Abstract: The Physical Performance Test (PPT) has been shown to be a useful tool as a performance-based measure to identify limitations of physical functioning in subjects with asymptomatic carotid disease. The primary purpose of this study is to describe the performance items on the 9-item PPT and provide a brief and practical measurement tool that best identifies potential limitations in persons with asymptomatic carotid artery disease. A total of 59 subjects with asymptomatic carotid artery stenosis of moderate and severe degrees or with occlusion and 129 control subjects with no known disease were selected from a previous published work. The scores and times of each item and the overall total scores on the 9-item PPT were collected for each individual subject. Factor analysis, internal consistency and discriminative validity for patients versus control subjects for the 9-item PPT were evaluated. Rasch analysis was used to identify the subgroup of items that best identify functional limitations in persons with asymptomatic carotid artery disease. The reduced item scale was then reevaluated for factor components, internal consistency and accuracy to identify subjects with asymptomatic carotid artery disease. The results of our study indicated that 3 items did not sufficiently challenge subjects in either the patient or healthy group. Removal of the 3 least challenging items (lifting a book, turning 360 degrees and climbing stairs) resulted in a reduced 6-item PPT with acceptable internal consistency and a more precise factor structure. However, our results showed that the average subject abilities are well above the average difficulty level for the reduced 6-item PPT which indicates a strong ceiling effect. The reduced 6-item PPT appears sufficient to screen for physical perfor
Abstract:
Background: Research related to balance and mobility in older adults has been conducted primarily in lab-based settings with individuals who are community-ambulators. Much less information about balance has been collected from residents of Long Term Care (LTC) facilities, even though they are at greater risk of falls than those who live in the community. The aim of this study was to validate measurements of postural sway in this population using inexpensive accelerometers that can be used in any LTC facility.

Methods: Sixteen subjects independently living in long-term care facilities participated in the study (5M/11F, 87±6 years). An accelerometer placed on the back of the subjects at waist level measured sway in the anterior-posterior (A-P) and medial-lateral (ML) directions. Subjects performed a test consisting of 4 different standing conditions designed to alter the sensory feedback by having subjects stand on level and foam surfaces with eyes open and closed for 30 seconds. The root-mean-square (RMS) of low pass-filtered acceleration for sway in A-P and M-L direction was calculated. To validate the procedures, non-parametric statistics were used to test for the effects of test condition.

Results: Sway increased significantly as the balance conditions became more difficult due to alteration of sensory feedback (p < 0.001). Sway was increased when subjects stood on foam or had eyes closed.

Discussion/Conclusion: The results demonstrate face validity of the measurements. Reliability and responsiveness studies should be conducted to further establish the psychometric properties so that it can be used on a more widespread basis.

Significance: Along with gait speed, measurement of postural sway may be an important biomarker for future mobility disability.
Carolyn Amspaugh, LCSW

Department: Critical Care Medicine  
Affiliation: Nursing  
Current Position: Staff  
Research Interest Areas: Social Work

Research Title:  
Medication Management among Male and Female Caregivers of Patients with Memory Loss

Project Authors:  
Carolyn M. Amspaugh, Lisa K. Tamres, Melissa L. Knox, Jennifer H. Lingler, Mary E. Happ, Jennifer B. Seaman, Judith A. Erlen

Abstract:  
Background  
Family caregivers are integral to enabling patients with memory loss to live at home. Fewer males than females take on this role, and may require different caregiving support. Research comparing differences between male and female caregivers is limited; findings are conflicting on utilization of resources and other support. This study examined differences in medication management between male and female family caregivers.

Methods  
This secondary analysis included 54 caregivers participating in a randomized-clinical trial that sought to improve caregiver medication management. Female (n = 27) and male (n = 27) caregivers were matched on age, race and relationship to patient. We measured medication management errors, use of formal/informal support, co-morbidities, and patient symptom severity. Differences were examined using t-tests and Chi square.

Results  
Both male and female caregivers made an average of 3 medication management errors, reported similar levels of social support (p = .56), and were caring for patients with an average of 8 co-morbidities. Patient behavioral and memory problem scores and cognitive status were equivalent between the two groups. Fewer males (26%) reported receiving help with medications than females (38%), a finding that was statistically significant (p <.001).

Conclusion and Significance  
Despite making as many medication errors as female caregivers, male caregivers were less likely to receive help managing the patient’s medications. Further research is required to develop and test interventions that help male caregivers maximize available support for managing caregiving responsibilities including medication management.
Richard Boyce, PhD

**Department:** Biomedical Informatics
**Affiliation:** Faculty, Center for Pharmaceutical Policy and Prescribing; Faculty, Geriatric Pharmaceutical Outcomes and Gero-Informatics

**Current Position:** Assistant Professor

**Research Interest Areas:** Medication Safety

**Research Support Sources:** Career development award from the National Institute of Aging

**Research Title:**
Empirical Simulation of Nursing Home Populations

**Project Authors:**
Richard Boyce, Jeremy Jao, Steven Handler

**Abstract:**
Objectives: Pharmacoepidemiology methods depend on a deep understanding of the strengths and limitations of a given observational dataset. The objective of this study was to test the feasibility of empirically simulating a nursing home population from drug dispensing, Minimum Dataset 3.0 (MDS), and fall incidence data.

Methods: We loaded data from five UPMC-affiliated nursing homes into the Observational Medical Outcomes Project Common Data Model (CDM). Drug exposure periods were computed by combining drug dispensing data with census information from the MDS. Computed drug exposure periods were validated against drug exposure periods from nursing medication administration records. The OMOP Observational Medical Dataset Simulator version 2 (OSiM2) was used to create an empirical simulation of the nursing home population. OSiM2 "Dashboard" queries generated descriptive statistics and figures that compared drug and condition prevalence and co-occurrence between the real and simulated datasets.

Results: We found exposure periods computed from the combined drug dispensing and MDS data to be much more accurate than the raw dispensing data. Data on 2,859 nursing home residents was loaded into the CDM. The majority of the residents were female (65%) and over the age of 70 (82%). OSiM2 created populations of 3, 6, and 12,000 patients had a good match with the original data set in terms of drug exposures, observations, conditions, and demographics.

Conclusions: The OSiM2 simulator is useful for generating a simulated nursing home population.

Significance: This pilot enables future work that will test the reliability of pharmacepidemiologic methods for studying the association of specific drug exposures with adverse events in UPMC nursing homes.
Victoria Buck, BSN Student

**Department:** University of Pittsburgh School of Nursing  
**Affiliation:** Undergraduate Research Mentorship Program

**Current Position:** BSN Student

**Research Interest Areas:** Nutrition in Older Adults

**Research Support Sources:** NIH, NINR, R01 NR010904

**Research Title:**  
The Association Between Body Mass Index and Diet Plans in Older Adults with Osteoarthritis of Knee and Hypertension

**Project Authors:**  
Victoria Buck, Elizabeth A. Schlenk

**Abstract:**  
Background/Purpose: Diet plans are important in self-managing osteoarthritis and hypertension. The purposes were to describe diet plans and the association between body mass index (BMI) and diet plans using baseline data from an ongoing clinical trial.

Methods: A descriptive correlational design was used. Height and weight were measured following a standardized protocol. Demographic and diet plan data were collected by self-report. Descriptive statistics summarized the data. Contingency tables with Chi Square analysis examined associations between BMI categories and diet plans.

Results: Sixty-five percent (n=69) received a diet recommendation from their health care provider; 22% (n=24) followed a diet plan. Of those with a diet plan, 75% (n=18) were satisfied/very satisfied with it and 63% (n=15) found it easy/very easy to follow. The diet recommendations included: lose weight (77%, n=53), reduce calories (54%, n=37), restrict salt (49%, n=34), control carbohydrates (40%, n=28), and reduce fat (39%, n=27). Ninety-three percent (n=99) reported needing to lose weight, with 58% (n=62) reporting needing to lose more than 20 pounds. Sixty-one percent (n=65) were trying to lose weight, with 33% (n=35) using diet and exercise. Mean BMI was 40.1 (SD=9.0) with 10% (n=11) overweight and 90% (n=96) obese. BMI category was associated with receiving a recommendation to follow a diet to lose weight (Chi Square (df=1)=13.35, p<.0001) and needing to lose weight (Chi Square (df=3)=27.06, p<.0001).

Conclusion: This sample was overweight or obese, and two-thirds received a diet recommendation. Obesity was associated with being advised to follow a weight reducing diet and needing to lose more than 20 pounds.
Abstract:
Study: Although many studies have looked at the association between low bone mineral density (BMD) and fracture risk in older men, none have studied the relationship between multiple sites BMD and risk of multiple types of fractures.

Methods: Using data from the Osteoporotic Fractures in Men (MrOS) study, we studied the association between multiple sites areal (a) and volumetric (v) BMD measurements, and different types of fractures during a 10.2 years follow up period. Risk of fractures was assessed at the hip, wrist, spine, arm, rib/chest/sternum, pelvis/tailbone, leg, hand/finger, skull/face, shoulder, and ankle/foot/toe. After excluding participants with fractures due to severe trauma, cox proportional-hazards modeling was used to assess the risk of fracture in 5910 older men; aBMD was available in all the men and vBMD in 3502 men.

Results: Areal BMD measurements (total spine, total hip, and femoral neck) showed an increased risk of fracture per SD decrease at the hip, wrist, spine, arm, rib/chest/sternum, pelvis/tailbone, shoulder, and ankle/foot/toe with statistically significant Hazard Ratios (HRs) ranging between 1.21 and 3.20. One SD decrease in trabecular bone vBMD (spine, femur, and femoral neck) was associated with more types of fractures than cortical bone vBMD (femur and femoral neck). For femur and femoral neck vBMD measurements, stronger associations were observed for trabecular bone vBMD compared to cortical bone vBMD. A decrease in aBMD and vBMD was also associated with an increased risk of non-trauma non-spine fractures

Conclusion: In older men, the risk of multiple types of fractures increases with a decrease in areal and volumetric BMD.

Significance: Improve the prediction and prevention of fractures in older men.
Abstract:
Background/Purpose: Balance is an important component of physical function in older adults with osteoarthritis of the knee (OAK) and hypertension. The purposes were to describe balance and examine predictors of balance using baseline data from an ongoing clinical trial.

Methods: A descriptive correlational design was used. Height, weight, quadriceps strength by a hand-held dynamometer, and performance-based physical function tests (balance, 6-minute walk, repeated chair stands, and chair sit-and-reach) were assessed following standardized protocols. Physical activity was measured by activity counts from an accelerometer. Demographic and fitness walking data were collected by self-report. Descriptive statistics summarized the data. Pearson correlations and multiple linear regression were performed on predictors of balance.

Results: Participants (N=107) were on average 65 (SD=8) years of age, 73% (n=78) female, 76% (n=81) white, 42% (n=45) married, and 47% (n=50) employed, with 77% (n=81) having more than a high school education and 54% (n=48) having a family income <$50,000. Mean balance was 4.09 (SD=.86) on a 0-5 scale. Balance was associated with 6-minute walk (r=.340, p<.0001), repeated chair stands (r=.250, p=.009), and quadriceps strength (r=.192, p=.047), but not age, body mass index, chair sit-and-reach, activity counts, and fitness walking. The model explained 15% of the variance (F(8,98)=2.091, p=.044) with 6-minute walk being the best predictor (B=.299, p=.019).

Conclusion: 6-minute walk was an independent predictor of balance indicating that those with better endurance also had better balance. Clinicians can encourage fitness walking and balance exercises in older adults with OAK and hypertension.
Nicole Fowler, PhD, MHSA

**Department:** Medicine/Medicine/General Internal Medicine
**Affiliation:** University of Pittsburgh

**Undergraduate:** University of Pittsburgh
**Graduate School:** George Washington University
**PhD:** University of Pittsburgh

**Current Position:** Assistant Professor of Medicine

**Research Interest Areas:** Cognitive Aging and Medical Decision Making

**Research Support Sources:** KL2

**Research Title:** Cancer Screening in Adults with Cognitive Impairment

**Project Authors:**
NR Fowler, AE Barnato, MA Schonberg, AM Torke

**Abstract:**
Background
Medical decisions about cancer screening for cognitively impaired (CI) older adults should match the patient’s goals of care and life expectancy. This study examined receipt of cancer screening among a community-based primary care (PC) cohort with normal cognition (NC), mild cognitive impairment (MCI), and dementia.

Methods
Cross-sectional survey of subjects from a trial in Pittsburgh, PA. Receipt of cancer screening (colon, prostate, breast and cervical) was measured with 20 validated questions from the CDC’s Behavioral Risk Factor Surveillance System. Cognition was measured using a full neuropsychological battery and clinical information. Using Fisher’s exact test and regression, we compared receipt of cancer screening by cognition and the association between cognition and receipt of cancer screening by age.

Results
Of the 289 who completed the survey, 170 (58.8%) were women and the mean age was 80.5 years. 199 (68.9%) were classified as NC, 72 (24.9%) with MCI, and 18 (6.2%) with dementia. We found no differences in colon cancer screening (66% NC, 69% MCI, and 61% dementia received a colonoscopy or sigmoidoscopy in the past 5 years, p=0.96). For women, we found no differences in mammography (79.7% NC, 72.5% MCI and 83.3% dementia within the past 2 years, p=0.85) or in receipt of PAP smears among women (44.1% NC, 52.5% MCI, and 41.7% dementia within in past 3 years, p=0.27). For men, prostate cancer screening differed by cognition (82.5% NC, 68.8% MCI, and 50% dementia within the past 3 years, p=0.06). Controlling for age, there were no significant differences in receipt of any cancer screening by cognition.

Conclusions
These results raise concerns for possible over-screening given the change in risk/benefit ratio for patients with CI.
Madhavi Gavini, Pharm.D.,BCPS

**Department:** UPMC Presbyterian Shadyside Department of Pharmacy  
**Affiliation:** University of Pittsburgh School of Pharmacy  
**Graduate School:** University of Florida College of Pharmacy  
**Current Position:** PGY2 Pharmacy Resident, Geriatrics

**Research Interest Areas:** Pharmacist services offered in patient centered medical homes, geriatric syndromes, medication safety

**Research Title:**  
Perceptions of Care Among High Risk Geriatric Patients, Families or Caregivers in a Patient-Centered Medical Home (PCMH)

**Project Authors:**  
Madhavi Gavini, Amelia S. Gennari, Christine M. Ruby

**Abstract:**  
UPMC Senior Care, a level 3 accredited Patient Centered Medical Home, is comprised of an interdisciplinary team of physicians, nurse practitioners, pharmacists, nurses, and support staff collaboratively managing the health of geriatric patients. The goal of this study was to identify potential areas for improvement in the delivery of care for our high risk patients, utilizing a survey. Our predefined criteria included those having ≥2 of the following in the past 12 months: congestive heart failure (>1 hospitalization), moderate to severe dementia, >2 incidents of falls, recurrent hospitalizations defined as ≥2, any readmit within 30 days, or significant psycho-social issues.

Methods: The survey categories included medication decisions, communications between providers, and goals of care; as these satisfied the 6B and 6C must-pass elements of our Medical Home. The study was approved by our institutions’ quality improvement review board. The survey was conducted during October 2013. Common themes in responses were determined using qualitative analysis procedures.

Results: 19 out of 24 surveys were conducted in person and 5 were via phone. 3 patients/caregivers declined and 3 were excluded. The mean number of medications was 15.5 (range 6-31); 75% reported using a pill box. 29% requested transparency in communication between the primary care providers and specialists. Medication reviews were provided for 96% of those surveyed leading to discrepancy resolution in 58%.

Conclusion: The majority of our patients were satisfied with the communication. Many patients requested additional medication education and lifestyle counseling. A follow up survey will be conducted to see if patients’ self-identified goals were met and if the mailed information was beneficial.
Nancy Glynn, PhD

**Department:** Epidemiology/Public Health  
**Affiliation:** Epidemiology

**Undergraduate:** BS, University of Massachusetts - Amherst  
**Graduate School:** M.Ed. University of Virginia  
**PhD:** PhD, University of Pittsburgh

**Current Position:** Research Assistant Professor

**Research Interest Areas:** fatigability in older adults

**Research Support Sources:** NIH grants (LIFE Study, Long Life Family Study) and departmental funds

**Research Title:**  
Association of Perceived Fatigability and Activity Levels on Physical Function of Older Adults

**Project Authors:**  
Nancy W. Glynn, PhD, Adam J. Santanasto, MPH, Eleanor M. Simonsick, PhD, Tamara Harris, MD, MS, Annemarie Koster, PhD, Paolo Caserotti, PhD, Elsa S. S

**Abstract:**  
Background: Fatigability is an emerging phenotype that describes perceived exhaustion in relation to performance of defined activities at fixed intensity and duration. Increasing fatigability is thought to underlie reduced activity and functional decline frequently observed with increasing age. Despite great interest and discussion, there exists remarkably little empirical investigation of these associations due to limitations in the assessment of fatigability and activity-related energy expenditure.

Methods: This relationship was examined in 63 older adults (mean age 78.3±5.4 yrs, gait speed 1.2±0.2 m/s, 86% female, 56% white) enrolled in the Developmental Epidemiology Cohort Study (DECOS). Function was defined as time (seconds) to complete a usual-paced 400m walk over level ground using a 40m course. Perceived fatigability was assessed by the physical subscore of the validated 10-item Pittsburgh Fatigability Scale (higher score=higher fatigability). Free-living, 7-day activity (mean minutes/day >1.5 METs) was captured by the SenseWear Pro armband.

Results: Regression analysis revealed higher fatigability scores were positively (std?=0.27, p=0.03, partial R2=0.07) and activity levels were inversely (std?=0.25, p=0.04, partial R2=0.05) associated with usual-paced 400m walk time after adjustment for age, sex, race, and body mass index (model R2=0.48).

Conclusions: Reducing fatigability and increasing physical activity may be important avenues for intervention in older adults to delay age-related decline in physical function.
Lu Hu, MSN

**Department:** School of Nursing  
**Affiliation:** University of Pittsburgh  
**Current Position:** PhD student

**Research Interest Areas:** self management of chronic conditions among older adults

**Research Support Sources:** R21

**Research Title:**  
First Person Vision for Objective Evaluation of Caregiving Quality

**Project Authors:**  
Lu Hu, Jennifer Lingler, Julie Klinger, Laurel Mecca, Grace Campbell, Amanda Hunsaker, Sally Hostein, Bernardo Pires, Martial Hebert, Judith Matthews

**Abstract:**  
Background: Self-reported caregiving distress is often subjected to recall bias. We are employing a novel wearable camera system with dementia caregiving dyads to capture their daily interactions and thus yield video clips to inform tailored interventions. This poster presents initial formative evaluation of our system.

Methods: Participants were community-residing care recipients (CRs) with dementia and their caregivers (CGs). We conducted home visits to obtain consent and collect baseline data including demographics and attitudes toward our system. CGs were shown how to use the system and encouraged to wear it at home during as many waking hours as desired for up to 7 days. CGs received daily calls to change the SD card and battery. A usability interview was conducted with the CG when the system was retrieved, and descriptive statistics were computed.

Results: Four dyads completed this evaluation. Two CGs were husbands and two were daughters, with a mean age of 67±21.86 years. All CRs were female, with a mean age of 80±5.94 years. MMSE scores were 30±0 for CGs and 21.33±6.66 for CRs. A total of 329 videos was generated, with wear times of up to 8.5 hours/day beginning as early as 7:00 AM and ending as late as 10:30 PM. From 1 to 10, CGs rated the wearable camera system as fairly easy to use (M=7.75±3.3), and they reported little anxiety (M=2.25±1.89), confusion (M=2.25±1.89), nervousness (M=1.75±1.5), or embarrassment (M=1.25±0.5) about using the system. Positive comments by CGs included “My wife says she likes it” and “…when she knew it [her behavior] was on tape, she actually complied [went to bed].”

Conclusion: Our wearable system may be a viable mHealth solution for remote assessment of caregiving quality and targeted intervention to support dementia caregiving at
Tiffany Hughes, PhD, MPH

Department: Psychiatry/Medicine
Affiliation: Psychiatry

Undergraduate: Allegheny College
Graduate School: University of South Florida
PhD: University of South Florida

Current Position: Research Assistant Professor

Research Interest Areas: Risk and Protective Factors for Cognitive Functioning in Late Life

Research Support Sources: NIA AG023651 (PI: Mary Ganguli)

Research Title:
Fall-related head injury and risk of cognitive impairment in a population-based sample

Project Authors:
Tiffany F. Hughes, Roya Tehranian-DePasquale, Mary Ganguli

Abstract:
Study: The occurrence of falls increases with advancing age. Studies suggest the head injury or trauma may be associated with increased risk of cognitive impairment (CI). We examined the association between history of fall-related head injury with loss of consciousness and CI.

Methods: Participants were 1,975 older adults from a community-based study of mild cognitive impairment. History of head injury or trauma resulting in loss of consciousness and the approximate age of this occurrence was based on self-report. Cognitive status was defined using the Clinical Dementia Rating (CDR) scale, with a score of 0 equating to normal and = 0.5 as CI. The odds of CI versus normal in relation to head injury was examined using logistic regression analyses. Whether the effect varied by age the head injury occurred (childhood: 2-20; adulthood: 21-65; old age: > 65 years) was also examined.

Results: At baseline, 228 (11.5%) participants reported a head injury. A total of 1,410 participants were classified as cognitively normal and 565 were classified as cognitively impaired. Those with a head injury were more likely to be cognitively impaired (OR=1.44, CI: 1.08-1.92) compared to those without. Head injury in old age generated the highest risk (OR=1.56, CI: 0.95-2.56), followed by adulthood (OR=1.34, CI: 0.81-2.22) and childhood (OR=1.20, CI: 0.76-1.90), compared to no head injury; although these estimates were not statistically significant.

Conclusion: Older adults with a history with a fall-related head injury resulting in loss of consciousness may have an increased risk for CI, which may be greatest if the head injury occurred in old age.

Significance: Fall prevention is important to reduce the risk of head injury that may contribute to cognitive deficits in old age.
Theodore Huppert, PhD

Department: Radiology
Affiliation: SOM

Undergraduate: Univ of Wisconsin
Graduate School: Harvard Univ
PhD: Harvard Univ

Current Position: Assistant Professor

Research Interest Areas: Biomedical imaging

Research Support Sources: Pepper P40

Research Title:
Brain imaging to-go: bringing portable near-infrared brain recordings into long-term care facilities

Project Authors:
Helmet Karim, (James) Chia-Chen Lin, Mary Anne Ferchak, Ervin Sejdic, Susan L. Greenspan, Patrick J. Sparto, Theodore J. Huppert

Abstract:
Introduction. Neuroimaging methods such as functional MRI or PET are a “gold-standard” for understanding how the brain works. However, these methods are limited to large facilities that operate the technologies requiring patients to travel in for appointments and exams. Thus, these methods are not practical or accessible to many populations who lack the means or ability to travel to these sites solely for the sake of enabling research. The objective of this research was to adapt a portable technology called near-infrared spectroscopy (NIRS) for recording brain activity in the field and to apply this method to image cognitive function in elderly participants living within long-term care facilities.

Methods. We have customized an 8-channel NIRS instrument for field-deployable research. The instrument is approximately 30x45x10cm in size, which allows it to be easily setup in the long-term care facilities. A NIRS recording probe was built to image brain areas of the frontal and prefrontal cortex, which consisted of a headband with embedded fiber optics. Brain signals were recorded on 16 individuals during a computerized version of the trails making task.

Results. We have been able to demonstrate the ability to record brain activity at remote long-term care facilities. This project is still ongoing to collect and analyze data.

Conclusions. NIRS is a portable device for brain imaging. The UPMC department of Radiology has developed this technology allowing a wider variety of unique brain imaging applications.
Juliann Jaumotte

**Department:** Neurology/School of Medicine  
**Affiliation:** University of Pittsburgh

**Undergraduate:** Purdue University

**Current Position:** Research Associate

**Research Interest Areas:** Aging, Parkinson's disease, Trophic factors

**Research Support Sources:** NIH

**Research Title:**  
An age-related decline in ERK5 in the basal ganglia may help explain why age is a risk factor in Parkinson’s disease.

**Project Authors:**  
Juliann D. Jaumotte, Stephanie L. Wyrostek, Mayur Parmar, Michael J Zigmond, Jane E Cavanaugh

**Abstract:**  
Study: Morphological, biochemical, and functional changes occur in the aged brain that may underlie the increased risk of neurodegenerative diseases such as Parkinson’s and Alzheimer’s disease. We focused on the dopamine (DA) neurons that reside in substantia nigra (SN) and project to striatum (STR), neurons that underlie many motor deficits that occur in PD. We hypothesized that age-related alterations in the expression and/or activation of cellular signaling molecules important for the survival of these neurons contribute to their increased susceptibility.

Methods: Mitogen-activated protein kinases (MAPKs), among other cellular signaling pathways, are essential for maintaining DA neuronal development, functioning, and survival. In this study, we used Western blot analysis to examine ERK1, 2, and 5 expression and activation in the SN, STR, and ventral tegmental area (VTA) during aging in BNF344F1 rats (3-24 mo).

Results: An age-related decrease in phosphorylated ERK5 was observed in SN and STR, whereas an increase in total ERK1 was observed in all 3 regions. In primary cultures of SN and VTA prepared from neonatal rats DA neuronal viability was significantly reduced by pharmacological inhibition of ERK5, but not by inhibition of ERK1 and 2.

Conclusions: These data suggest that ERK5 is essential for the basal survival of SN and VTA dopaminergic neurons. This is the first study to examine ERK1, 2, and 5 expression and activation in the SN, STR, and VTA during aging, and the relative roles of ERK1, 2, and 5 in basal survival of SN and VTA dopaminergic neurons.

Significance: These data raise the possibility that a decline in ERK5 signaling plays a role in age-related impairments in DA function and may be significant for other conditions in which age is a risk factor.
Caitlin Kilcullen

**Department:** University of Pittsburgh, School of Nursing, Health and Community Systems  
**Affiliation:** University of Pittsburgh School of Nursing

**Undergraduate:** BSN Student

**Current Position:** Undergraduate student researcher

**Research Interest Areas:** Medication Management

**Research Support Sources:** NIH/NINR #P01NR010949

**Research Title:** Optimism, Self-efficacy, and Discrepancies in Medication Reconciliation in a Sample of Caregivers of Community Dwelling Individuals with Memory Loss

**Project Authors:** Kilcullen, Caitlin E.; Tamres, Lisa K. MS; Sereika, Susan M. PhD; Lingler, Jennifer, PhD, CRNP; & Erlen, Judith A., PhD, RN, FAAN

**Abstract:**

Study: This study explored associations among optimism, self-efficacy, and discrepancies in medication reconciliation in caregivers of community-dwelling patients with memory loss.

Methods: We examined data from several caregivers (n=66) participating in a larger randomized controlled trial implementing an intervention to improve medication management. Participants completed self-report assessments of optimism, self-efficacy, and demographics. We also collected data on the patients’ medication regimens which were compared to medical records of the patients’ primary health care providers. The total number of discrepancies between the two sources was recorded.

Results: Caregivers were on average 67 years of age, 73% female, 91% Caucasian, and had 15 years of education. Average optimism score was 15.2 (SD=5.2) and self-efficacy was 6.9 (SD=2.10). Caregivers averaged 1.5 medication reconciliation discrepancies (SD=2.1, range 0-9). Optimism was correlated with self-efficacy (r=.313, p=.010). Multiple regression analysis revealed that optimism (b=-.130, p=.012) and self-efficacy (b=.281, p=.029) were independently associated with medication reconciliation discrepancies, explaining about 12% of the variance (F(2,63) = 4.458, p=.015; R²=.124).

Conclusion: Optimism and self-efficacy were jointly associated with medication discrepancies. More optimistic caregivers had fewer discrepancies. Caregiver self-efficacy was associated with greater discrepancies than optimism.

Significance: Clinicians need to assess and address the role of caregiver psychological factors when assisting caregivers with medication management.
Brittney Lange-Maia, MPH

**Department:** Department of Epidemiology/Graduate School of Public Health  
**Affiliation:** Center for Aging and Population Health

**Undergraduate:** Indiana University Purdue University Indianapolis  
**Graduate School:** University of Pittsburgh

**Current Position:** Predoctoral Trainee

**Research Interest Areas:** Peripheral Nervous System Functioning and Physical Fitness in Older Adults

**Research Support Sources:** NIA T-32 Aging Training Grant

**Research Title:**  
Comparison of Performance on Usual and Fast Paced 400m Walk Tests in Older Adults

**Project Authors:**  
Brittney S. Lange, Anne B. Newman, Elsa S. Strotmeyer, Tamara B. Harris, Paolo Caserotti, Nancy W. Glynn

**Abstract:**  
STUDY: Fast and usual paced 400m walking tests are often used in studies of older adults to assess fitness and function, respectively. The purpose of this study was to examine correlation and agreement in performance between a fast and usual paced 400m walking test for older adults and identify factors related to difference in completion times for each.

METHODS: Participants (26 men and 38 women, age 70-92) completed a fast 400m walking test and then a usual paced 400m walk 8-14 days later. A short physical performance battery assessed function and consisted of standing balance, chair stands, and 6m usual and narrow walk (score range 0-4). Body mass index and health history were also assessed.

RESULTS: Fifty-nine participants completed both walking tests (92.2%). Finish times for fast and usual paced 400m walks were (mean ± SD) 333.3±8.6 sec and 380.3±7.3 sec, respectively (p<0.0001), and highly correlated (r=0.88, p<0.001). The times for the fast 400m walk were generally faster (range= 221.3-566.0 sec), and the range of times was wider compared to usual 400m walk (range = 264.6-557.9 sec). Older age and poorer physical performance battery scores were univariately associated with smaller differences between tests (p<0.001), though only older age remained independently associated in a multivariate model.

CONCLUSION: Difference between completion times between a fast versus usual paced 400m walk lessened with increasing age. Similarities between the two walks may potentially be due to these older adults already performing at their maximal aerobic capacity during the usual paced walk.
OBJECTIVE
Older African Americans are more likely to report poorer self-rated health (SRH) than Caucasians even when individual-level characteristics are controlled. One explanation is health pessimism, which posits that African Americans are more pessimistic about their health because of non-health factors. We examined whether health pessimism or other factors explain the SRH differential between African Americans and Caucasians.

METHOD
Research participants were members of the Community Research Registry of the Claude D. Pepper Center at the University of Pittsburgh. The cohort, recruited between 2005 and 2013 (n=2483), is a convenience sample of residents aged 60+ living in western Pennsylvania. Participants completed the CDC Healthy Days module, which includes questions on SRH. We estimated hierarchical logistic regression to examine demographic characteristics, health characteristics (number of diseases), life style characteristics (current tobacco use, alcohol consumption, and physical activity), and perceived number of unhealthy days on reports of poor or fair health.

RESULTS
African Americans were 1.6 times (95% CI=1.04, 2.45) more likely to report poor or fair SRH after controlling for demographic and health characteristics. Including lifestyle characteristics, especially physical activity and alcohol consumption attenuated the association, so that African Americans no longer differed from Caucasians in fair-poor SRH. Significant correlates of poorer SRH included male gender, less education, a greater number of diseases, number of reported unhealthy days, less physical activity, and no alcohol consumption.

CONCLUSIONS
Health pessimism but also actual poorer health may be responsible for greater likelihood of fair or poor SRH in older African American.
Chia-Cheng Lin, PT, PhD, MS

**Department:** Physical Therapy  
**Affiliation:** University of Pittsburgh

**Undergraduate:** Chung Shan Medical University  
**Graduate School:** University of Pittsburgh  
**PhD:** University of Pittsburgh

**Current Position:** Postdoctoral Associate

**Research Interest Areas:** Balance

**Research Support Sources:** Department of Physical Therapy & Otolaryngology

**Research Title:**  
The effects of vibrotactile feedback on postural sway under dual-task conditions in people with unilateral vestibular hypofunction

**Project Authors:**  

**Abstract:**  
Purpose: The purpose of the study was to investigate how well individuals with vestibular disorders can utilize VTF to reduce sway during dual-task balance performance.

Methods: Seven participants completed the three-visit experimental protocol consisting of 4 different sensory integration balance conditions lasting 120s (level (L) and sway-referenced (SR) platform with either eyes open (EO) and eyes open in dark (EOD)). During the first visit, subjects completed screening tests and were trained in the use of VTF and practiced auditory CRT tasks. During the second and third visit, each of the 16 conditions (auditory CRT on/off * VTF on/off * Vision (EO/EOD) * platform (L/SR)) were tested in random order after a short re-training period. The average root-mean-square (RMS) of the center of pressure (COP) in the anterior-posterior direction was calculated during different time-periods (1: 0-30 s, 2: 30-60 s, 3: 60-90 s and 4: 90-120 s) from the second and third visit. For each of the four balance conditions, a repeated measures ANOVA was conducted to test within-subjects effects of VTF, CRT, and Period and all interaction effects. Results: In the EO/L condition, subjects had increased sway when VTF was used compared with not used (p =0.032). In the EO/SR condition, subjects had reduced sway with VTF on compared with VTF off (p =0.019). In addition, there was reduced sway in Period 2 compared with Period 3 (p = 0.025). No significant within-subject effects were found in EOD/L and EOD/SR conditions.

Conclusions: Subjects with unilateral vestibular hypofunction responded well to VTF under the EO/SR condition in which somatosensory feedback was reduced. The CRT task did not increase sway while VTF was applied.
Chien-Wei Lin

**Department:** Biostatistics  
**Affiliation:** University of Pittsburgh, School of Public Health

**Current Position:** PhD

**Research Interest Areas:** Genomic analysis, Meta analysis,

**Research Support Sources:** University of Pittsburgh

**Research Title:**  
Genetic Modulation of Brain Molecular Aging

**Project Authors:**  
Lun-Ching Chang, Chien-Wei Lin, Hyunjung Oh, David A. Lewis, George C. Tseng, Etienne Sibille

**Abstract:**  
As life expectancy has prolonged significantly in the past decades, research for “healthy aging” has become an important direction to improve general public health and alleviate nationwide medical burden. In this study, we performed gene expression array analysis on two brain regions (BA47 and BA11) in 214 postmortem brain samples collected from the Allegheny County Coroner’s Office (Pittsburgh, PA). The neuropsychiatric-related resources of this brain collection have been amply characterized in microarray and micro-anatomical studies. To assess “molecular age” of each patient, we performed regression analysis with power models to identify trajectories of age-associated genes. Under control of false discovery rate at 0.01% we identified 978 age-associated genes. Based on these candidate genes, molecular ages were estimated with weighted average of each gene prediction. Cluster analysis of the 978 age-related genes generated six gene modules and pathway analysis identified functional annotations of the six clusters of different aging trajectories. Cis-eQTL studies are further conducted for 978 age-associated genes to find genetic modulators for molecular ages. Under control of false discovery rate at 5% and removing redundant SNPs based on LD block, we constructed a genetic risk model on 561 cis-eQTL age-associated SNPs. We validated the risk prediction model on an independent HABC cohort, and the result generated statistically significant prediction power in walking speed (p=0.02). Our study elucidated genetic mechanisms underlying the aging process and the molecular aging prediction model provides a translational tool to further understand the process for deferred aging and to provide an early intervention screening for potentially risky populations.
Ge Liu, MS

**Department:** Department of Epidemiology  
**Affiliation:** Department of Epidemiology, GSPH  
**Current Position:** PhD student  
**Research Interest Areas:** Racial differences in brain structure, cognition and vascular risk factors  
**Research Support Sources:** Analyze and report racial differences in brain structure, cognition, and vascular risk factors based on the Health Brain Project  
**Research Title:** Higher gray matter integrity in very old blacks measured via diffusion tensor imaging  
**Project Authors:** Ge Liu, Ben Allen, Caterina Rosano, et al.

**Abstract:**  
Study: In 283 community-dwelling white and black adults (mean age=83 years) from the Health, Aging and Body Composition study at Pittsburgh site, we quantified racial differences in brain characteristics at the macro- and micro-structural levels to identify potential targets for reducing racial differences in cognition.

Methods: Cross-sectional study. Neuroimaging was obtained at 3 Tesla to quantify macro-structure (white matter hyperintensities, WMH and gray matter atrophy, GMA) and micro-structure (mean diffusivity of normal appearing gray matter; MD). Racial differences were tested before and after multivariate adjustment. Additional analyses tested the associations between neuroimaging markers and the digit symbol substitution test (DSST) in each race.

Results: Blacks had lower MD (i.e., higher gray matter micro-structural integrity) than whites (β=-.041, p=.002), but WMH and GMA did not differ by race. Male sex and diabetes were significantly related to higher MD, but did not modify racial differences in MD. MD was inversely associated with DSST independent of WMH (β=-23.99, p=.04) or GMA (β=-29.82, p=.02). In contrast, the inverse association of WMH and GMA with DSST became non-significant after adjustment for MD (β=-1.93, p=.37 and β=-43.46, p=.45, respectively) in whites. Results were similar in blacks and after adjustment for sex, literacy, smoking, drinking, income, hypertension and diabetes.

Conclusions: Compared to whites, elderly blacks who survive into their ninth decade display remarkably higher gray matter micro-structural integrity in the presence of similar severity of GMA and WMH.  
Significance: Higher micro-structural integrity in very old blacks may compensate for the negative impact of GMA and WMH on cognition.
Mary Marchetti, PT, MS, GCS

**Department:** Department of Physical Therapy/School of Rehabilitation Sciences  
**Affiliation:** University of Pittsburgh

**Undergraduate:** BS from Bridgewater State College; BS from University of Pittsburgh  
**Graduate School:** University of Pittsburgh  
**PhD:** University of Pittsburgh (near completion)

**Current Position:** PhD Candidate, Pitt/instructor, Department of Physical Therapy, Duquesne University

**Research Interest Areas:** Falls in Older Adults

**Research Support Sources:** No funding; dissertation research

**Research Title:**  
Developing a Training Program on Falls and Falls Prevention for Staff in Assisted Living Facilities and Personal Care Homes

**Project Authors:**  
PI: Mary T. Marchetti; Coauthors: S Whitney, J Brach, N Castle, M Redfern, E Rubenstein, S Studenski

**Abstract:**  
STUDY: The American Geriatrics Society (AGS) published a position statement to the effect that, with assisted living facilities (ALF) becoming utilized along the continuum of care for older adults, staff should be trained in a variety of areas. Currently, no federal and few state guidelines exist regarding the training of staff in ALFs. One key area identified by the AGS was falls/fall prevention. The aim of this study was to develop (but as of yet test) such a program.

METHODS: Various steps were employed in the development of this program. First, literature reviews were performed in different areas: required education and training levels for non-professional staff, test development and educational approaches. Falls literature was thoroughly reviewed to identify key areas to address in the educational program. The PI observed 2 local ALFs on each shift to identify issues specific to this setting. Once proposed program content was determined based on literature and the observations, content experts from various professions participated in a Delphi Survey to identify priority areas to address in a 30-40 minute presentation. Cognitive interviewing was completed with non-professional staff from a local ALF for test development.

RESULTS: Key areas identified to address included assistive devices, clothing, footwear, lighting, staff interactions with residents, furniture, among others. Pre-/post-tests were developed to be consistent with a 6th-grade or less reading level, and refined through cognitive interviews. Experiential learning is more effective than traditional didactic teaching, therefore an interactive game was developed with the participants competing on teams and utilizing electronic clickers to register responses to questions.
Zachary Marcum, PharmD, MS

**Department:** Medicine/Geriatric Medicine

**Current Position:** Assistant Professor

**Research Interest Areas:** Geriatric Pharmacy

**Research Support Sources:** Agency for Healthcare Research and Quality (R01HS018721); National Institute of Aging (P30AG024827; K07AG033174)

**Research Title:**
Determining the Incidence of Drug-Associated Acute Kidney Injury in Nursing Home Residents

**Project Authors:**
Steven M. Handler, MD, PhD; Pui Wen Cheung, MD; Colleen M. Culley, PharmD; Subashan Perera, PhD; Sandra L. Kane-Gill, PharmD, MS; John A. Kellum, MD

**Abstract:**
Methods: The goal of this study was to determine the incidence of drug-associated AKI using the RIFLE criteria in NH residents. We conducted a retrospective study between February 9, 2012 and February 8, 2013 for all residents at four UPMC NHs located in Southwest Pennsylvania. The TheraDoc™ clinical active surveillance system, which monitors laboratory and medication data and fires alerts when patients have a sufficient increase in serum creatinine, was used for automated case detection. An increase in serum creatinine in the presence of an active medication order identified to potentially cause AKI triggered an alert, and drug-associated AKI was staged according to the RIFLE criteria.

Results: Of the 249 residents who had a drug-associated AKI alert fire, 170 (68.3%) were female, and the mean age was 74.2 years. Using the total number of alerts (n=668), the rate of drug-associated AKI was 0.35 events per 100 resident-months. Based on the RIFLE criteria, there were 191, 70, and 44 residents who were classified as AKI risk, injury, and failure, respectively. The most common medication classes included in the AKI alerts were diuretics, ACEIs/ARBs, and antibiotics.

Conclusion: Drug-associated AKI was a common cause of potential adverse drug events. Future studies are needed to better understand patient, provider and facility risk factors as well as strategies to enhance the detection and management of drug-associated AKI in the NH.

Significance: AKI is included among a list of 20 diagnoses associated with potentially avoidable hospitalizations from the NH and will soon result in payment penalties. Consequently, new methods are needed for the detection and management of drug-associated AKI to reduce potentially avoidable hospitalizations.
Heather Margonari, BSN, DNP student, RN

Department: School of Nursing
Affiliation: Health and Community Systems

Undergraduate: University of Slippery Rock

Current Position: Graduate Student Worker

Research Interest Areas: Older adults' pain management of osteoarthritis of the knee and cardiovascular risk factors

Research Support Sources: NIH, NINR, R01 NR010904

Research Title:
Non-Steroidal Anti-Inflammatory Drugs in Older Adults with Osteoarthritis of Knee and Hypertension: Use and Effects on Pain and Blood Pressure

Project Authors:
Heather A. Margonari, Susan Sereika, Elizabeth A. Schlenk

Abstract:
Background/Purpose: Non-steroidal anti-inflammatory drugs (NSAIDS) are used in older adults with osteoarthritis of the knee (OAK) to manage pain, which may affect blood pressure (BP). The purposes were to describe diagnosis of OAK and hypertension (HBP) relative to each other, describe use of NSAIDS to manage pain, and examine the effect of NSAIDS on pain and BP using baseline data from an ongoing clinical trial in 107 older adults with OAK and HBP.

Methods: A descriptive comparative design was used. BP was assessed following a standardized protocol. Demographic and medical history data were collected by self-report. Pain was evaluated by the WOMAC Knee Pain scale and SF-36 Bodily Pain scale. Descriptive statistics summarized the data. T-tests were conducted on effect of NSAIDS on pain and BP.

Results: A greater proportion had OAK diagnosed before HBP (61.3% vs. 38.7%), and a smaller proportion used NSAIDS to manage pain (40.2% vs. 59.8%). Mean SBP and DBP were 122.4 mm HG (SD=15.0) and 73.2 mm HG (SD=10.2), respectively. Mean knee pain was 4.9 (SD=3.3); mean bodily pain was 57.8 (SD=20.5). Use of NSAIDS was significantly related to greater knee pain (t(105)=2.014, p=.047) but not bodily pain (t(105)=.838, p=.404). Use of NSAIDS was significantly related to lower SBP (t(105)=2.41, p=.018) but not DBP (t(105)=.860, p=.392).

Conclusion: OAK preceded HBP. Mean BP was within normal limits. Over half used NSAIDS to manage pain. Knee pain was greater in those using NSAIDS. Greater pain management in those using NSAIDS may be related to lower SBP.
Neelesh Nadkarni, MD, PhD

**Department:** Geriatric Medicine/Medicine

**Current Position:** Assistant Professor

**Research Interest Areas:** mobility and cognition, brain aging

**Research Support Sources:** Pittsburgh Pepper Center, Hartford COE Award

**Research Title:**
Brain Amyloid Deposition Influences the Cognition-Mobility Interface (COMBINE) in Cognitively Normal Older Adults

**Project Authors:**
Oscar Lopez, Beth Snitz, Annie Cohen, Stephanie Studenski, Subashan Perera, Robert Nebes, and William E. Klunk

**Abstract:**
Study: The cognition-mobility interface (COMBINE), assessed by measuring costs on gait when performing cognitive tasks while walking, acts as a “stress test” of underlying brain resources. Cerebral amyloidosis could affect the COMBINE manifesting as greater dual-task costs on gait speed. This study aimed to investigate whether cerebral amyloidosis affects the COMBINE in cognitively normal elders.

Methods: Gait speed during single-task walking (ST) and costs on gait speed while walking and dialing a phone (dual-task cost) were measured on an automated walkway. Participants were grouped, based on their Pittsburgh B (PiB) PET standardized uptake value ratio (SUVR), into high- (PiB+) and low-amyloid (PiB-). ST gait speed and dual-task costs were compared between groups. Regional PiB correlates of the dual-task costs were explored in the entire sample.

Results: The two groups (4 PiB+, 7 PiB-) were comparable in age (75.3 years), education, general cognitive and processing speed measures, physical performance and grip strength. ST gait speed was comparable between groups (1.2 vs 1.1 m/sec, p=0.2); however, the dual-task cost was significantly greater in the PiB+ than PiB- group (p=0.02). Dual-task cost significantly correlated with global PiB SUVR (r=0.6, p=0.04) and regional PiB SUVR in frontal (r=0.67, p=0.03), striatal(r=0.75, p=0.01), anterior and posterior cingulate (r=0.7, p=0.02, both) cortices. ST gait speed did not correlate significantly with any global or regional PiB SUVR.

Conclusions: Brain amyloid burden may influence the COMBINE, which appears to be related to the severity of amyloid deposition in regions relevant to cognition and mobility.

Significance: Walking while dialing a phone could serve as a bed-side measure of assessing neuronal health of the COMBINE.
Abstract:
Introduction: Study purposes were to: 1) describe interaction behaviors and factors (Augmentative & Alternative Communication (AAC) strategies) that may influence communication between older patients and nurses and 2) explore associations between interaction behaviors and nursing care quality indicators.

Methods: This expanded secondary study utilized data on 38 ICU patients (>60 yrs of age) and their nurses (N=24) who participated in the Study of Patient-Nurse Effectiveness with Communication Strategies (SPEACS). Behaviors were measured by rating nurse-patient videotaped observations (4 observations per dyad, N=152) using the Communication Interaction Behavior Instrument. Demographic, clinical characteristics and quality indicators were obtained from the SPEACS dataset and medical chart abstraction. Descriptive statistics, group comparative statistics, and repeated measures were used to explore the association between interaction behaviors and nursing care quality.

Results: Negative behaviors were rare. Use of positive nurse behaviors was associated with an increase in positive patient behaviors (p<.001). Use of patient unaided AAC strategies was positively associated with the count of positive nurse behaviors (p=.002) and individual patient unaided AAC strategies were associated with individual nurse positive behaviors (p<0.05). Finally, count of different positive nurse behaviors was positively associated with the absence of reported pain (p=.011) and the count of different positive patient behaviors the association with the patient being calm (p<.001).

Conclusions: Findings provide evidence that nurse behaviors are associated with communication methods used by intubated patients and that both nurse and patient behaviors may impact nursing care quality.
Hyunjung Oh,

**Department:** Department of Psychiatry  
**Affiliation:** Center for Neuroscience  

**Current Position:** Pre-doctoral scholar  

**Research Interest Areas:** Molecular substrates of age by depression interaction  

**Research Support Sources:** MH093723 (ES)  

**Research Title:**  
Effect of normal aging on the expression of BDNF transcripts and synaptic markers in human frontal cortex.  

**Project Authors:**  
Hyunjung Oh, Etienne Sibille  

**Abstract:**  
Introduction. Age-related cognitive decline is closely linked to molecular and structural changes of frontal cortex such as reduced BDNF (brain-derived neurotrophic factor), mild brain atrophy and synaptic loss. Recent animal studies report that BDNF transcript variants have distinct cellular localization and that selective knockdown of dendritically-targeted BDNF splice variants is sufficient to induce anatomical and behavioral abnormalities. The aim of this study was to investigate the specificity and correlation of expression changes for specific BDNF transcripts and synaptic markers during aging.

Method. We identified the top 200 genes positively correlated with BDNF from microarray data obtained from orbitofrontal cortex of control subjects (n=209, age range: 16-96). Using qPCR, we determined the expression level of BDNF splice variants and synaptic markers in subjects from the same cohort grouped into two different age ranges (=42 or =60; n=40/group).

Results. (1) A total of 48 genes among the top 200 genes (24%) coregulated with BDNF was related to synaptic transmission, including voltage gated channels (CACNA1E, CALB1, KCND2, SCN8A), neurotransmitter receptors (GABBR2, GABRA4/5, GABRB3, GLRA3, GRIA1, GRIN2A, 2B, HTR2A), and synaptic vesicle-related molecules (SV2B, SVOP, SYT4/5, VAMP2). (2) qPCR results showed lower expression of BDNF transcript variants and synaptic markers in frontal cortex of older versus younger subjects.

Discussion. Aging-associated low BDNF signaling occurs across cellular compartments and might lead to general impairment of synaptic function.
Mijung Park, PhD, MPH, RN

**Department:** Department of Health and Community Systems  
**Affiliation:** School of Nursing

**Undergraduate:** Ewha Woman’s University  
**Graduate School:** University of Washington (MPH in Health Services)  
**PhD:** University of California San Francisco (UCSF, PhD)

**Current Position:** Assistant Professor

**Research Interest Areas:** Developing an innovative health care services model for older adults with complex health issues; Family Engagement in Health Care Delivery

**Research Support Sources:** Institute of Aging

**Research Title:**  
Hundred thirty two more days with depression: The association between marital conflict and depression free days

**Project Authors:**  
Mijung Park, PhD MPH RN  
Jürgen Unützer, MD MPH MA

**Abstract:**

**Background:**  
Although collaborative care programs are effective in improving late-life depression, only about half of treated patients achieve clinically meaningful improvement. Thus, we need to examine what characteristics may predict poor late-life depression course. Despite the robust evidence for the negative association between the quality of couple relationships and depression outcomes, few studies have examined these associations in the context of long-term late-life depression course.

**Aim:**  
To examine the relations between the severity of couple conflict, receiving collaborative depression care program, and 24-months depression outcomes.

**Methods:**  
Study sample comprised 840 depressed older adults subsample from the IMPACT trial. Depression and couple conflict were assessed at baseline, 12-, and 24-month follow-up. Descriptive statistics and multivariate regression analyses were performed to examine mean 24-month depression free days (DFD) and the marginal effects of receiving IMPACT program over usual care among participants with varying degrees of 24-month couple conflict.

**Results:**  
Compared to those who never endorsed frequent couple conflict over the three observation points, those who did twice had 63 fewer DFD (p=0.01) and those who did three times experienced 138 fewer DFD (p<0.001). Although the marginal effects of receiving IMPACT program over usual care was greater in overall sample, it was not statistically significant among those who endorsed frequent conflict at twice or three times.

**Conclusion:**  
Frequent couple conflict is associated with worse long term late-life depression outcomes among the patients in primary care clinics.
Tracy Polak, CRNP

**Department:** UPMC Health Plan  
**Affiliation:** UPMC Health Plan

**Current Position:** Director of Geriatric Programs

**Research Interest Areas:** Geriatric

**Research Support Sources:** UPMC Health Plan

**Research Title:** Supportive Services

**Project Authors:**  
Tracy Polak, CRNP and Annette Kline, RN

**Abstract:**  
Abstract Title: Impact of Hospital-Based Geriatric Services on Readmissions, Time to Readmission, and Readmission Costs

Study: Evaluate the impact of UPMC Supportive Services, a program that delivers hospital-based geriatric services with continued outpatient support to patients who are 65 years or older at the time of initial hospitalization.

Methods: Retrospective claims data were used to measure primary (30-day, any Diagnosis Related Group hospital readmission rates) and secondary (post-discharge ER use, time to readmission, and cost of readmissions) outcomes for UPMC Health Plan members (N=818) who were enrolled in the program and a propensity-matched comparison group of UPMC Health Plan members (N=972) not enrolled in the program. Members of both groups had medical admissions with discharges between January 1, 2011 and May 31, 2012. Difference-in-differences were estimated using a logistic regression for readmission and ER use and a Poisson regression for days to readmission. Readmission cost data were analyzed using a linear regression model. Models were adjusted for age, sex, type of insurance, CCI, and admission diagnosis.

Results: No significant differences in readmission rates or use of ER services were observed between the intervention and comparison groups. However, time to readmission was significantly longer (p=0.056) and costs of readmission were significantly lower (p=0.01) for intervention versus comparison group members.

Conclusions: Hospital-based geriatric support services did not decrease 30-day readmission rates but resulted in significantly more community-dwelling days before readmission and significantly less expensive readmissions. Sig: Identify the potential for a hospital-based geriatric support services to impact the time & cost to readm
Juleen Rodakowski, OTD, OTR/L

**Department:** School of Health and Rehabilitation Sciences  
**Affiliation:** Department of Occupational Therapy  

**Current Position:** Post-Doctoral Scholar  

**Research Interest Areas:** Examining performance in daily activities for individuals at-risk for dementia  

**Research Support Sources:** Clinical and Translational Research Training in Late-Life Mood Disorders (T32 MH019986; Reynolds, PI)  

**Research Title:**  
Predicting conversion to dementia for older adults at-risk for progressing  

**Project Authors:**  
Juleen Rodakowski, OTD, OTR/L, Elizabeth Skidmore, PhD, OTR/L, Charles Reynolds, MD, Ketki Raina, PhD, OTR/L, Joan Rogers, PhD, OTR/L  

**Abstract:**  
Title: Predicting conversion to dementia for older adults at-risk for progressing  

Study: Understanding how changes in performance of daily activities are associated with conversion to dementia may be informative for early intervention. We examined performance in cognitively- and physically-focused instrumental activities, functional mobility, and self-care among individuals at-risk for dementia.  

Methods: Secondary data analyses were conducted with 122 individuals who had a history of major depression and entered an intervention study examining donepezil versus placebo. The Performance Assessment of Self-Care Skills (PASS) assessed performance of cognitively- and physically-focused instrumental activities, functional mobility, and self-care through standardized observations. The number of cues required to complete the daily activities were calculated. A generalized estimating equation was used to assess the relationship between daily activities and dementia conversion over 2-years. The exchangeable correlation structure specified correlations within subjects.  

Results: Participants were 73.8(6.2) years. Results indicated that on average improvements in physically-focused instrumental activities were protective against conversion (p=0.03), and slight decreases in cognitively-focused instrumental daily activities were associated with increased conversion (p<0.001), even after adjusting for donepezil effects. Functional mobility and self-care were not associated with conversion.  

Conclusion: Changes in performance of daily activities may predict conversion to dementia in a population of individuals at-risk for dementia due to a history of depression.  

Significance: Interventions addressing cognitively- and physically-focused instrumental daily activities may be able to slow conversion to dementia among individuals at-risk for conversion.
Bedda Rosario, PhD

**Department:** Epidemiology  
**Affiliation:** University of Pittsburgh

**Undergraduate:** University of Puerto Rico  
**Graduate School:** University of Puerto Rico  
**PhD:** University of Pittsburgh

**Current Position:** Visiting Assistant Professor

**Research Interest Areas:** neuroepidemiology, neuroimaging, biostatistics

**Research Support Sources:** NIDDKD

**Research Title:**  
Micro-structural integrity is related to faster gait in the presence of white matter hyperintensities in older adults

**Project Authors:**  
Bedda Rosario, Andrea Rosso, Howard Ainzenstein, Tamara Harris, Anne Newman, Suzanne Satterfield, Stephanie Studenski, Kristine Yaffe, Caterina Rosano

**Abstract:**  

Study: White matter hyperintensities (WMH) are associated with slowing gait in older adults, but some individuals maintain a faster gait with WMH. We characterize micro-structure of normal appearing white matter (NAWM) and grey matter atrophy (GMA) in relation to slow gait in those with high WMH.

Methods: Diffusion tensor imaging data were acquired in 2006-08 on a 3T scanner concurrent with GMA, WMH, and cognitive and physical performance measures in 279 participants of the Healthy Brain Project (78-90 yrs, 58% women, 41% black). Tract Based Spatial Statistics and Voxel Based Morphometry was used to test the association between fractional anisotropy (FA) and GMA with gait speed (above the median=0.91 m/s) in those with high WMH burden (above the median), before and after adjustment for muscle strength. Significant clusters were identified using a threshold-free cluster enhancement (p<0.05 FWE corrected).

Results: Among those with high WMH, higher FA was related to faster gait speed in interhemispheric tracts and in tracts related to sensory-motor function and information processing. Adjustment for muscle strength attenuated but did not substantially change results. Lower GMA of the temporal gyrus and cerebellum was associated with faster gait speed among those with high WMH. Results were not robust to adjustment for muscle strength.

Conclusions: Some older adults may be able to maintain faster gait in the presence of WMH due to widespread higher integrity of the NAWM and reduced GMA in particular regions of the brain.

Significance: Greater integrity of white matter throughout the brain may provide compensation to WMH for gait speed in older adults. Future studies to examine the factors to promote NAWM integrity in older adults and its impact on mobility are warranted.
Andrea Rosso, PhD, MPH

**Department:** Epidemiology/Public Health  
**Affiliation:** Center for Aging and Population Health, Dept. Epidemiology, School of Public Health, U of Pittsburgh

**Undergraduate:** Virginia Tech  
**Graduate School:** Drexel University  
**PhD:** Drexel University

**Current Position:** Post-doc

**Research Interest Areas:** aging and mobility

**Research Support Sources:** T32-AG-000181

**Research Title:**  
Multisystem Physiologic Impairments and Changes in Gait Speed in Older Adults

**Project Authors:**  
Andrea L Rosso, Jason Sanders, Caterina Rosano, Robert M Boudreau, Steven B Kritchevsky, Alice Arnold, Cal Hirsch, Michelle Carlson, Anne B Newman

**Abstract:**  
Study: Slow gait is an important health indicator in older adults but a single identifiable cause is often lacking. Impairments across multiple physiologic systems may increase risk of slow gait with age.

Methods: Data from the Cardiovascular Health Study was used to assess associations between baseline physiologic index (vasculature, brain, kidneys, lungs, and glucose metabolism; range 0-10) and annual gait speed (m/s) over six years. Participants with complete data on the index and at least three gait speed measures were included. Mean differences (md) in gait speed and 95% confidence intervals (CI) by quartile of index were calculated using mixed effects models.

Results: Higher physiologic index was associated with slower gait speed at baseline (p<0.001). Those with scores of 5-6 or 7-10 on the index had significantly slower gait speed during follow-up after adjustment for age, demographics, and health characteristics compared to those with scores of 0-2 (5-6: md = -0.033 m/s; 95% CI: -0.057, -0.010; and 7-10: md = -0.058 m/s; 95% CI: -0.085, -0.031). One year of age is associated with a mean difference in gait speed of 0.012 m/s. Those with high indices also had faster decline in gait speed compared to those with low scores. The index explained a larger proportion of the association of age with gait speed than did chronic disease count (25% vs 8% attenuation).

Conclusions: Greater impairment across five organ systems was associated with slower gait speed and greater declines in gait speed over six years.  
Significance: Impairments accumulated over multiple physiologic systems may make older adults more vulnerable to slow gait speed. This has important implications for risk stratification and intervention efforts for prevention of gait and mobility impairments.
Reza Sadeghian, MD, MBA

**Department:** Department of Biomedical Informatics, School of Medicine  
**Affiliation:** School of Medicine

**Current Position:** Post-Doctorate Fellow

**Research Interest Areas:** Clinical and Transnational Informatics, Telemedicine, Education, Quality Improvement, Improve Patient Care

**Research Support Sources:** National Library of Medicine, CMS

**Research Title:** Telemedicine to Assist Nurse Practitioners with Managing Acute Change in Condition and Palliative Care Assessments of Nursing Home Residents: A Feasi

**Project Authors:**  
Reza Sadeghian, MD, MBA; Harry Hochheiser, PhD; Andrew R. Watson, MD; Subashan Perera, PhD; Yihuang Kang, MS, Steven M. Handler, MD

**Abstract:**  
Background: There are a limited number of studies using telemedicine in the nursing home (NH) setting, where residents have multiple comorbidities, polypharmacy, and are frequently admitted/readmitted to the hospital.

Objective: To determine the feasibility of using telemedicine to assist certified nurse practitioners (CRNPs) with managing acute change in condition and palliative care assessments of NH residents.

Setting: Residents of a single, 80-bed non-profit, non-chain NH.

Participants: Two CRNPs and 18 RNs were involved in the telemedicine consultations.

Methods: We used web-based surveys to assess the perception of telemedicine services in terms of quality of the diagnostic medical equipment and medical care provided from both CRNP and RN perspectives.

Results: Sixty telemedicine consultations were performed between 5/1/13 and 7/28/13. For 88.3% of the sessions, CRNPs believed that the technology is effective in the medical management of the resident. For 91.7% of the sessions, CRNPs believed that the use of telemedicine is an appropriate and effective use of their skills and time. CRNPs perceived that the telemedicine allowed them to provide appropriate care while helping the resident avoid a face-to-face visit by a CRNP 86.7% of the time, and an attending physician 90% of the time. For 60% of the sessions, CRNPs stated that telemedicine consultations helped to avoid resident transfer to the hospital/emergency department.

Conclusion: Telemedicine used by CRNPs to conduct telemedicine consultations for an acute change in condition and/or palliative care need in the NH is effective in the medical management of residents, avoids the need for face-to-face visits, and can help avoid resident transfers to the hospital/emergency department.
Adam Santanasto, PhD

**Department:** Epidemiology/Graduate School of Public Health

**Affiliation:** University of Pittsburgh

**Undergraduate:** University of Pittsburgh

**Graduate School:** University of Pittsburgh

**PhD:** University of Pittsburgh

**Current Position:** Post Doctoral Fellow

**Research Interest Areas:** Skeletal muscle aging

**Research Support Sources:** The Lifestyle Interventions and Independence for Elders (LIFE) Study (U01 AG022376)

**Research Title:**
The Relationship between Mitochondrial Energy Production and Mobility in Older Adults with a wide Range of Function

**Project Authors:**
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**Abstract:**
Mitochondria produce over 90% of ATP needed for movement and the capacity for oxidative phosphorylation decreases with age. We examined the association between mitochondrial function and walking performance in older adults. Participants were from an ancillary to the Lifestyle Interventions and Independence for Elders (LIFE) Study (n=33), which recruited lower functioning, sedentary participants (Short Physical Performance Battery (SPPB, 0-12), 7.9±1.2) and the Study of Energy and Aging (SEA, n=29), which enrolled higher functioning participants (SPPB, 10.9±1.4). Phosphocreatine recovery in the quadriceps was measured following an exercise-bout using 31P magnetic resonance spectroscopy and ATPmax (mM ATP/s) was calculated. Walking performance was defined as time (s) to walk 400m at usual-pace and participants were asked if anything was bothering them upon completion. Participants were 77.6±5.3yrs, 64.2% female and 67.2% white. ATPmax was nearly identical between LIFE and SEA (0.51±0.14 vs. 0.50±0.13). In linear regression analyses, walk-time was significantly related to ATPmax in SEA (β -181.3, p=0.05); but not the combined (β 9.3, p=0.93) or LIFE (β 76.8, p=0.74) cohorts. In LIFE, ATPmax was higher in those reporting discomfort at the end of the walk vs. those not (0.61±0.13 vs. 0.52±0.14, p=0.06). When we examined those who reported no discomfort separately, walk-time was significantly related to ATPmax in the combined cohort (β -183.2, p=0.05) and the relationship in LIFE was β -127.38, p=0.27. In conclusion, LIFE and SEA had nearly identical ATPmax despite LIFE being significantly lower functioning and less active. Future work will aim to explain why LIFE appeared to possess preserved ATPmax compared to SEA and why ATPmax was inconsistently related to function.
Alyssa Sartore, BSN Student

**Department:** University of Pittsburgh School of Nursing  
**Affiliation:** Undergraduate Research Mentorship Program  
**Current Position:** Undergraduate Research Mentorship Program student  
**Research Interest Areas:** Self-management in older adults with chronic disorders  
**Research Support Sources:** NIH, NINR, R01 NR010904  
**Research Title:**  
Intervention Integrity in a Randomized Clinical Trial to Promote Physical Activity in Older Adults with Comorbidity  
**Project Authors:**  
Alyssa M. Sartore, Elizabeth A. Schlenk  

**Abstract:**  
**Background/Purpose:** Effectiveness of behavioral interventions requires intervention integrity. Instruments to evaluate integrity that are tailored to a protocol with feedback to interventionists may enhance clinical trials. The purpose was to describe integrity to the protocol by interventionists in an ongoing clinical trial.

**Methods:** A descriptive design was used. Intervention sessions were audiotaped and 10% were randomly selected for audit, stratified by interventionist and session. Measures included 15 content integrity forms, one for each session, to evaluate percentage of agreement (POA) to the protocol and two visual analog scales (VAS) to evaluate quality of interaction (QOI) by interventionists and subjects relative to engagement, demeanor, listening skills, attentiveness, accuracy, openness, responsiveness, and understanding with scores ranging from 0 to 5. Descriptive statistics were performed.

**Results:** Two physical therapists and two nurses delivered 515 sessions to 44 subjects. Fifty-two sessions on 37 subjects were reviewed. Subjects were on average 67 (SD=9) years old, 78% (n=29) female, 78% (n=29) white, 43% (n=16) married, and 51% (n=19) employed, with 73% (n=27) having more than a high school education and 45% (n=14) having a family income <$50,000. Mean POA was 99.2% (SD=2.8%), which exceeded the criterion of 90% protocol adherence. Mean interventionist QOI score was 4.99 (SD=0.02), and mean subject QOI score was 4.98 (SD=0.05). Results were shared with interventionists for positive reinforcement.

**Conclusion:** Intervention content was reliably delivered, and QOI by interventionists and subjects was excellent. Regular evaluation of intervention integrity during a clinical trial is essential for intervention effectiveness and confidence in results.
Victoria Sharp, MA, CCC-SLP

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**Research Interest Areas:** Adult neurologic communication disorders

**Research Title:**
Frequency and co-occurrence of suppression and coarse coding deficits in adults with RHD

**Project Authors:**
Victoria Sharp, Dr. Connie Tompkins, and Dr. Margaret Lehman Blake

**Abstract:**
Study: This study examines two language processing functions that have the potential to create socially handicapping language comprehension difficulties in adults with right hemisphere brain damage (RHD). To date, there is no information about how prevalent these deficits are, or how often they may co-occur in the same individual. Coarse semantic coding allows normal comprehenders to bring to mind distant meanings or features of words that are appropriate in highly specific contexts (e.g., the "rotten" feature of the word "apple"). Suppression, is a process that inhibits contextually-irrelevant meanings (e.g., the "card-playing" meaning of the word "spade" in "He dug with the spade.").

Methods: 47 adults with RHD due to cerebrovascular accident listened to simple sentences followed by probe words. For coarse coding, the task was auditory lexical decision while suppression deficits were identified using an auditory relatedness judgment task. Deficits were defined by inaccurate or too slow responses (compared to healthy control group) on >50% of the experimental stimuli.

Results: Participants were identified in one of four categories: coarse coding deficit only (4.3%), suppression deficit only (36.2%), both coarse coding and suppression deficits (29.8%), and neither processing deficit (29.8%).

Conclusions: Determining the prevalence of these two central language processing deficits assists with accurately diagnosing and providing treatment for this understudied population. Both deficits are responsive to treatment and improvements in these basic language processes generalize to narrative comprehension. Work in this lab continues to examine treatment response as well as the neuroanatomical correlates of ineffective suppression function and coarse coding deficits.
C. Elizabeth "Beth" Sarles, MPH

**Department:** Dept. of Epidemiology/Graduate School of Public Health

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**Current Position:** Doctoral Student/Graduate Student Researcher

**Research Interest Areas:** Cognitive and Brain Aging

**Research Support Sources:** Aging Institute, Claude D Pepper, NIA contract, MR Research Center, University of Florida

**Research Title:** Venular Density by 7Tesla MRI Correlates with Cognitive Function in LIFE-M: An Exploratory Study of Brain Ultrastructure

**Project Authors:**
C. Elizabeth Sarles, Howard J. Aizenstein, Stephanie Studenski, Marco Pahor, Jack Guralnick, Nancy Glynn, Anne B. Newman, Tamer Ibrahim, Paul J. Laurienti, Caterina Rosano

**Abstract:**
Study: Brain small vessel disease changes (SVD) including lower vessel density and microbleeds are emerging as pathognomonic markers of cerebral arterial angiopathy, and are related to diminished brain function in older adults without neurological disorders. Brain SVD can remain clinically silent for several years before manifesting as stroke or dementia. Although difficult to quantify on conventional neuroimaging, recent advances in ultra-high field (UHF) neuroimaging can more accurately identify SVD markers.

Methods: We applied UHF at 7Tesla to quantify SVD severity and to explore the correlations with cognition. Participants of Lifestyle Interventions and Independence for Elders received UHF at study entry (N=58, 76yo, 43 Female). Susceptibility-weighted MR Images were rated by 2 independent raters (ICC >0.8). Post-capillary venules (length 9-10mm) were traced in predetermined 10cm2 periventricular areas. Dilated perivascular spaces, microbleeds, and white matter edema were also measured. Memory testing (HVLT-R) was administered. Results: Lower venular density was associated with significantly lower performance on HVLT-R (more false positive responses on recognition memory, spearman rho: -0.40, p= 0.003). Perivascular spaces and edema in the white matter were identified in more than half of the participants but were not related to cognition.

Conclusions: UHF can uncover early signs of SVD that are not readily visible using low-field MRI and that are related to lower processing speed and memory.

Significance: UHF can help early identification of older adults at greatest risk of SVD and may provide biomarkers to closely monitor brain vascular health.
Amit Sethi, PhD, OTR/L

**Department:** Occupational Therapy  
**Affiliation:** School of Health and Rehabilitation  
**Current Position:** Assistant Professor  
**Research Interest Areas:** Aging and Falls

**Research Title:** The temporal distribution of ambulatory activity discriminates fallers from non-fallers in acutely hospitalized older patients

**Project Authors:**  
Amit Sethi, Department of Occupational Therapy, University of Pittsburgh  
Ervin Sejdi, Department of Electrical and Computer Science Engineering, University of Pittsburgh  
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Amit Kumar, Department of Rehabilitation Sciences, University of Texas Medical Branch  
Steve R Fisher, Department of Rehabilitation Sciences, University of Texas Medical Branch; Department of Physical Therapy, University of Texas Medical Branch.

**Abstract:**  
The association between ambulatory activity and falls in acutely hospitalized older patients is unclear. It may be important to determine this relationship since reduction in-patient ambulatory activity is a common measure undertaken to minimize falls in hospital settings. The objective of this study was to apply novel analytic techniques to examine links between ambulatory activity and falls in acutely hospitalized older patients. Ambulatory activity, assessed via body-worn accelerometers, of nine older patients who fell during hospitalization was compared to that of 14 similar non-fallers. Ambulatory activity was evaluated using average number of steps, and skewness and kurtosis measures of temporal distributions of steps. Skewness measures the degree to which the distribution deviates from symmetry, while kurtosis reveals the pointiness of a distribution. While the average number of steps between both the groups was similar, inpatient fallers demonstrated significantly decreased skewness and increased kurtosis compared to non-fallers. These preliminary findings suggest that while inpatient fallers demonstrated a constant pattern with a greater probability of occurrence of small number of steps, the non-fallers had a variable pattern in their step activity. Therefore, while the average step activity was similar between the groups, the temporal distribution of step activity discriminated fallers from non-fallers, implying that reducing mobility while acutely hospitalized to prevent falls is unfounded. Future studies are warranted to examine whether measures of temporal distribution of steps can prospectively predict falls in acutely hospitalized older patients.
Tushar Singh, MD, MS, PhD(c)

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**Graduate School:** Charite Medical School, Humboldt University, Berline, Germany; Victor Segalen University, Bordeaux, France; University of Bergen, Bergen, Norway  
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**Research Interest Areas:** Cardiovascular disease and disability in aging population

**Research Support Sources:** Dean's office, Graduate School of Public Health

**Research Title:**  
Design and baseline characteristics of a rural Indian cohort: Mobility and Independent Living in Elders Study (MILES)

**Project Authors:**  

**Abstract:**  
Background: Demographic increase in the older population is most rapid in developing countries and will have major impact on public health. Indian population is not well described, but evidence suggests that the current demographic transition provides a unique opportunity to better understand future disability. To accomplish this, we established a longitudinal cohort study – MILES, in a rural population of older Indians.

Methods: We enrolled a random sample of 564 men and women aged 60+ from Medchal Mandal region in Andhra Pradesh state. Baseline visit consisted of two separate clinic visits for measurements of blood pressure, anthropometry, short physical performance battery, 400-meter walk, grip strength, ankle-arm index, cognitive examination, peripheral quantitative computerized tomography, knee x-ray, carotid ultrasound, blood draw and a comprehensive interview. Annual follow-up visits are planned to collect information on incident disability and disease.

Results: According to preliminary data analysis from the first clinic visit, median age of the participants was 66 years (60-92); median body mass index, 21.7 kg/m2; median gait speed, 0.67 m/s and median grip strength 17 kg; 55% self-reported their health status as fair or poor and 13% reported falling >1 times in past 12 months.

Conclusion: Preliminary data estimates suggest a much frailer population in this cohort compared to US subjects age 66 years. MILES will provide estimates of global burden of disease and disability and their risk factors in older adults, and findings from the study will be used to identify potential interventions to prevent disability appropriate in this rural population of Indians.
Abstract:
Mobility is important for maintaining health. The United States (US) federal government has allocated hundreds of billions of dollars to help provide resources to Americans with disabilities, older adults, and the poor. Understanding one of the main data sources—the American Community Survey (ACS)—influencing the distribution of resources is important for public health. The study introduces readers to publicly available Public Use Microdata Sample (PUMS) files from 2009-2011 and provides prevalence estimates of three disability related items in the data for those aged 15 and over who reside in one of the 48 contiguous US states and Washington DC. Estimates are stratified by age and poverty status. When the population weight is applied to the 7,198,221 individuals in the sample under analysis, they are said to represent 239,641,088 of their counterparts in the US population. The three tables show the heterogeneity of variation in the three disabilities measures between states. ACS data are large, of high quality, transparent, and have the ability to influence the allocation of resources capable of affecting the physical mobility of older adults and the disable. Public health researchers should seek ways to make use of ACS data.
Abstract:
It is well documented that older adults restrict their physical activity following a fall. However, few studies have explored whether older adults compensate for restricted activity following a fall by engaging in other types of activities. This study aims to examine physical activity patterns in three different domains: (1) leisure activities, (2) moderate- to vigorously intense activities, and (3) non-mobility activities, among older adults who fall. Participants included 1836 adults (M age = 75.0 years) who participated in Falls Free PA, a statewide trial for the primary prevention of falls. Incident falls and physical activity measures were collected at baseline, and at 6-month and 12-month follow-ups. At baseline, 128 adults (6.8%) reported a fall within the last 30 days. Compared to non-fallers, older adults who fell engaged in significantly less leisure activity F(1, 1722) = 3.92, p = .04, less moderate- to vigorously intense activity, F(1, 1735) = 3.72, p < .01, but more non-mobility activities F(1, 1764) = 1.95, p = .04. Activity restriction is a serious consequence of falling because it contributes to physical deconditioning, which in turn places older adults at risk for recurrent falls. Our cross-sectional findings suggest that older adults compensate for restricted activity following a fall by engaging on non-mobility activities, such as volunteering, attending church, and reading. This finding highlights the plasticity of older adults' efforts to manage disability, with efforts aimed at compensation for lost functional abilities. Further analyses will explore changes in physical activities and incident falls across the 12 month study.
Dana Tudorascu, PhD

**Department:** Internal Medicine, Biostatistics, Psychiatry

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**PhD:** University of Pittsburgh

**Current Position:** Assistant Professor

**Research Interest Areas:** Biostatistics, Neuroimaging

**Research Support Sources:** RO1 AG0374541

**Research Title:**
Potential mechanisms of resilience to brain aging

**Project Authors:**
Dana Tudorascu, Howard Aizenstein, Anne Newman, Caterina Rosano

**Abstract:**
Study One hypothesis to explain why some older adults maintain high functioning late in life despite white matter ischemic changes (i.e. small vessel disease), is that they have a greater “brain reserve”. However, brain reserve has not been objectively quantified, as it has mostly relied on gross measures of whole-brain abnormalities that are largely non-specific manifestations of brain aging. We identified biomarkers of brain reserve by examining longitudinal neuroimaging data of the medial temporal lobe (parahippocampus, hippocampus and entorhinal cortex) obtained in older adults with higher burden of small vessel disease, and their association with processing speed.

**Methods**
Brain MRIs were obtained in 2006-09 in 325 participants and repeated in 165 participants three years later. Of these, n=65 (age (82.7±2.5), 26 AA, 37 women) had high burden of small vessel disease defined as white matter hyperintensity burden above the median (0.003). Spearman’s rank correlation and 95% bootstrap confidence interval were computed.

**Results**
Among the 65 participants the DSST score was inversely related to atrophy of the medial temporal lobe during the prior three years, with associations stronger for the entorhinal cortex, r=-0.289, 95% CI (-0.461,-0.114) as compared to hippocampus r=0.208, 95% CI (0.008,0.394) or parahippocampus r=-0.046, 95% CI (-0.233,0.154).

**Conclusions**
Among older adults with signs of small vessel disease, higher score on a simple test of processing speed indicates a relative preservation of the entorhinal cortex, an area important for memory.

**Significance**
A relative preservation of the gray matter of the medial temporal lobe, and of the entorhinal cortex in particular, may be a potential mechanism of resilience to brain small vessel disease in older adults.
Abstract:
Study: Visinin-like protein-1 (VILIP-1) is a neuronal Ca2+ sensor (NCS) protein that shows cell surface membrane association, including association with membranes of axons and dendrites, where it functions as a modulator of cell surface associated proteins. VILIP-1 has been implicated in the pathology of Alzheimer disease (AD). VILIP-1 is increased in cerebrospinal fluid of early AD subjects relative to normal controls and other dementia subjects, and predicts more rapid cognitive decline. The objective of this study was to determine if mice heterozygous for VILIP-1 gene deletion (VILIP-1 +/-) have altered expression of synaptic and neurodegenerative markers.

Methods: Sample tissue was obtained from 8 week old VILIP-1 +/- (HET) and age-matched wild-type (WT) mice. We used SDS-PAGE and quantitative western blot to examine homogenized tissue from cortex and hippocampus. Blots were tagged with fluorescent antibodies for pre- and postsynaptic markers, APP and a loading control, ß-tubulin.

Results: Our results demonstrated that VILIP-1 expression was significantly decreased by 38% in cortex and 47% in hippocampus of HET mice compared to WT (p<0.01 and <0.04 respectively). There was no significant alteration in the expression of synaptic markers GluR1, GluR2, NR1, NR2B, GAD65, PSD95, Synaptophysin, or Spinophilin. Similarly APP levels were unchanged.

Conclusions: These findings indicate that although VILIP-1 +/- mice had reduced expression of VILIP-1, levels of synaptic markers and APP remained unchanged. Further studies will examine additional neurodegenerative markers such as total-tau, phospho-tau, and examine older VILIP-1 +/- mice to more closely approximate the AD age of onset.
Chao Hsing Yeh, PhD

**Department:** School of Nursing  
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**PhD:** University of Massachusetts Medical Center, Worcester

**Current Position:** Associate Professor

**Research Interest Areas:** Complementary and alternative medicine

**Research Support Sources:** Aging Institute

**Research Title:**  
Auricular Point Acupressure to Manage Chronic Low Back Pain in Older Adults: A Randomized Controlled Pilot Study

**Project Authors:**  
Natalia E. Chao Hsing Yeh, Natalia E. Morone, Ronald Glick, Kathryn M. Albers, Lorna Kwai-Ping Suen

**Abstract:**  
This prospective, randomized clinical trial (RCT) pilot study was designed to (1) assess the feasibility and tolerability of an easily administered APA intervention and (2) provide an initial assessment of effect size as compared to a sham treatment. Thirty-seven subjects were randomized to receive either the real or sham APA treatment using a computer generated randomization routine. Vacaria seeds were taped onto active or inactive auricular points for both treatment groups. All participants were treated weekly for 4 weeks. Self-report measures were obtained at baseline, weekly during treatment, at end-of-intervention (EOI), and at a 1-month follow-up. Measures included report of pain, disability, quality of life, and psychological factors. Data was analyzed using intention-to-treat (ITT), and a secondary analysis was performed per protocol (PP) for treatment completers. A dropout rate of 26% in the real APA group and 50% in the sham group was observed. The reduction in worst pain from baseline to EOI was 41% for the real and 5% for the sham group with a Cohen’s effect size of 1.22 (p < 0.00). Disability scores on the Roland Morris Disability Questionnaire (RMDQ) decreased in the real group by 29% and were unchanged in the sham group (+ 3%) (p < 0.00). Given the high dropout rate, results must be interpreted with caution; nevertheless, our results suggest that APA may provide an inexpensive and effective complementary approach for the management of back pain in older adults, and further study is warranted.