

University of Maryland Center for Research on Aging Presents:

An Aging Research Symposium



Richard Hodes, M.D.

*Director of the National Institute on Aging (NIA)
at the National Institutes of Health (NIH)*

**NIA Enters a New Age:
Aging Research Questions
and the Opportunities
Available to Address Them**

Monday, March 4, 2019

1:00-2:30pm Poster Session
featuring aging related research
by faculty and trainees

2:30-2:45pm Introductions by Dr.
Jay Magaziner and Welcome by
Dean E. Albert Reece

2:45-3:45pm Keynote Address by
Dr. Richard Hodes
(Reception to follow)

Leadership Hall in MSTF
University of Maryland
Baltimore, School of
Medicine 685 W. Baltimore
Street Baltimore, MD 21201



UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

Forward

The University of Maryland School of Medicine Center for Research on Aging is proud to present poster abstracts from the 1st Annual Aging Research Symposium on March 4, 2019. The program will include a lecture to be given by Richard Hodes, MD, Director of the National Institute on Aging entitled, "NIA Enters a New Age: Aging Research Questions and the Opportunities Available to Address Them."

In addition to Dr. Hodes presentation, the Center will be sponsoring a poster session featuring research in the field of aging conducted by University of Maryland, Baltimore and Baltimore County faculty, and pre- and post-doctoral students. This compilation of abstracts from faculty, fellows and graduate students from UMB, UMBC, and the University of Maryland College Park presents some of the exciting research in aging on our campuses.

The poster session will begin at 1:00pm in the Atrium of the Medical Students Teaching Facility building. At 2:30pm, we will adjourn to Leadership Hall for opening remarks by Dean Reece and Dr. Hodes' lecture. At 4:00pm we will be adjourn to a reception in the Atrium until 5:00pm.

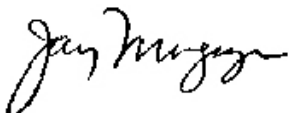
The Center for Research on Aging is now in its 21st year of existence, is an interdisciplinary program with an advisory board comprised of faculty from all of the schools and major aging-related programs at UMB and UMBC. The mission of the Center is to facilitate, amplify, and enrich research in gerontology and geriatrics; provide outstanding research training and educational opportunities in gerontology for graduate students and health professionals; and enhance delivery of excellent multidisciplinary geriatric care that prevents functional and mental disability in the elderly, and promotes a healthy lifestyle. We currently have more than 135 affiliates that focus on aging research, education, and clinical care. We are hoping that these abstracts will inspire others and promote collaborations amongst students, fellows, and faculty at our campuses and beyond. Through these collaborations, faculty continue to secure aging-related grants, establish new research collaborations, and strengthen already established areas of research.

The Center for Research on Aging would like to thank Dean Reece for his ongoing support of aging research as well as the many Centers and Programs across campus that focus on the aging population and improving their health and quality of life.

We hope you enjoy our 1st Aging Symposium in what will hopefully become an annual event. If you would like more information about the Center for Research on Aging, please contact Anne Sullens (asullens@som.umaryland.edu) or visit

<https://www.medschool.umaryland.edu/research-centers/Center-for-Research-on-Aging/>.

Sincerely,



Jay Magaziner, PhD, MS Hyg
Professor and Chair
Department of Epidemiology and Public Health
Director, Center for Research on Aging
University of Maryland School of Medicine

Poster #	Name	Academic Title	Dept/School/University	Poster Title
1	Katrina Williams, PhD	Post-Doctoral Fellow	Orthopaedics, SOM, UMB	Aging and oxidative stress modify the osteocyte microtubule cytoskeleton, a key regulator of skeletal mechanotransduction
2	Alison Trinkoff, BSN, MPH, ScD	Professor	Family and Community Health, SON, UMB	Optimal threshold for CNA training hours in US nursing homes
3	Jamila Torain, MPH	Pre-Doctoral Grad Student	Epidemiology and Public Health, SOM, UMB	Medicare Home Health Care Payment Reform—A Systematic Review
4	Kriti Sharma, MD, MPH	Post-Doctoral Fellow	Pharmaceutical Health Services, SOP, UMB	Listening to the Medicare Beneficiaries' voice to optimize the MTM Program Standardized Format
5	Shalini Sahoo, MA	Pre-Doctoral Grad Student	Gerontology, SOM, UMB	Problem Solving Skills and Cancer Screening Behaviors in the Middle-aged and Older U.S. Adults
6	Oluwadamilola Onasanya, MD, PhD	Pre-Doctoral Grad Student	Pharmaceutical Health Services, SOP, UMB	Coded Diagnoses of Patients Receiving Anti-Dementia Drugs Without a Documented Dementia Diagnosis
7	James Borrelli, PhD	Post-Doctoral Fellow	Physical Therapy and Rehabilitation Sciences, SOM, UMB	Center of Mass Control Differentiates Single and Multistep Lateral Protective Stepping Reactions in Older Adults
8	Shama Iyer, PhD	Post-Doctoral Fellow	Orthopaedics, SOM, UMB	Nuclear dynamics and cytoskeletal coupling are altered in murine aging skeletal muscle
9	Shabnam Salimi, MD	Research Associate	Epidemiology and Public Health, SOM, UMB	Metabolomic markers in men reveal mechanisms of diverse inflammatory trajectory following hip fracture
10	Shabnam Salimi, MD	Research Associate	Epidemiology and Public Health, SOM, UMB	Reduced methylation at ubiquitination-related genes are protective for age-related multi-morbidity: Findings from the InCHIANTI Study
11	Vicki Gray, PhD, MPT	Assistant Professor	Physical Therapy and Rehabilitation Sciences, SOM, UMB	Asymptomatic carotid stenosis is associated with mobility and cognitive dysfunction and heightened fall rates in older adults
12	Laura Bozzi, MS	Pre-Doctoral Grad Student	Pharmaceutical Health Services, SOP, UMB	Age Differences in Antiretroviral Treatment and Fracture Risk among Women with Human Immunodeficiency Virus
13	Rodney Ritzel, PhD	Post-Doctoral Fellow	Anesthesiology / STAR-ORC, SOM, UMB	Old age worsens functional outcome after TBI and exacerbates microglial senescence: Therapeutic potential of CSF1R antagonism
14	Odessa Addison, DPT, PhD	Assistant Professor	Physical Therapy and Rehabilitation Sciences, SOM, UMB	The relationship of intermuscular adipose tissue and skeletal muscle capillarization in sedentary older adults
15	Derik Davis, MD	Associate Professor	Diagnostic Radiology & Nuclear Medicine, SOM, UMB	Correlation of Magnetic Resonance Imaging Measures of Rotator Cuff Intramuscular Fatty Infiltration to Shoulder Strength and Range of Motion in Older Adults
16	Konstantin Birukov, MD, PhD	Professor	Anesthesiology, SOM, UMB	Truncated oxidized phospholipids is a factor exacerbating ALI in the aging lungs
17	Jayaum Booth, PhD	Post-Doctoral Fellow	Pediatrics, Center for Vaccine Development and Global Health, UMB	Induction of distinct S. Typhi specific memory T cell responses in the terminal ileum mucosa of elderly volunteers following oral Ty21a immunization
18	Timothy Jarvela, PhD	Post-Doctoral Fellow	Anatomy and Neurobiology, SOM, UMB	Expression of the proSAAS chaperone reduces cellular hAPP content and Aβ secretion
19	Anju Paudel, MGS	Pre-Doctoral Grad Student	Nursing, SON, UMB	Factors Influencing Staff-resident Interactions in Nursing Homes
20	Ivana Alexander	Pre-Doctoral Grad Student	Social Work, SSW, UMB	"One brick at a time": Vietnam Era Veterans' Conceptualizations of Recovery in PTSD
21	Monica Tong, PharmD	Post-Doctoral Fellow	SOP, UMB	Choosing OTC medications wisely: Developing and evaluating an educational outreach program for community dwelling older adults
22	Maryam Movassaghian, MD	Post-Doctoral Fellow	Geriatrics, University of Maryland Medical Center	HPV as a culprit of oropharyngeal cancer in the elderly man

23	Joshua Chou, PharmD	Post-Doctoral Fellow	The Peter Lamy Center on Drug Therapy and Aging, SOP, UMB	A National Survey of Medicare Beneficiary Perspectives on the Medicare Part D Medication Therapy Management (MTM) Standardized Format
24	Aida Kuzucan, PharmD	Pre-Doctoral Grad Student	SOP, UMB	Characteristics Associated with Suicidal Opioid Overdose in Medicare Beneficiaries
25	Aakash Bipin Gandhi, B.Pharm	Pre-Doctoral Grad Student	Pharmaceutical Health Services, SOP, UMB	Healthcare Resource Utilization Associated with Parkinson's Disease: A Longitudinal Study
26	Husam Albarmawi, BS Pharm, MS	Pre-Doctoral Grad Student	Pharmaceutical Health Services, SOP, UMB	A Longitudinal Examination of Progression-related Events among Medicare Beneficiaries with and without Parkinson's Disease
27	Victoria Nalls, GNP, PhD candidate	Pre-Doctoral Grad Student	Nursing, SON, UMB	Predictors of Depressive Symptoms in Nursing Home Residents with Severe Cognitive Impairment.
28	Rachyl Fornaro, PharmD Candidate	Pre-Doctoral Grad Student	SOP, UMB	Identifying barriers to implementing antimicrobial stewardship in Maryland nursing facilities
29	Emerson Wickwire, PhD	Associate Professor	Neurology, SOM, UMB	Trends in Insomnia Prescription Medication Use Among Medicare Beneficiaries, 2006-2013
30	Hafiz Rehman, MD	Fellow	Geriatric Medicine, SOM, UMB	Benign or Malignant , A Difficult Question (Case study lung cancer)
31	Tham Le, MPH	Pre-Doctoral Grad Student	Pharmaceutical Health Services, SOP, UMB	Risk of Falls and Fractures Associated WITH Concomitant Opioid and Sedative Use Among Medicare Beneficiaries With Chronic Obstructive Pulmonary Disease
32	Jungmin Yoon, PhD Nursing Candidate, MSN	Pre-Doctoral Grad Student	Nursing, SON, UMB	Factors Associated with a Composite Score of Behavioral and Psychological Symptoms of Dementia
33	Kayleigh Majercak, MS	Pre-Doctoral Grad Student	Pharmaceutical Health Services, SOP, UMB	Social capital and health status: race/ethnicity differences in the Health and Retirement Study, 2006 to 2014
34	Rainer von Coelln, Dr.med.	Assistant Professor	Neurology, SOM, UMB	Accelerometry-Based Quantitative Analysis of Mobility in Parkinson Disease
35	Sol Baik, MA	PhD Student	Social Work, SSW, UMB	Identifying Pathways from Neighborhood Environments to Hypertension in Baltimore City
36	Sarah Holmes, MSW	Pre-Doctoral Grad Student	Gerontology, SOM, UMB	Testing the Reliability and Validity of the Resident Satisfaction Index in Assisted Living
37	Gretchen Tucker, MA	Pre-Doctoral Grad Student	UMBC	Person-Centered Programming for Adult Day Clients with Alzheimer's Disease and Related Dementias
38	Brett Weir, BSN	Pre-Doctoral Grad Student	Adult-Gero Acute Care, SON, UMB	Screening for Polypharmacy in the Elderly Population
39	Heather Mutchie, BA	Pre-Doctoral Grad Student	Gerontology, SOM, UMB	Feasibility of Four Square Step Test in Hip Fracture Patients
40	Ameera Chakravarthy, BSN, MS, PhD	Pre-Doctoral Grad Student	Organizational Systems and Adult Health, SON, UMB	Using PHOTOFOOD and Recall to assess Adherence to Protein Intake in Older Cardiac Surgery Participants
41	Robin Majeski, PhD, RN	Clinical Associate Professor	The Erickson School, UMBC	Engagement in the Creative Arts, Mindfulness, and Resilience in Aging
42	Alison Larsen	Graduate Student	The Erickson School, UMBC	Amazon Echo: Providing autonomy for the varying needs of mNCD care recipients and care givers
43	Jiaqi Gong, PhD	Assistant Professor	Information Systems, UMBC	Augmenting Preconscious Perception and Regulation for Emotionally Demanding Works
44	JiaqiGong, PhD	Assistant Professor	Information Systems, UMBC	Brain-Locomotion Network Connectivity across the Lifespan
45	Zongtian Tong, PharmD	Pre-Doctoral Grad Student	SOP, UMB	Online Provision of Part D Medication Therapy Management (MTM) Program Information
46	Roberto Millar, BA	Research Assistant	Gerontology, SOM, UMB	Problem Solving Skills in Technology Rich Environments and Self-Rated Health Among Adults in the U.S.
47	Roberto Millar, BA	Research Assistant	Gerontology, SOM, UMB	Racial and Ethnic Differences in the Association between Neighborhood Social Environment and Objective Physical Function in Older Adults

48	Jennifer Klinedinst, RN, PhD, MPH	Associate Professor	Organizational Systems and Adult Health, SON, UMB	Post-stroke fatigue as an indicator of underlying bioenergetics alterations
49	Anjana Muralidharan, PhD	Assistant Professor	Veterans Affairs Capitol Healthcare Network, Mental Illness Research Education and Clinical Center	Mobility Function Among Older Male Veterans: The Impact of Mental Illness
50	Aparna Vadlamani, MPH	Pre-Doctoral Grad Student	Epidemiology and Public Health, SOM, UMB	Traumatic Brain Injury Severity is Associated with Increased Risk of Stroke in Older Adults
51	Nancy Kusmaul, PhD, MSW	Assistant Professor	Social Work, UMBC	Convincing the Leaders: Perceived Barriers to the Implementation of Nursing Home Culture Change

Aging and Oxidative Stress Modify the Osteocyte Microtubule Cytoskeleton, a Key Regulator of Skeletal Mechanotransduction

Katrina M. Williams, PhD; James S. Lyons; Christopher W. Ward, PhD and Joseph P. Stains, PhD

Low bone mass and the associated increased propensity to fracture have become a substantial problem for the expanding elderly population. The multi-factorial mechanisms leading to age-related osteopenia are incompletely understood; however, it is well established that bone becomes less mechanoresponsive with age. Recently, our lab has identified a role for the osteocyte cytoskeleton in the bone mechanoresponse, which down regulates the sclerostin protein, a negative regulator of bone mass. Specifically, we showed that a subset of the microtubule network, which is post-translationally modified by detyrosination (deTyr), is required to sense and transduce mechanical load signals to downstream signaling effectors (phospho-Ca²⁺/calmodulin-dependent protein kinase II and sclerostin) via NADPH oxidase 2-generated reactive oxygen species and opening of the TRPV4 channel. Activation of this pathway, which is dependent upon cytoskeletal stiffness, ultimately leads to reduced sclerostin.

Here, we examine aging-dependent changes in the microtubule network that predict mechanoresponsiveness. We show concomitantly with decreased bone mass, deTyr-tubulin, total α -tubulin, Tau, MAP1b, MAP4, α -Tub4A increase. These changes are consistent with a decreased mechanical load response. Our data reveal increases in glutathione reductase protein and the Nrf2-activated gene *Nqo1*, consistent with increased oxidative stress. We predict that oxidative stress may be a driver of changes in cytoskeletal stiffness as cultured osteocytes exposed to peroxide increase deTyr-tubulin and Tau expression, which is associated with increased cytoskeletal stiffness. Our data suggest that age-dependent oxidative stress may be a driver of microtubule-dependent changes in the cytoskeleton that would be predicted to blunt bone mechanoresponsiveness and lead to low bone mass.

Optimal Threshold for CNA Training Hours in US Nursing Homes

Alison M. Trinkoff, BSN, MPH, ScD; Bo Kyum Yang, PhD, RN; Carla L. Storr, ScD, MPH;
Shijun Zhu, DrE, MS; Nancy Lerner, DNP, RN, CDONA and Kihye Han, PhD, RN

Purpose: This study provided empirically derived estimates of the number of certified nursing assistant (CNA) training hours that yielded the best nursing home (NH) resident care outcomes.

Methods: CNA state-level training regulatory information was linked to 2014 quality indicator (QI) data from 13,608 US NHs. Optimal training hour thresholds that yielded the best outcomes for three QIs: activities of daily living (ADLs), falls with injury, and pain were estimated using multivariate regression models with generalized estimating equations.

Findings: Lower proportions of residents with QIs were found in facilities in states with CNA training hours over the federal minimum (>75 hrs) compared to those in states that required only 75 training hours (all $p < 0.001$). Our estimating procedures found that 151.6 total training hours, with a ratio of twice as many clinical hours per didactic hours, were needed to provide optimal quality of care in NHs.

Conclusions: Given the increasing complexity of clinical settings in NHs, our findings suggest that regulatory changes in US CNA training requirements may be indicated.

Medicare Home Health Care Payment Reform—A Systematic Review

Jamila Torain, MPH and Joan K. Davitt, MLSP, MSW, PhD

Medicare Home Health Care (HHC) provides in-home post-acute care for beneficiaries with a skilled care need. Home health care has been shown to be more cost effective and to be a major predictor of long-term health outcomes. However, the HHC reimbursement structure has been subjected to major reforms which authorized the rebasing of home health payments, ultimately affecting both providers' ability to deliver health care and utilization of services by beneficiaries. The Balanced Budget Act and the Affordable Care Act both mandated rebasing changes to the Medicare HHC reimbursement structure generating substantial provider payment reductions. Current literature lacks a comprehensive review of the policy changes that occurred under these two acts. A systematic review of the peer-reviewed literature was conducted for articles published between 1990 and 2017 with a focus on reimbursement policy. Seven databases were searched by key words: (1) "home health care" or "home health" or "home health care agencies", (2) "payment reform" or "payment reduction" or "rebasement" or "reimbursement structure" or "reimbursement changes" or "reimbursement reform", (3) "Medicare policy" or "policy" or "legislation", and (4) "access" or "utilization" or "beneficiary use". Thirty-one papers that focused on reimbursement changes were included. These papers described two major payment reforms that mandated changes to the HHC reimbursement structure, the impact of these changes on service delivery and beneficiary use, and their proposed and unintended consequences.

Listening to the Medicare Beneficiaries' voice to optimize the MTM Program Standardized Format

Kriti Sharma, MD, MPH; Catherine E. Cooke, PharmD, BCPS, PAHM; Amy K. Howard, PharmD; Rebecca Chater, RPh, MPH and Nicole J. Brandt, PharmD

Background: Plan sponsors of Medicare Part D must provide their beneficiaries who receive a comprehensive medication review (CMR) with a written summary using the Medicare Part D Medication Therapy Management (MTM) Standardized Format (SF). While this requirement advanced consistency in the CMR service, barriers such as integration the SF into existing electronic medical records exist. The objective of this study is to determine beneficiaries', caregivers' and care managers' perceptions of the MTM SF, in order to inform potential modifications for its optimal use.

Methods: Multi-site focus group interviews were conducted with Medicare beneficiaries who had received a medication review in the past year or their caregivers, and case managers. Interviews were audio recorded, transcribed and proofread by two independent individuals, and coded using NVivo® qualitative software.

Results: There were a total of 23 participants at 5 different sites. Qualitative data analysis found that beneficiaries and case managers prefer the SF to be a consolidated document that could be shared and updated across their entire healthcare team. The Personal Medication List, medication names, especially generic names, were found important for better understanding as were the sections on 'why I use it', 'how' and 'side effects'. While the beneficiaries recognized the SF as a helpful tool, more information was sought on dosage and timing for medications, drug interactions, cost and "cheaper alternatives".

Implications: Identifying elements of the SF that are useful to beneficiaries, their caregivers and case managers will ensure a more streamlined SF that may enhance interoperability among the healthcare team.

Problem Solving Skills and Cancer Screening Behaviors in the Middle-aged and Older U.S. Adults

Shalini Sahoo, MA; Roberto J. Millar, MA; Takashi Yamashita, PhD, MPH, MA and Phyllis Cummins, PhD

Routine cancer screening is widely recognized as an effective preventive healthcare service in reducing cancer mortality. Yet, cancer screening requires a complex array of tasks such as seeking the up-to-date guideline, making an appointment, planning a hospital visit and communicating with healthcare professionals. In addition, the modern healthcare relies on the technology to disseminate the latest information and managing the system. However, little is known about the skills that are relevant to preventive healthcare utilization. This study examined the association between problem-solving skills in technology-rich environment (PSTRE) and cancer screening behaviors in later life. We obtained the nationally representative data from the 2012/2014 Program for the International Assessment of Adult Competencies (PIAAC) survey. Binary logistic regressions with the survey weights were used to estimate the association between PSTRE and four cancer screening services among the corresponding target populations aged between 45 to 74 years old ($n = 1,373$ for mammogram; $n = 1,374$ for pap smear; $n = 1,166$ for prostate screening; $n = 2,563$ for colorectal screening). Results showed that greater PSTRE skills were significantly associated with prostate cancer screening ($OR = 1.005$, $p < 0.05$) in men, but not with mammogram, cervical, or colorectal cancer screening. Improvement in the problem-solving skills may promote the specific cancer screening behaviors. Finally, we evaluated the plausible explanations of the results and several policy implications (e.g., removal of complex tasks related to the cancer screening).

Coded Diagnoses of Patients Receiving Anti-Dementia Drugs without a Documented Dementia Diagnosis

Oluwadamilola Onasanya, MD, MPH; Maya L. Hanna, MPH; Teyrra D. Crawford, PharmD and Eleanor M. Perfetto, PhD, MS

Objective: Describe demographic characteristics and coded diagnoses, if any, for patients' receiving anti-dementia drug treatment without a documented dementia diagnosis.

Methods: We extracted data from the OptumLabs™ Data Warehouse for newly diagnosed adults between 2011 and 2014 having a dementia diagnosis and/or receiving anti-dementia drugs with 36 months continuous coverage before first diagnosis or treatment, and 6 months follow-up. We examined characteristics and coded diagnoses in the 3 months pre- and post-first anti-dementia drug fill among treated-only individuals.

Results: We identified 4,732 treated-only and 8,850 diagnosed and treated individuals. Treated-only individuals were younger [Mean age (sd) = 75(11) vs 79(07)]; more often prescribed anti-dementia drugs by a general practitioner (33% vs 27%); and had more prevalent obstructive sleep apnea (15% vs 12%). Among treated-only individuals, codes related to dementia symptomology occurring in close temporal proximity to first anti-dementia drug fill were: memory loss (46%), malaise and fatigue (21%), dizziness and giddiness (10%) and anxiety (7.5%). Forty-one percent of treated-only individuals averaged two memory-loss-related codes prior to first anti-dementia drug fill, with 84% of memory-loss symptom codes occurring in an outpatient setting.

Conclusion: It would be useful to understand the reasons why not all patients treated with anti-dementia drugs have a corresponding dementia diagnosis. Many of these patients do experience memory loss and dementia-related symptoms that are coded. General practitioners might identify the symptoms but are hesitant to assign a dementia diagnosis to younger patients. These findings may provide insights for future studies in dementia and its treatment.

Perturbation-Evoked Lateral Steps In Older Adults: Why Take Two Steps When One Will Do?

James Borrelli, PhD; Robert Creath, PhD; Douglas Pizac, MS; Haoyuan Hsiao, PhD; Ozell Sanders PhD and Mark W. Rogers, PhD, PT

Hip fractures in older adults often result from a fall in the lateral direction. While younger adults tend to recover balance from a lateral perturbation with a single lateral sidestep, older adults are prone to multistep responses which are associated with an increased fall risk. This study compared the stepping characteristics and stability of single and multistep responses to lateral perturbation in healthy older adults. Eighty-four older adults received lateral waist-pull perturbations to either side. Spatio-temporal stepping characteristics and balance stability were quantified. Fewer steps were taken to recover balance when the first step was a lateral sidestep. The stability margin of single lateral sidesteps was greater than medial sidesteps and cross-over steps to the back but not significantly different from single cross-over steps to the front at step termination. Single step responses were more stable than multistep responses at step termination and at step initiation for lateral sidesteps and cross-over steps to the front. The decreased stability of multistep responses was attributed to an increased center of mass velocity and a smaller distance between the center of mass and base-of-support at step termination. Although lateral sidesteps result in fewer steps than cross-over steps to the front, the stability margin was not significantly different at step termination. These results suggest difficulty terminating center of mass motion and/or inefficient center of mass control differentiates single and multistep responses. Future studies should investigate perturbation training and/or hip abductor muscle conditioning as a means of improving compensatory stepping reactions.

Nuclear Dynamics and Cytoskeletal Coupling are Altered in Murine Aging Skeletal Muscle

Shama R. Iyer, PhD; Sameer B. Shah, PhD; Christopher W. Ward, PhD; Joseph P. Stains, PhD; Eric S. Folker, PhD and Richard M. Lovering, PhD, PT

Informed by evidence that dysregulated nuclear dynamics and nuclear mechanics may contribute to atrophy in diseased skeletal muscle, the purpose of this study was to assess nuclear dynamics (mobility and deformability) and mechano-signaling outputs (YAP/TAZ and their downstream genes) during aging in skeletal muscle. We hypothesized that in aging, changes in nucleo-cytoskeletal components and mechano-signaling outputs would be associated with a loss of nuclear mobility and decreased nuclear deformability. This increase in nuclear strain would increase nuclear YAP/TAZ (a marker of mechano-responsiveness) and downstream indicators of YAP activity (*Ankrd1*, *Cyr61*). Consistent with our hypothesis, nuclear movement ($12.4 \pm 0.06 \mu\text{m}$ vs. $14.2 \pm 0.05 \mu\text{m}$ distance traveled) and nuclear velocity ($0.023 \pm 12.5\text{E-}5 \mu\text{m}/\text{min}$ vs. $0.027 \pm 9.81\text{E-}5 \mu\text{m}/\text{min}$ velocity) were markedly reduced in aged muscle (~24 months, n=3) relative to young mice (2-months, n=3). Likewise, the nuclei were less deformable to passive mechanical stretch ex-vivo in adult muscle fibers (12-months, n=3) compared to young muscle fibers. LINC protein gene expression, YAP/TAZ protein, and expression of YAP/TAZ downstream targets, *Ankrd1* and *Cyr61* were significantly increased in adult muscles compared to young muscles, and were further increased in aged muscles, indicating hyperactivation of YAP/TAZ during the aging trajectory. In summary, these data highlight a possible role for LINC in changes of aging-related nuclear dynamics and mechano-sensing, and may represent therapeutic targets for sarcopenia. Future studies will examine how altering these components affects muscle function during aging.

Metabolomic Markers in Men Reveal Mechanisms of Diverse Inflammatory Trajectory Following Hip Fracture

Shabnam Salimi, MD, MSc; Alice Ryan, PhD; Denise Orwig, PhD; Ann Gruber-Baldini, PhD; Jack Guralnik, MD, PhD; MPH; Jay Magaziner, PhD, MS Hyg and March Hochberg, MD, MPH

Introduction: Previously we showed that older men exhibited two different trajectories of inflammation: high (HiInf) vs. low (LoInf) following a hip fracture.

Methods: Seven men with HiInf and 7 with LoInf were randomly selected to quantify serum metabolites at baseline, 2 and 6 months following hip fracture in Baltimore Hip Study-7. We performed principle component analyses, analysis of variance and mixed effects models. A $p \leq 0.05$ was considered significant.

Results: At baseline, men with HiInf had higher oxidative stress, lipid-related inflammatory markers, and antioxidant compounds compared to LoInf group. These markers were reduced in both groups at follow-ups consistent with reduced stress. However, attenuation level was significantly different between the two groups.

Polyamines with maintaining DNA structure and anti-oxidant activity were declined more significantly in the LoInf group presumably indicating more response to bodily anti-oxidant activity compared to the HiInf group.

Arachidonic acid-derived eicosanoids, mediators of the immune response, were significantly elevated at baseline in the LoInf while oxidative stress markers were increased more in HiInf group.

Branched-chain amino acids (BCAAs), the essential amino acids abundant in muscle, were elevated at baseline in the LoInf compared to HiInf group.

Conclusion: Both groups showed an increase in anti-oxidative stress following hip fracture, with LoInf group showing more reduction in oxidative stress level. Reduced intermediate compounds of BCCA suggest that their catabolism was attenuated following hip fracture in LoInf, plausibly due to use of more BCAAs for protein synthesis in LoInf or reduced muscle breakdown or turnover in the LoInf group.

Reduced Methylation at Ubiquitination-Related Genes are Protective for Age-Related Multi-Morbidity: Findings from the InCHIANTI Study

Shabnam Salimi, MD, MSc; Brian Chen, PhD; Elisa Fabbri, MD; Toshiko Tanaka, PhD; Stefania Bandinelli, MD; Jack Guralnik, MD, PhD, MPH and Luigi Ferrucci, MD, PhD

Introduction: Aging is a strong risk factor for chronic diseases. The large number of older patients with multiple chronic condition are a challenge to the health care system. Understanding the mechanisms underlying age-related multiple condition may lead to new and more effective strategies to manage geriatric patients. Changes in DNA methylation may offer one possible mechanism.

Methods: In 477 individuals with mean age 62 (range 21-91 yrs) from Invecchiare in Chianti (InCHIANTI) study DNA methylation was measured in the whole blood using Illumina 450K arrays. We performed a case/control Methylome-Wide Analysis adjusted for age, sex, batch of samples, and differential peripheral blood cells. CpG sites that were differentially methylated between cases and controls were also analyzed for their association with age-related muscle quality defined as dividing muscle strength over muscle area.

Results: We found that reduced methylation at the ubiquitination-related genes were protective against multi-morbidity (standardized beta = -0.07, $p < 5.0 \times 10^{-8}$). The magnitude of effect increased with increased number of diseases (beta = -0.24). After adjustment for age, sex, and body mass index. We excluded cancer patients, and the results remained robust. Pathway analysis revealed interactions between ubiquitination-related genes, P53, suggesting that the protein encoded by *these genes may regulate P53*, a tumor suppressor gene that plays a pivotal role in aging process.

Conclusion: The reduced methylation at the ubiquitination genes in whole blood is protective for age-related multi-morbidity. We plan to further study collective effects of DNA methylation changes on temporal multi-morbidity phenotype in whole blood and in specific immune cells.

Asymptomatic Carotid Stenosis is Associated with Mobility and Cognitive Dysfunction and Heightened Fall Rates in Older Adults

Vicki Gray, MPT, PhD; Mark W. Rogers, PT, PhD; Andrew P. Goldberg, MD; Laila Anthony; Michael Terrin, MDCM, MPH; Jack Guralnik, MD, PhD, MPH; William C. Blackwelder, PhD; Diana Lam; Siddhartha Sikdar, PhD and Brajesh K. Lal, MBBS

Purpose: Atherosclerosis of the carotid bifurcation with plaque formation causes asymptomatic carotid artery stenosis (ACAS) which is associated cerebral hypoperfusion. Cerebral hypoperfusion adversely affects multiple aspects of mobility and cognition. This study tests the hypothesis that community-dwelling adults with $\geq 50\%$ diameter-reducing ACAS will have greater mobility and cognitive impairments that heighten their risk for falls to a greater extent than age-matched controls.

Methods: Eighty community-dwelling adults completed a mobility assessment (Short Physical Performance Battery [SPPB], Berg Balance Scale [BBS], Four Square Step Test [FSST], Dynamic Gait Index [DGI], Timed Up and Go [TUG] and gait speed), self-reported physical function (Activities-Specific Balance Confidence [ABC], SF-12 Physical Function Component [PCS]), and cognitive tests (Mini-Mental State Examination [MMSE]). Falls were recorded for the past six months. Standardized carotid ultrasonography classified subjects into no-stenosis ($<50\%$ diameter-reduction) ($n=54$), moderate stenosis (50-69%) ($n=17$), and high-grade stenosis group (70-99%) ($n=9$). Linear and logistic regression analyses determined the associations between these measures and the degree of stenosis.

Results: Logistic regression analysis showed that the degree of stenosis was associated with reductions in SPPB ($P=0.008$), BBS ($P=0.0008$), DGI ($P=0.0001$), and increases in FSST ($P=0.005$), TUG ($P=0.0004$), and gait speed ($P=0.02$). The reductions in MMSE ($P=0.003$), SF12 PCS ($P<0.0001$) and ABC ($P<0.0001$) correlated with the degree of stenosis. Participants with stenosis had a greater incidence of falls compared to those without stenosis (Relative Risk, $RR=2.86$, $P=0.01$).

Conclusion: ACAS is associated with impaired mobility and cognition that are accompanied with increased fall risk. These impairments increased with worsening severity.

Age Differences in Antiretroviral Treatment and Fracture Risk among Women with Human Immunodeficiency Virus

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Tenofovir disoproxil fumerate (TDF), a nucleotide reverse transcriptase inhibitor associated with fracture risk, may be prescribed selectively to older versus younger women. Our objective is to examine the association of age and fracture risk with antiretroviral therapy (ART) use among women with Human Immunodeficiency Virus (HIV+).

Our study included 1,325 HIV+ non-pregnant women aged 30-60 enrolled in the Women's Interagency HIV Study. We categorized age as younger (30-44 years) and older (45-60 years) women and ART as TDF-containing regimen, other ART, or no ART. Baseline fracture risk was defined by primary (race; body mass index; current smoking; alcohol use; previous fracture; parental fracture; rheumatoid arthritis/lupus) and secondary fracture risk factors (diabetes; hepatitis; intravenous drug use; low cd4 count). Multinomial logistic regression examined the association between age, baseline fracture risk, and ART, adjusting for demographic covariates (education; marital status; employment; income; years since HIV diagnosis).

Of our sample, 37% were older women. Prevalence of TDF-containing regimens was greater in older versus younger women (56% vs 29%, $p < 0.0001$). More older women reported 3+ primary and 2+ secondary risk factors compared to younger women (55% vs. 48%, $p < 0.01$ and 36% vs. 20%, $p < 0.0001$, respectively). Compared to younger women, older women were 3.08 times more likely to receive TDF-containing regimens than other ART ($p < 0.0001$).

Older age was associated with higher odds of TDF-containing regimens, but baseline fracture risk factors were not correlated with TDF-containing regimens. Future longitudinal studies should explore the association between ART treatment patterns and long-term fracture risk among aging HIV+ women.

Old Age Worsens Functional Outcome after TBI and Exacerbates Microglial Senescence: Therapeutic Potential of CSF1R Antagonism

Rodney Ritzel, PhD; Sarah Doran; Julie Faden; Ethan Glaser; Victoria Meadows; Niaz Khan, MD, PhD; Nivedita Hegdekar; Bogdan Stoica, MD; Alan Faden MD and David Loane, PhD

Following traumatic brain injury (TBI), individuals over 65 years of age show increased mortality and worse functional outcomes compared to younger persons. As neuroinflammation is a key pathobiological mechanism of secondary injury after TBI, we examined how aging affects posttraumatic microglial responses and functional outcomes. Young (12-wks) and aged (18-mos) male C57Bl/6 mice were subjected to moderate-level controlled cortical impact or sham surgery and neurological function was evaluated. At 72 hours, aged mice demonstrated more severe deficits in forelimb grip strength, balance and motor coordination, spontaneous locomotor activity, and anxiety-like behavior. These animals also exhibited greater microglial proliferation and significantly higher numbers of brain-infiltrating leukocytes. Microglia in aged mice showed impairments in phagocytic activity and higher production of IL-1 β . Infiltrating myeloid cells in aged TBI mice also had deficits in phagocytosis, but showed diminished pro-inflammatory cytokine production and greater reactive oxygen species production. Expression of several senescence markers (Bcl-2, p16, p21, lipofuscin, and H2AX) was increased with age and/or TBI in both microglia and injured cortex. Dystrophic microglia in aged mice exhibited dramatic changes in function even at baseline. Elimination and repopulation of aged microglia using the CSFR1 antagonist, PLX5622, selectively depleted the senescent population and reversed age-related neuroinflammation. Age-related impairments in grip strength, endurance and motor coordination, and gait dynamics were attenuated by PLX treatment. Thus, worse posttraumatic behavioral outcomes in aged animals are associated with exaggerated microglial responses, increased leukocyte invasion, and up-regulation of senescence markers. Dietary treatment of PLX5622 may partially alleviate these deficits and speed recovery.

The Relationship of Intermuscular Adipose Tissue and Skeletal Muscle Capillarization in Sedentary Older Adults

Odessa Addison, DPT, PhD; Alice Ryan, PhD; Jacob Blumenthal, MD and Steven Prior, PhD

High levels of intermuscular adipose tissue (IMAT) and low levels of capillarization are both predicative of decreased muscle and mobility function in older adults, however little is known about their relationship. The purpose of this study was to examine the relationship of IMAT and capillarization in the thigh in a group of sedentary adults. We hypothesized decreased capillarization would be related to increased IMAT. Forty-seven sedentary adults (Age 59.9 ± 1.0 years, BMI 32.0 ± 0.7 kg/m², VO_{2max} 22.4 ± 0.7 ml/kg/min) underwent CT scans to determine %IMAT. Muscle biopsies were used to determine capillarization in the mid-thigh. A step-wise hierarchical linear regression was used to examine the contributions of age, sex, BMI, muscle capillarization, and fitness to explaining the variability in %IMAT. The predictors as a group accounted for 45.9% of the variance in %IMAT, with BMI, capillarization, and sex each significantly contributing to the final model. BMI, capillarization, and sex explained 25.8%, 18.5% and 4.2% of the variance in %IMAT. While increasing capillarization to a muscle is typically thought of as a positive development, in some conditions, such as tendinopathies, an increase in capillarization is part of the pathological process related to the expansion of the extracellular matrix and ultimately the fibrosis, this may also be an explanation for the surprising relationship that high capillarization is related to high levels of IMAT. Future studies are necessary to determine the relationship of changes in both capillarization and IMAT with interventions, such as exercise.

Correlation of Magnetic Resonance Imaging Measures of Rotator Cuff Intramuscular Fatty Infiltration to Shoulder Strength and Range of Motion in Older Adults

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Background: 25% of adults >60 years have rotator cuff (RC) tear; most commonly supraspinatus tendon tear (STT). Shoulder strength, range of motion (ROM) and RC intramuscular fatty infiltration (FI) on magnetic resonance imaging (MRI) are major parameters affecting clinical decisions to maintain functional independence in older adults. The correlation of FI with shoulder strength and ROM is poorly understood.

Purpose: To determine the correlation of supraspinatus Goutallier grade (GG) and fat fraction (FF) with shoulder strength and ROM in a convenience sample of older adults.

Methods: Prospective recruitment over 12 months (N=32; median age, 66.0 years; mean age 62.8±9.5 years; 53% male; 47% full-thickness STT). The cross-sectional study included a questionnaire; shoulder MRI; examination of abduction strength (abd-strength), abduction ROM (abd-ROM) and forward flexion ROM (ff-ROM). Two blinded radiologists rated supraspinatus GG on T1-weighted MRI. Two blinded radiology residents measured supraspinatus FF on 6-point-Dixon-MRI-fat-fraction map. Descriptive, analysis of covariance, correlative and reliability analyses were performed.

Results: Mean GG and mean FF were 0.66±0.65 and 5.08±4.24%, respectively. Examination means: abd-strength, 10.4±4.1 lbs.; abd-ROM, 121.3±32.1°; ff-ROM 142.7±33.3°. There were no significant GG*sex interactions or FF*sex interactions for abd-strength, abd-ROM or ff-ROM. Inverse correlation existed for FF: abd-strength ($r=-0.454$; $p=0.013$), abd-ROM ($r=-0.468$; $p=0.009$) and ff-ROM ($r=-0.505$; $p=0.005$). GG showed weak correlation without significance for same measures. Inter-rater reliability: FF (intraclass correlation coefficient: 0.903); GG (kappa: 0.178).

Conclusion: Our study suggests that supraspinatus quantitative fat fraction has stronger correlation to shoulder strength and ROM, and higher inter-rater reliability, than semi-quantitative Goutallier grade on MRI.

Truncated Oxidized Phospholipids is a Factor Exacerbating ALI in the Aging Lungs

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As mechanisms controlling redox homeostasis become impaired with aging, exaggerated oxidant stress may cause disproportional oxidation of the cell membranes and circulating phospholipids, leading to formation of truncated oxidized phospholipid products (TR-OxPLs), which exhibit deleterious effects. We tested a role of elevated TR-OxPL as a factor exacerbating inflammation and lung barrier dysfunction in the animal model of aging. Mass Spectrometry analysis of TR-OxPL species in young (2-4 m.o.) and aging (18-24 m.o.) mice revealed elevated basal levels of several products (POVPC, PGPC, lyso-PC, PONPC, PazPC, KOdiAPC and others) in the aged lungs. Intratracheal injection of bacterial lipopolysaccharide (LPS) caused increased generation of TR-OxPLs in the lungs, but not in the liver, with higher levels detected in the aged group. In addition, OxPLs clearance from the lung tissue after LPS challenge was delayed in the aged group. The impact of TR-OxPLs on endothelial cell (EC) barrier compromise under inflammatory conditions was further evaluated in the two-hit cell culture model of ALI. Cell co-treatment with low dose TR-OxPLs augmented EC permeability caused by cytokine mixture. Deleterious effects of TR-OxPLs on inflamed EC were associated with further weakening of cell junctions and more robust EC hyperpermeability. Intratracheal injection of aged mice with TNF- α caused more pronounced elevation of cell counts and protein content in BAL samples. Interestingly, i.v. administration of low POVPC doses which did not affect BAL parameters alone in young mice in combination with i.t. TNF- α challenge augmented lung injury to the levels observed in aged mice stimulated with TNF α alone. Inhibition of TR-OxPLs generation by ectopic expression of phospholipid-specific PAF-acetyl hydrolase-2 (PAFAH2) or by PAFAH2 pharmacological inhibitor rescued EC dysfunction caused by cytokine mixture. Furthermore, PAFAH2 inhibition exacerbated TNF- α -induced lung injury *in vivo*. These results demonstrate age-dependent increase in TR-OxPLs production under basal conditions and augmented TR-OxPLs generation upon inflammatory stimulation suggesting a major role for elevated TR-OxPLs in more severe ALI and delayed resolution in aging lungs.

Induction of Distinct *S. Typhi* Specific Memory T cell Responses in the Terminal Ileum Mucosa of Elderly Volunteers Following Oral Ty21a Immunization

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Mucosal infections represent a common cause of morbidity and mortality in the elderly. Most human immunosenescence studies primarily use peripheral blood; age-associated changes in mucosal tissues are very limited. For example, little is known regarding the generation of CD4 and CD8 T cells at mucosal sites in the elderly following oral immunization. Here, we compared *S. Typhi* specific responses of terminal ileum (TI) lamina propria mononuclear cells (LPMC) CD4+ and CD8+ T memory (T_M) isolated from elderly (>60 yrs old) and adult (<60 yrs) volunteers following oral attenuated Ty21a typhoid vaccination. Oral Ty21a immunization elicited distinct *S. Typhi*-specific responses in elderly volunteers, denoted by significantly lower *S. Typhi* specific (i) CD8+ $T_{effector/memory}$ (T_{EM})(CD107a and IL-2) and CD45RA+ T_{EM} (T_{EMRA}) (CD107a, IL-17A and IL-2) responses and (ii) CD4+ T_{EM} (IFN γ , IL-17A and MIP1 β), $T_{central/memory}$ (T_{CM})(CD107a, IFN γ and MIP1 β) and T_{EMRA} (CD107a) responses. Finally, we compared elderly and adult tissue resident memory T cells (CD4+ T_{RM} and CD8+ T_{RM}) responses following Ty21a immunization. Interestingly, CD8+ T_{RM} from elderly volunteers produce significantly lower levels of *S. Typhi* specific IL-17A than their adult counterparts. However, CD4+ T_{RM} produced significantly lower levels of *S. Typhi* specific IFN γ , IL-2 and IL-17A in the elderly than in adults. This study provides the first evidence of decreased *S. Typhi* specific CD4+ and CD8+ T_M and T_{RM} responses terminal ileum mucosa from elderly following Ty21a immunization, adding valuable information which might impact future vaccine design and development targeted to the elderly.

Expression of the ProSAAS Chaperone Reduces Cellular hAPP Content and Abeta Secretion

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Brain chaperone proteins are known to be cytoprotective against toxic protein aggregates in various neurodegenerative diseases; for example, in blocking the aggregation of amyloid beta (Abeta) *in vitro*, a process implicated in Alzheimer's Disease. Secretory pathway chaperones, such as the small neural/endocrine-specific chaperone proSAAS, may have the ability to prevent, intercept, and blunt the toxicity of extracellular aggregates prior to entry into the cell. However, it is unclear what role secretory chaperone proteins play in the trafficking and secretion of aggregation-prone proteins such as amyloid protein precursor (APP), the precursor to ABeta. In the present work we sought to determine how proSAAS affects the production and secretion of ABeta. In Neuro2A cells expressing the APP-Swedish mutant, we find that overexpression of proSAAS results in a sharp reduction of cellular APP content as well as its downstream cleavage products, including ABeta and APP-sAlpha. qPCR and cycloheximide chase studies indicate that this proSAAS effect is not due to decreased APP expression, but rather to increased protein turnover. We hypothesize that during transit within the secretory pathway, proSAAS acts to target intracellular APP to a degradative pathway such as the lysosome or proteasome, thereby reducing the amount of Abeta secreted.

Factors Influencing Staff-Resident Interactions in Nursing Homes

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Background: Staff-resident interaction is an integral part of daily life of nursing home residents and has an influence on residents' well-being. However, less is known about the factors that influence these interactions.

Aim: The purpose of this study was to describe the quality of interaction between staff and residents with dementia in nursing homes, and explore the factors associated with 'positive' and 'negative/neutral' interactions.

Method: This cross-sectional analysis utilized baseline data from the first two cohorts in a randomized clinical trial, EIT-4-BPSD, including 338 residents from 35 nursing homes. Generalized linear mixed model (GLMM) was used to explore the factors associated with interactions. It was hypothesized that the resident factors (age, gender, race, marital status, cognition, comorbidities, depressive symptoms, agitation, functional status) and facility factors (facility ownership, facility size, RN hours, LPN hours, CNA hours, and star rating) would be associated with staff-resident interactions.

Results: The staff-resident interactions were mostly positive. Overall, the models for 'positive interactions' and 'negative/neutral interactions' correctly classified 82.8% and 85.3% of the cases respectively. Both 'positive' and 'negative/neutral' interactions were significantly associated with marital status, and profit status of the facility. Being married and living in a not for profit facility was associated with lower odds of positive interaction and higher odds of negative/neutral interaction.

Conclusion: There is some evidence that marital status influences staff-resident interactions and that profit status of facilities are associated with staff resident interactions. Future studies could explore staff factors such as consistent assignment, job satisfaction, staff characteristics, and training.

One brick at a time”: Vietnam Era Veterans’ Conceptualizations of Recovery in PTSD

Ivana T. Alexander, MSW, LGSW; Amanda D. Peeples, PhD and Sera Havrilla, MS, LGPC

Vietnam era veterans suffer unique and significant challenges related to their physical and mental health that can be linked to their military service. Veterans Health Administration (VHA) data estimates that 18% of Vietnam era veterans meet the full diagnostic criteria for PTSD. This figure is much larger when considering veterans who exhibit clinically significant PTSD symptoms. Despite the existence of evidence-based practices for the treatment of PTSD, little research has focused specifically on Vietnam era veterans’ beliefs about engaging with trauma-focused therapy. This poster presents Vietnam era veterans’ conceptualizations of PTSD recovery. It reflects their beliefs, expectations, and perceived limitations related to the recovery trajectory and its impact on their well-being. The findings are drawn from a qualitative pilot study with Vietnam era veterans who have had recent engagement with a trauma-focused treatment program at a VA Medical Center. The veterans (n=12) each participated in a two-interview research protocol that examined narratives related to their thoughts, feelings, and impressions of treatment and recovery in PTSD.

Choosing OTC Medications Wisely: Developing and Evaluating an Educational Outreach Program for Community Dwelling Older Adults

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Purpose: Over-the-counter (OTC) medications are easily accessible to patients. In our growing older adult population, OTC medication misuse and adverse effects are a major concern. The primary objective of this study is to evaluate the change in knowledge, skills, attitudes, and intended behaviors of older adults and caregivers to make informed decisions about OTC medication use after participating in an educational program on choosing OTC medications wisely. The secondary objective is to evaluate the understandability and actionability of an OTC education brochure using the Patient Education Materials Assessment Tool for Printable Materials (PEMAT-P).

Methods: This study will be submitted to the Institutional Review Board for approval. The project will occur in 3 phases. Phase 1 is determining the content for the program through semi-structured interviews with key informants (patients, caregivers, geriatric healthcare providers, and the poison center). Phase 2 is developing the live program content and printable materials from the information gathered in Phase 1. The printable materials will be assessed using the PEMAT-P. Phase 3 is implementing the educational program outreaches at different senior living communities. On the day of the outreach, the participants will be given an anonymous paired pre- and post- survey containing questions assessing knowledge, skills, attitudes, and intended behaviors related to OTC medication use and decision-making. The surveys will be assessed for a 20% change from baseline for each of the domains using paired student t-tests.

Results: Research in progress.

Conclusion: Research in progress.

HPV as a Culprit of Oropharyngeal Cancer in the Elderly Man

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Introduction:

The clinical presentations of oropharyngeal tumors vary depending on anatomical site. We describe an uncommon case of tonsil tumor, presenting as ear itching.

Case:

84 yo man with extensive smoking history/COPD as well as HTN, Type 2 DM presented with a year of chronic right ear (and occasional right neck) pruritus and odynophagia, without: dysphagia, otalgia, otorrhea, fever, cough, or history of ear infections/instrumentation. On exam, auditory canals and TMs were normal, as were naso/oropharynx, excluding poor dentition. Although no cervical lymphadenopathy was noted, asymmetric enlargement/edema of right tonsil was noted (without exudate or ulceration) extending into oropharynx. CT neck w/ contrast revealed large (2.6x2.5x4.0cm) right submucosal oropharyngeal mass extending to the right soft palate and base of tongue, without cervical lymphadenopathy. Biopsy revealed invasive HPV-related oropharyngeal squamous cell carcinoma, with diffuse strong staining for P16.

Discussion:

Symptoms of oropharyngeal tumor are often related to primary mass effect, including invasion into neighboring structures (including cranial nerves which may cause referred symptoms). Because of insidious and nonspecific presentation as well as difficulties inherent in visualization in a primary care setting, early ENT evaluation is critical. Despite previous declines in tobacco and ETOH use, HPV16 is increasingly recognized as an etiology for oropharyngeal SCC. This is particularly relevant among older individuals, where the proportion of cancers caused by HPV is increasing. Given the unique challenges related to anatomic location and morbidity associated with treatment in elderly population early work up and ENT referral can help in the better outcome.

A National Survey of Medicare Beneficiary Perspectives on the Medicare Part D Medication Therapy Management (MTM) Standardized Format

Joshua Chou, PharmD; Catherine Cooke, PharmD, BCPS, PAHM; Kriti Sharma, MD, MPH and Nicole Brandt, PharmD

Background: The Medication Therapy Management (MTM) Standardized Format's (SF) length, cost, static nature, and lack of integration into electronic health records limit its utility. Limited research exists on Medicare beneficiaries' opinions and perceptions of the SF.

Objective: The study's objective is to evaluate Medicare beneficiaries' perspectives regarding SF utility to inform potential modifications for optimal use.

Methods: Medicare Part D plans distributed a survey to beneficiaries receiving Comprehensive Medication Review (CMR) in the past year. Descriptive statistics are reported for demographic information, health status, perceived value and helpfulness of the SF and its components, updates to the SF, alternate formatting, and integration into health records.

Results: A total of 9975 surveys were sent to beneficiaries. Of the 434 unduplicated respondents, 58.5% were 65-84 years, 60% were white, and 49.1% had college education or higher. About 40.8-44.9% of beneficiaries felt the SF was very good/excellent in improving their medication management. Helpful sections included "What we talked about," medication name, strength, and how/why I use the medication. If available, 54.6% of respondents would use a wallet card of their medication list. About 30% and 26% of beneficiaries shared the SF with their doctor and relatives, respectively.

Conclusions: Fewer than half of respondents perceived the SF as very good/excellent in their medication management. Work is needed to improve SF utility and integration into healthcare delivery. This can be achieved by allowing flexibility in SF design while requiring elements identified as helpful to the beneficiary and removal of less helpful sections.

Characteristics Associated with Intentional Opioid Overdose in Medicare Beneficiaries

Aida Kuzucan, PharmD, PhD; Danya M. Qato, PharmD, MPH, PhD and Linda Simoni-Wastila, BSPHarm, MSPH, PhD

Background: Few studies have identified characteristics of older and disabled adults experiencing intentional opioid overdoses (OOD). We sought to define sociodemographic, clinical, and opioid use characteristics of Medicare beneficiaries with diagnoses of intentional or unintentional OOD.

Methods: Using a validated algorithm, fatal and non-fatal OODs among Medicare beneficiaries occurring in inpatient and emergency department settings were identified from a 5% sample of nationally-representative claims from 1/1/2010-12/31/2013. Inclusion criteria included ≥ 10 months Medicare Parts A, B, and D coverage in the year prior to the OOD. Covariates included sociodemographics (race, sex, age, original reason for entitlement), comorbidities (physical, psychiatric, substance use disorder), reason for Medicare entitlement, and other prescription medication use (analgesics, muscle relaxants, psychotherapeutics). We compared characteristics of intentional and unintentional OOD events using chi-square statistics. Logistic regression analysis was employed to determine the association of covariates with the likelihood of intentional OOD versus non-intentional OOD.

Results: Our sample consisted of 228,025 Medicare beneficiaries, 6,994 experienced an OOD; 10.6% were intentional and 89.4% unintentional. Relative to beneficiaries with unintentional OOD, more individuals with intentional OOD had no opioid prescription in the study period (39.9% vs. 46.8%, $p=0.0004$). In our adjusted model, the odds of intentional vs. unintentional OOD was lower among beneficiaries age ≥ 65 versus age < 65 (OR=0.22; 95%CI=0.16-0.30), Black versus White (OR=0.59; 95%CI=0.42-0.82), and with opioid therapy > 90 days versus < 90 days (OR=0.65; 95%CI=0.52-0.80). The odds of mental illness diagnosis was almost 5 times higher among intentional vs. unintentional OOD groups (OR=4.86; 95%CI=3.912-6.037).

Conclusions: One in ten OOD events among Medicare beneficiaries was intentional. Shorter duration of opioid therapy and mental illness may be associated with increased risk of intentional OOD. Findings suggest interventions aimed at preventing OOD should consider intentionality and include mental health support particularly among beneficiaries with psychiatric disorders.

Healthcare Resource Utilization Associated with Parkinson's disease: A Longitudinal Study

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Objective: Longitudinal information on healthcare resource utilization (HcRU) is important given that Parkinson's disease (PD) evolves over time. This study's purpose was to investigate differences in HcRU for PD cases and controls over time.

Methods: This retrospective study utilized the Medicare Chronic Condition Data Warehouse (CCW) 5% from 2005 to 2015 to identify PD cases. We matched cases to controls based on age, race, gender and comorbidities. Differences in HcRU were assessed over a 10-year follow-up period between PD cases and controls using summary statistics.

Results: The matched sample consisted of 15,172 cases & 15,172 controls. Among those with 1 year of follow up, a higher proportion of PD cases experienced an inpatient hospitalization (20% vs. 10%, p-value: < 0.01). A similar pattern existed among those with 9 years of follow-up (56% vs. 43%, p-value: < 0.01). We observed a similar pattern for SNF stays based on 1 year of follow-up (24% vs. 7%, p-value: < 0.01) and 9 years of follow-up (51% vs 24%, p-value: < 0.01). PD cases displayed increased HcRU with longer follow-up periods. For PD cases, the median number of SNF stays was 0 among those with 1 year of follow-up and 4 among those with 9 years of follow-up, compared to controls where the median number of SNF stays remained 0 across the periods.

Conclusions: We characterized HcRU among a cohort of Medicare beneficiaries with and without Parkinson's disease – related claims. Over time, PD cases consistently displayed higher HcRU as compared to controls.

A Longitudinal Examination of Progression-Related Events among Medicare Beneficiaries with and without Parkinson's disease

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Objective: The purpose of this study is to characterize Parkinson's disease (PD) progression-related events over time among PD cases and compare to PD controls.

Methods: This retrospective cohort study utilized administrative medical claims data from 2005 to 2015 for Medicare beneficiaries represented in the Medicare Chronic Condition Data Warehouse (CCW) 5% sample. We matched cases to controls based on age, race, gender and comorbidities. Cases and controls were required to have at least 7 years of follow-up. We captured the presence of mental health disorders, autonomic dysfunction and falls or fractures (FoF) in each year of follow-up. We compared these progression-related events between cases and controls using Pearson's chi-square tests.

Results: The matched sample consisted of 3,570 individuals. The occurrence of events among cases in years 1, 3, 5 and 7 was as follows. Autonomic dysfunction: 69%, 68%, 73%, 75%; mental health disorders: 53%, 52%, 59%, 66%; FoF: 21%, 18%, 20%, 22%; respectively. The occurrence of all three events was higher among cases compared to controls in each year. The largest difference between cases and controls was observed in year 1: autonomic dysfunction (69% vs. 45%, $p<0.01$); mental health disorders (53% vs. 18%, $p<0.01$); FoF (21% vs. 9%, $p<0.01$).

Conclusions: Progression-related events occurred at significantly higher rates among PD cases compared to controls in each year of follow-up. The differences between cases and controls were highest in year 1. Among cases, the largest increase in autonomic dysfunction and mental health disorders occurred between years 3 and 5.

Predictors of Depressive Symptoms in Nursing Home Residents with Severe Cognitive Impairment

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Introduction: Depressive symptoms are common among residents who live in long-term care and can have a negative impact on health outcomes. Factors such as gender, marital status, number of comorbidities, race, history of falls, functional status, and pain are associated with depressive symptoms among nursing home residents who are cognitively intact or mildly impaired. Less is known about residents with moderate to severe cognitive impairment. The purpose of this study was to determine the factors associated with depressive symptoms among nursing home residents with moderate to severe cognitive impairment.

Methods: This study was a secondary data analysis using baseline data from the Function and Behavior Focused Care randomized control trial. Descriptive statistics describe the sample. Controlling for age, gender, number of comorbidities, marital status, and race, stepwise regression was used to test for relationships between history of falls, functional status (Barthel Index), and use of opioids with the outcome variable of depression (Cornell Scale for Depression in Dementia).

Results: On average, participants were 83 (SD=10.08) years old, mostly female (72%), Caucasian (60%), unmarried (65%), and had moderate functional impairment (Barthel Index 43.64, SD:25.30). A history of falls ($b=1.368$; $p=.007$) and female gender ($b=1.724$; $p=.002$) were significantly associated with depressive symptoms. Functional status, comorbidities, race, and use of opioids were not significant. The model explained a total of 8.8% of the variance.

Conclusion: A prior history of falls is significantly associated with depression in nursing home residents with moderate to severe cognitive impairment. Study limitations include being a secondary data analysis with a homogeneous sample. Despite these limitations, the findings from this study provide additional information about factors associated and not associated with depressive symptoms among nursing home residents with moderate to severe dementia.

Identifying Barriers to Implementing Antimicrobial Stewardship in Maryland Nursing Facilities

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Objectives: National organizations have developed guidelines and tools for antimicrobial stewardship, but there is a need to effectively translate these into actionable, measurable, and impactful programs tailored to the needs of the 230 long-term care facilities in Maryland. The purpose of this study is to identify, prioritize, and characterize the barriers to implementing antimicrobial stewardship programs in long-term care facilities across the state, with a focus on the assessment and management of urinary tract infections.

Methods: An electronic survey was distributed to healthcare providers and administrators involved with antimicrobial stewardship activities who provide post-acute long-term care services.

Results: Preliminary results to date reveal that, among the 10 respondents, the percentage of staff members who have received training in infection prevention and control ranged from zero to 100%, despite the common (80%) belief that there are sufficient funds and time necessary for training. Most facilities (80%) do not utilize infectious disease consults or have an infectious disease specialist. Only three respondents completed the survey in its entirety. All three are compliant with most current federal guidelines and regulations, utilize antibiograms, and collect antibiotic use data; 1/7 of the incomplete survey respondents indicated 0% compliance with these Federal requirements. One of three facilities does not collect data about adverse events. All three have policies and protocols for the management of urinary tract infections, including at the point of prescribing. All process urine cultures 24/7 and receive antibiotic sensitivities, but one does not have access to a specialist to help interpret the results.

Implications: These findings suggest that while most facilities have established antimicrobial stewardship programs, not all facilities have optimal practices. In particular, there is limited access to individuals who have received training and/or specialize in infectious disease.

Trends in Insomnia Prescription Medication Use among Medicare Beneficiaries, 2006-2013

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Introduction: Traditional pharmacotherapy for insomnia has known adverse outcomes among older adults, including falls and cognitive impairment. However, few studies have characterized longitudinal insomnia-related medication trends among Medicare beneficiaries. These characteristics are of particular interest given the recent (2012) inclusion of benzodiazepines in the Medicare prescription drug formulary. The objective of this study was to characterize trends in insomnia-related prescription medication use among Medicare beneficiaries over a seven-year period.

Methods: We conducted a time-series analysis to estimate the annual prevalence of use of insomnia medications using a 5% sample of Medicare fee-for-service beneficiaries from 2006-2013. Insomnia medication use (defined as at least 1 fill annually) was identified by searching the Part D prescription drug claims and included insomnia-related medication classes and drugs: barbiturates, benzodiazepines, chloral hydrate, hydroxyzine, non-benzodiazepine sedative hypnotics (NBSH), and sedating anti-depressants.

Results: Prevalence of insomnia medication use ranged from 20.8% in 2006 to 23.4% in 2013 ($p > .10$). Benzodiazepine use increased from 0.5% in 2012 to 8.0% in 2013 ($p = 0.03$). Use of sedating antidepressants and NBSH decreased modestly from 9% and 8%, respectively, in 2006 through 2013. Prevalence of sedating antidepressant, NBSH, and hydroxyzine use was higher among women than men ($p < 0.001$ for all). Benzodiazepine and sedating antidepressant use was most common among those age < 65 and ≥ 85 years. NBSH use was most common among those age < 65 years. Use of all drugs was similar among those ages 65 – 74 years and 75 – 84 years.

Conclusions: Prevalence of insomnia medication use remained high among Medicare beneficiaries from 2006 – 2013, particularly among women. Benzodiazepine use increased sharply following inclusion in the Medicare formulary. Future studies should examine population-level outcomes associated with this increased use of benzodiazepines.

Benign or Malignant, a Difficult Question

Hafiz Rehman, MD and Maryam Movassaghian, MD

Background: Lung cancer has a 5 year survival of 18.6 % increasing to 56 % when localized. Pulmonary nodules are detected in screening CTs at a rate of 8–51% (1.1-12%, malignant) presenting the opportunity of early diagnosis.

Fleischner's society guidelines balances benefits of early diagnosis and harms of diagnostic interventions. We present a case of incidental PNs with missed diagnosis indicating limitations in standard of care.

Case Description: Our pt. is a 73 Y O M with a PMH of CAD, HTN, smoking, asbestos exposure and incidental PNs (detected 2016). He was followed via 3 CTs done 08/2016, 11/2016 and 05/2017 with PNs in RLL partially calcified, 2.4x1.7 cm (stable) and LUL (decreased in size 9.8 mm - 6.5 mm) during follow up. In 08/2017, the patient presented with right sided weakness and on brain MRI had an 18 mm lesion in the pons treated as a Brain abscess with Abx. The failure of the " abscess " to resolve prompted biopsy of the lesion showing adenocarcinoma leading to diagnosis of NSCLC with brain metastasis in 04/2018. Brain radiation had poor response and patient was transitioned to inpatient hospice in 11/2018.

Conclusion/Discussion: This case highlights limitations of Fleischner's guidelines and the potential of further risk stratification possibly by using Labs (ESR and CRP) and alarm features (weight loss, decreased appetite) into a very high risk category requiring a more aggressive workup. Potentially lifesaving treatment could be offered in cases such as the one reported.

Risk of Falls and Fractures Associated With Concomitant Opioid and Sedative Use Among Medicare Beneficiaries With Chronic Obstructive Pulmonary Disease

Tham T Le MPH; Siyeon Park PharmD and Linda Simoni-Wastila PhD

Background: Although opioids and sedatives are frequently prescribed to older adults with chronic obstructive pulmonary disease (COPD), little research has examined how concomitant use of these drug classes contributes to falls and fractures in this population.

Methods: This retrospective study used a 5% nationally-representative sample of Medicare beneficiaries from 2010-2013 aged 65 or older with COPD and opioid prescription. We excluded beneficiaries in hospice or long-term care, and those with cancer diagnoses during the study period. The index date is the first date of opioid prescription identified the data with a six-month washout period. Beneficiaries were required to have continuous Medicare Parts A, B, and D enrollment for six months pre- and post- index or until death. Main exposures were opioids only or opioids+sedatives, measured as total days overlap between opioids and sedatives. Primary outcomes were falls/fractures requiring hospitalization or emergency room visit. Logistic regression was used to estimate odds of falls/fractures, adjusting for covariates.

Results: Among 6,595 beneficiaries meeting eligibility criteria, the median age was 80; 66% were female and 84% were white. More than 1 in 10 (n=731) beneficiaries had concomitant opioid+sedative use. Following opioid initiation, there were 229 fall/fracture events. Odds of falls/fractures increased 2.6 times among beneficiaries with 20-30 days concomitant use relative to opioid-only use (95%CI=1.2-5.5), but did not increase among those with <20 and >30 days of concomitant use (ORs=0.5, 1.0, and 0.8, respectively).

Conclusions: Results indicated an increased risk of falls/fractures as duration of concomitant use increased to 20-30 days, suggesting extra caution for patients receiving concomitant therapy beyond short-term.

Factors Associated with a Composite Score of Behavioral and Psychological Symptoms of Dementia

Jungmin Yoon, PhD Candidate, MSN, RN; Elizabeth Galik PhD, CRNP, FAAN, FAANP and Barbara Resnick PhD, RN, CRNP, FAAN, FAANP

Introduction: Behavioral and psychological symptoms of dementia (BPSD) include many different symptoms that often occur concurrently. However, there is limited research exploring factors of a composite BPSD as opposed to a single behavior symptom.

Aim: To explore frequency of composite BPSD and factors associated with multiple symptoms

Method: This secondary data analysis used baseline data from the Function and Behavior Focused Care intervention study, which included 366 residents with moderate to severe cognitive impairment in 12 nursing homes. The composite BPSD was calculated by combining symptoms of apathy, agitation, aggressive behavior, inappropriate or disruptive vocalization, wandering, repetitive behaviors, sexually inappropriate behaviors, and resistiveness to care. Hierarchical multiple regression was used for data analysis.

Results: Over 60% of study participants had two or more behavioral symptoms. Controlling for age, gender, race, education and number of medical co-morbidities, cognitive function and adequacy of pain management were associated with composite BPSD scores. One unit increase in the cognitive function score predicted a decrease in the composite BPSD score by 10.4% ($p < .001$). Compared to those whose pain were managed with medications, participants without pain medications had a higher composite BPSD score by 66.0% ($p = .010$).

Discussion: Optimizing cognitive status and pain management should be considered as ways to prevent BPSD. More research is needed to identify factors that are associated with composite versus single BPSD.

Implications for practice: Interventions should include training for care providers as well as engagement in physical and functional activities for individuals with severe cognitive impairment to effectively manage multiple behavioral symptoms.

Social Capital and Health Status: Race/Ethnicity Differences in the Health and Retirement Study, 2006 to 2014

Kayleigh Majercak, MS; Johana Almansa, MS and Ester Villalonga-Olives, PhD

Objective: We examined the longitudinal effects of social capital on health status and the impact of race/ethnicity as a moderator.

Methods: We used the Health and Retirement Study data (years 2006-2014, n=18,859), a nationally representative panel of US adults aged ≥ 50 years. A longitudinal structural equation multilevel analysis to investigate the relationship between social capital indicators (neighborhood social cohesion, neighborhood physical disorder, positive social support and negative social support) on health status accounting for age, sex, education and race/ethnicity.

Results: Results indicated that the variability of social capital between persons is higher than the changes over time within persons. Random intercepts ranged from -0.19 to 0.25 indicating that individuals with an overall higher level of positive social support and neighborhood social cohesion have higher levels of health status. Stratifying by race/ethnicity, the variability of social capital was higher for between persons. Neighborhood social cohesion and neighborhood physical disorder were strongly related to health status in Whites. The person-level correlations with health status were lower for neighborhood social cohesion and neighborhood physical disorder for Hispanics (0.15 and -0.11) and African Americans (0.19 and -0.08) compared to Whites (0.26 and -0.22). Hispanics showed higher correlations of positive social support (0.24) compared to Whites (0.12).

Conclusions: The between persons variability suggest that when planning social capital interventions, the target should be at the context level. Multilevel interventions that address specific types of social capital are crucial to increase the health status of older adults and to eliminate race/ethnic disparities.

Accelerometry-Based Quantitative Analysis of Mobility in Parkinson Disease

Rainer von Coelln, DrMed; Katrina Schrader, MA; Erik Barr; Ann Gruber-Baldini, PhD and Lisa Shulman, MD

Objective: To identify quantitative measures of mobility that correlate with the severity of Parkinson disease (PD), using a wearable triaxial accelerometer/gyroscope (Dynaport MT; DMT).

Background: Gait and mobility impairment are cardinal features of PD. Quantitative mobility measures using a wearable sensor allow detailed characterization of mobility. It is unclear which specific measures are associated with PD severity.

Methods: PD patients performed 8ft walk and timed-up-and-go-test (TUG), wearing the DMT on the lower back. Patients were stratified by disease severity, using Hoehn & Yahr (HY) stage, Unified Parkinson's Disease Rating Scale (UPDRS), and Older Americans Resource and Services disability scale (OARS). Patient Reported Outcome Measures (PROMIS-29) and Montreal Cognitive Assessment were completed to assess for non-motor features. Statistical analysis included ANOVA and Tukey post hoc test.

Results: Preliminary results are based on 89 patients (61% male, average age 67.3) with average motor and total UPDRS of 26.2 and 39.9, respectively, and stratified by HY stage (HY 1-2, n=47; HY 2.5, n=21; HY 3, n=12; HY 4, n=9). Gait speed, regularity, step/stride duration, and power spectral density (PSD) measures, as well as TUG measures of sit-to-stand/stand-to-sit-transitions and turning were significantly correlated with PD severity. Furthermore, DMT gait measures are correlated with depression and cognition. Analysis of a larger sample size, as well as additional motor tasks is currently ongoing.

Conclusions: Wearable biosensors enable quantitative gait analysis of PD patients during routine clinic visits. Several gait parameters are associated with PD severity, and have potential as a novel biomarkers for PD progression.

Identifying Pathways from Neighborhood Environments to Hypertension in Baltimore City

Nicole Mattocks, MSW; Sarah Holmes, MSW; Roberto J. Millar, BA; Sol Baik, MA and Ji Hyang Cheon

One strategy to reduce cardiovascular disease (CVD) incidence is to target prevalent and well-established clinical risk factors, such as hypertension. While the majority of research on CVD risk factors has focused on examining the role of individual predictors (e.g., genetics, diet, smoking), in recent years, scholars are increasingly recognizing the importance of social determinants of cardiovascular health, such as neighborhood environments. Interventions targeting neighborhoods may help to reduce risk factors for CVD, yet current empirical evidence is limited. The purpose of this study is to (1) examine associations between modifiable neighborhood characteristics (i.e., physical infrastructure, social environment, disorder) and hypertension, and (2) identify the potential mediating role of health care access, health behaviors, and psychological distress. This was a secondary analysis using quantitative data from two sources: individual-level data from Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) Study Wave 1 (collected 2004-2009) and neighborhood-level data compiled by the Baltimore Neighborhood Indicators Alliance (BNIA). Structural equation modeling was used to test the proposed aims, starting with a measurement model, building in complexity with predictors and mediators, and ending with a direct effects model including covariates. Results for the full model produced excellent model fit statistics ($\chi^2_{(2047)}=2822$, $p<.001$; CFI=.97; RMSEA=.01). Direct associations with neighborhood characteristics, such as perceived access to businesses nearby ($\beta=0.08$, $p < .05$) are mediated by psychological distress ($\beta=0.09$, $p < .01$). These findings suggest potential pathways for modifying urban neighborhood environments to promote health and can inform neighborhood-level interventions aimed at reducing CVD risk.

Testing the Reliability and Validity of the Resident Satisfaction Index in Assisted Living

Sarah D. Holmes, MSW; Barbara Resnick, PhD, CRNP and Elizabeth Galik, PhD, CRNP

Understanding life satisfaction in assisted living from the residents' perspective is essential for creating supportive environments that are specifically targeted toward the needs and desires of residents. Unfortunately, few measures have been developed and tested to evaluate residents' satisfaction with living in these settings. The purpose of this study was to test the reliability and validity of the Resident Satisfaction Index (RSI) which was designed to measure residents' life satisfaction in assisted living. Baseline data was used from a study testing the dissemination and implementation of function focused care in assisted living. A total of 503 participants from 54 assisted living facilities across three states were included in the sample. Based on Rasch analysis, there was support for item reliability with an item separation of 4.54 and item reliability of 0.95. The INFIT and OUTFIT statistics were all in acceptable range suggesting that each item on the RSI fit the appropriate concept. Differential analysis was done to examine differences in the difficulty of each item by age, gender, and cognition. There were significant and substantive differences identified by gender and cognition for items related to relationships with staff (items 15, 16) and social activities (items 18, 19, 20, 22), although there were no differences by age. Recommendations for changes to the measure in regards to the findings will be discussed. The RSI can be used to evaluate residents' life satisfaction which will help to guide administrators and clinicians in making changes in these settings to increase residents' satisfaction.

Person-Centered Programming for Adult Day Clients with Alzheimer's disease and Related Dementias

Gretchen G. Tucker, MA

The implementation of person-centered care and its positive effects on the quality of life for nursing home and assisted living residents have been well documented. In this paper we compare the person-centered approach to activity programming for participants with Alzheimer's disease and related dementias (ADRD) in two community-based adult medical day centers. Further, we examine how staff members provide meaningful activities and social interaction for clients with ADRD and explore the types of activities conducted, use of physical space, and size and format of activity grouping. This paper concludes with a discussion of the general philosophies of management and activity staffs and how they influence the decision-making process which creates and sustains a person-centered approach to activities for ADRD participants.

Screening for Polypharmacy in the Elderly Population

Brett S. Weir, BSN, RN-BC, PCCN

The over 65 population has increased exposure to polypharmacy, with data showing up to 42% taking five or more medications. Polypharmacy increases the frequency of potentially inappropriate medications (PIM) being prescribed which are associated with adverse drug events (ADEs) and higher healthcare costs. The Screening Tool of Older Persons' Prescriptions (STOPP) and Screening to Alert to Right Treatment (START) criteria have demonstrated effectiveness in identifying PIMs and preventing ADEs. A quality improvement project was completed using the STOPP/START criteria to augment the medication reconciliation process on the general neurology service at a large, academic medical center. During the seven-week implementation, patients over 65 admitted to the service were screened by providers using the tool's criteria. A pharmacist consultation was to be requested for positive findings. Of the 73 patients admitted during the project, 29 were eligible for screening; however, only nine screenings were completed with five (55%) of the patients screening positive resulting in three consults to the clinical pharmacist. Overall compliance with the screening was 31%, falling below the goal of 80%. Use of the STOPP/START tool was evaluated by providers using the System Usability Scale (SUS). The SUS score for using the tool was 86.25 indicating that the criteria were easy to use and a viable option for sustained integration into this process. Despite the low compliance with screening, the presence of a PIM in 55% of the patients screened suggests that this population is at a high risk of polypharmacy exposure and enhanced medication reconciliation is warranted.

Feasibility of Four Square Step Test in Hip Fracture Patients

Heather L. Mutchie; Denise Orwig, PhD; Brock Beamer, MD; Vincent Conroy, PT, DScPT; Jack Guralnik, MD, PhD, MPH; Jay Magaziner, PhD, MS Hyg and Ann Gruber-Baldini PhD

The Four Square Step Test (FSST) is a clinical tool testing dynamic balance for predicting falls in older adults. The FSST has not been widely used in hip fracture patients. The purpose of this study was to assess the feasibility of FSST after hip fracture and consider the impact of cognitive impairment (which is high after hip fracture) on FSST performance.

Baseline data are from an ancillary study of a randomized trial, Community Ambulation Project-Mechanistic Pathways (CAP-MP; n=40). Subjects walked <0.8m/s by \leq 26wks post hip fracture surgery and completion of standard rehabilitation. Cognitive measures included Modified Mini Mental State Examination, Hooper Visual Organization Test, and Trails A&B.

Descriptives, bivariate-correlations, and ANCOVA models tested the association of FSST performance with cognitive measures, demographics, physical function, and fracture-side.

Of the 40 CAP-MP participants, 27(68%) completed the FSST. Of those who did not attempt, 25%(n=3) refused and 74%(n=9) were deemed unsafe or unable. Participants who did complete had slow FSST times (26.85 ± 18.4 s), with 74%(n=20) >15seconds. FSST was significantly ($p \leq .05$) correlated with Hooper($r = -0.45$), Trails A($r = 0.39$), gait speed($r = -0.37$), fracture-side($r = -0.61$), male sex($r = -0.40$), and age($r = 0.38$). In models of FSST, only fracture side remained significant, with a borderline interaction with Hooper($p = .07$). Those with lower Hooper scores and left side fracture performed slower, while right side fracture performed faster (regardless of Hooper).

Many CAP-MP hip fracture patients were unable (23%) or failed (50%) the FSST. The influence of fracture side and cognition merit further exploration to improve FSST testing in hip fracture patients.

Using PHOTOFOOD and Recall to assess Adherence to Protein Intake in Older Cardiac Surgery Participants

Ameera Chakravarthy, MS, CRNP

Background: Approximately 30 gm's per meal, is critical to maintaining and increasing muscle mass especially for hospitalized older adults. Precise measurement of protein intake is challenging as most estimates are a rough estimate made by clinical staff on delivered meals. Without reliable and valid ways in which to measure protein, it is difficult to test interventions to optimize adherence to a high protein diet.

Objective: The purpose of this pilot study was to evaluate the reliability and validity of an innovative approach to protein intake among hospitalized older adults, PHOTOFOOD as well as to describe protein intake among older adults hospitalized following cardiac surgery.

Methods: The PHOTOFOOD measure involves using a photograph of a meal tray taken before and after consumption. Interrater reliability was based on evaluation of the picture by two independent evaluators. Validity was based on evidence of a relationship between the evaluator's assessment and the participant's recall of protein intake.

Results: 12 older adults were evaluated including 12 meal trays and the mean protein intake was 19 gm's with 81% of the participants ate less than 30 gm's of protein in a given meal. Interrater reliability Cohens Kappa for the evaluators was 0.80 ($P < 0.001$). There was agreement in protein intake between the participant and the evaluator in 83 % of the observations.

Conclusion: This study provided support for the reliability and validity of the PHOTOFOOD measure. The findings confirm poor adherence to the recommended intake of 30 gm's of protein per meal. Anorexia, meal disruptions for diagnostic testing, food preparation factors were some of the reasons for decreased adherence. Future research to consider interventions to overcome barriers and facilitate optimal protein intake.

Engagement in the Creative Arts, Mindfulness, and Resilience in Aging

Robin A. Majeski, PhD, RN

The incidence of chronic disease and functional impairment increases with age and is common among the oldest old (Jaul & Barron, 2017, Tey, Lai, & Teh, 2016). These challenges call for resilience leading to successful aging (Bolton, Praetorius, & Smith-Osborne, 2016, van Abbema et al, 2015, Byun & Jung, 2016, Lavretsky, 2010). Engagement in the creative arts may promote characteristics of resilience such as the ability to construct meaning from one's experience, emotional regulation, heightened cognitive function, and well-being (Hanna, Noelker, & Bienvenu, 2015, Kapstein, Hughes, & Murray, 2018, Barcelos, Teixeira, Riberiro, da Silva, Rodrigues, & Siqueira, 2018, Batt-Rawden, 2010, Chin & Rickard, 2014, Stickley, et al, 2017, Lomas, 2016, Pike, 2013, van Abbema et al, 2015).

While considerable evidence has documented the beneficial effects of engagement in the creative arts for older adults, there has been a dearth of attention paid to formulating conceptual frameworks for understanding these effects and their relationship to resilience in aging (Stickley, et al, 2017, Koch, 2017). Thus, this poster presents a model of Klein's (2018) process of artistic engagement which is significantly expanded by using psychology to more fully explain each step of this process. This expanded model is linked with characteristics of resilience in aging. Last, ways in which mindfulness practices be may used to deepen each step of creative engagement process leading to resilience in aging is presented.

Amazon Echo: Providing Autonomy for the Varying Needs of mNCD Care Recipients and Care Givers

Alison Larsen and Galina Madjaroff, PhD

It is often difficult for a caregiver to address their own needs while they are caring for a loved one with mild cognitive impairment (MCI). In order for a caregiver to ensure the physical security, quality of life and cognitive health of the care recipient, they often neglect their own physical, emotional and cognitive wellbeing leading to a decrease in their own quality of life (Takai, Takahashi, Iwamitsu, Ando, Okazaki, Nakajima, Oishi, & Miyaoka, 2009). Six dyads were recruited from a memory care clinic in Maryland to participate in this study. One individual from each dyad had a mild neurocognitive disorder (mNCD) diagnosis, the care recipient, and relied on the caregiver to help with everyday tasks.

To explore how a voice user interface (VUI) can promote autonomy for both the caregivers and care recipients, an Amazon Alexa was placed in the homes of the dyads for approximately twelve weeks with a one-week familiarization period. A thematic analysis revealed that there were three main themes in the usage data collected from the Amazon Alexa; supporting daily life, entertainment, and providing autonomy. It was found that the Amazon Alexa was different from other current technologies in that it contributes to successful transitions for the care recipients while also benefiting the caregivers by preserving their personhood and overall welfare. Amazon Alexa also supported the relationship between the care recipient and caregiver by providing content for them to talk about through entertainment such as readings from the bible or news headlines. The collected data offers an understanding of future technology development and how to provide autonomy for both caregivers and care recipients.

Augmenting Preconscious Perception and Regulation for Emotionally Demanding Works

Jiaqi Gong, PhD; Fow-Sen Choa, PhD; Charissa Cheah, PhD; Alison Trinkoff, ScDm MPH, RN

Every job entails many demands of an emotional and interpersonal kind. However, the extent to which job demands makes a difference, specifically, the work focused on the emotional well-being of others, such as caregivers, social workers, and teachers. For instance, approximately half physicians, 8% high-school teachers, and 20% social workers reported burnout experiences. Existing technologies have focused on reactively and consciously rehabilitating the potential existing impairment caused by emotion labor rather than proactively and these interventions are administrated too late in a symptom of ill health among employees to be effective. However, a most recent psychological model of emotion regulation has suggested that strategies that intervene at earlier stages of emotion generation tend to require less effort and be more effective than strategies that intervene later.

Therefore, this interdisciplinary team propose a 3-phase project to develop a tool to train the emotionally demanding workers to proactively percept negative job-related factors and to protect themselves through emotion-regulated skills preconsciously thus improving both employee quality of life and employer economic metrics. The first phase involves designing the lab-based experimental environment such as the sensing and modeling system. The second phase involves developing the link between visual and haptic feedback and models of emotion generation and regulation. The third phase will focus on developing the tool with integrated haptic feedback which is scalable in real-world settings under emotionally-demanding situations. Successful completion of this project will provide supporting evidence for a larger study to investigate various job-related factors and emotion models.

Brain-Locomotion Network Connectivity across the Lifespan

Jiaqi Gong PhD; Fow-Sen Choa, PhD and Sanjay Purushotham, PhD

It is widely accepted that promoting a benign cycle between the neurologic functions in the brain and appropriate locomotion practices will develop various benefits for patient populations, such as musculoskeletal and neurodegenerative diseases. Clinical research has been conducted intensively to understand the relationships between locomotion and other brain functions (e.g., cognition, perception) in different patient populations with the goal of developing personalized treatments to promote their good cycles. However, despite centuries of studies in neuroscience and medicine, the mechanisms correlated locomotion and these brain functions and how they are different across individuals remain largely unknown. To address this long-standing puzzle, we propose to examine brain-locomotion network connectivity by using mobile brain/body sensing including electroencephalography (EEG), surface electromyography (sEMG), and high-fidelity inertial sensors, as a development/degenerative process across the lifespan. Healthy participants in different age groups (e.g., preschoolers, grade-schoolers, adolescents, young, middle-aged, and older adults) will be recruited to conduct designed experimental protocols (e.g., dual-task paradigms) to induce observable variations in brain-locomotion network connectivity. Multiscale biomimetic modeling through integrative analysis of the multimodal sensor data will be developed to tests hypothesis with respect to how brain-locomotion network connectivity develops along with age and degenerates along with aging. In addition to generating a fundamental understanding of how brain-locomotion network connectivity across the lifespan, the project could provide a critical first scientific step towards personalized treatment to ameliorate age-related effects.

Online Provision of Part D Medication Therapy Management (MTM) Program Information

Zongtian Tong, PhD PharmD Candidate; Catherine E. Cooke, PharmD, BCPS, PAHM and Nicole J. Brandt, PharmD, MBA, BCPP, CGP, FASCP

Background: Lower rates of beneficiary participation in medication therapy management (MTM) programs may be partly due to their lack of awareness and understanding of the MTM program. To address this, the Centers for Medicare & Medicaid Services (CMS) requires Medicare Part D sponsors to provide online information about their MTM programs.

Objective: To evaluate Part D sponsors' compliance with MTM program website elements that are required and suggested by CMS, and investigate the use of National Institute on Aging (NIA) recommended elements for websites for older adults.

Methods: A random sample of Part D sponsors MTM program websites was selected from a list of approved Part D plan contracts for 2016. Each website was reviewed to determine compliance with CMS Required, CMS Suggested, and Other elements.

Results: Of the 106 unique MTM websites reviewed, 51% were compliant with all of the 14 CMS Required elements. For the three elements in the Other category, 46% of the plan sponsors were compliant. There were 51% of Medicare Advantage Prescription Drug (MA-PD) Plans (n=81), 56% of Medicare-Medicaid Plans (MMPs) (n=9), and 50% of Prescription Drug Plans (PDPs) (n =16) that met all of the elements in the CMS Required category.

Conclusions: Medicare Part D plan sponsors are providing much of the CMS required MTM Program information on their websites. However, only 51% of Part D plan websites are fully compliant and provided all of the CMS required elements on their MTM website.

Problem Solving Skills in Technology Rich Environments and Self-Rated Health Among Adults in the U.S.

Roberto J. Millar, BA, Shalini Sahoo, MA, Takashi Yamashita, PhD, MPH, MA and Phyllis Cummins, PhD

Health literacy, as well as general literacy skills, are linked to health outcomes over the life course. However, the roles of specific literacy domains remain unclear. As healthcare and health communication are rapidly adopting evolving information technology, skills to navigate complex healthcare systems and to utilize the latest health information are critical to promote/maintain one's health. Most individuals face a greater risk of health problems in later life. As such, the purpose of this research is to examine the associations between problem-solving skills in technology-rich environment (PSTRE) and health among a nationally representative sample of middle-aged and older adults in the U.S (N=3,260), and identify potential age differences in these associations. We use data from the 2012/2014 Program for the International Assessment of Adult Competencies (PIAAC). Greater PSTRE scores were associated with better self-rated health (OR = 1.06, $p < 0.01$). PSTRE was only partially predictive of health in some age groups. Lower PSSTRE may deteriorate the existing health disparities over the later life course while greater PSSTRE seems to have a health-promoting effect. Findings from this study highlight the potential of PSSTRE to promote health equality among middle-aged and older adults living in modern technology and information rich societies. The implications and next steps are discussed in depth.

Racial and Ethnic Differences in the Association between Neighborhood Social Environment and Objective Physical Function in Older Adults

Roberto J. Millar, BA

Empirical and theoretical scholarship link neighborhood social environments to health and well being. Few studies link neighborhood-level social processes to performance-based physical function. Furthermore, racial and ethnic differences are widely understudied. The objectives of this study are (1) to examine the association between neighborhood social cohesion and physical disorder on physical function in older adults, and (2) to identify potential racial/ethnic differences in these associations. Data come from round five of the National Health and Aging Trends Study (NHATS; N=5,619). A series of linear regression models were used to predict performance-based physical function based on race/ethnicity and neighborhood characteristics. Neighborhoods with signs of physical disorder were associated with poorer physical function ($p < .05$), while neighborhoods with low social cohesion were not ($p = .06$). Neighborhood physical disorder, and not social cohesion, was associated with poorer physical function in Whites. There was no significant association between either neighborhood characteristic and physical function for Black or Hispanic older adults. Racial and ethnic differences warrant closer investigation in studies of neighborhood effects on health.

Post-Stroke Fatigue as an Indicator of Underlying Bioenergetics Alterations

N. Jennifer Klinedinst, RN, PhD, MPH

Approximately half of stroke survivors suffer from clinically significant fatigue, contributing to poor quality of life, depression, dependency, and increased mortality. The etiology of post-stroke fatigue is not well understood and treatment is limited. This study tested the hypothesis that systemic aerobic energy metabolism, as reflected by platelet oxygen consumption, is negatively associated with fatigue and systemic inflammation is positively associated with fatigue in chronic ischemic stroke survivors. Data on self-reported level of fatigue, platelet oxygen consumption rates (OCR) and plasma inflammatory markers were analyzed from 20 ischemic stroke survivors. DNA copy number for two mitochondrial genes was measured as a marker of platelet mitochondrial content. Basal and protonophore-stimulated maximal platelet OCR showed a biphasic relationship to fatigue. Platelet OCR was negatively associated with low to moderate fatigue but was positively associated with moderate to high fatigue. DNA copy number was not associated with either fatigue or platelet OCR. Fatigue was negatively associated with C-reactive protein but not with other inflammatory markers. Post-stroke fatigue may be indicative of a systemic cellular energy dysfunction that is reflected in platelet energy metabolism. The biphasic relationship of fatigue to platelet OCR may indicate an ineffective bioenergetic compensatory response that has been observed in other pathological states.

Mobility Function among Older Male Veterans: The Impact of Mental Illness

Anjana Muralidharan, PhD; Odessa Addison, DPT, PhD; Steven J. Prior, PhD; Monica C. Serra, PhD; Jamie Giffuni, MA; Lydia Paden, MS; Leslie Katzel, MD, PhD

Objective: Mobility function is a robust predictor of incident disability and mortality among older adults. Emerging evidence indicates that mental illness is associated with decrements in mobility function; the present study examined whether this association is attributable to increased medical illness burden among individuals with mental illness.

Method: Participants (n=185) were older male Veterans (ages 65 and up) enrolled in an outpatient exercise program. Diagnoses were extracted via chart review. The Charlson Comorbidity Index (CCI) was used to quantify medical illness burden. Mental illness was coded as present or absent. Participants completed the following assessments: height/weight, gait speed, 30 second chair stands, six-minute walk (6MW), four-square step test, and Short Physical Performance Battery (SPPB). Controlling for age, body mass index (BMI), and CCI, mental illness was examined as a predictor of each mobility outcome in multiple linear regression models.

Results: Participants were majority African-American (69.2%); 17.3% had a mental illness diagnosis. Overall, the sample was mobility impaired and/or at risk for future declines in mobility function. The addition of mental illness comorbidity significantly increased variance accounted for, for 6MW (R^2 change = .022, $t=2.209$, $p=.028$) and SPPB (R^2 change = .045, $t=3.100$, $p=.002$).

Conclusions: Mental illness comorbidity may contribute to poorer gait speed and lower extremity function among older adults, beyond a correlation with increased medical illness burden. Mobility and lower extremity function may be particularly important targets for intervention among older adults with mental illness.

Traumatic Brain Injury Severity is Associated with Increased Risk of Stroke in Older Adults

Aparna Vadlamani, MPH and Jennifer S. Albrecht, PhD

Traumatic brain injury (TBI) is a significant public health problem among older adults ≥ 65 that resulted in 282,000 hospitalizations and 2.5 million emergency department visits in 2013. Stroke risk is increased following TBI and may contribute to increased disability and poorer recovery in older adults. However, the impact of TBI severity on risk of stroke is unknown. This information can inform appropriate care for older adults post-TBI to minimize subsequent stroke occurrence.

We linked records of older adults treated for TBI at an urban level 1 trauma center between 2006-2010 to their Medicare administrative claims. Our primary outcome was incident stroke post-TBI, defined by ICD9 codes. TBI severity was obtained from the Abbreviated Injury Scale Head score, ranging from 1 (mild injury) to 6 (fatal injury, excluded), and was dichotomized as low (≤ 2) and high (> 2) severity. The association between TBI severity and stroke was estimated using Cox proportional hazards modeling adjusting for variables associated with stroke.

Of 132 subjects with TBI, 67 (51%) had low TBI severity and 65 (49%) had high TBI severity. Absolute risk of stroke following TBI was greater for those in the high TBI severity group vs those with low TBI severity; 25.1 (95%CI 13.4-38.5) vs 3.2 (95%CI 1.3-7.7) stroke cases/100 person-years. High TBI severity was associated with increased risk of stroke compared to low TBI severity (HR 6.68, 95% confidence interval 2.49-17.94), after adjusting for chronic kidney disease. Clinicians should consider close monitoring and prevention efforts for stroke in older adults with severe TBI.

Convincing the Leaders: Perceived Barriers to the Implementation of Nursing Home Culture Change

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Nursing home culture change has been around since the emergence of the Eden Alternative in the early 1990's, yet few long-term care communities use its practices. Culture change practices radically change nursing home operations and organizational structures to make them more person-centered by flattening hierarchies and sharing power with elders and direct care workers. Implementation studies have shown that organizational change is challenging and requires sustained engagement from leadership. The aim of this translational research study was to identify what keeps nursing home leaders from adopting culture change so that barriers could be addressed, resulting in more living communities adopting person-centered culture change practices.

The Maryland Culture Change Coalition conducted a culture change training series across the state in the Summer of 2015 aimed at nursing home administrators and assisted living managers. Exit surveys were given to all participants. Ninety eight participants completed the survey. The most common barriers identified were about regulations and their enforcement, and about the effectiveness of culture change practices.

Together these indicate ongoing concerns with regulations and the application thereof. If administrators are not convinced that culture change practices improve outcomes for older adults then they are less likely to consider making changes that they perceive as threatening to the health of the organization. This suggests a need for more outcomes research, clearer policies, and education for administrators and surveyors.