparts, HIV-positive persons have increased rates of several illnesses even in the setting of long-term well-controlled HIV infection, which has been characterized as “premature aging.” Living with HIV infection and its associated illnesses could potentially impact how HIV-positive people view growing older. Since people with more positive views about the aging process demonstrate increased longevity, improving attitudes toward aging among HIV-positive persons is a potential unexplored means of improving health outcomes in this population.

**Objective:** To determine whether, and if so how, attitudes toward aging among HIV-positive people differ from HIV-negative people.

**Methods:** We administered a survey consisting of questions from validated questionnaires to men 50 years of age or older. Together, these questions captured subjects’ Age Identity, Attitudes toward Aging, Self-Perceived Physical Health Status, Mental Health Status, Sense of Mattering, and Degree of Mindfulness. We compared groups using ANCOVA, independent samples t-tests, and bivariate correlation tests in SPSS.

**Results:** HIV-positive men had more negative views of the aging process than HIV-negative men according to the Attitudes to Ageing Scale ( $p=0.003$ ) and higher depression scores ( $p=0.045$ ) when age group and physical health were considered as confounding variables. These groups exhibited no significant differences in the Age Identity ( $p=0.540$ ) and Levy Image of Aging Scales ( $p=0.646$ ). Subjects of either HIV status who screened as positive for depression (scoring  $\geq 2$  points on Geriatric Depression Scale) had more negative attitudes toward aging than those who screened negative (scoring  $< 2$  on Geriatric Depression Scale) based on Age Identity Difference ( $p=0.005$ ), Image of Ageing Scale ( $p<0.001$ ), and the Levy Image of Aging Scale ( $p=0.021$ ). Mindfulness scores for patients of either HIV status exhibited a positive correlation with more positive views of aging based on the Image of Ageing Scale ( $R=0.469$ ,  $p<0.001$ ) and the Levy Image of Aging Scale ( $R=0.351$ ,  $p<0.001$ ).

**Conclusion:** HIV-positive men viewed growing older more negatively than HIV-negative men. In addition, subjects who screened positive for depression viewed growing older more negatively than those who screened negative. Finally, subjects’ degree of mindfulness is moderately positively correlated with more positive views on aging. Those with more negative views of aging, especially those suffering from comorbidities related to HIV infection, may benefit from a behavioral intervention and mindfulness-based stress reduction techniques.

# DESIGN THINKING: A NOVEL APPROACH TO PREVENT HEAT-RELATED ILLNESSES AMONG OLDER ADULTS IN NEW YORK CITY

**Mary Patricia Smith BS and Perry Elizabeth Sheffield MD MPH**

*Icahn School of Medicine at Mount Sinai, New York, NY, USA; Department of Pediatrics and Preventive Medicine, Icahn School of Medicine at Mount Sinai, New York, USA.*

**Introduction:** In New York City (NYC), the frequency of heat waves is projected to at least double by the 2050s; coinciding with this climate change, NYC's population of older adults ( $\geq 65$  years) is projected to reach 1,410,000 by 2040. Since older adults are especially vulnerable to heat-related illnesses (HRIs), the NYC Department of Health and Mental Hygiene (DOHMH) has recognized building heat resilience as a key priority.

**Objective:** This study explored HRI prevention efforts by the NYC DOHMH and used those findings to identify opportunities to more effectively prevent HRIs among urban older adults.

**Methods:** This study involved a mixed source approach, including literature review and information sessions with representatives from NYC DOHMH as well as the Office of Emergency Management and Department for the Aging. This mixed approach elicited and corroborated information regarding current NYC DOHMH programs to prevent HRIs among older adults. Subsequent analysis focused on the preventive effect of such efforts and extent to which existing programs were developed using a patient-centered approach.

**Results:** This analysis determined that despite having exemplary health surveillance and emergency response systems, the NYC DOHMH's efforts to prevent HRIs among older adults is a critical area for improvement. Existing programs do not optimally meet the complex needs of older adults since most were developed without engagement of these patients to inform design and/or evaluate how well these programs prevent HRIs.

**Conclusions:** To more effectively prevent HRIs in the decades of rising temperatures and population aging ahead, a patient-centered approach must be adopted. This paper offers Design Thinking (DT) as such an approach that could be applied by the NYC DOHMH and HCPs alike to partner with older adults and co-design public health programs and clinical interventions that more effectively prevent HRIs in NYC.

# INTRAOPERATIVE HEMODYNAMIC STABILITY OF ELDERLY PATIENTS UNDERGOING RENAL TRANSPLANTATION.

**Ashley J. So, BS, Sang Kim, MD and Samuel DeMaria, MD**

*Icahn School of Medicine at Mount Sinai, New York, NY; Department of Anesthesiology, The Mount Sinai Medical Center, New York, NY*

**Introduction:** Elderly patients generally receive fewer renal transplants, and those that do receive transplants often receive “marginal” grafts from expanded criteria donors (ECD), which are associated with higher rates of postoperative infection and chronic renal failure. Prior studies have demonstrated the benefits of pressure-targeted perioperative intravenous fluid management on graft survival.

**Objectives:** We hypothesize that there is a stronger predictive effect of intraoperative hemodynamic instability on 5-year mortality in older patients as compared to younger patients. Furthermore, we hypothesize that hemodynamic instability in older patients leads to increased rates of delayed onset of diuresis, postoperative infection and 30-day readmission, longer ICU and total hospital stays, and increased rates of 5-year mortality.

**Methods:** A retrospective matched cohort analysis of 960 adult patients ( $\geq 18$  years) who underwent renal transplantation between 2002 and 2010 will be performed. The intraoperative hemodynamic stability of each patient will be defined as a fractional change in MAP (FCM) of greater than 0.25. Additional measures of instability include  $40 > HR > 120$  bpm,  $60 > SBP > 200$  mmHg,  $30 > DBP > 110$  mmHg, and  $40 > MAP > 120$  mmHg. The patient population will be stratified into younger ( $< 65$  years) and older ( $\geq 65$  years) cohorts and into patients receiving grafts from living and deceased donors.

**Analysis:** Bivariate, specifically t-tests, chi square, and Wilcoxon analyses, and multiple regression analyses will be used to evaluate the predictive effects of preoperative and intraoperative variables on postoperative outcomes in the elderly cohort and for patients receiving grafts from deceased donors.

**Implications:** Our results could help to improve the intraoperative care and fluid management of geriatric patients undergoing renal transplantation and to define patients at higher risk for graft dysfunction. Better understanding the predictive effects of intraoperative variables on postoperative outcomes may allow us to redefine the target ranges of hemodynamic stability in elderly patients and to reconsider the criteria for patients receiving renal grafts from deceased donors.

## MISSING NSQIP DATA: PREDICTIVE ABILITY OF A 5-FACTOR MODIFIED FRAILITY INDEX

**Sneha Subramaniam, Jeffrey Aalberg, Rainier P. Soriano MD and Celia Divino MD**  
*Division of General Surgery, Department of Surgery, Icahn School of Medicine at Mount  
Sinai, New York, New York*

**Introduction:** The modified frailty index (mFI) is a NSQIP based 11 factor index that has been proven to adequately reflect frailty and predict mortality and morbidity. These 11 factors, made of 16 variables, map to the original 70 item Canada Study of Health and Aging Frailty Index. In the past years, certain NSQIP variables have been removed from the database. As of 2015, only 5 out of the original 11 factors remain. The predictive power and usefulness of these five factors in an index have not been proven in past literature.

**Objective:** The goal of our study was to compare the effectiveness of this 5-factor index (mFI-5) as a predictor for mortality, post-operative complication and unplanned thirty-day readmission in comparison to mFI-11 in all surgical specialties and to evaluate the potential use of the mFI-5 for future research and clinical purposes.

**Methods:** The mFI-5 is made up of functional status, diabetes, history of COPD, hypertension, and history of CHF. The mFI was calculated by dividing the number factors present for a patient by the number of available factors for which there were no missing data. Spearman's Rho was used to assess correlation between the mFI-5 and mFI-11. Predictive models, using logistic regressions were created for mortality, post-operative complication and unplanned thirty-day readmission and for 10 surgical subspecialties using 2012 data, the last year all variables existed.

**Results:** Correlation between the mFI-5 and mFI-11 were above 0.9 across all surgical specialties except for cardiac and vascular surgery. Adjusted and unadjusted models showed similar C-statistics for mFI-5 and 11 and strong predictive ability for mortality and post-operative complications.

**Conclusion:** The mFI-5 is an equally effective predictor as the mFI-11 in all subspecialties and is a strong predictor of mortality and post-operative complication. It has credibility for future use to study frailty within the NSQIP database. It also has potential in other databases and for clinical use.

# PRE-MORBID MRI BRAIN INJURY ANALYSIS TO LINK COGNITIVE AND BRAIN RESERVE TO FUNCTIONAL OUTCOMES IN GERIATRIC PATIENTS

**Hua-Hsin Tai, BS, Anthony Costa, PhD, Neha Dangayach, MD**

*Department of Geriatrics and Palliative Medicine, Department of Neurosurgery,  
Department of Neurology, Icahn School of Medicine at Mount Sinai School, New York,  
New York*

**Introduction:** Stroke is an important issue among elderly patients. There are ongoing uncertainties and variabilities in determining outcomes in stroke patients. Coping mechanisms and psychological adjustment after stroke have been studied qualitatively, but there has been no research to-date directly exploring cognitive reserve and brain reserve as determinants of outcome after stroke.

**Objective:** The linking of cognitive reserve (defined as individual differences that help patients cope with brain pathology) and brain reserve (which refers to anatomical differences that might contribute to this coping ability) may have important scientific and clinical implications. Characterization of geriatric brain injury patients is necessary to better highlight individual cognitive reserve and brain reserve.

**Methods:** Patient data recruited from Mount Sinai data bases of IHOP, CARS, and EPIC from December 2012 to December 2016. Geriatric patients needed to have a MRI scan prior to their first brain injury. Out of 500 patients, 11 met the criteria for the study. Preliminary brain reserve data for important deep brain structures was gathered using FreeSurfer and volBrain from the pre-stroke MRI scans. Cognitive reserve factors like education level, occupation, history of CHF, CAD, HTN, and admin GCS, were also gathered.

**Results:** The education distribution was as follows: 55% had graduated from university or higher, 27% from high school, and 18% others. Looking at the occupation prior to hemorrhage: 36% were unemployed retired, 36% were disabled or unknown, 9% were professional/technical, and 18% were skilled trade /other. None had CHF, 73% had HTN, 27% had CAD, 18% had Kidney Disease, and 18% had a cerebral infarct. Admission GCS showed 64% were mild, 9% were moderate, 18% were severe, and 9% did not have a record. Some brain reserve data show lower than average volume for caudate, thalamus, amygdala and accumbens.

**Conclusion:** The relationship between cognitive reserve and brain reserve remains unexplored but may have important clinical implications. The finalization of analysis for all data is ongoing. Researchers hope to conclude certain brain reserve volumes could pre-emptively predict stroke and find important cognitive reserve factors to improve stroke outcomes.

# RACIAL DISPARITIES IN SURVEILLANCE MAMMOGRAPHY AMONG ELDERLY BREAST CANCER SURVIVORS

**Jimmitti Teysir, Nana Gegechkori, MD, Ph.D., Juan Wisniveski, MD, DrPH,  
and Jenny Lin, MD, MPH**

*Icahn School of Medicine at Mount Sinai, New York, NY; Department of Internal  
Medicine, Icahn School of Medicine at Mount Sinai, NY, NY*

**Introduction:** A previous study evaluating data from 1990-2000 found a racial disparity in the receipt of surveillance mammography among older breast cancer (BC) survivors. These data may partially explain the widening gap in BC mortality rates between black and white women in the US, despite lower incidence rates among black women and a national decline in BC deaths.

**Objective:** To evaluate whether racial disparity in receipt of surveillance mammography persists among older women diagnosed with early-stage BC between 2000 and 2011.

**Methods:** We conducted a retrospective analysis of women >65 years who were diagnosed with early-stage (0-IIIA) BC in the Surveillance, Epidemiology and End Results-Medicare registry who underwent BC surgery. The primary outcome was receipt of surveillance mammography within 12 months of surgery. Chi-square analyses were used to compare characteristics between black and white women. Multivariate logistic regression was used to assess receipt of surveillance mammography after controlling for age, income, marital status, urban/rural, BC stage, comorbidities and BC treatment.

**Results:** There were 3,353 black and 44,727 white women in the cohort. 58% of black received surveillance mammography within 12 months of surgery, compared to 67% of white women ( $p < 0.0001$ ). Those who were married, younger, in the highest income quartile, diagnosed at earlier stages, had a lower comorbidity score, or who resided in metropolitan areas were more likely to receive surveillance mammography ( $p < 0.05$ ). After adjusting for confounders, black women were still 24% less likely than white women to receive surveillance mammography (AOR = 0.76, 95% CI = 0.70-0.82).

**Conclusion:** In an updated analysis, we found that older black BC survivors continue to experience lower surveillance mammography rates, even after adjusting for multiple potential confounders. There remains a need to investigate which individual and systemic factors affect disparities in breast cancer care.

# IMPROVING A SENIOR RISK SCREENING INSTRUMENT TO BETTER PREDICT ADVERSE OUTCOMES IN OLDER EMERGENCY DEPARTMENT PATIENTS

Emily Tixier, BA, George Loo, Laura Rivera, Lynne Richardson, MD, Jeremy Sze and Ula Hwang, MD, MPH

*Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, New York; Brookdale Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** The Identification of Seniors at Risk (ISAR) is one of the most widely reported screening tools that attempt to identify “high-risk” seniors in the emergency department (ED). However, comprehensive meta-analyses have demonstrated that it has low predictive value in accurately identifying such patients.

**Objective:** By combining the six-point ISAR with the emergency severity index (ESI) triage score, we hypothesize that we can more accurately predict adverse outcomes of seniors in the ED.

**Methods:** This is a retrospective, cross-sectional study of patients 65 years and older with complete ISAR and ESI data who were seen at the Mount Sinai ED between 11/26/12 and 6/30/15. Dichotomous dummy variables were created for patients who had ISAR values  $\geq 2$  and  $\geq 4$ , ESI values  $\leq 2$  and  $\leq 3$ , and every possible combination of these ISAR/ESI threshold scores. Higher ISAR score indicates high-risk for adverse outcomes. Lower ESI score indicates greater clinical urgency. The adverse outcomes studied were hospital admission, ICU admission, expiration within the hospital, ED returns within 30, 90, and 180 days, and hospital re-admission within 30, 90, and 180 days. Specificity, sensitivity, and positive/ negative likelihood ratios (LRs) were calculated for each test threshold.

**Results:** 39,720 patients were eligible for inclusion. Results indicate that having an ISAR score  $\geq 4$  and ESI score  $\leq 2$  significantly predicts adverse events and improves predictive LRs beyond that of ISAR only (e.g., combined ISAR  $\geq 4$  and ESI  $\leq 2$  combination was associated with +LR of 4.9 (CI: 4.4–5.3) for the outcome of hospital admission when compared to solely ISAR  $\geq 4$ , which had a +LR of 2.3 (CI: 2.2–2.4).

**Conclusion:** Clinicians can use this combined ISAR + ESI screening tool to better identify patients at higher risk of specific adverse ED outcomes. However, better screening tools with higher likelihood ratios are necessary to more accurately identify these seniors.

# HEALTH LITERACY AND PATIENT ACTIVATION AS PREDICTORS OF LIMITED HEALTH INFORMATION EXCHANGE IN MENTALLY ILL DUAL CARE OLDER VETERANS

**Rodrigo A. Torres, B.A., Shatice Jones, B.S., Daniel Sun, B.S., Lee Stefanis, B.S., and William W. Hung, MD MPH**

*Geriatric Research, Education and Clinical Center, James J. Peters VAMC Brookdale  
Department of Geriatrics and Palliative Medicine, Icahn School of Medicine at Mount  
Sinai*

**Introduction:** Studies have shown that a significant proportion of older Veterans with mental illness utilize Veterans Affairs (VA) and non-VA systems for their healthcare needs. Those that use dual care have higher rates of utilization and have an increased risk for adverse events, especially during care transitions. This increased health utilization may be associated with levels of health literacy and patient activation as these measures have been associated with poor health outcomes and poor use of health services.

**Objective:** Identify whether health literacy and patient activation assessments can serve as predictors of the effect of mental illness on health information exchange of older dual care Veterans.

**Methods:** Veterans 65+ were identified from 2 VA systems following a non-VA hospitalization or ER visit and were stratified into: with mental illness and no mental illness. Mental illness was defined as having an active diagnosis of depression, PTSD, dementia, anxiety, schizophrenia or bipolar disorder. Higher ADL and IADL scores are associated with an increased independence in performing daily tasks of basic self-care. Higher S-TOFHLA and PAM Levels are associated with increased health literacy and degree of care self-management, respectively.

**Results:** Currently, 50 Veterans 65+ were identified, 19 with mental illness and 31 with no mental illness. Mean age 73.5 and 93.9% male. For Veterans with mental illness the average ADL score was 5.6, IADL was 11.2, PAM Level was 2.8, with 79% having an Adequate S-TOFHLA. Those with no mental illness had an average of 5.7, 11.2, 2.9 and 69%, respectively. Preliminary analysis shows that other than age no statistically significant difference was found between groups.

**Conclusions:** It appears that health literacy and patient activation measures may not be predictive of limited health information exchange as no statistically significant differences were found between groups.



# CHARACTERIZATION OF DEGENERATIVE MITRAL VALVE PROLAPSE IN ELDERLY PATIENTS: FIBROELASTIC DEFICIENCY AS PREDOMINANT UNDERLYING DISEASE

**Lauren C. Williams; Dimosthenis Pandis, MD; Percy Boateng, MD  
and David H. Adams, MD**

*Icahn School of Medicine at Mount Sinai, New York, New York*

**Introduction:** Primary degenerative mitral valve disease is a common form of mitral valve disease, estimated to affect about 2-3% of people in the United States. A thorough assessment of disease etiology is essential for understanding valve patho-anatomy in patients with this condition. Degenerative mitral valve prolapse (DMVP) can be subdivided based on the underlying disease process; degeneration can be attributed to fibroelastic deficiency (FED), forme fruste Barlow's disease, or Barlow's disease.

**Objectives:** The aim of this study is to characterize the etiological subtypes of primary DMVP and analyze their associated valve pathologies in elderly vs. non-elderly patients.

**Methods:** We conducted a retrospective cohort analysis of 476 patients undergoing surgery for DMVP at our center from 2013-2016. Patients were divided into two groups: elderly patients, defined as patients of age 65 or higher, and non-elderly patients. These two groups were compared for primary degenerative disease etiology as well as for valve pathology and surgical resection types. Statistical analysis was done using a two-sample t-test.

**Results:** FED was more prevalent in elderly patients than in non-elderly patients (53% vs 36%;  $p=0.001$ ), whereas Barlow's disease was more prevalent in younger patients (38% vs 36%;  $p=0.007$ ). In the non-elderly group, in which Barlow's disease was more prevalent, a more radical (quadrangular) tissue resection was performed than in the elderly group, in which FED was more prevalent (25.3% vs 12.7%;  $p=0.001$ ).

**Conclusions:** The most common cause of primary DMVP in elderly patients is fibroelastic deficiency, as opposed to Barlow's disease which is the most common cause in non-elderly patients. The complexity of the mitral valve patho-anatomy tends to increase from localized, segmental lesions in FED to diffuse, multi-segmental or bi-leaflet prolapse with larger annuli in Barlow's disease.

# PREDICTORS OF REVERSAL, MORTALITY, AND FUNCTIONAL STATUS DECLINE IN GERIATRIC PATIENTS AFTER OSTOMY FORMATION

**Hope Xu and Celia Divino, MD**

*Division of General Surgery, Department of Surgery, Icahn School of Medicine at Mount Sinai, New York, New York.*

**Introduction:** Major abdominal surgeries often necessitate the creation of diverting stomas, which can be especially difficult to care for in geriatric populations. Studies suggest up to a third of patients never undergo reversal for “temporary” stomas.

**Objective:** This study evaluated predictors of 1) reversal in elderly patients after ostomy formation, 2) mortality from reversal, and 3) functional status changes following formation and/or reversal.

**Methods:** A retrospective case control analysis was conducted with 178 patients age 65 or older who underwent ostomy formation. EMRs were evaluated for demographics, past medical history, operative reports, and history of reversal. 53 patients were excluded due to lack of follow-up or an intentionally permanent stoma. Functional status was assessed using levels of ADL assistance as proxy. Comparisons were analyzed with t-tests, chi-square, and multivariate logistic regressions.

**Results:** Of 125 patients, 57% were female, 25% required ADL assistance at time of formation, and median age was 72 years (65-94). Reversal rate was significantly associated with postoperative complications ( $p = 0.032$ ) and type of procedure performed, with patients less likely to reverse following an end ileostomy (OR 0.133), loop colostomy (OR 0.149), or end colostomy (OR 0.051) compared to loop ileostomy. Mortality rate was associated with history of CAD (OR 5.87) and renal disease (OR 3.70). Functional status decline for both pre- to post-stoma formation and pre-stoma to post-reversal was associated with age ( $p = 0.02$ , OR 1.12/year;  $p = 0.032$ , OR 1.11/year).

**Conclusions:** These findings may inform decisions to reverse and what ostomy formation procedure to perform in geriatric patients desiring eventual restoration of GI continuity. If reversal is unlikely given the procedure and postoperative status, more effort should be made to provide excellent patient education for stoma care. Furthermore, geriatric patients who value functional independence should be made aware of the probability of functional decline before agreeing to the procedure.

## EMPHYSEMA IS AN ADDITIONAL SIGNIFICANT PREDICTOR OF LUNG CANCER DIAGNOSIS IN VALIDATED RISK STRATIFICATION MODELS

**Patrick C. Yong, BS, Juan P. Wisnivesky, MD, DrPH and Keith M. Sigel, MD, PhD**  
*Department of General Internal Medicine, Icahn School of Medicine at Mount Sinai,  
New York, NY*

**Introduction:** Uncertainty surrounds whether patients benefit from continued annual lung cancer screenings after receiving a negative initial low dose computed tomography (LDCT) screen. In this clinical scenario, lung cancer risk prediction models can be used to estimate a specific patient's risk of lung cancer. Many of these models do not include emphysema, which has been independently associated with lung cancer.

**Objective:** Our study investigates whether emphysema is a significant predictor of lung cancer diagnosis, even after risk stratification using three externally validated models.

**Methods:** We performed a retrospective cohort analysis of data from the National Lung Screening Trial (NLST), a randomized, multicenter trial comparing three annual LDCT screens with chest radiographs in the detection of lung cancer. Current and recently quit smokers between 55 and 74 with at least 30-pack-years of smoking were recruited and followed up for up to 5 years. Our cohort consisted of participants randomized to the LDCT arm who received a negative initial screen (N=16,624). Participants were stratified into risk quartiles using the Bach, PLCOm2012, and Liverpool Lung Project risk prediction models. Emphysema was included as an independent predictor in the Cox Proportional Hazard Models used to calculate of the relative hazards of lung cancer diagnosis across risk quartiles.

**Results:** Participants with emphysema had a higher hazard of lung cancer diagnosis at both the second and third annual LDCT screens in all three risk prediction models (HR range 1.9-2.0, all  $P < 0.001$ ). The number needed to screen to diagnose a case of lung cancer was lower in the emphysema cohort.

**Conclusion:** Although lung cancer risk in high-risk smokers is well stratified by the Bach, PLCOm2012, and Liverpool Lung Project models, emphysema is another important predictor that is factored in these models and may be clinically useful in determining whether a patient would benefit from continued screening.

# ASSESSING INTER-OBSERVER VARIABILITY OF ASA CLASSIFICATION ON GERIATRIC ORTHOPAEDIC SURGERY PATIENTS: A LARGE-SCALE RETROSPECTIVE STUDY

Yi Hong Zheng, BA and Samuel K. Cho, MD

*Department of Orthopaedics, Icahn School of Medicine at Mount Sinai, New York, NY*

**Introduction:** Anesthesiologists have practiced assigning ASA physical status class prior to surgery for decades, while orthopaedic surgeons at Mount Sinai Hospital (MSH) have begun doing so within the past six years. While anesthesiologists typically receive more training with classification, they frequently learn the patient history and assign ASA class on the day of surgery. Orthopaedic surgeons often know the patient for weeks or months beforehand. Surgeons have noticed consistent inter-observer variability in ASA class assigned by the surgeon and the anesthesiologist.

**Objective:** To measure the frequency and degree of inter-observer error in ASA class and to correlate ASA class with postoperative complications and 30-day mortality in orthopaedic surgery patients treated at Mount Sinai Hospital.

**Methods:** Retrospective review of (age  $\geq$  65) patients who underwent orthopaedic surgeries from 1/1/11 – 8/31/14 at MSH. Patients were identified from MSH medical records database (n=5331). Preoperative ASA assignments from each patient's surgeon and anesthesiologist were gathered to detect the presence and degree of inter-observer variability between the two scores. The degree of correlation between assigned ASA classification and 30-day postoperative mortality were compared between the two types of physician specialties to assess the accuracy of the assignment.

**Analysis:** The results of the Kendall's coefficient of concordance procedure can indicate that there is inter-observer variability of ASA classification, using W, p variables. Comparisons between the correlation coefficient and the statistical significance of the correlation coefficient may show that there can be a stronger correlation between higher ASA class and 30-day postoperative mortality using scores assigned by orthopaedic surgeons than those assigned by anesthesiologists, using rs value and p value.

**Future Directions:** These findings may suggest that there does exist a consistent inter-observer variability in ASA class and that orthopaedic surgeons' assignments can be more predictive of 30-day postoperative mortality than those assigned by anesthesiologists. Adjusting the methods and practices in which patients are assigned, ASA scores might yield improved patient outcomes. The analysis will provide a better understanding of which group (orthopaedic surgeons or anesthesiologists) are making more accurate ASA assignments and which may benefit from further training in ASA classification.