THE JOHNS HOPKINS
Center on Aging and Health

Together with

The School of Public Health Gerontology Interest Group

Present the 3rd Annual

Research on Aging Showcase

Monday, April 26th, 2010
1-4pm
Feinstone Hall, JHSPH

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

JOHNS HOPKINS MEDICINE

JOHNS HOPKINS UNIVERSITY SCHOOL OF NURSING

Monday, April 26, 2010

Good Afternoon,

We are excited to welcome you to the 3rd annual Research on Aging Showcase!

This year the session features current work by students, post-doctoral fellows, faculty, and research associates at Johns Hopkins and the University of Maryland. We thank you for joining us and hope that today's event will help spark connections and promote cooperation among researchers across diverse departments and schools as well as between universities.

We are grateful to the Center on Aging and Health and the Division of Geriatric Medicine and Gerontology at the School of medicine for their continued support of our student initiative.

We would also like to thank the JHSPH Student Assembly, the Hopkins Epidemiology and Biostatistics of Aging Training Program, the Hopkins Claude D. Pepper Older Americans Independence Center, and the University of Maryland Epidemiology of Aging Training Program as well as the JHSPH Event Planning and Housekeeping teams for helping to make the showcase possible.

Finally we would like to thank our esteemed panel of judges, including:

Emily Agree, PhD
Dawn E. Alley, PhD
Karen Bandeen-Roche, PhD
C. Lynne Burek, PhD
M. Daniele Fallin, PhD
Luigi Ferrucci, MD, PhD
Judith Kasper, PhD
A. Richey Sharrett, MD, PhD
Eleanor Simonsick, PhD
Adam P. Spira, PhD
Jeremy D. Walston, MD
Paul Willging, PhD
Qian-Li Xue, PhD

We hope that you enjoy today's poster session, and look forward to seeing you at future events.

Sincerely,

The Gerontology Interest Group steering committee -

Jennifer Deal
Michal Engelman
Alden Gross
Zenobia Moore
Jennifer Schrack

ABSTRACTS

PAGE

YU-CHING CHENG
POST-DOCTORAL FELLOW
UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

Genetic Variants in and around *ADIPOQ* on Chromosome 3q are Associated with Circulating Adiponectin Levels and Adiposity Traits in the Old Order Amish

Yu-Ching Cheng, Braxton D. Mitchell, Alan R. Shuldiner, Toni I. Pollin

University of Maryland School of Medicine, Baltimore, Maryland

Adiponectin, a hormone produced exclusively by adipocytes, enhances insulin sensitivity and reduces vascular inflammation. Plasma adiponectin levels are decreased in obesity and increased after weight reduction, and is an important marker associated with metabolic syndrome, diabetes and cardiovascular diseases. To identify genetic variants that have pleiotropic effects on adiponectin levels and adiposity, we studied 849 healthy Amish individuals characterized for adiposity (reflected by BMI, waist circumference and percent body fat) and plasma adiponectin levels. Through a genome-wide association analysis, we identified three SNPs on chromosome 3q associated with adiponectin levels with $P < 10^{-7}$. Two SNPs (rs3774261 and rs6773957) were located within *ADIPOQ*; the third (rs698092) was located within mannan-binding lectin serine protease 1 (*MASP1*), approximately 400 kb telomeric to *ADIPOQ*. Rs698092 was significantly associated with BMI ($\beta = -0.7 \pm 0.2$, age- and sex-adjusted $p = 0.004$) but not with waist ($p = 0.1$) or percent body fat ($p = 0.08$). Further analyses revealed the rs698092 (A/G polymorphism)-adiposity associations to be limited to women only, with 1.36 kg/m^2 lower BMI ($p < 0.001$), 2.28 cm lower waist ($p = 0.006$) and 1.76 % lower body fat ($p = 0.003$) per G allele. Rs3774261 and rs6773957 were not associated with BMI, waist or percent body fat in either men or women. We conclude that independent of SNPs in *ADIPOQ*, a variant in *MASP1* is associated with both adiponectin levels and obesity. These findings suggest that the contribution of chromosome 3q to adiposity may involve loci in addition to *ADIPOQ*.

ELIZABETH COLANTUONI
ASSISTANT SCIENTIST, DEPARTMENT OF BIOSTATISTICS
JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

Treatment Strategies: An Evaluation of the Impact of Potential Preventative and Therapeutic Interventions on Costs of Alzheimer's Disease

Elizabeth Colantuoni and Ron Brookmeyer

Introduction: With the predicted increase in the prevalence of Alzheimer's disease in the coming decades, the associated health care costs are forecast to be staggering.

Methods: We extended the multi-stage incidence to prevalence disease model proposed by Brookmeyer, et al (2007) to predict costs and the impact of interventions designed to delay disease onset or progression. The interventions can be targeted to subpopulations defined by risk factors such as age or apolipoprotein E4.

Results: We estimate that delaying disease onset by an average of 1 year starting in 2015 can result in savings of 10% annually by 2025. If disease progression could also be delayed 1 year on average, the maximum cumulative savings is achieved by starting the preventative treatment when persons reach approximately age 75. We find that using both age and an additional risk factor to selectively target preventative interventions can also significantly reduce costs. The exact savings are dependent on the relative cost of the preventative intervention and caring for early stage patients, in addition to the strength (its relative risk) and prevalence of the risk factor.

Conclusions: Significant savings in the costs of AD can be achieved with preventative or therapeutic interventions. Models of disease progression are useful for assessing the cost effectiveness of potential interventions and devising optimum strategies for targeting those interventions.

Disclosure for all authors on abstract: Elizabeth Colantuoni and Ron Brookmeyer were supported by Elan and Wyeth Pharmaceuticals.

CHRIS D'ADAMO
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UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

The Associations Between Baseline Serum Vitamin E Concentrations and Recovery of Physical Function During the Year After Hip Fracture

Background: Poor nutritional status after hip fracture is common and may contribute to the steep decline and protracted recovery of physical function post-fracture. Low serum concentrations of vitamin E have been associated with incident decline in physical function among older adults, but the role of vitamin E in physical recovery has never been explored in older hip fracture patients. We examined whether serum vitamin E concentrations shortly after hip fracture were associated with physical function at specific points and throughout the year after fracture.

Methods: Baseline concentrations of the two major forms of vitamin E – alpha and gamma tocopherol – were assessed among female hip fracture patients in the Baltimore Hip Studies cohort 4 (BHS 4). Four physical function measures; Lower Extremity Gain Score (LEGS), Six Minute Walk Test (6MWT), SF-36 Physical Functioning Domain (SF36-PF), and Yale Physical Activity Score (YPAS); were assessed at 2, 6, and 12 months post-fracture. Generalized estimating equations modeled the relationship between serum tocopherol concentrations and physical function at each post-fracture time point.

Results: Ninety-six women were studied. Higher levels of alpha tocopherol and combined alpha and gamma tocopherol were associated with longer 6MWT distances ($p<0.01$) and higher YPAS scores ($p<0.07$) during the year post hip fracture after adjusting for covariates.

Conclusions: Serum concentrations of both alpha and gamma tocopherol were associated with better physical function after hip fracture. These micronutrient markers of a healthy diet may represent a potentially modifiable factor related to recovery of physical function after hip fracture.

JENNIFER A. DEAL, MHS
PHD CANDIDATE, DEPARTMENT OF EPIDEMIOLOGY
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Autonomic Dysfunction and IADL Disability in Community-Dwelling Older Women: The Women's Health and Aging Study I

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1 Department of Epidemiology, 2 Center on Aging and Health, 3 Department of Medicine Division of Geriatric Medicine and Gerontology, The Johns Hopkins Medical Institutions

Context: Disability in older adults is a major public health concern. Whether autonomic dysfunction contributes to instrumental activities of daily living (IADL) disability has not been studied.

Objective: To test the hypothesis that autonomic dysfunction, as measured by abnormal heart rate variability (HRV), is independently associated with IADL disability in community-dwelling older women.

Setting and Participants: Pilot study (N=280) within the Women's Health and Aging Study I, a population-based, prospective cohort study of 1002 women representative of the 1/3 most disabled community-dwelling older women in Baltimore (1992-1995).

Design: Cross-sectional. HRV was measured by 7 traditional time and frequency domain measures. IADL disability was defined as difficulty with 2 or more of the following: managing money, taking medications, preparing your own meals, using a telephone, doing light housework, doing heavy housework, or shopping for personal items.

Results: Autonomic dysfunction was associated with IADL difficulty. The odds ratio of IADL disability, comparing the lowest tertile of HRV (indicating worse HRV) to the top two tertiles, was 2.11 (95% CI: 1.19, 3.75) for the standard deviation of normal-to-normal intervals (SDNN) index, and 2.48 (95% CI: 1.38, 4.45) for very low frequency (VLF) power, after adjustment for demographic and disease variables. Estimated odds ratios were greater in models restricted to those with no disease (i.e., no clinical cardiovascular disease, diabetes, or depression).

Conclusion: Autonomic dysfunction was associated with IADL disability, although associations were heterogeneous by HRV index. These findings raise the hypothesis that autonomic dysfunction may be a potentially modifiable risk factor for IADL disability.

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Impact of Dementia on Medication Use and Adherence among Medicare Beneficiaries with Congestive Heart Failure

Sarah Dutcher, BS; Gail Rattinger, PharmD, PhD; Ilene Zuckerman, PharmD, PhD; Linda Simoni-Wastila, BSPharm, PhD; Stephen Gottlieb, MD; Bruce Stuart, PhD

Research Objective: This study describes medication use and adherence among older Medicare beneficiaries with CHF and evaluates the impact of comorbid dementia on medication adherence patterns.

Methods: We conducted a retrospective analysis of older Medicare beneficiaries diagnosed with CHF. Adherence was assessed for evidence-based drugs indicated for chronic use in the treatment of systolic CHF. Two year adherence measures included: 1) binary measure of use (prevalence); 2) continuous measure of days of therapy (duration); 3) medication possession ratio (MPR). We describe the cohort and medication adherence patterns, and apply multivariable regression to assess the adjusted impact of dementia on use and duration of CHF treatment.

Results: Of the 117,510 beneficiaries with CHF, the mean age was 78.5 (±7.3) years, 51.4% were female, and 80.4% filled $\geq$1 prescription for a chronic use medication. Mean MPR was 0.89 (±0.14). The 7.5% of individuals with a concurrent dementia diagnosis were older (82.6 vs. 78.1 years), disproportionately female (58.6% vs. 50.9%), and more often had 'unspecified' CHF diagnoses (92.6% vs. 88.3%), compared to patients without dementia. Chronic CHF medication prevalence was lower in patients with dementia (67.7% vs. 81.4%) and duration was significantly shorter (460 vs. 565 days), though MPR did not differ. In regression analyses, dementia was associated with 14% lower prevalence and 11% shorter duration of chronic CHF medication use (both $p<0.0001$).

Conclusion/Implications: Although Medicare beneficiaries with CHF exhibit good medication adherence, findings suggest that dementia status may negatively affect treatment decisions for chronic diseases such as CHF.

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Difficulty with Health Care Tasks Among Caregivers of Multimorbid Older Adults

Erin Giovannetti, Jennifer Wolff, Lisa Reider, Qian-Li Xue, Carlos Weiss, Bruce Leff, Chad Boult, Travonia Hughes, and Cynthia Boyd

Family caregivers of multimorbid older adults often provide assistance with health care tasks, however little is known about the difficulty they may have providing assistance or implications for their well-being. This study aimed to (1) describe caregivers' health care task difficulty (HCTD); (2) determine what characteristics are associated with HCTD; and (3) explore the association between HCTD and caregiver well-being. We conducted a cross-sectional analysis of caregivers (N=308) to multimorbid older adults (65+) enrolled in an ongoing RCT of Guided Care. A HCTD scale (0-16) was generated measuring the difficulty caregivers reported in assisting older adults with health care tasks, including taking medications, visiting health care providers, and managing medical bills. We examined the relationship between HCTD and caregiver strain (Caregiver Strain Index), depression (Center for Epidemiological Studies Depression Scale) and self-efficacy for caregiving. A multinomial logistic model indicated that older age, number of health tasks assisted with, and low self-efficacy were significant independent predictors of high caregiver HCTD. Each one-point increase in self-efficacy decreased the odds of high HCTD by 41% (OR 0.59, 95% CI:0.47, 0.75). Adjusted linear regression models showed that caregiver reported increased HCTD was independently associated with higher caregiver strain (B:2.7, 95% CI: 1.12, 4.29) and depression (B:3.01, 95% CI: 1.06, 4.96). High HCTD is associated with increased strain and depression among caregivers to multimorbid older adults. That caregiver self-efficacy was strongly associated with HCTD suggests health-system-based educational interventions designed to increase caregiver self-efficacy might improve caregiver well-being.

ALDEN GROSS, MHS
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Evidence-based Strategies for Improving Memory Function among Older Adults

Alden L. Gross, Jeanine M. Parisi, George W. Rebok, Jean Ko, Adam P. Spira, Quincy M. Samus, Jane S. Saczynski, Steven Koh, Ronald E. Holtzman

Maintenance of memory ability and prevention of memory decline are major public health challenges. Memory abilities are important factors for the preservation of independence and well-being among older adults. We conducted a systematic review of memory training research to identify evidence-based strategies in training programs for particular clinical populations. Decisions about evidence-based methods were made using APA criteria (Weisz & Hawley, 2001). The review identified 402 memory training studies published between 1967 and 2008. From these, 50 treatment-control comparisons (3 using MCI populations, 12 using dementia populations, and 35 using healthy, older adult populations) met APA criteria for inclusion. These 50 comparisons provided information about 9 distinct mnemonic strategies (association, categorization, visual imagery, rehearsal, concentration, Method of Loci, face-name, number mnemonics, story mnemonics) and 6 program approaches (spaced retrieval, self-guided training, procedural, cognitive control, relaxation therapy, external memory aids) to be considered as evidence-based. The review identified 8 different memory training techniques (association, categorization, visual imagery, rehearsal, concentration, Method of Loci, face-name, self-guided training) beneficial for improving memory in cognitively intact or mildly cognitively impaired older adults. These findings can inform the development and implementation of future cognitive training programs for older adults.

SU YEON LEE
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Prevalence of Depression, Cognitive Impairment and Mental Health Service Utilization among Community-residing Korean Elders: Preliminary Findings from the Memory and Aging Study among Koreans in Maryland (MASK-MD)

Introduction: Korean-Americans comprise the fourth largest Asian-American subgroup, and the vast majority of Korean elders attend ethnic churches. The Memory and Aging Study among Koreans in Maryland (MASK-MD) is a community-based, cross-sectional study that examines mental health service needs of Korean elders.

Methods: Based on cluster sampling method, we selected 20 out of 150 Korean churches in Baltimore-Washington area and recruited 631 Korean American elders (mean age: 71.03 +/- 6.31 years; female: 69.5%), all first-generation immigrants. Participants were screened for depression and dementia based on Korean versions of Patient Health Questionnaire (PHQ-9-K) and Mini-mental Status Examination (MMSE-KC) administered by trained community health workers.

Results: 22.8% and 7.2% of the participants had PHQ-9 scores of 5 or above ("any depression") and 10 or above ("clinical depression"), respectively. 19.2% scored less than 24 on MMSE-KC, and 7.0% scored below the age- and education-specific cut-off values for “probable dementia” based on Korean normative data for MMSE-KC. Of forty-five participants screened positive for severe depression (PHQ>=10), only eight (18.2%; all females) reported seeking treatment from a health care provider and one of them was on antidepressant. Likewise, of forty-one participants with “probable dementia” based on Korean MMSE-KC normative data, only three (7.3%) sought consultation and treatment from a health care provider.

Conclusions: The prevalence of depression and cognitive impairment are high in this sample of Korean American elders. Rate of mental health service utilization among depressed or cognitively impaired Korean elders, especially men, is low. Further research is needed to further identify barriers to and strategies for appropriate mental health care.

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Predictors of Any Drug Use, Persistent Use, and Level of Medication Use Among Medicare Beneficiaries with Diabetes

Authors: Jennifer Lloyd[1-3], Amy Davidoff[1,4,5], Bruce Stuart[1,4,5], J. Samantha Shoemaker[1,4,5], Thomas Shaffer[1-5]

1 University of Maryland Baltimore, 2 University of Maryland Baltimore County,
3 Doctoral Program in Gerontology, 4 Pharmaceutical Health Services Research , 5 University of Maryland School of Pharmacy

Objective: Examine the role of knowledge, attitudes and other health behaviors as predictors of three dimensions of medication use among Medicare beneficiaries with diabetes.

Design: Panel data from the 1997-2005 Medicare Current Beneficiary Survey.

Participants: Six pooled cohorts of disabled and aged beneficiaries who self-reported diabetes at baseline and were followed for 3 years (N=2,648).

Measurements: Self-reported use of oral antidiabetic agents, angiotensin-converting enzyme inhibitor (ACE-I) and angiotensin II receptor blockers (ARBs), and statins was tracked. Hypothesized predictors include disease specific prevention behaviors, use of preventive health services, attitudes about care seeking, overall medication burden, and supplemental insurance. Dependent variables were drug use in the first year, persistent drug use, and level of medication for each of the three drug classes.

Results: Having less knowledge about diabetes was associated with less persistent use of antidiabetic drugs and statins. Attending a diabetes management class was associated with less persistence in antidiabetic use, but greater levels of use (3 additional prescription fills) among persistent users. Avoidance of doctors was associated with 1.6 more prescription fills of antidiabetic drugs compared with those who do not avoid doctors. Preventive health behaviors were positively associated with being a statins user and with persistent use of statins, respectively.

Conclusions: Disease specific and other preventive health behaviors were jointly significant predictors of adherence behaviors in all three equations for some but not all drugs. Diabetes management class attendance, avoiding doctors, and a count of other drugs used had unexpected and inconsistent impacts on adherence behaviors.

Funding Source: Robert Wood Johnson Foundation and the National Institute on Aging T-32 grant

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Prevalence of Minor Psychotic Symptoms in a Community-Based Parkinson's Disease Sample

Introduction: Psychotic symptoms occur frequently in patients with Parkinson 's disease (PD) and are associated with greater physical disability, cognitive and affective dysfunction, caregiver distress, and mortality. The so called minor psychotic phenomena, which include sense of presence, passage hallucinations, and illusions, are often excluded from studies on PD-related psychosis and reported prevalence estimates are variable. The objective of this study was to determine the prevalence of psychotic phenomena in a PD sample from community-based movement disorders clinics and examine and compare the clinical correlates associated with the various psychotic phenomena.

Methods: 250 patients with idiopathic PD and MMSE>23 from three community-based movement disorder clinics underwent comprehensive research diagnostic evaluations by a geriatric psychiatrist as part of a study on mood disorders in PD. Psychotic symptoms were categorized using a checklist, which included a breakdown of hallucinations, delusions and minor symptoms. Clinical characteristics of groups with minor and other psychotic symptoms were compared. The NINDS/NIMH criteria for PD-psychosis were then applied.

Results: Of the total sample, 63 (25.2%) patients were found to have any current psychotic symptoms, with 31 (12%) having minor symptoms alone, and 32 (13%) having hallucinations and/or delusions. Compared to those with no current psychiatric diagnoses, minor symptoms are associated with greater PD-related disability and complications of dopaminergic therapy, more depressive symptoms, and worse quality of life. 94% (n=59, 24% of the total sample) diagnosed with psychosis by the expert panel fulfilled the NINDS/NIMH proposed criteria**.**

Conclusions: Psychotic symptoms are common in PD patients, with minor psychotic phenomena present in up to half of affected patients in a community-based sample. Psychotic symptoms, including minor phenomena, are clinically significant. The NINDS/NIMH PD-psychosis criteria capture the clinical characteristics of psychosis as it relates to PD, specifically. Longitudinal studies are needed to determine whether minor psychotic symptoms represent a precursor to hallucinations and delusions and if age of PD onset is indicative of a differing disease trajectory.

DAVID MARON
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FIDELITY RESEARCH PROGRAM COORDINATOR
BALTIMORE EXPERIENCE CORPS STUDY

Baltimore Experience Corps® Training Program Improves Volunteer Self-Efficacy

Objectives: This research investigated the levels of volunteer self-efficacy through an 11-item questionnaire administered before and after a weeklong training program designed to improve older adult volunteers' confidence in mentoring school children grades K-3. Participants volunteer for a minimum of 15 hours per week for two school years. The training program occurs one week before placement in a school. The questionnaire is designed to assess the self-efficacy for mentoring skills, preparedness for entering the school/program, and connectedness to other program volunteers; all key constructs covered in training. Participants' reporting higher levels of self-efficacy for post-training scores than pre-training scores is hypothesized.

Participants: 161 older adults aged 60 years and older from the Baltimore area participated. The majority of participants were African-American females.

Design/Methods: Responses to items are given on a 5-point Likert scale with lower scores indicating higher levels of self-efficacy (1=Strongly Agree, 2=Agree, 3=Not Sure, 4=Disagree, 5=Strongly Disagree). The analysis comprised data from eight training sessions during 2008/2009.

Results: Analyses assessed 1) the overall Pre/Post averages and 2) differences for each item. A t-test of Pre/Post averages showed statistically significant differences ($p < .0001$), with means of 22.1 (SD 5.5) for pre-training scores and 17.3 (SD 4.3) for post-training scores. Statistical significance of $<.05$ or lower was found for all but two items (1 and 11).

Conclusion: The Baltimore Experience Corps® study training program significantly increases volunteer self-efficacy as a mentor for elementary school children.

ERIN MCINRUE
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JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

Disordered Sleep and Sleep Medication Use in United States Nursing Homes

Introduction: Sleep disorders affect half of community-dwelling older adults; however, there are no recent epidemiologic reports describing sleep disorder prevalence in nursing home residents (NHR). This study aims to identify the prevalence of sleep disorder diagnosis and prescribed sleep medication use among US NHR ages 65 years and older.

Methods: 11,940 respondents ages 65 and older completed the 2004 National Nursing Home Survey. Sleep disorders and medications were ascertained from chart review using International Classification of Diseases (ICD-9-CM) and long-term care drug database system codes, respectively.

Results: Sleep medications were taken by 16.0% of NHR the day before the survey while sleep disorders were diagnosed among 3.07% of NHR. 44.7% of NHR with sleep disorders took a sleep medication. 8.6% of sleep medication users had a diagnosed sleep disorder.

Compared to residents without a sleep disorder, NHR with a diagnosed sleep disorder used more prescription medications ($p<0.0001$), had more symptoms of depression ($p<0.001$), and greater functional impairment ($p=0.016$).

Compared to residents who did not use sleep medication, NHR who took medication were younger (82.8 vs. 84.4 years; $p<0.0001$), had a shorter length of stay (766.7 vs. 896.5 days; $p=0.02$), used more prescription medications ($p<0.0001$), had more symptoms of depression ($p<0.001$), were more likely to be female ($p=0.002$), and white ($p<0.001$).

Conclusion: The low prevalence of sleep disturbances, as ascertained by diagnosis or medication use, suggest possible under-detection of sleep disorders in NHR. That less than 10% of NHR using sleep medications had a sleep disorder diagnosis merits attention.

ANDY MENKE
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Sex Steroid Hormone Concentrations and Risk of Death in US Men

The association of sex hormone levels with mortality over a median of 16 years of follow-up was evaluated in a prospective cohort study. The study included 1,114 US men who participated in phase 1 (1988–1991) of the Third National Health and Nutrition Examination Survey Mortality Study and had no history of cardiovascular disease or cancer at baseline. Multivariable adjusted hazard ratios for all-cause mortality associated with a decrease in hormone concentration equal to the difference between the 90th and 10th percentiles of the sex hormone distributions were estimated by using proportional hazards regression. The hazard ratios associated with low free testosterone and low bioavailable testosterone levels were 1.43 (95% confidence interval (CI): 1.09, 1.87) and 1.52 (95% CI: 1.15, 2.02), respectively, for follow-up between baseline and year 9; they were 0.94 (95% CI: 0.51, 1.72) and 0.98 (95% CI: 0.56, 1.72), respectively, for follow-up between year 9 and year 18. Men with low free and bioavailable testosterone levels may have a higher risk of mortality within 9 years of hormone measurement. Future studies should be conducted to fully characterize the association of low free and bioavailable testosterone concentrations and mortality in men and to describe the mechanism underlying the association.

ESTHER PAK
MD CANDIDATE (MSII)
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Longer Enrollment at One PACE site is Associated with the Decision for Less Aggressive Code Status

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Purpose: Advance care planning, encompassed in end of life care, is especially important for the growing high risk, nursing home eligible elderly population. Specially trained team members at PACE (Programs of All-inclusive care for the Elderly) regularly conduct and document discussions regarding code status. The purpose of this study was to evaluate changes in codes status at one PACE site and to determine whether longer duration in the program affects these decisions.

Methods: We conducted a retrospective chart review of 93 Hopkins ElderPlus participants who died while enrolled during 2007-2009 (54% black, 80% females, mean age 82.2 $\pm$ 8.7). We quantified the number of code status discussions and recorded the documented code status at the time of enrollment and all subsequent changes in code status. Code status was categorized as one of the following: 1) full code; 2) Do Not Resuscitate (DNR), but hospitalize; 3) DNR/Do Not Hospitalize (DNH), but treat; and 4) DNR/DNH/comfort measures. Frequency distributions of code status at time of enrollment and time of death were performed. Univariate and multivariate logistic regression analyses were conducted to evaluate the association between the measured patient characteristics and code status determination at time of death and the trend toward less aggressive code status over time.

Results: The mean length of enrollment prior to death was 3.7 $\pm$ 2.7 years with 46% of patients enrolled for more than 3 years. The mean number of hospital days in the last 6 months of life was 7.1 $\pm$ 13.6; 63% died at home or community-based setting. Patients had an average of 2 $\pm$ 2 documented code status discussions per year of enrollment. Distribution of code status evolved from 34.4% electing "full code" at time of enrollment to 6.5% at time of death. After adjusting for number of medical diagnoses, dementia, health care agent designation and race, we found that length of enrollment was associated with a change in code status toward less aggressive care ($p=0.048$).

Conclusion: Through commitment to advance care planning such as in frequent discussions about code status, PACE programs can have a significant impact on code status decisions and end of life care during the time patients are enrolled. This results in trends toward less aggressive code status, compliance with patient wishes, and low hospital utilization at end of life.

Supported by the Medical Student in Training in Aging Research Program of the American Federation for Aging Research

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Effect of Financial Strain on Oxidative Stress in Community-Dwelling Older Adult Women: The Women's Health and Aging Studies I And II

Introduction: The cellular breakdown processes associated with elevated oxidative stress levels may be the underlying biological mechanism for many poor health outcomes, including atherosclerosis and diabetes. High oxidative stress and low socioeconomic status (SES) are both risk factors for morbidity and mortality, but little research has investigated their relationship. This study investigated whether low SES was associated with higher oxidative stress levels.

Methods: A cross-sectional analysis was conducted on 720 community-dwelling older women from the Women's Health and Aging Studies I and II. A multivariate linear regression was performed to quantify the relationship between low SES, measured by financial strain, and oxidative stress. Oxidative stress was measured using protein carbonyl concentrations obtained from serum samples. Control variables included age, race, education, income, smoking status, body mass index, physical activity, cardiovascular diseases, diabetes, and disability.

Results: In the multivariate analysis, those who reported having "just enough" money left over at the end of the month exhibited a 15.32% increase in protein carbonyl concentrations compared to individuals who reported having "some" money left over (p-value<0.05). No significant associations were found comparing individuals perceived to have "not enough" money left over at the end of the month to individuals perceived to have "some" money left over (*p-value* > 0.1).

Conclusion: Data from this analysis suggests that higher financial strain among community-dwelling older adult women may be predictive of high oxidative stress. These results are of critical importance given that individuals from low SES backgrounds consistently exhibit poorer health outcomes; and poverty is a growing concern due to our aging population.

JENNIFER SCHRACK
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Energy Availability and Walking Speed: a Key to Mobility?

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1 Center on Aging and Health, The Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, 2 Clinical Research Branch, National Institute on Aging, National Institutes of Health, Baltimore, MD

PURPOSE: The capacity to walk autonomously comprises a central component of independent living. Walking ability tends to decline with age, and is a strong, independent predictor of disability and mortality. Emerging evidence suggests a mismatch between energy supply and demand may underlie walking speed decline in older adults.

METHODS: We measured energy expenditure (EE) at two workloads (rest and peak sustained walking speed) and usual gait speed over 6 meters in 340 participants (52% male, mean age 70.3, range: 50-96) in the Baltimore Longitudinal Study of Aging. EE was assessed during 400 meters of walking at peak sustained speed via indirect calorimetry. Participants walked "as fast as possible" on a 20 meter course while wearing portable equipment measuring breath-by-breath oxygen consumption and carbon dioxide release to estimate energy expenditure per kilogram of body weight per minute. Usual walking speed was assessed as gait speed over six meters with participants instructed to walk at their "usual comfortable pace." We assessed variation in (1) walking speed with age, (2) energy availability with age, and (3) the relationship between walking speed and energy availability adjusted for age, sex, height, and body composition.

RESULTS: Usual gait speed decreased with age ($p<0.001$), with a steeper decrease after age 80. Available energy (peak - resting EE) decreased linearly with age ($p<0.001$), by approximately 50% from middle to late life. There was a positive association between available energy and usual gait speed ($p<0.001$), independent of age, sex, height, and body composition. Although age less than 80 years was not a significant contributor to the model ($p=0.50$), age over 80 years was ($p<0.001$), indicating that energy availability is not an important contributor to walking speed in young and middle aged adults.

CONCLUSION: Even though both walking speed and energy availability decrease beginning around age 60, energy availability does not contribute to walking speed until age 80. This may indicate that as energy becomes deficient in late life a compensatory mechanism emerges and behaviors are adapted to conserve energy. Further assessment of factors contributing to energy reserves may provide insight into the mechanisms by which energy deficiency contributes to disability in older adults.

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Estimating Effects by Combining Instrumental Variables with Case-Control Designs

The instrumental variables framework is commonly used for the estimation of causal effects from cohort samples. However, the combination of instrumental variables with more efficient designs such as case-control sampling requires new methodological consideration. For example, as the use of Mendelian randomization studies is increasing and the cost of genotyping and gene expression data can be high, the analysis of data gathered from more cost-effective sampling designs is of prime interest. We show that the standard instrumental variables analysis does not appropriately estimate the causal effects of interest when the instrumental variables design is combined with the case-control design. We also propose a method that can estimate the causal effects in such combined designs. We illustrate the method with a study of colorectal cancer, a major cause of mortality in aging populations.

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The Vancouver Inter-Professional (VIP) Practice Statements Initiative: An innovative bundled care model to improve outcomes for hospitalized older adults.

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Introduction: Acute care hospitals are high-risk environments for older adults; 1/3 of older adults discharged from the acute hospital experience incident functional decline which contributes to prolonged lengths of stay and an increased risk of hospital readmission, institutionalization, and mortality.

Objective: Determine the effectiveness of a hospital-based bundled care intervention to reduce patient lengths of stay.

Intervention: 5 risk factors known to complicate an older patient's hospitalization and prolong their Length of Stay (LOS) were identified: functional mobility, delirium, medications, catheter use, nutrition and hydration. Employing a voluntary uptake approach concordant with Interprofessional Collaborative Practice principles, evidence-informed practice statements were developed and incorporated into interprofessional care strategies targeting these 5 areas for care improvement by the staff of a 39 Bed Acute Geriatric Medicine Unit at an large urban Canadian teaching hospital.

Methods: Using the Vancouver Coastal Health regional database, the Actual LOS/Expected LOS (ALOS/ELOS) Ratio for the patients 70 and older admitted to this unit was calculated and tracked. RESULTS: At 30 Months, a sustained 39% ALOS/ELOS ratio reduction (1.3 vs 0.85) has been achieved, despite the increasing acuity levels of the patients being admitted to the unit. Based on a conservative estimate of achieving a 50% reduction in the acute days that exceeded the ELOS, and the prevention of 20% of cases from awaiting nursing home placement from hospital, that had been accomplished on our unit, we calculated that 12,300 acute care days could be saved across the Vancouver region annually.

Conclusions: A bundled care strategy that incorporates evidenced-informed practice statements and interprofessional care strategies around five areas that traditionally complicate an older patient's hospitalization is a low-cost initiative that can achieve significant patient and system outcomes.

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Are Acute Care Processes Associated with Hospital Readmission for Older Adults?

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Problem - Older adults require complex management after discharge, making them especially vulnerable to suboptimal care transitions and hospital readmission. Acute care processes may be related to the risk of hospital readmission.

Objective - To identify whether acute care processes are associated with an increased risk for hospital readmission within the first 6 months of discharge.

Study Design - Retrospective cohort study of 717 hospitalized adults aged ≥70 years admitted to 4 academic general medicine services from January to December, 2007.

Measures - Outcome: days to first readmission. Acute care processes: transitions of care intervention (Geri-FITT), discharge summary quality, satisfaction with primary care provider (PCP) knowledge of hospitalization, care transition quality using Care Transitions Measure (CTM-3). Demographic and hospitalization characteristics: age, gender, minority status, education, Medicaid, marital status, discharge disposition, primary diagnosis, length of stay.

Conclusions- White race, unmarried status, limited education, and discharge disposition were found to be significantly associated with decreased days to readmission. Acute care processes do not appear to be associated with hospital readmission in this analysis of older adults hospitalized on general medical services in our institution.

Key Words: Hospital Readmissions, Processes of Care, Cohort Study, Elderly

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Joint Genetic Influences on Height and Bone Mineral Density

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Bone mineral density, a clinical indicator of osteoporosis, and height are both under substantial genetic influence. Whether genes related to skeletal growth and maintenance throughout the life-course contribute jointly to variation in both of these traits is unknown. We evaluated whether common sets of genes may exert joint influence on both human stature and BMD in large families of Old Order Amish and Mexican American ancestry.

We first used quantitative genetic methods to partition the phenotypic covariance between height and skeletal traits into components attributable to genetic and environmental sources and estimated the genetic correlation (ρ_G) among traits. Significant genetic correlations were observed in both populations between height and whole body BMD (ρ_G=0.24-0.26) and between height and femoral neck cross-sectional area (ρ_G=0.56-0.59). A significant genetic correlation between height and hip BMD measures was observed in Mexican Americans (ρ_G=0.19-0.24) but not Amish (ρ_G=0.03-0.06). We then tested whether 29 loci previously associated with height were associated with BMD. In Amish, the number of 'tall' alleles across all SNPs was significantly associated with increased height ($p=1x10^{-6}$), and with increased BMD at the femoral neck (p=0.03) and total hip (p=0.04) and with femoral neck cross sectional area (p=0.008). In contrast, the number of 'tall' alleles was associated with neither height (p=0.70) nor BMD (p>0.20) in Mexican Americans These results suggest that genes contributing to variation in height may also have modest influences on BMD, although the associations of these SNPs with both height and BMD may vary across populations of different ancestral backgrounds.