21st Annual Forum on Aging

Sponsored by
The Sealy Center on Aging in collaboration with Research Services

October 19, 2017
5:00p.m. to 7:00p.m.
Levin Hall Dining Room

Web Site: http://www.utmb.edu/scoa
Dear Forum on Aging Attendees:

On behalf of the Sealy Center on Aging and the Department of Research Services, I would like to thank you for being a part of the 21st Annual Forum on Aging poster session. This is one of the events that we look forward to most during the year, as it provides an opportunity for researchers from all backgrounds and levels of expertise to share their aging-related work.

The major purpose of the forum is to inform gerontology researchers, in particular, and the UTMB community, in general, of the types of research on aging going on at UTMB and of the resources available from the Sealy Center on Aging. This year, we are proud to say we have posters from teams of investigators encompassing all UTMB Schools here to showcase their research.

Again this year, we’d like to extend a special “thank you” to Sigma Xi for sponsoring some of the awards. Best of luck to all the students and postdoctoral fellows/residents who have submitted a poster for this event.

Thank you for joining us, and we hope you enjoy this evening as much as we do.

Sincerely,

Elena Volpi, MD, PhD
Director, Sealy Center on Aging
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CLAUDE D. PEPPER OLDER AMERICANS INDEPENDENCE CENTER (OAIC)

Elena Volpi, MD, PhD, Sealy Center on Aging

The UTMB Pepper Center is currently comprised of five cores led by senior investigators of the Sealy Center on Aging: the Leadership Administrative Core, led by Drs. Elena Volpi and James S. Goodwin; the Research Education Component/RL5 Program, led by Drs. Kenneth Ottenbacher, Rebeca Wong and James S. Goodwin; the Pilot/Exploratory Studies Core, led by Drs. Douglas Paddon-Jones and Kyriakos Markides; the Clinical Research Resource Core, led by Drs. Elena Volpi, Timothy Reistetter and Gulshan Sharma; the Metabolism and Biology Resource Core, led by Dr. Blake Rasmussen and Christopher Fry; and the Biostatistics and Data Management Resource Core, led by Drs. Kristopher Jennings and Yong-Fang Kuo.

The Center has been continuously funded since 2000. From the very beginning, we have nurtured a multidisciplinary translational research culture to fulfill our mission, which is to improve physical function and independence in older adults. Central to this mission is the career development and training of the next generation of leaders in geriatric research.

Our scientific focus has evolved over the years from a narrow interest in the mechanisms of sarcopenia to the translation of our findings in much needed patient-centered interventions to improve physical function and independence. This evolution derives not only from the natural progression of our research from basic discoveries to healthy humans and from healthy humans to patients, but also from a deliberate effort of the OAIC leadership to promote and support collaborations between scientists in muscle aging and investigators in population health and outcomes research on aging and rehabilitation. This second line of research has always been present from the beginning of our OAIC, but was conducted in parallel with muscle research. The intersection of these two lines has accelerated the development of new research foci. An example is the rapid development of patient-centered outcomes research in the elderly, which culminated with the funding of a large infrastructure grant and, more recently, with our participation in the trans-Pepper patient-centered multicenter clinical trial on fall prevention.
GERIATRIC RESEARCH ON THE ACUTE CARE FOR ELDERS (ACE) UNIT

Shawn Goodlett, Sealy Center on Aging
Rachel Deer, PhD, Department of Nutrition and Metabolism
Roxana Hirst, MS, Sealy Center on Aging
Elena Volpi, MD, PhD, Sealy Center on Aging

The Acute Care for Elders (ACE) unit at UTMB opened in October 2000 at John Sealy Hospital. This geriatric unit, now located at the new Jennie Sealy Hospital, utilizes a unique interdisciplinary approach to patient care with nurses, physicians, case managers, and therapists who have been trained in the special needs of older adults.

Geriatric research is crucial to the advancement of translational research and evidence-based practice. The vision of our research is to make the ACE unit nationally renowned for interdisciplinary translational programs. To work towards this vision, the research objectives are to better understand the health experience of a diverse group of older patients hospitalized with an acute illness and identify those older patients vulnerable to further health declines.

Our team recently completed a pilot randomized clinical trial “Feasibility study of post-hospitalization interventions to improve physical function in older adults (PACE)” with 100 subjects to test the feasibility and efficacy of exercise, nutrition, and testosterone interventions to improve physical function in elderly adults after discharge. Currently, there are two major studies led by our team of investigators on the unit. The first is a Phase 1 double-blind randomized clinical trial “Translating Muscle Anabolic Strategies into Interventions to Accelerate Recovery from Hospitalization in Geriatric Patients (GRAMS).” The second is an observational study “Prevalence of Malnutrition and/or Sarcopenia at Hospital Admission (MASS).” Additionally, our team collaborates with other researchers and physicians. Using the information collected, our interdisciplinary team of investigators has the potential to provide important scientific information on the health and health outcomes of hospitalized older patients.
THE STRIDE STUDY, NIA AND PCORI MULTICENTER TRIAL: STRATEGIES TO REDUCE INJURIES AND DEVELOP CONFIDENCE IN ELDERS

Elena Volpi, MD, PhD, Sealy Center on Aging
Summer Chapman, RN, MSN, Sealy Center on Aging
Roxana Hirst, MS, Sealy Center on Aging
Eloisa Martinez, BS, Sealy Center on Aging

The STRIDE Study is a cluster randomized, evidence-based, patient-centered multifactorial fall injury prevention strategy.

Each person in the trial will be assessed for his or her risk of falling, and receive either the current standard of care—primarily information about preventing falls—or the experimental study intervention in which individualized care plans will be developed and administered. The care plans will be presented to the participant’s primary care physician for review, modification, and approval and will include proven fall risk reduction interventions that can be implemented by the research team, physicians and other health care providers, caregivers and community-based organizations. The intervention centers on the concept of a falls care manager working with each participant’s primary care provider to develop the plans and monitor success.

The research team plans to enroll 6,000 adults age 75 and older, living in the community, with one or more modifiable risk factors for falls. The first year of the study was a pilot phase, during which many aspects of the intervention were tested with small numbers of people across 10 clinical sites. The enrollment for the full trial started on August 1, 2015 and will take place over 18 months. The participants will be followed for up to three years.

The primary trial outcome is reduction in serious fall injuries, including non-spinal fractures, joint dislocation, head injuries, lacerations, internal injuries, and hypothermia. Secondary outcomes include reduction in all falls that cause injuries; all falls regardless of injury; indicators of well-being, physical function and disability; and anxiety and depression.

Ten trial sites across the country have been chosen to address geographic, rural/urban, academic/non-academic, and racial/ethnic diversity, and models of care.
FALLS PREVENTION AWARENESS EVENT

Rebecca Galloway, PT, PhD, Department of Physical Therapy
Janna McGaugh, PT, ScD, Department of Physical Therapy
Mansoo Ko, PhD, Department of Physical Therapy

“In 2008, the Falls Free® State Coalitions on Falls Prevention Workgroup requested that a national Falls Prevention Awareness Day (FPAD) be observed on the first day of fall” (National Council on Aging - NCOA). The 2017 theme was “10 Years Standing Together to Prevent Falls”. In Galveston, we organized the “Standing Together” event, a collaboration of Osher Lifelong Learning Center – OLLI, UTMB Physical Therapy Department, UTMB Internal Medicine – Geriatrics, Sealy Center on Aging, and Texas A&M AgriLife. During this event, 51 members of our community participated in booth activities to learn about strategies to reduce fall risk. We provided screening and education on medication safety, bone health, walking devices, home safety, strength, balance, gait analysis, fall recovery, Tai Chi, and Matter of Balance program. Activity coordinators included 21 Bridge PTA to DPT students, 3 PT faculty, a physician, a nurse practitioner, a nurse, and 3 community resource providers.

This event facilitated positive interaction among older adults in our community, students, health care and community service providers. Goals for FPAD in 2018 include: 1) Expand advertisement of event in Galveston and Mainland to increase older adult attendance, and 2) Involve students in schools of medicine, nursing, and other health professions for inter-professional activity in health promotion.
COMPARATIVE EFFECTIVENESS RESEARCH ON CANCER IN TEXAS (CERCIT)

James S. Goodwin, MD, Sealy Center on Aging

Comparative Effectiveness Research (CER) recognizes that different patients respond differently to the same treatment. Furthermore, patients differ in their preferences, in their prioritization among various health outcomes. The first five years of CERCIT aimed to increase the evidence to support individualized care by assessing outcomes of treatment in comparative effectiveness research (CER) using large administrative databases. CERCIT is based at UTMB, and several of the projects involve investigators from MD Anderson.

In the recently refunded CERCIT renewal, we wish to build on the findings of our analyses of administrative data but expand our methods to better measure individual patient characteristics and include information on patient preferences and patient reported outcomes. Our goal is to generate evidence that will assist patients and their physicians in individualized decision making when faced with choices among different options in screening, treatment and end of life care in cancer.

This multi-institutional grant program consists of three cores: (1) Administrative Core [Goodwin, PI], (2) Data Management and Analytics Core [Kuo, PI], and (3) Survey Core [Peterson, PI]. These will serve the four research projects within the grant, which are the following:

Project 1: Screening for Cancer in Texas
PI: James S. Goodwin, MD

Project 2: Chemotherapy Treatment Choices in Older Patients with Cancer
PI: Sharon Giordano, MD, MPH

Project 3: Assisting Cancer Patients with Surgery and Radiation Treatment Choices
PI: Benjamin Smith, MD

Project 4: Investigating Patient Preferences Regarding End-of-Life Care Among Cancer Patients in Texas
PI: Ashleigh Guadagnolo, MD, MPH
CENTER FOR LARGE DATA RESEARCH AND DATA SHARING IN REHABILITATION

Kenneth J. Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences
Amol M. Karmarkar, PhD, Division of Rehabilitation Sciences
James E. Graham, PhD, DC, Division of Rehabilitation Sciences
Matthew Lakich, MPH, Division of Rehabilitation Sciences
Beth A. Cammarn, CRA, Division of Rehabilitation Sciences

The Center for Large Data Research (CLDR) and Data Sharing in Rehabilitation is an extension of the previously funded (R24), Center for Rehabilitation Research using Large Datasets (CRRLD). The CRRLD was funded in 2010 to build scientific capacity among rehabilitation scientists in research using large healthcare and administrative datasets. The CLDR will continue to build scientific capacity in large data research by focusing on education and learning experiences designed to promote collaborative research through our successful pilot studies and visiting scholar programs. The mission of the CLDR will expand to include an important focus on data sharing and archiving information from completed rehabilitation research studies. This new focus addresses recent federal requirements for sharing information and data from research studies supported by government funding. The requirement will result in datasets becoming available for secondary data analysis by rehabilitation and disability investigators.

The CLDR involves a consortium of investigators from the University of Texas Medical Branch, Cornell University, and the University of Michigan. The CLDR will develop education and training programs, facilitate interdisciplinary collaboration, and support pilot studies. Each of these components will include activities and learning experiences involving the Center’s two focus areas:

- Developing research capacity in the design, analyses and interpretation of large data, and
- Creating an infrastructure to support archiving and sharing information from completed rehabilitation research studies in order to make them available for secondary data analyses.

The new center will expand our successful Rehabilitation Data Directory with the creation of an archiving and data sharing portal. The portal will provide access to archived datasets along with information and learning opportunities related to data sharing. The CLDR will build scientific capacity in important new areas related to health care reform and large data research that will advance rehabilitation science and practice.

Information regarding the Center’s programs and services are available at: https://www.utmb.edu/cldr/home
Program Information

CENTER FOR RECOVERY, PHYSICAL ACTIVITY AND NUTRITION

Kenneth Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences
Blake Rasmussen, PhD, Department of Nutrition and Metabolism
Beth Cammarn, CRA, Division of Rehabilitation Sciences

The Center for Recovery, Physical Activity and Nutrition is committed to creating relationships among basic and clinical scientists to translate and apply research findings for the benefit of persons with disability or chronic disease and their families. The Center also develops and participates in collaborative research to reduce or prevent the loss of mobility and function in at-risk and vulnerable populations. Originally established in 2001 as the Center for Rehabilitation Sciences, the mission and focus of the Center was expanded in 2013 as part of the School of Health Professions (SHP) Research Strategic Planning process. The Center's activities and programs continue to be guided by the enabling-disabling conceptual model originally described in the Institute of Medicine (IOM) report titled “Enabling America” (1997) and updated in the 2007 IOM report “The Future of Disability in America.” The goal of the Center is to integrate research involving physical activity, exercise, function and nutrition to provide new opportunities for education and scientific training and external grant funding, and to create collaborative research partnerships consistent with the mission of the SHP and UTMB, and the objectives and priorities of the Affordable Care Act and national health care reform.

Information regarding the Center’s programs and services are available at: https://rehabsciences.utmb.edu/cerpan/.
THE MEXICAN HEALTH AND AGING STUDY (MHAS)

Rebeca Wong, PhD, Preventive Medicine and Community Health

The Mexican Health and Aging Study (MHAS) is a longitudinal study of Mexican aging with a national sample of persons aged 50 and older, or born in 1951 or earlier (n=15,000). The study protocols and survey instruments are highly comparable to the U.S. Health and Retirement Study (HRS). Emphasis areas are the study of aging in a mixed infectious-chronic epidemiological regime; assessment of the quality of self-report; the continuous Mexico-U.S. migration and its consequences for aging; the impact of an important health sector reform in Mexico (in 2004); health and economic conditions in early life and their consequences in old age; and mortality. The data enables enhanced research on aging and related population changes: of physical and mental health and disability, cognition, health behaviors and health care use, family support, aging and the life course, wealth, income, labor and retirement, migration and old age, and mortality. This is unique cohort for the study of aging in a developing country aging fast with limited institutional support for individuals in old age. In addition, the data enables cross-period and cross-cohort analyses of health and aging, and is highly comparable with other similar studies in developed and developing countries, in particular the United States, enhancing the study of aging and health with a cross-national perspective.

Four waves of data have been collected so far (2001, 2003, 2012 and 2015) and two more waves are planned for 2018 and 2021. In 2012, a new sample was added from the 1952-1961 birth cohorts. A new refresher sample will be added for 2018. In addition, the study is planning to collect hair samples from a sub-sample to study environmental health in Mexican older adults.

Data bases are available to the research community free of charge through a study website. For more details, see: www.MHASweb.org.

The MHAS is partly supported by the National Institutes of Health/National Institute on Aging (R01AG018016, R. Wong, PI) and the National Institute of Statistics and Geography (Instituto Nacional de Estadística y Geografía, INEGI) in Mexico.

ANCILLARY STUDY
The MHAS also served as the basis for a timely Cognitive Aging Ancillary Study (Mex-Cog), in which a sub-sample (n=2,265) of the MHAS 2015 national sample successfully completed an in-depth cognitive assessment and/or informant questionnaire in 2016. The purpose of the study is to estimate the prevalence of dementia and its covariant factors, leveraging the use of existing cohort studies on aging. The Mex-Cog study was completed in harmonization with similar studies in the U.S. (HRS), England (ELSA), India (LASI), China (CHARLS), and others, under the Brain Initiative of the NIA/NIH (Grant R01-AG051158, R. Wong, PI).

BLOOD SAMPLES FOR GENETIC ANALYSIS
The MHAS also collected blood samples from two sub-samples selected in 2012 (n=2,009) and 2015 (n=747) for genetic analysis. Blood samples were used also to obtain key biomarkers (Glucose, Hemoglobin, Vitamin D, Cholesterol, Thyroid hormone, C-reactive protein)
THE OFFICE OF BIOSTATISTICS

Allen Haas, MS, Preventive Medicine and Community Health

STATISTICAL HELP IS AVAILABLE, OFFICE OF BIOSTATISTICS

Faculty members:
Y. Kuo (director)

Staff:

The Office of Biostatistics (OBIOS) provides statistical support services to all UTMB faculty, staff and students. The areas of expertise include design support, database management and data analysis. Design support services include power calculations, sample size determinations, and identification of appropriate methods to minimize experimental error. Data management services include development of project specific systems for data acquisition, scheduling and modification, while data analysis services focus on the application of appropriate methods to allow valid statistical inferences. In addition, through long-term collaboration between a UTMB researcher and a member of the OBIOS, adaption and development on quantitative research will be conducted to maximize the information obtained from biomedical research. OBIOS is the point of contact for the computer software, including SAS® (a statistical application with extensive data management capabilities), nQuery Advisor® (a statistical application for sample size calculation and power analyses), and ArcGIS (a mapping and analytics platform). OBIOS maintains the Clininformatics DataMart, which contains the medical and pharmacy claims for approximately 56 million enrollees in one of the nation’s large commercial insurance company. This database offers numerous opportunities for researchers who are interested in population studies. OBIOS also provides Biostatistics, Epidemiology and Research Design (BERD) support to the Clinical Translational Science Award.
CENTER FOR SPIRITUALITY OF AGING

Helen Appelberg, DMin, Sealy Center on Aging

The Center for Spirituality of Aging is within the Sealy Center on Aging at the University of Texas Medical Branch. We are a resource for seniors in Galveston County aimed at promoting mental, physical, emotional, and spiritual health. Our activities promote the exploration of aging as a spiritual journey, a time to find deeper meaning and purpose with dignity and hope.

Our Goals are to:
• Improve the spiritual health of seniors in Galveston County;
• Provide quality educational programs for seniors and their families;
• Partner with community programs to educate seniors in healthy choices.

Programs & Activities

**Abundant Living:** A 3-day conference held at Camp Allen near Navasota, Texas, explores aging as a spiritual journey. It is a dynamic, multi-faceted program that includes geriatricians, art, music, movement, experts on aging, and a “Bucket List” of activities with nature walks, canoeing, fly fishing, labyrinth walks, meditation, and much more.

**Friends of the ACE Unit:** Structured training and support for volunteer visitors [“compassionate listeners”] to the Acute Care for Elders Unit.

To provide events that focus on the needs of elders, we partner with other departments at UTMB, the City of Galveston, the Osher Lifelong Learning Institute, the RSVP program, and numerous churches in the Galveston area.

Community outreach includes: Promoting healthy aging activities, increasing creativity and spiritual self-care. We invite and encourage seniors to participate in the nationwide fall prevention program, STRIDE. On Thursday mornings in the spring and fall seniors are invited to gather at Stewart Beach Pavilion for a community beach walk.

We believe the gift of years provides the opportunity for seniors to live life to the fullest, a time to increase their creativity, their life-long learning and to serve others.
QUALITY OF PHARMACEUTICAL CARE IN DEMENTIA PATIENTS

Hemalkumar Mehta, PhD, Department of Surgery
Sneha Sura, MS
Mukaila Raji, MD, Department of Internal Medicine - Geriatrics
Yong-Fang Kuo, PhD, Office of Biostatistics
James S. Goodwin, MD, Sealy Center on Aging

OBJECTIVES: Use of potentially inappropriate medications (PIM) in dementia patients reflect poor quality of care. The goal of this study was to evaluate quality of pharmaceutical care in dementia patients using the most recent 2015 American Geriatric Society (AGS) Beers criteria.

METHODS: This cohort study used the 5% national Medicare data from 2011-2012. The cohort included elderly patients diagnosed with dementia in the baseline year, i.e. 2011. Quality of care, i.e., use of PIMs, was defined in 2012 using the AGS Beers criteria. Predictors were identified in the baseline year based on the Andersen Behavioral Model: predisposing (sociodemographic), enabling (dual eligibility) and need factors (Elixhauser comorbidities, medication use and healthcare utilization). Descriptive statistics was used to determine the prevalence of PIMs. Multivariable logistic regression analysis was used to determine predictors of PIMs in dementia patients.

RESULTS: The cohort included 57,469 elderly dementia patients, with mean age of 85±8 years. Overall, 53.1% of dementia patients received PIMs. The prevalence of top seven drugs classes were as follows: antipsychotics (31.3%), H2-receptor antagonists (11.3%), antihistamines (10.3%), antimuscarinic urinary incontinence (9.1%), antiemetics (6.7%), nonbenzodiazepine receptor agonist hypnotics (6.1%), tricyclic antidepressants (5.7%). Mutivariable logistic regression found that females (odds ratio [OR], 1.16), Blacks (OR, 1.18), patients with Elixhauser comorbidities (twelve conditions), emergency room visit (OR, 1.1) and more than five prescription medications (OR, 3.0) were associated with higher likelihood of receiving PIMs.

CONCLUSIONS: One out of two dementia patients received at least one PIMs reflecting poor quality of pharmaceutical care in this vulnerable patient population.
PERCEPTIONS OF OVERDETECTION IN BREAST CANCER SCREENING MAMMOGRAPHY AMONG A TRI-ETHNIC SAMPLE OF OLDER WOMEN AGED 70 AND OLDER

Monique Pappadis, PhD, MEd, Division of Rehabilitation Sciences
Robert Volk, PhD, MD Anderson Cancer Center
Shilpa Krishnan, PT, PhD, Department of Occupational Therapy
Susan Weller, PhD, Preventive Medicine and Community Health
Sharon Giordano, MD, MD Anderson Cancer Center
Alai Tan, PhD, Ohio State University
Kristin Sheffield, PhD, Eli Lilly
James S. Goodwin, MD, Sealy Center on Aging

Medical organizations suggest upper age limits for breast cancer screening, partly due to concerns about overdetection, or overdiagnosis – the diagnosis of a cancer that would not have caused symptoms or death. This mixed-methods study explored the conceptualization of overdetection in screening mammography and its influence on screening decisions among a tri-ethnic sample of 59 English-speaking community-dwelling older women with no prior breast cancer history. Participants were stratified by ethnicity (i.e., Non-Hispanic Black, Non-Hispanic White, Hispanic,), age (i.e., 70-74, ≥75), and educational level (i.e., ≤high school, college or greater). Themes related to perceptions of overdetection and screening preferences were based on inductive and deductive thematic analysis. Differences in theme usage by socio-demographic characteristics, screening preference, and understanding of overdiagnosis were assessed using an inferential clustering technique. Very few women were familiar with the concept of overdetection. Older women conceptualized overdetection in context of resistance to the concept, reliance on a physician’s recommendation, or other harms of screening. Many women expressed suspicion of the concept, equating it to rationing. Women who showed understanding of overdiagnosis were more likely to express an intent to discontinue screening, although 86% of the women stated that hearing about overdiagnosis did not influence their screening decision. Differences were identified between women whose screening preference was to continue screening and women who preferred to discontinue (r=0.19, P<0.001), and between women who understood overdetection and women who did not (r=0.22, P<0.001). Greater efforts are needed on determining how best to convey the benefits and risks of screening among older women to support informed and shared decision making.
Reducing Readmission by Improving Transitions – Process and Outcomes. Hospital readmission rates are well documented indicators of quality of care transition from hospital to skilled nursing facilities (SNF). We describe our DSRIP project whose goal is to develop and implement programs to improve transition and coordination of care from inpatient to SNFs and from SNF to home health, for patients aged 65 and older. The overall outcome is a reduction of 30-day re-hospitalizations. Processes implemented to improve these transitions include: (1) Evidence-based identification of seniors at highest risk of re-hospitalization based on chronic conditions, socioeconomic factors, and patient characteristics; (2) Program coordination and patient, staff and caregiver education led by Master-level Nurse practitioner; (3) Education of patient/caregiver dyads to increase their roles in managing their health; (4) Education addressing indications and early side-effects of medications, and (5) Development of “What to Expect” transitional care documents aimed at preparing patients/families as they transition to different healthcare settings. We used tools used developed by Project BOOST (Better Outcomes for Older adults through Safe Transitions) and Interact (Interventions to Reduce Acute Care Transfers), including the “8P’s” score and the “Stop and Watch Early Warning Tool”. Collaboration with stakeholders such as SNF administrators and home health agencies help to identify areas in transitions that require improvement. Preliminary data indicate a steady increase in patients’ satisfaction score, timeliness of discharge information and a decline in re-hospitalizations to our Acute Care for Elders unit. Challenges (e.g. readmission from non-SNF sites) and opportunities identified during the implementation of the project will be discussed during the symposium.
UNDERUTILIZATION OF RADICAL CYSTECTOMY AMONG PATIENTS DIAGNOSED WITH CLINICAL STAGE T2 MUSCLE-INVASIVE BLADDER CANCER

Tamer Dafashy, MD, Department of Surgery
Cameron Ghaffary, MD, Department of Surgery
Christopher Kosarek, MD, Department of Surgery
Kyle Keyes, MD, Department of Surgery
Jinai Huo, PhD
Karim Chamie, MD, University of California – Los Angeles
Jim Hu, MD, Weill Cornell Medicine
Sharon Giordano, MD, MD Anderson Cancer Center
Colin Dinney, MD, MD Anderson Cancer Center
Ashish Kamat, MD, MD Anderson Cancer Center
Ya-Chen Shih, PhD, MD Anderson Cancer Center
Stephen B. Williams, MD, Department of Surgery

Objective: We sought to identify population-based factors predicting the use of radical cystectomy.

Design, setting, and patients: Analysis of Surveillance, Epidemiology, and End Results (SEER)-Medicare data for 3922 patients aged 66 yr diagnosed with clinical stage T2 MIBC from January 1, 2002 to December 31, 2011.

Outcome measurements and statistical analysis: We used univariate and multivariable regression analyses to identify factors predicting the use of radical cystectomy. Cox proportional hazards models were used to analyze survival outcomes.

Results and limitations: A total of 740 (18.9%) patients with MIBC underwent radical cystectomy. Older age at diagnosis (>80 vs 65–69 yr, odds ratio [OR] 0.15, 95% confidence interval [CI] 0.11–0.19; p < 0.001) and higher comorbidity (Charlson comorbidity index 3+ vs 0, OR 0.41, 95% CI 0.29–0.57; p < 0.001) were associated with lower use of radical cystectomy. Moreover, non-Hispanic black patients were less likely than white patients to undergo radical cystectomy (OR 0.62, 95% CI 0.40–0.96; p = 0.032) and pelvic lymph node dissection (OR 0.65, 95% CI 0.42–1.02; p = 0.058). Overall survival was better for patients who underwent radical cystectomy alone (hazard ratio [HR] 0.70, 95% CI 0.56–0.88; p = 0.002) and with lymph node dissection (HR 0.45, 95% CI 0.40–0.51; p < 0.001). Limitations include the limited ability of retrospective analysis to demonstrate causality.

Conclusions: There is significant underutilization of radical cystectomy among patients diagnosed with MIBC, especially among older patients with significant comorbidities and non-Hispanic black patients.

Patient summary: Despite guideline recommendations, there is significant underutilization of radical cystectomy among patients diagnosed with bladder cancer, especially for non-Hispanic black patients and older patients with significant comorbidities.
IMPACT OF PROXIMITY TO NATIONAL CANCER CENTERS IN THE UNITED STATES ON OUTCOMES FOR PATIENTS WITH PROSTATE CANCER UNDERGOING RADICAL PROSTATECTOMY

Tamer Dafashy, MD, Department of Surgery
Preston Kerr, MD, Department of Surgery
Cameron Ghaffary, MD, Department of Surgery
Christopher Kosarek, MD, Department of Surgery
Zhigang Duan, PhD
Brian Chapin, MD, MD Anderson Cancer Center
Karim Chamei, MD, University of California – Los Angeles
Simon Kim, MD, University Hospitals Cleveland Medical Center
Karen Hoffman, MD, MD Anderson Cancer Center
Sharon Giordano, MD, MD Anderson Cancer Center
Stephen B. Williams, MD, Department of Surgery

Objective: To identify whether proximity to National Cancer Institute (NCI) and National Comprehensive Cancer Network (NCCN)-designated cancer centers (CCs) was associated with survival outcomes for prostate cancer patients who undergo radical prostatectomy (RP).

Patients and Methods: A total of 12,478 patients diagnosed with clinical stage T1 or T2 prostate cancer from January 1, 2004 to December 31, 2011 who underwent RP were identified. Multivariable regression analyses were used to quantify the role of proximity to NCI/NCCN CCs on overall survival and use of secondary therapies. Cox proportional hazards models were used to quantify the association between survival outcomes and proximity to NCI/NCCN CCs.

Results: Patients with proximity to ≥2 NCI centers and those diagnosed in 2011 enjoyed a statistically significant overall survival advantage when compared to no proximity to an NCI center (Hazard Ratio (HR) 0.72; 95% confidence interval (CI) 0.57–0.92, p<0.01). Proximity to an NCCN CC, when compared with men who did not have proximity, was associated with improved overall survival (HR 0.76; 95% CI 0.61–0.95, p=0.015). There was no significant difference in use of secondary therapies according to NCI or NCCN proximity.

Conclusions: Patients who undergo RP with proximity to an NCI/NCCN CC experienced improved overall survival with no significant difference in utilization of secondary therapies. Further research understanding the mechanisms underlying the RP healthcare factors associated with improved survival according to proximity are needed.
Patient-Centered Outcomes Research - Resident

ATYPICAL SMALL ACINAR PROLIFERATION AT INDEX PROSTATE BIOPSY: RETHINKING THE RE-BIOPSY PARADIGM

Tamer Dafashy, MD, Department of Surgery
Leslie Ynalvez, BS, School of Medicine
Christopher Kosarek, MD, Department of Surgery
Preston Kerr, MD, Department of Surgery
Ali Mahmoud, BS, School of Medicine
Eduardo Eyzaguirre, MD, Department of Pathology
Eduardo Orihuela, MD, Department of Surgery
Joseph Sonstein, MD, Department of Surgery
Stephen B. Williams, MD, Department of Surgery

Purpose: Guidelines for atypical small acinar proliferation (ASAP) diagnosed on prostate biopsy recommend repeat biopsy within 3–6 months after diagnosis. We sought to discern the rate of detecting clinically significant prostate cancer on repeat biopsy and predictors associated with progression.

Materials and Methods: We performed a retrospective chart review of patients who underwent prostate biopsy at our institution from January 1, 2008 to December 31, 2015. Gleason grade group (GGG) system and D’Amico stratification were used to report pathology and risk stratification, respectively. Logistic and linear regression analyses were performed.

Results: A total of 593 patients underwent transrectal ultrasound-guided prostate biopsy, of which 27 (4.6%) had the diagnosis of ASAP. Of these, 11 (41%) had a repeat biopsy. Median time from diagnosis to repeat biopsy was 147 days (IQR: 83.5–247.0). Distribution across the GGG system on repeat biopsy was as follows: 7 (63.6%) benign, 3 (27.3%) GG1, and 1 (9.1%) GG2. ASAP was not associated with subsequent diagnosis of clinically significant prostate cancer (OR=0.46, 95% CI: 0.064 to 3.247, p=0.432). There was no association between ASAP and high cancer risk (ASAP: β = −0.12; p=0.204).

Conclusions: Patients diagnosed with ASAP managed according to guideline recommendations are more likely diagnosed with benign pathology and indolent prostate cancer on repeat biopsy. These findings support prior studies suggesting refinement of guidelines in regards to the appropriateness and timeliness of repeat biopsy among patients diagnosed with ASAP.
Objective: Neoadjuvant chemotherapy (NAC) is underutilized, however, the quality of regimens used in this setting remains largely unknown. Our objective was to determine utilization patterns, quality and survival outcomes associated with NAC.

Methods: We used the Surveillance, Epidemiology, and End Results (SEER) Medicare-linked database to identify patients diagnosed with clinical stage TII–IV, N0M0 bladder cancer from January 1, 2001 to December 31, 2011. Temporal trends were assessed using the Cochran-Armitage test. Generalized linear models were performed to determine the association between risk factors and the use of NAC. Cox proportional hazards models were used to compare overall and cancer-specific survival.

Results: With a total of 2,738 patients, 344 (12.6%) received NAC. The most commonly used NAC agents were gemcitabine (72.3%), cisplatin (55.2%) and carboplatin (31.1%), and the most commonly used regimens were gemcitabine-cisplatin (45.3%), gemcitabine-carboplatin (24.1%), and methotrexate, vinblastine, doxorubicin, and cisplatin (6.7%). The use of NAC more than tripled, from 5.7% in 2001 to 17.3% in 2011 (P < .0001). Receipt of regimens was associated improved overall survival among patients diagnosed with stage II bladder cancer (HR, 0.74; 95% CI, 0.53-1.03; P = 0.07, compared with no NAC; HR, 0.48; 95% CI, 0.24-0.95; P = 0.04, compared with receipt of single agent).

Conclusions: While we noticed increased utilization of NAC during the study period, there was variability in the quality of regimens used in this setting. Further research into improving utilization and quality of NAC regimens administered for bladder cancer patients are needed.
CANCER AND ALL-CAUSE MORTALITY IN BLADDER CANCER PATIENTS UNDERGOING RADICAL CYSTECTOMY: DEVELOPMENT AND VALIDATION OF A NOMOGRAM FOR TREATMENT DECISION-MAKING

Preston Kerr, MD, Department of Surgery
Stephen B. Williams, MD, Department of Surgery
Jinhai Huo, MD
Yiyi Chu, PhD, MD Anderson Cancer Center
Christopher Kosarek, MD, Department of Surgery
Jacques Baillargeon, PhD, Preventive Medicine and Community Health
Simon Kim, MD, University Hospitals Cleveland Medical Center
Douglas Tyler, MD, Department of Surgery
Eduardo Orihuela, MD, Department of Surgery
Stephen Freedland, MD, Cedars-Sinai
Ashnish Kamat, MD, MD Anderson Cancer Center
Yong-Fang Kuo, PhD, Preventive Medicine and Community Health

OBJECTIVE: To develop and validate a nomogram assessing cancer and all-cause mortality following radical cystectomy. Given concerns regarding the morbidity associated with surgery, there is a need for incorporation of cancer-specific and competing risks into patient counseling and recommendations.

MATERIALS AND METHODS: A total of 5325 and 1257 diagnosed with clinical stage T2-T4a muscle-invasive bladder cancer from January 1, 2006 to December 31, 2011 from Surveillance, Epidemiology, and End Results Medicare and Texas Cancer Registry-Medicare linked data, respectively. Cox proportional hazards models were used and a nomogram was developed to predict 3- and 5-year overall and cancerspecific survival with external validation.

RESULTS: Patients who underwent radical cystectomy were mostly younger, male, married, non-Hispanic white and had fewer comorbidities than those who did not undergo radical cystectomy (P < .001). Married patients, in comparison with their unmarried counterparts, had both improved overall (hazard ratio 0.76; 95% confidence interval 0.70-0.83, P < .001) and cancer-specific (hazard ratio 0.76; 95% confidence interval 0.68-0.85, P < .001) survival. A nomogram developed using Surveillance, Epidemiology, and End Results-Medicare data, predicted 3- and 5-year overall and cancer specific survival rates with concordance indices of 0.65 and 0.66 in the validated Texas Cancer Registry-Medicare cohort, respectively.

CONCLUSION: Older, unmarried patients with increased comorbidities are less likely to undergo radical cystectomy. We developed and validated a generalizable instrument that has been converted into an online tool (Radical Cystectomy Survival Calculator), to provide a benefit-risk assessment for patients considering radical cystectomy.
ISOLATED HIP FRACTURE PROCESS IMPROVEMENT AT A TERTIARY-CARE MEDICAL CENTER

Morteza Komeylian, MD, Department of Internal Medicine - Geriatrics
Erin Hommel, MD, Department of Internal Medicine - Geriatrics
Diana Grimm-Map, BS, Department of Surgery

Hip fracture is one of the most serious consequences of falls in the elderly, with high rates of immediate and long term morbidity and mortality. Current guidelines recommend surgical repair within 48 hours of injury as earlier surgery is associated with improved functional status and lower peri-operative complications. In 2014-2015 at UTMB, only 73% of isolated hip fracture patients received operative fixation within 48 hours of presentation (peer benchmark 88%). Also, UTMB rate of complications was 13% compared to national average of 6%. We aimed to improve the % of patients with isolated hip fracture receiving operative repair within 48 hours to 88% over 3 months.

A multidisciplinary team was convened to investigate and recommend best practices. Initial management was discussed to reduce unnecessary pre-operative work-ups. Appropriate patient placement algorithms were drafted and geriatric assessment tools were implemented. Extensive faculty and resident education was provided. Outcome measures including time to OR, post-operative complications, and length of stay were closely monitored.

Six months following implementation the goal of 88% to OR in 48 hours was met. Positive results were sustained throughout 2016 (94% to OR before 48 hours) and again in 2017 (95% to OR before 48 hours). Length of stay was simultaneously reduced from baseline 5.85 days to current 2017 average of 5.46 days.

Through a multidisciplinary effort of focused education and care standardization, we were able to improve time to OR within 48 hours to well above the goal benchmark of 88%. Furthermore, this has been successfully sustained for approximately 18 months. Further education and an ongoing multidisciplinary approach is needed to address rate of complications and length of hospitalizations.
IMPLEMENTATION OF THE AMERICAN BURN ASSOCIATION FIRE AND BURN SAFETY FOR OLDER ADULTS EDUCATION PROGRAM AT THE UNIVERSITY OF TEXAS MEDICAL BRANCH

Guillermo Foncerrada, MD, Department of Surgery
Karel Capek, MD, Department of Surgery
Celeste Finnerty, MD, Department of Surgery
David Herndon, MD, Department of Surgery

Introduction: Increasingly, the average American can expect to grow old. Advances in health care, economic prosperity and injury prevention all are contributing to a longer life span. Older adults experience a myriad of physical and cognitive changes associated with the aging process that make them more vulnerable to fire and burn injury.

Statistics: More than 1,200 Americans aged 65 and older die each year as a result of fire. More than 25% percent of all fire deaths and one-third of all residential fire deaths occur in this population. Older adults have twice the fire death rate of the national average. During the last year, 34 older adults received burn care at UTMB burn unit.

Rationale: With adequate education of potential victims, many fire and burn deaths among older adults could be prevented.

The first step in designing an effective burn safety program for older adults is to understand the physical, psychological and social conditions in which they live.

The American Burn Association has designed educational material to prevent burns in older adults which are meant to be shared among the community.

Implementation: To distribute specialized designed prevention material for older adults at our Blocker Burn Unit and evaluate staff usage and acceptance of these new patient education materials.
Background: An improved risk adjustment model in surgery is useful for comparing outcomes of different providers and control of confounding. The goal was to develop and validate a claims-based risk adjustment model, SurgScore, for patients undergoing surgery, and compare its performance against Charlson and Elixhauser comorbidity scores.

Methods: This study used national Medicare data from 2007-2014 and included older patients undergoing six operations: coronary artery bypass grafting, pulmonary lobectomy, endovascular repair of abdominal aortic aneurysm, open repair of abdominal aortic aneurysm, colectomy, and hip replacement. Using the derivation cohort (70%), SurgScore was developed to predict 1-year mortality; 140 comorbidities based on the AHRQ's clinical classification systems were considered. SurgScore was calibrated and validated in the validation cohort (30%), and compared against Charlson and Elixhauser comorbidity score in predicting in-hospital, 30-day, and 1-year mortality and 30-day readmissions using c-statistics (c) and net reclassification index (NRI). All risk indices were modeled as individual comorbidities and summary score.

Results: The cohort included 69,475 (derivation) and 29,775 (validation) patients. The SurgScore included 63 comorbidities. In the validation cohort, SurgScore was well calibrated and performed better (individual comorbidities: c=0.799, NRI=26.4%; summary score: c=0.792, NRI=25.1%) than Charlson (individual comorbidities: c=0.754, NRI=15.5%; summary score: c=0.747, NRI=13.2%) and Elixhauser comorbidity scores (individual comorbidities: c=0.769, NRI=18.2%, summary score: c=0.743, NRI=11.4%) in predicting 1-year mortality. Similar results were observed for in-hospital mortality, 30-day mortality and 30-day readmissions.

Conclusions: Compared to Charlson and Elixhauser, SurgScore provides a better risk adjustment tool for mortality and readmission outcomes in the surgical population.
SAFER OPIOID PRESCRIBING PRACTICES IN UTMB GERIATRIC CLINICS

Devi Meyyappan, MD, Department of Geriatrics
Erin Hommel, MD, Department of Geriatrics

BACKGROUND: Opioid use, abuse, and adverse consequences, including death, have escalated at an alarming rate since the 1990s(1). Older adults are particularly at risk of these opiate side effects. In 2015, CDC guidelines were published to guide safer prescribing of opioids. Recognizing practice variation in opiate prescribing within the UTMB geriatric clinics, we aimed to improve opioid prescribing practices.

PROJECT DESCRIPTION (including metrics): A retrospective chart review of outpatient opiate prescribing among 6 UTMB geriatricians over 6 months was performed with analysis of opiate dose, pain contract, UDS and concomitant sedative use. The following interventions were designed - opioid clinical practice policy, extensive provider education, EMR smart phrases and patient education materials. Project commenced February 2017.

OUTCOMES: Improvement in safe opioid prescribing was measured by: completion of UDS and pain contract at prescribing onset and at least annually, reduction in MME and reduction in concomitant sedative use. At 6 months post-implementation, pain contract use rose from 12.1% to 46.1% with UDS use from 12.1% to 34.6%. Total prescriptions for opiates decreased from 72 patients to 52 patients, with 15.3 % remaining on concurrent benzodiazepines (decreased from 16.1%). Patient with intermediate and high dose opiates dropped from 24.6% to 19.2%.

DISCUSSION: With careful education and feedback about safe prescribing of opiates, we have seen substantial improvements in our prescribing practices. Through continued provider feedback and ownership of their practice panel, we hope to drive continued improvement and collaborate with other primary care clinics to enhance safe opioid prescribing across UTMB.

Reference
PATIENT CENTERED OUTCOMES AMONG OLDER BURN SURVIVORS: A LITERATURE REVIEW

Jason Johnson, BS, Division of Rehabilitation Sciences

The purpose of this review is to assess the current literature regarding patient centered outcomes among older adults with burn injuries. No prior reviews have focused exclusively on rehabilitation outcomes among burn survivors aged 65 years and older. This project will provide a ‘State of the Research’ overview for this vulnerable population, distinct from pediatric and non-geriatric adult populations. This review will outline the epidemiology of different mechanisms of injury and rates of treatment in older burn survivors. Primary outcomes of interest include contractures, hypertrophic scarring, heterotopic ossification, neuropathy, pruritus, neurocognitive disorders, body image, community reintegration and psychosocial recovery. This review will also highlight both risk and protective factors for morbidity and mortality. The goal of this literature review is to help stimulate clinical reasoning and questioning in the rehabilitation of older burn survivors, as well as identifying gaps in the current research.
DEPRESSION, RELIGION/SPRITUALITY, AND DIABETES-RELATED OUTCOMES: A MIXED METHODS STUDY OF OLDER US ADULTS WITH TYPE 2 DIABETES

Ben Vickers, MS, Preventive Medicine and Community Health

Background: Type 2 Diabetes Mellitus (T2D) is a growing public health problem among U.S. older adults, especially older Hispanics and non-Hispanic blacks. Poor glycemic control is associated with depression, but patient coping strategies and resources may attenuate this association.

Purpose: This project will use mixed methods to study the effects of religious/spiritual (R/S) coping and resources on diabetes management in a clinical sample and outcomes in a national sample.

Subjects: Subjects will include T2D patients 50 years and older from a clinical sample and a nationally representative sample, the Health and Retirement Study (HRS). The multi-ethnic samples will include Hispanics, non-Hispanic blacks, and non-Hispanic whites.

Outcome: The HRS diabetes outcomes include glycemia (A1c) and health-related quality of life. The clinical sample outcome will be patient-provided ways that R/S resources are used by patients in their management of T2D relevant to treatments, goals, concerns, functionality, and coping, and the extent to which these are shared.

Predictors: Depressive symptoms, R/S resources, and their interactions will predict diabetes outcomes. Covariates include sociodemographics, medical history, and relevant clinical variables.

Analysis: The SAS Mixed Procedure will be used to explore within-subject changes in the diabetes outcomes from 2006 to 2008.

The poster will present study methods, preliminary results, and preliminary comments and analysis.
INVESTIGATION OF CHRONIC YOUNG STROKE SURVIVORS' GOAL PRIORITIES

Catherine Cooper Hay, MS, Division of Rehabilitation Sciences
Monique Pappadis, PhD, MEd, Division of Rehabilitation Sciences
Timothy Reistetter, PhD, OTR, Department of Occupational Therapy

Background: Current recommendations for stroke rehabilitation emphasize patient centered care. It is often challenging for stroke survivors to communicate both short term and long term goal priorities during rehabilitation.

Objective: Examine young stroke patients' importance rating on patient centered outcomes and compare by gender. Determine the relationship between perceived importance and current performance on stroke related activities.

Method: Qualitative investigation utilizing importance performance analysis (IPA).

Results: 18 interviews were completed of young stroke survivors (10M and 8 F). Sample was diverse (56% African American, 37.5% Caucasian, 6.25% Asian, 12.5% Biracial), young (mean age 55.5 years, SD=7.3) and chronic (mean time since stroke 83.3 months, SD=77.5). IPA analysis created a visual of top goal priorities based on current performance that can be utilized as a framework during goal discussions. According to IPA, areas of focus for both men and women included walking, driving, balance, hand function, and leg strength. Women focus areas also included memory, depression, participation in activities outside of the house, and continence. Men focus areas included mood control, and endurance.

Conclusions: Many items rated as important to stroke survivors are not captured on currently required rehabilitation documentation. IPA could be utilized to increase patient centered care and monitor goal priorities over the course of recovery.
GENDER DIFFERENCES IN STROKE REHABILITATION GOAL ATTAINMENT IN OLDER ADULTS

Catherine Cooper Hay, MS, Division of Rehabilitation Sciences
Kenneth Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences
James Graham, PhD, DC, Division of Rehabilitation Sciences
Timothy Reistetter, PhD, OTR, Department of Occupational Therapy

Background: In qualitative patient interviews, stroke survivors rated all FIM items as important in stroke recovery. Previous studies have found a gender difference in recovery after stroke, but utilized the total score on functional measures rather than looking at individual items.

Objective: To investigate the impact of gender and social support on goal attainment after stroke and inpatient rehabilitation. To better understand how social support impacts the relationship between gender and functioning at IRF discharge.

Method: Retrospective cohort study was conducted utilizing Medicare fee-for-service beneficiaries (N=185,904) discharged from inpatient rehabilitation in 2013 and 2014 after receiving care for a stroke. Outcome variable: Discharge scores on individual FIM items, rating of 5 or better. Independent variables: gender and social support.

Results: More men had a FIM ≥ 5 on UE dressing, walking, and stairs. More women had a FIM ≥ 5 on eating, LE dressing, toileting, bladder control, tub transfers, and all cognitive items. Women were more likely to live alone prior to their rehabilitation. In logistic regression analysis, using family/friends as the reference group, no social support was associated (P<.05) with higher odds of reaching a FIM ≥5 on all 18 FIM items.

Conclusions: Individuals who live alone prior to their stroke are more likely to return to at least a supervision level after rehabilitation. Further investigation is warranted to better understand the relationship between gender, social support, and goal attainment.
THE MODERATING ROLE OF EDUCATION IN THE RELATIONSHIP BETWEEN CHRONIC CONDITIONS AND COGNITIVE FUNCTION AMONG MEXICAN OLDER ADULTS

Jaqueline Avila, BS, Preventive Medicine and Community Health
Brian Downer, PhD, Division of Rehabilitation Sciences
Silvia Mejia Arango, PhD, Sealy Center on Aging
Rebeca Wong, PhD, Preventive Medicine and Community Health

Background: Cardio metabolic conditions are associated with poor cognition among older adults. Educational attainment is also correlated with cognitive function in old age. However, the prevalence of chronic conditions varies according to educational status. Thus, it is important to understand how the prevalence of chronic conditions, educational achievement, and cognition interact in aging populations of developing countries such as Mexico, in which successive cohorts are more educated and survive longer to experience chronic diseases and cognitive decline.

Objective: Assess how educational status moderates the impact of chronic disease on cognitive function among older adults in Mexico

Methods: Data based on 8,339 individuals above 60 years of age from the 2015 Mexican Health and Aging Study. The dependent variable was mean cognitive score using 8 domains of the Cross-Cultural Cognitive Examination. The independent variables were the self-report of a chronic disease diagnosis in the previous two years. Education was the moderator variable in this relationship. Bivariate differences in overall mean cognitive score according to each chronic disease was tested as well as the interaction between chronic diseases, education, and cognition score.

Results: The mean cognition score is 63.9, ranging from 4 to 125.6. Individuals with more years of education are less likely to report having been diagnosed with any chronic condition. Mean cognitive score was lower for individuals with all chronic conditions. Mean cognitive score increased across all diseases as the level of education increased. Only diabetes and stroke significantly interacted with education.

Conclusion: Chronic diseases and educational status are both significantly associated with cognition scores for Mexicans aged 60 and older. The interaction of chronic diseases and education is only observed for diabetes and stroke.
HIGH-COST INPATIENT ADMISSIONS AMONG ELDERLY PATIENTS WITH CANCER

Jaqueline Avila, BS, Preventive Medicine and Community Health
Daniel Jupiter, PhD, Preventive Medicine and Community Health
Mariana Chavez MacGregor, MD, MD Anderson Cancer Center
Sapna Kaul, PhD, Preventive Medicine and Community Health

Background: Inpatient costs account for one-third of overall health care spending in the U.S. Further, the majority of health care costs are driven by a small proportion of patients who are more likely to be older and have chronic conditions such as cancer. To improve value in care, it is important to examine high-cost cancer patients and identify opportunities to effectively manage their care needs.

Objective: Examine characteristics of high-cost elderly cancer patients compared with lower cost patients in hospital settings.

Methods: We identified 571,751 individuals aged 65 years or older with a cancer diagnosis using the 2013 data from the National Inpatient Sample, an all-payer sample of hospital discharges and inpatient stays in the U.S. High-cost visits were defined as those with total cost above or at the 90th percentile. Patients below the 90th percentile were used as the comparison group. Patients’ clinical (e.g., comorbidities [e.g., anemia, congestive heart failure], type of procedure [major or minor]) and hospital characteristics were examined. Logistic regression was utilized to identify characteristics associated with high-cost.

Results: The average cost of visits above the 90th percentile was $47,073 (average length of stay [LOS]=12.4 days) versus $9,577 (LOS=4.4 days) for visits below this percentile (p<0.001). High-cost patients were more likely to have a greater number of comorbidities than their counterparts. Those who had major procedures were twice as likely to be in the top 10% group as their counterparts (OR: 2.01, 95% CI: 1.89- 2.15).

Conclusion: High-cost individuals demonstrated a higher prevalence of comorbidities, received more intensive care and stayed longer in the hospital. These features are important for determining strategies to effectively manage these patients in inpatient settings.
Health Disparities Research - Student

LONELINESS AMONG OLDER MEXICAN AMERICANS: A LONGITUDINAL STUDY OF INCIDENCE AND PREDICTIVE FACTORS

Leah Dierking, MS, Preventive Medicine and Community Health
M. Kristen Peek, PhD, Preventive Medicine and Community Health
Brian Downer, PhD, Division of Rehabilitation Sciences
Kyriakos Markides, PhD, Preventive Medicine and Community Health

OBJECTIVES: The purpose of this study is to determine predictors of loneliness among older Mexican Americans over time.

DESIGN: Longitudinal study

SETTING: Community-dwelling residences throughout California, Colorado, New Mexico, Arizona, and Texas

PARTICIPANTS: One thousand six hundred and eighty-two community-dwelling Mexican Americans, aged 72 and over, participating in the Hispanic Established Populations for the Epidemiologic Study of the Elderly (H-EPESE, 2000/01 – 20110/11)

MEASUREMENTS: Loneliness was measured at baseline and at each subsequent wave interval. Baseline demographic and clinical variables included social support, depression symptoms, Mini-Mental State Examination (MMSE), Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) limitations, and chronic health conditions.

RESULTS: Loneliness was present in 1682 subjects (20.75%) at baseline. The predictors of reporting loneliness over time includes feeling close to friends, living alone and high depressive symptoms. Protective factors include being female, having someone to count on or talk to, physically seeing friends monthly, and higher cognitive functioning.

CONCLUSION: Loneliness is prevalent among older Mexican American adults. Presence of friends nearby and seen physically each month was shown to have a protective effect, while presence of family relationships was not significantly associated with loneliness.
Orthotopic liver transplantation (OLT) currently represents a life-saving procedure used to extend and improve the quality of life for those with End-Stage Liver Disease (ESLD). However, this procedure, both available and the gold standard of treatment for ESLD, is not readily accessible to all populations. Racial and socioeconomic disparities exist throughout the OLT system still today. Research has shown that these social determinants of health impact the development and progression of any given disease, including ESLD. This proposal uses multi-level modeling in the Scientific Registry of Transplant Recipients (SRTR) national dataset. To satisfy the overall objective of this investigation, which is to better understand the relationship between ethnicity and OLT outcomes, as well as the mechanisms behind racial and SES disparities regarding OLT outcomes, three specific aims will be addressed. First, to identify the relationships between SES, ethnicity and OLT outcomes (graft failure and patient survival) in a pre- and post-MELD era. Second, to assess the extent to which lower SES is associated with poorer OLT outcomes, with this association being mediated by waitlist time. And third, to examine the effects of race/ethnicity in the relationship between SES and OLT outcomes (graft failure and patient survival) in the post-MELD era. The results from this study will further our understanding of the problem of inequality and disparities as they relate to the interconnectedness of SES and race regarding liver allocation and survival.
THE IMPACT OF SOCIAL INTEGRATION ON DEPRESSIVE SYMPTOMOLOGY IN MEXICAN OLDER ADULTS

Paige Downer, MPH, Preventive Medicine and Community Health
Rebeca Wong, PhD, Preventive Medicine and Community Health

Background: Depression among older adults is an important public health concern worldwide. However, there is limited research assessing the burden of depression in Latin American countries such as Mexico. Our objective is to evaluate population-level differences in depressive symptomology in Mexican older adults aged 65 and older, assessing the role of social integration in reducing depression. Evidence has identified low social participation and small social networks as increasing the risk of depression. We hypothesize that socially integrated Mexican adults aged 65 and older will have fewer reported depressive symptoms than those lacking social support or engagement.

Methods: This analysis used data from the 2015 Wave of the Mexican Health and Aging Study (n=14,779) and was restricted to direct interviews of participants aged 65 and older who completed the depression section of the survey (n=7,422). Depressive symptoms were measured using a 9-point scale. Social engagement was measured through frequency of visits with neighbors. Social support was measured by participants stating they felt they could rely on their neighbors or friends. Multi-variable linear regression was used to examine differences in the mean number of depressive symptoms. Analysis was adjusted for socio-demographic and self-reported chronic health characteristics.

Results: The mean number of depressive symptoms for Mexican older adults increases with older age and with fewer years of formal education. Social support is significantly associated with fewer depressive symptomology (p < 0.0001); however, social engagement is not.

Discussion: Future research should explore the context of perceived social support in comparison to objective social engagement as determinants of depressive symptomology among older Mexican adults. Continued research is needed to identify factors contributing to differences in depressive symptoms by educational attainment.
ASSOCIATION BETWEEN PAIN AND FRAILTY OVER TIME AMONG OLDER MEXICAN AMERICANS

Jaspreet Sodhi, MSPT, Division of Rehabilitation Sciences
Soham Al Snih, PhD, Division of Rehabilitation Sciences
Kyriakos Markides, PhD, Preventive Medicine and Community Health
Kenneth Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences
Amol Karmarkar, PhD, Division of Rehabilitation Sciences
Rogelio Coronado, PhD, Department of Physical Therapy

Objective: Examine the association between pain and frailty in a selected sample of older Mexican Americans over a 18-year period.

Methods: The sample included 1545 Mexican Americans aged 67 years and older from the Hispanic Established Populations for the Epidemiologic Studies of the Elderly (1995-96/2012-13) non-frail at baseline. The outcome variable was Frailty and was defined as 3 or more of the following components: weight loss, weakness, self-reported exhaustion, slow walking speed and low physical activity. The main independent predictor was pain on weight bearing. Covariates included: age, gender, body mass index (BMI), marital status, education, comorbidities, Mini Mental State Examination (MMSE), hip fracture and depression. GENMOD model was used to estimate the odds ratio of becoming frail over time as a function of pain.

Results: A total of 538 participants (34.8%) reported pain at baseline and 432 participants (28%) became frail over time. The odds ratio of becoming frail over time as a function of pain was 1.67 (95% CI, 1.41-1.97) after controlling for all covariates. Age, female gender, heart attack, hip fracture, diabetes, and depression were associated with frailty over time. Participants with high level of education and high MMSE were less likely to become frail.

Conclusions: Pain is a predictor of frailty in older Mexican Americans. Earlier assessment and better management of pain may prevent or delayed frailty in older Mexican Americans.
TRENDS IN PAIN PREVALENCE IN OLDER ADULT AMERICANS: FINDINGS FROM THE NATIONAL HEALTH AND AGING TRENDS STUDY (NHATS).

Jaspreet Sodhi, MSPT, Division of Rehabilitation Sciences
Soham Al Snih, MD, PhD, Division of Rehabilitation Sciences

Objective: To investigate the trends of pain and pain location, and the association between socio-demographic factors and pain over time among older adults Americans.

Methods: The sample included 7136 participants who were aged 65 years and older from the National Health and Aging Trends Study (2011-2015) with complete information on pain and all covariates of interest. The variables included are socio-demographic characteristics (age, gender, marital status, race/ethnicity and years of formal education), pain location in upper extremity (shoulder, wrist and hand), lower extremity (hips, knees and foot) and spine (back and neck), depression, and comorbidities. General estimation equation model was fitted using the GENMOD procedure to test whether socio-demographic variables, comorbidities or depression are associated with pain over time.

Results: The prevalence of pain was 54% at baseline. The most prevalent pain location in upper extremity was shoulder (37.3%) and in lower extremity was knee (46.6%). The prevalence of back and neck pain was 57.5% and 30.4%, respectively. The odds ratio of reporting pain over the five-year period was 0.98, 95% CI=0.92-1.05. Participants aged 65 to 74 years and 75 to 84 years were significantly more likely to report pain over time than those aged 85 years and older. Arthritis, diabetes, cancer, osteoporosis, stroke, lung disease and depression were associated with increased odds of reporting pain over time.

Conclusions: Older adults American are less likely to report pain over the five-year period. Back and knee pain were the most prevalent pain locations.
POOR LOWER-BODY FUNCTIONING IS ASSOCIATED WITH ACCELERATED COGNITIVE DECLINE FOR MEXICAN AMERICANS 75 YEARS AND OLDER

Paul Wadsworth, BS, Graduate School of Biomedical Sciences
Brian Downer, PhD, Division of Rehabilitation Sciences
Nai-wei Chen, PhD, Preventive Medicine and Community Health
Kyriakos Markides, PhD, Preventive Medicine and Community Health

Background. Decreased walking speed, abnormal gait, and poor balance in older adults have been associated with increased morbidity and mortality, but the relationship between these physical limitations and rates of cognitive decline has not been explored. The purpose of this analysis was to examine the association between measures of lower-body functioning and changes in cognition over 9 years of follow-up in elderly Mexican Americans.

Methods. Data used were from 1,489 participants of the H-EPESE who were followed-up during four study periods from 2004/05 to 2012/13. Lower body function was measured at baseline using three performance-based tasks: time to complete an 8 ft. walk; balance; and repeated chair stands. Cognitive function was measured at each observation wave using the MMSE. Linear mixed modeling was applied to investigate the association between lower body function and change in cognitive function.

Results. Compared to the highest performers, participants who were unable or poorly performed the 8 ft. walk, as well as those unable to perform the chair stands, had significantly lower cognitive functioning at baseline and significantly faster cognitive decline. Compared to the best performers on the balance task, participants who could only complete the side-by-side task or worse had significantly lower cognitive functioning at baseline. Those who were unable to complete any of the functioning measures showed significantly greater cognitive decline compared to the highest performers.

Conclusion. Objective measures of lower body function were significantly associated with poorer cognitive function and accelerated cognitive decline in Mexican American elderly persons. Limitations in lower-body functioning may be an early marker of cognitive decline and dementia, and can feasibly be measured in a clinical setting.
HEARING IMPAIRMENT IS CORRELATED WITH DEPRESSION IN VERY OLD MEXICAN AMERICANS: A STUDY USING THE HISPANIC EPESE

David V. Flores, PhD, MPH, Preventive Medicine and Community Health
Nai-Wei Chen, PhD, Preventive Medicine and Community Health
Brian Downer, PhD, Division of Rehabilitation Sciences
Kyriakos Markides, PhD, Preventive Medicine and Community Health

Background: More than 299 million men and 239 million women have impaired hearing and hearing loss is the third leading cause of years lost due to disability worldwide. Consequences of hearing impairment include a reduced ability to communicate, economic and education disadvantages, and social isolation. The older U.S. population is becoming increasingly diverse and older Hispanics are projected to be the largest minority population in the U.S. Although there have been several studies linking depression, Alzheimer’s, and cognitive deterioration to hearing loss, less research has focused on older Mexican Americans with hearing loss. In this study, we employ a unique data set of older Mexican Americans (H-EPESE) to examine the relationship between self-reported hearing loss, depressive symptoms, and dementia related neuropsychiatric disturbance.

Methods: We used data from 383 subject/informant dyads from Wave 9 of the H-EPESE. Outcomes of interest included informant reported neuropsychiatric symptoms and subject self-reported depressive symptoms (>= 16 on the CES-D). The main independent variable was subject self-reported hearing impairment. Covariates included age, sex, marital status, and ADL limitations of the subject.

Analysis: (1) logistic regression analysis was employed to analyze the association between hearing impairment and high depressive symptoms; (2) Negative binomial regression analysis was employed to analyze the association between hearing impairment and count of NPI symptoms.

Results: A total of 223 (58.2%) of subjects reported having impaired hearing. Controlling for covariates, hearing impairment was associated with greater odds for high depressive symptoms (OR:1.65; 95% CI: 1.02 to 2.68). Impaired hearing was not associated with significantly higher NPI symptoms.

Conclusions: We expected hearing loss to be associated with depressive symptoms. Understanding these mechanisms becomes crucial as rising hearing disability rates increase the need for hearing assisted devices and interventions.
PATTERNS OF SES HEALTH DISPARITIES AMONG OLDER ADULTS IN MEXICO, PUERTO RICO, US AND ENGLAND

Rafael Samper-Ternent, MD, PhD, Sealy Center on Aging
Mary McEniry, PhD, University of Wisconsin - Madison

Objective: Examine SES health disparities across different health dimensions. We compare SES disparities in older adults in Mexico and Puerto Rico—countries with similar demographic transition—benchmarking our results with the US and England.

Methods: We use data of adults 60 years or older from years 2001 and 2012 of the Mexican Health and Aging Study (MHAS, n=7171), years 2002 to 2006 of Puerto Rican Elderly Health Conditions Project (PREHCO, n=4291), years 2000 to 2012 from the Health and Retirement Study (HRS, n=12,527), and years 2004 to 2012 of the English Longitudinal Study on Aging (ELSA, n=6183). We focus on: Mortality, Self-reported Health, Chronic Conditions, Functionality, Cognition, Depression, Unhealthy Lifestyles (smoking, no exercise), BMI, and Low Height. We create logistic models for the four countries using education as a proxy for SES.

Results: In terms of education, large education differences are observed between Mexico and Puerto Rico. The United States and England have similar educational distribution. In terms of mortality, age-standardized mortality rates per 1,000 show Mexico and Puerto Rico are similar to US but not England which has the lowest mortality rate. When analyzing results from the regression analyses, interesting reversals are observed comparing Mexico and Puerto Rico and also comparing these countries with the US and England.

Conclusions: In Mexico and Puerto Rico, there is some cross over—reversal of patterns: cancer and no exercise are more likely among those with high SES. Reversal is observed in heart disease only in Mexico. No significant differences are observed by SES status on risk of obesity in Mexico or Puerto Rico. In the US and England expected patterns are observed with low SES associated with poorer health.
Impaired cognition and physical limitations are common comorbid conditions among older adults.

Prior research has also identified cognitive impairment to be a risk factor for increased physical decline whereas physical impairment is associated with greater cognitive decline.

The close relationship between cognitive and physical impairments is due in part to shared risk factors and underlying biological mechanisms that contribute to impaired cognitive and physical functioning.

However, traditional modeling approaches are unable to examine how cognitive and physical declines co-develop.

This research used 20 years of data from the Hispanic Established Populations for the Epidemiologic Study of the Elderly to model trajectories of cognitive function and physical functioning, measured in terms of Mini Mental State Exam (MMSE) scores and performance-oriented mobility assessment (POMA) scores after age 65 in a large longitudinal sample of Mexican-origin individuals. We estimate dual domain growth curve models that permit initial levels of MMSE scores to impact the change in POMA scores as well as allowing initial levels of POMA scores to impact change in MMSE scores.

Cross-domain regressions of intercepts on slopes show that higher baseline levels of physical function dampen the rate of cognitive decline for both men and women. Conversely, cross-domain regression of initial cognitive levels on physical function show that higher baseline MMSE scores increase the rate of decline in POMA scores for women only. This research presents new evidence that suggests physical impairment is a stronger risk factor for declining cognitive function than impaired cognition is for physical decline. These findings have important implications for the development of social and health policies to appropriately target the medical conditions and disabilities of older Mexican Americans entering late life.
RACIAL/ETHNIC DISPARITIES AND EDUCATIONAL DIFFERENTIALS IN LIFE EXPECTANCY WITH COGNITIVE IMPAIRMENT AMONG OLDER ADULTS IN THE UNITED STATES

Marc Garcia, PhD, Sealy Center on Aging
Brian Downer, PhD, Division of Rehabilitation Sciences
Chi-Tsun Chiu, University of Texas at Austin

Objective: To document racial/ethnic and educational differences in life expectancies with cognitive impairment among older adults in the United States.

Methods: We used data (1998-2012) from RAND HRS Version O Data File (RAND, 2016) to estimate differences by race/ethnicity and educational attainment for cognitive life expectancies (cognitively normal, CIND, and dementia) and death for adults 50 years and older.

Results: Total life expectancy increases with education across all racial/ethnic groups, regardless of gender. Furthermore, the remaining years spent cognitively healthy also increases with higher educational attainment across all racial/ethnic groups. However, large racial/ethnic differences in cognitive life expectancies remain despite similar levels of education.

Discussion: Our findings contribute to the importance of race/ethnicity and education when assessing cognitive life expectancies. Social policy aimed at increasing educational attainment for minority populations can potentially have major impacts on reducing or eliminating future disparities in adult CIND and dementia.
ASSOCIATION BETWEEN GAIT SPEED AND MOBILITY DISABILITIES IN MEXICAN OLDER ADULTS

Chih-Ying Li, PhD, Division of Rehabilitation Sciences
Amit Kumar, PhD, Brown University
Rebeca Wong, PhD, Preventive Medicine and Community Health

Background: Self-reported physical limitations is a widely used measure of dependence among older adults. However, the validity of the self-report physical limitations is unknown among older adults in global populations.

Objective: To validate the self-reported physical limitations in Mexican older adults by examining the associations between gait speed and mobility disabilities.

Methods: We used a sub-sample of the 2012 Mexican Health and Aging Study for whom gait speed was measured. We categorized respondents’ gait speed based on the Youden Index, an optimal threshold method frequently used to identify the cutoff point. We used 0.6 m/s as the gait speed cutoff point (normal vs. slow). Mobility disability was defined as having difficulty in any of the following tasks: walking, walking several blocks, walking one block, climbing several stairs and climbing one stair. We performed correlation analysis and logistic regression to examine the association between gait speed categories and mobility disabilities (continuous and categorical).

Results: A total of 1,094 patients were included. Participants in the slow gait speed group were older, female, not married, had higher BMI and higher proportion of six medical conditions (hypertension, cardiovascular disease, diabetes, arthritis, falls and fracture), compared to the normal gait speed group (p all <.001). Gait speed groups had a weak but significant correlation with the total number of mobility disabilities (r=0.35, p<.0001). Individuals with slow gait speed had 95.4% higher odds to have mobility disabilities compared to those with normal gait speeds [Odds Ratio= 1.954, 95%CI=1.49-2.57].

Conclusions: Mexican older adults who had slow gait speed also reported some mobility disabilities. We plan to extend these preliminary results to consider other self-reported physical limitations.
EARLY FRAILTY TRANSITION PREDICTS 17-YEARS OF MORTALITY AMONG NON-DISABLED OLDER MEXICAN AMERICANS

Chih-Ying Li, PhD, Division of Rehabilitation Sciences
Soham Al Snih, MD, PhD, Division of Rehabilitation Sciences
Amol Karmarkar, PhD, Division of Rehabilitation Sciences
Kyriakos Markides, PhD, Preventive Medicine and Community Health
Kenneth Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences

Background: Understanding the impact of early frailty transitions on long-term mortality risk is crucial for care planning in older adults.

Objective: To investigate the effect of early frailty transitions on 17-year mortality.

Design: Longitudinal analysis of data from the Hispanic Established Populations for the Epidemiological Study of the Elderly (EPESE) Survey.

Participants: This study included 1,173 community-dwelling Mexican Americans aged 67 years and older. Frailty was determined using the following criteria: unintentional weight loss >10 pounds, weakness, self-reported exhaustion, and slow walking speed. Frailty was defined as meeting two or more of the criteria and pre-frail was defined as meeting one. Frailty transition was defined as changing status among non-frail, pre-frail and frail. Participants were non-disabled at baseline (1995/96) and divided into nine transition groups based on frailty status transition occurring between 1995/96 and 1998/99.

Main Measure(s): Mortality occurring from 1998 through 2013, adjusted for socio-demographic variables, comorbidities, disability, body mass index and cognitive impairment.

Key Results: Mean age was 75.6 (SD=6.6) years in 1995/96 and 77.0 (SD=5.3) years in 1998/99. The sample was 58.4% female at baseline. Participants who transitioned from pre-frail to frail, frail to pre-frail, or remained frail, had significantly higher mortality risk at 17-year follow-up compared to persons who remained non-frail [Hazard Ratio (HR)=1.71, 95%CI=1.25-2.32; HR=1.49, 95%CI=1.01-2.20; HR=1.77, 95%CI=1.25-2.52, respectively].

Conclusions: Non-disabled older Mexican Americans who transitioned to, or remained frail had significantly higher risk of mortality over 17 years compared to individuals who remained non-frail. Weight loss and slow walking speed were associated with transitions to a frail state in this sample of older Mexican Americans.
POST-ACUTE CARE TRAJECTORY AMONG HIP FRACTURE MEDICARE BENEFICIARIES: HOSPITAL REFERRAL REGIONS PERSPECTIVES

Chih-Ying Li, PhD, Division of Rehabilitation Sciences
Amol Karmarkar, PhD, Division of Rehabilitation Sciences
Allen Haas, MS, Preventive Medicine and Community Health
Kenneth Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences

Background: Hip fracture can lead to higher mortality, morbidity, care utilization and hospitalization among older adults. Post-acute care (PAC) plays a crucial role to restore function after hip fracture, however, is delivered across varied settings [e.g. Inpatient Rehabilitation Facilities (IRF), Skilled Nursing Home (SNF) and Home Health (HH)], with limited evidence to support which setting provides the best care.

Objective: To describe hip fracture patient characteristics and post-acute care trajectories within 90 days following a hip fracture, and to examine how these trajectories vary regionally.

Methods: We used 2013-2015 Medicare claims and Hospital Referral Regions (HRRs) data in this study. We stratified 306 HRRs into two categories: regions with high and low IRFs percentage (above and below 75% quartile). We compared demographics and clinical characteristics of patients among immediate post-acute discharge destinations using Chi-Square tests, Fisher’s exact test or Analysis of variance and examined differences in patient characteristics and post-acute care trajectories between HHRs using standardized differences (> 0.2 is significant) and p-values (< 0.05 is significant).

Results: A total of 184,313 patients with hip fracture were included. The majority was female (76.2 %) with a mean age of 82.6 (±7.8 SD). Most patients (60.0%) had more than one Elixhauser comorbidities. Hip fracture patients discharged to home-based settings were younger and tended to be hospitalized in a previous year compared to those discharged to IRFs/SNFs. Black and Hispanic who first discharged to home tend to live in High-IRF health region (difference=0.25).

Conclusions: Hip fracture older adults with similar demographics were discharged to different post-acute settings. More patients were discharged to SNFs. Variations of ethnicity distribution across Low/High-IRF health region may imply health disparities among regions.
KNEE OSTEOARTHRITIS-RELATED WALKING DIFFICULTY Dictates Gait Strategies

Annalisa Na, PhD, School of Health Professions
Zbigniew Gugala, MD, School of Medicine
Thomas Buchanan, PhD

Knee osteoarthritis (OA), the leading cause of walking difficulty\(^1\), can reduce functional independence in older adults. Quantifying gait mechanics (e.g., neuromuscular strategies, or co-contraction [CoC] and movement smoothness or jerk) can help establish interventions and improve mobility. This study quantifies CoC and jerk as related to knee OA and walking difficulty. We hypothesize that walking difficulty dictates the relationships; therefore, walking difficulty will moderate the relationship between CoC and jerk.

Methods: A total of 39 age- and sex-matched subjects divided into three groups (Diff: walking difficulty with knee OA, NoDiff: no walking difficulty with knee OA, and control: no knee OA) walked at 1.0 m/s with an inertial measurement unit (IMU) at the tibia and electromyography (EMG) electrodes on the lateral quadriceps (LQ), hamstrings (LH), and gastrocnemius (LG). Jerk was derivative from the IMU and CoC from LQLH and LQLG EMG. OA subjects ranked walking difficulty on a scale from 0 (unable to walk) to 5 (no walking difficulty). Responses \( \leq 3 \) were in the Diff group and \( \geq 4 \) were in the NoDiff group. Stepwise regression analyses examined group differences and interaction effects.

Results: Jerk was significantly different between Diff vs. No Diff (\( p = .01 \)), and vs. control (\( p < .01 \)). Group*interaction effects were significant for LQLH (\( p = .02 \)) and LQLG (\( p = .03 \)).

Conclusion: Results suggest that perception of walking difficulty may influence neuromuscular strategies during walking, which may be explained by a feed-forward and closed-loop neuromuscular system. Further understanding and interventions should focus on training to improve OA-related walking difficulty. Although temporal relationships are difficult to determine, perhaps neuromuscular efficiency via strength- and gait training may be beneficial to limit OA-related walking difficulty.
PATIENT CHARACTERISTICS ASSOCIATED WITH FUNCTIONAL STATUS CHANGE IN STROKE

Julianna M. Bores, MS, Division of Rehabilitation Sciences
Amol Karmarkar, PhD, Division of Rehabilitation Sciences
Brian Downer, PhD, Division of Rehabilitation Sciences

Objective: To identify patient-level characteristics associated with changes in the motor Functional Independence Measure (FIM) measure from admission to discharge in stroke patients.


Setting: Inpatient rehabilitation facilities (IRF) across the United States.

Participants: Stroke survivors aged 40-90 years old who received care in an IRF (n=1,219).

Intervention: None.

Main Outcome Measures: A least squares regression model to characterize changes in motor FIM from IRF admission to discharge was developed adjusting for demographic covariates (age, sex, years of education, marriage status, race) and stroke-related diagnoses (stroke type and type of impairment).

Results: In comparison to patients who experienced an ischemic stroke, a hemorrhagic stroke was associated with approximately a 2 point increase in motor FIM (β = 1.869, SE = 0.893, p = 0.037). Patients who experienced a stroke other than ischemic or hemorrhagic (transient, ill-defined, or late effects) experienced a 4 point decrease in motor FIM (β = -4.298, SE = 1.092, p < 0.001). Additionally, for every one-year increase in age, motor FIM change from admission to discharge decreased by approximately 0.1 points (β = -0.133, SE = 0.025, p < 0.001).

Conclusions: Age and stroke type were associated with changes in motor FIM performance from admission to discharge. For patients who experience transient, ill-defined or late effects strokes, special care should be taken during rehabilitation to address the lower motor FIM change scores associated with this population. Additionally, patient age should be taken into consideration during individualized rehabilitation programs as older individuals tend to have less improvement in motor FIM from admission to discharge.

Keywords: stroke, rehabilitation, linear regression
PHYSICAL ACTIVITY GOALS AND EATING BEHAVIOR IN ADULTS

Maria Elisa Diaz, BS, Department of Nutrition & Metabolism
Elizabeth Lyons, PhD, Department of Nutrition & Metabolism
Maria Swartz, PhD, MPH, RD, LD, Department of Nutrition & Metabolism

Introduction: Physical activity has been associated with decreased risk for comorbidities. Adherence to physical activity over time has shown to improve eating behavior through Eating Behavior Inventory (EBI) questionnaire in overweight adults. However, adherence to the use of technology-based apps for physical activity and the relation to EBI scores have not been well established. Therefore, this study aimed to determine if there is an association between adherence to meeting physical activity goals through a technology-based intervention and differences in the 12-week EBI score and the baseline EBI score.

Methods: A secondary data analysis was conducted using a 12-week narrative mobile game-based activity intervention. There were a total of 40 participants. However, only the intervention group (n=20) was included in this analysis. EBI scores range from 26 to 130. Adherence was measured through to their physical activity goal and was defined successful when meeting their weekly goal 75% of the time. For the statistical analysis, a multivariable linear regression was used to evaluate the association between adherence to their physical activity goals and differences in EBI scores.

Results: Participants were a mean age of 47±13 years, BMI of 31 kg/m2 ±3.6, 80% were Non-Hispanic White, and 90% were female. The final model shows that there was no association between adherence to physical activity goal and differences in EBI scores. However, there is a suggestive relationship between gender and differences in EBI scores after controlling for adherence to activity goal (p<0.10).

Conclusion: Our exploratory result showed that gender might remain as one of the important factors associated with the differences in EBI scores warranting future studies with a larger sample size.
NARRATIVE MOBILE APPLICATIONS TO INCREASE EXERCISE SELF-EFFICACY/REGULATION IN SEDENTARY OVERWEIGHT AND OBESE ADULTS

Martha Mack, BS, School of Health Professions
Elizabeth Lyons, PhD, Department of Nutrition & Metabolism
Maria Swartz, PhD, MPH, RD, LD, Department of Nutrition & Metabolism

Introduction:
Task and barrier self-efficacy (SE) as well as plan and goal self-regulation (SR) are important determinants of behavior and relate to a person’s motivation to exercise. The use of narrative-based exercise games to increase determinants of motivation is not well understood. Thus, we aim to determine if using narrative mobile exercise tracking applications is associated with increase SE (task and barrier) and SR (plan and goal) when compared to wait-list controls in overweight/obese adults.

Methods:
We conducted secondary data analysis using data from the STEP and GO (Study of Technology-Based Exercise Promotion and Gaming Outcomes), a 12-week randomized controlled trial. Participants were 18-69 years old, had a BMI of 25-35 kg/m2, and were sedentary (60 min/week of planned exercise). Intervention group was provided with the Zombies, Run! narrative mobile exercise tracking application and set activity goals of >60 min/week of exercise with an end goal of >150 min/week exercise. An analysis of covariance and bivariate correlation were used to evaluate the association between the application and the four determinants of interest.

Results:
Of the 39 participants (20 intervention, 19 control) the mean age was 48 years, the mean BMI was BMI was 28.9 kg/m2, and one was male. A significant difference at 12 weeks was observed between groups for goal SR (p=0.001, partial eta2: 0.262) and task SE (p =0.035, partial eta2: 0.118). A significant correlation was observed between each of the four psychological determinants (p=<0.05).

Conclusion:
Further research is necessary to determine more precisely how these parameters are interrelated and how this can inform future weight loss studies and programs.
SENIOR CARE ENGAGING STUDENTS WITH INTERPROFESSIONAL EXPERIENCES IN OLDER ADULTS HEALTH INITIATIVE

Rachel Perry, BS, Department of Occupational Therapy
Erica Hsu, BS, Department of Occupational Therapy
Olivia Hubbard, BS, Department of Occupational Therapy
Norma Perez, MD, DrPH, Hispanic Center of Excellence

INTRODUCTION
Local service-learning educational opportunities are often overlooked despite their cost-effective value for immersive education and long-term benefits for local communities. Long-term, local service-learning programs are rich, immersive experiences that facilitate hands-on education in environments, cultures, and populations different from the student’s own.

PROCESS
Senior Care is a community health initiative under Frontera de Salud that brings students from every school at UTMB to serve and interact with older adults living at Holland House. As one of the few currently active student groups focused on community health among geriatric populations, Senior Care brings interdisciplinary students from all health professions the opportunity for experiential learning among the culturally and socio-economically diverse geriatric community at Holland House through monthly visits, health fairs, and health promotion workshops.

OUTCOMES
In the past 3 years, Senior Care has collaborated with Holland House’s community leaders to provide over 150 in-home visits, 3 health fairs, and a variety of resident-centered workshops. Based on feedback from the Holland House community, Senior Care has adjusted monthly visits to include booths for blood pressure, blood glucose, and board games in a community area that provides older adults motivation and opportunity for social interaction with students and fellow residents. Residents have participated in exercise classes, a sleep hygiene workshop, and a diabetes care workshop targeted for geriatric populations. Further workshops are being planned on nutrition and exercise at the request of the residents.

CONCLUSION
Students from a variety of health professions have indicated increased empathy for and desire to work in older, underserved populations. Older adults participating in visits regularly express looking forward to interacting with students each month.
ASSOCIATION BETWEEN POLYPHARMACY AND COGNITIVE FUNCTION IN OLDER ADULTS BY AGE GROUP

Efstathia Polychronopoulou, MS, Division of Rehabilitation Sciences
Amol Karmarkar, PhD, Division of Rehabilitation Sciences

Objective: To examine whether the association between polypharmacy and cognitive function in community-dwelling older adults varies with age.


Setting: Communities in the greater Los Angeles area.

Participants: Older adults without dementia aged > 60 years, without missing medication data (N=381). Only baseline data were considered, prior to any intervention.

Intervention: Not applicable.

Main Outcome Measures: Cognitive function was assessed through Recognition, Immediate and Delayed Memory Recall, measured by the Consortium to Establish a Registry for Alzheimer’s Disease 10 word list. Higher scores indicate better cognitive ability. Polypharmacy (yes/no) was defined as concurrent use of five or more drugs. Age was categorized as less than or equal to 75 years and more than 75 years old. We controlled for gender, race, socioeconomic and marital status, depressive symptoms, perceived health and mental status, supplement use and presence of hypertension using generalized linear regression models.

Results: Immediate Memory Recall and Recognition were not significantly associated with polypharmacy and this effect was not modified by age. For Delayed Memory Recall, the interaction between polypharmacy and age group was significant ($\beta = -1.07$, 95% CI: [-2.03,-0.1], p= 0.03); for age <= 75 years, the estimated mean difference on Delayed Recall between the polypharmacy and no-polypharmacy group was positive ($\beta = 0.33$, 95% CI: [0.09,0.57]) whereas for age > 75, the difference was negative ($\beta = -0.73$, 95% CI: [-1.013,-0.45]).

Conclusions: Aspects of cognitive function in older adults are impacted by polypharmacy differentially among age strata. Further research is warranted to determine if this effect is due to reduced drug clearance associated with aging or due to interactions between drugs.
DIABETES IS ASSOCIATED WITH LOWER LIMB STRENGTH DECLINE IN HISPANIC OLDER ADULTS

Camille R. Brightwell, MS, Graduate School of Biomedical Sciences
Amol Karmarkar, PhD, Division of Rehabilitation Sciences

Involuntary atrophy of skeletal muscle mass occurs in aging. This atrophic phenomenon coupled with strength loss is known as sarcopenia and is exacerbated in older adults with diabetes, a group known to exhibit excessive skeletal muscle atrophy compared to healthy older adults. Sarcopenia is associated with significant functional deterioration and increased risk of disability, functional dependence, and mortality. Hispanic older adults demonstrate disproportionally high rates of diabetes, possibly placing them at greater risk for skeletal muscle wasting and potential strength decline. The objective of this study was to compare strength loss in Hispanic older adults with and without diabetes. We conducted a retrospective secondary analysis of the Hispanic Established Populations for Epidemiological Studies of the Elderly (EPESE) Frailty Study: 2006-2009 data (ICPSR #36321). We used multivariate analysis of covariance (MANCOVA) to assess and compare changes in muscle strength between individuals with diabetes and those without diabetes. Muscle strength was measured by isokinetic dynamometry for hip abduction, hip flexion, and knee extension. Covariates included age, sex, comorbidities, self-reported exercise frequency, and Body Mass Index. Compared to their counterparts without diabetes, Hispanic older adults with diabetes had a greater strength loss for hip abduction (p=0.01) and hip flexion (p=0.03) with a trend toward significant difference in knee extensor strength change (p=0.07). Self-reported exercise frequency was associated with each measure of strength change (p<0.001). These data demonstrate a disproportionate strength loss in Hispanic older adults with diabetes compared to those without diabetes. Strength decline could be indicative of increased difficulty in performing daily activities. With a significant effect of exercise frequency, targeted strength training may slow down the strength-related functional decline process in Hispanic older adults with diabetes.
MODERATE INTENSITY AEROBIC EXERCISE TRAINING IMPROVES MYOFIBRILLAR PROTEIN SYNTHESIS, CAPILLARIZATION, AND QUADRICEPS STRENGTH IN OLDER ADULTS

Camille R. Brightwell, MS, Graduate School of Biomedical Sciences
Tatiana Moro, PhD, Sealy Center on Aging
Christopher S. Fry, PhD, Department of Nutrition & Metabolism
Elena Volpi, MD, PhD, Sealy Center on Aging
Blake B. Rasmussen, PhD, Department of Nutrition & Metabolism

Skeletal muscle atrophy and subsequent strength loss occur in aging via a myriad of biological mechanisms. This involuntary loss of muscle and strength, termed sarcopenia, can progress to a clinically relevant decline in physical function. Resistance exercise training (RET) effectively attenuates sarcopenia but may not be feasible for many older adults. Aerobic exercise training (AET) is well-established to improve cardiopulmonary health; however, its effects on protein turnover, skeletal muscle mass and strength are less clear. Our aim was to determine if moderate intensity AET improves basal myofibrillar protein synthesis (MPS) and capillarization, thereby promoting increased muscle growth and strength. We hypothesized that basal MPS would increase in response to AET and that this would be accompanied by enhanced capillarization, muscle growth and strength. Subjects included healthy older adults randomized to non-exercise (NON) or exercise (EX). EX group completed 24 weeks of walking 3x/week for 1 hr at 70% heart rate reserve. For both groups, a stable isotope tracer was infused after an overnight fast before and after 24 weeks. Muscle biopsies were taken from the vastus lateralis to assess MPS and capillarization. Subjects performed maximal strength testing via isokinetic dynamometry, and lean mass was determined with dual-energy X-ray absorptiometry. Basal MPS increased in the EX group (p<0.05) along with capillary density (p<0.05), peak oxygen consumption (p<0.05), and quadriceps strength (p<0.05). Lean mass did not increase in either group (p>0.05). These results indicate the effectiveness of moderate intensity AET to increase muscle protein turnover and capillarization in older adults, possibly ridding muscle of damaged proteins and improving overall muscle quality. We conclude that AET improves muscular strength which may mitigate the functional decline associated with sarcopenia.
THIRTY-DAY READMISSIONS AND REASONS FOR READMISSION AFTER INPATIENT REHABILITATION AMONG MEDICARE BENEFICIARIES WITH TOTAL KNEE ARTHROPLASTY

Kshitija Kulkarni, PhD, Department of Occupational Therapy
Soham Al Snih, MD, PhD, Division of Rehabilitation Sciences
Yong Fang Kuo, PhD, Office of Biostatistics
James Graham, PhD, DC, Division of Rehabilitation Sciences
Kenneth Ottenbacher, PhD, OTR, Division of Rehabilitation Sciences

This study examined the effect of obesity on outcomes following discharge into the community from inpatient rehabilitation facility including 30-day hospital readmissions and the reasons for readmission. The study population was Medicare beneficiaries 65 years and older, with osteoarthritis, who underwent elective primary total knee arthroplasty during the years 2012 and 2013 and were directly admitted to inpatient rehabilitation facility. The study design was a secondary data analysis of 100% Medicare Claims data. Reasons for hospital readmission were classified based on their connection to the index surgical procedure: local complications, systemic complications, or unrelated. Chi-square statistics and one-way ANOVA were used for descriptive statistics. Multivariable logistic regression was used for the categorical outcome of 30-day hospital readmission. Among the total knee arthroplasty sub-cohort of beneficiaries who were readmitted, multinomial logistic regression was used for the categorical outcome of reason for readmission. Survival analyses using cox proportional hazard modeling were conducted for 30-day hospital readmission. Normal weight was used as the reference category in all multivariable analyses. Among those who were readmitted, morbid obesity was associated with greater odds of local/procedure-related reasons for readmission.
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Other - Faculty Member

THE EFFECT OF A 4-WEEK POSTURAL INTERVENTION OF MANUAL THERAPY AND THERAPEUTIC EXERCISE ON POSTURE AND FUNCTION IN A HEALTHY OLDER ADULT

Lynne Hughes, PhD, Department of Physical Therapy
Mohammad Khan, MD, Department of Physical Therapy
Mansoo Ko, PhD, Department of Physical Therapy
Hyun-jeong Jang, PhD, Department of Physical Therapy
Adrianna Laprea, PT, DPT, Department of Physical Therapy
Rod Welsh, PhD, Department of Physical Therapy
Rebecca Burnett, DPT, Department of Physical Therapy

Purpose: Hyperkyphosis, a common postural deformity in the elderly, has been associated with fall risk and poor balance. Previous research showed an improvement with therapeutic exercise in longer interventions. Little research exists with manual therapy and hyperkyphosis. This study performed a short intervention of 4-weeks with manual therapy and therapeutic exercise. This case study explores the effect of a postural intervention of manual therapy and therapeutic exercise on posture and function in an 88-year-old male with increased forward head, thoracic kyphosis, hip flexion, and poor functional balance.

Methods: Outcome measures were taken at baseline and 4 weeks. Anthropometric data included height and weight. Postural outcomes included the flexicurve to measure kyphosis and block method to forward head position. Timed Up and Go (TUG) was used to assess the functional mobility. The postural intervention included manual therapy (joint mobilizations of spine, rib cage, shoulder/pelvic girdle, and myofascial release), strengthening exercises (scapular and hip using theraband), stretching exercise (spine, shoulder/pelvic girdle), and a home breathing program. Baseline and 4-week data differences were calculated to show changes.

Results: Improvements in height, TUG time, and the block test were found with differences of 2.3 centimeters, -3.7 seconds, and -2.5 centimeters, respectively. Changes in the flexicurve were pronounced in the thoracic length and kyphotic index with differences of 6.4 centimeters and -3.6, respectively.

Conclusions: This 4 week postural intervention showed improvements in height, TUG, block test, and KI. TUG time over 12 secs initially classified the patient as “at risk” for falls. Decreased TUG time was attributed to the postural intervention that corrected his postural alignment and may positively influence gait and balance, thereby decreasing fall risk.
THE EFFECTS OF A 4-WEEK POSTURAL INTERVENTION OF MANUAL THERAPY AND THERAPEUTIC EXERCISE ON POSTURE AND PULMONARY FUNCTION IN A HEALTHY OLDER WOMAN: A CASE STUDY

Jose Rojas, PhD, Department of Respiratory Care
Hughes Lynne, PhD, Department of Physical Therapy
Adrianna Laprea, PT, DPT, Department of Physical Therapy
Rod Welsh, PhD, Department of Physical Therapy
Muzna Khan, MS, Department of Respiratory Care
Rebecca Burnett, DPT, Department of Physical Therapy
Hyun-jeong Jang, PhD, Department of Physical Therapy
Mohammed Khan, MD, Department of Physical Therapy

Background & Purpose: Increased thoracic kyphosis has been associated with impaired posture and decreased respiratory function in older adults. The purpose of this case study is to describe the effects of a 4-week postural intervention on postural alignment and pulmonary function in an older woman.

Case Description: A 62-year old woman with thoracic kyphosis underwent a postural intervention program that consisted of manual therapy and therapeutic exercise 3 times per week for 4 weeks. Manual therapy included traction and joint mobilizations of the spine, ribs, and scapulae. Myofascial release techniques were applied to the pectorals, scalenes, suboccipitals and erector spinae. Therapeutic exercises included stretching of the lumbar spine musculature and strengthening of the scapular retractors and depressors. Pre- and post- measurements included 1) simple spirometry to assess forced vital capacity (FVC), 2) flexicurve for kyphotic index to capture the shape of the thoracic kyphotic curve, 3) blocks method to assess forward head posture, and 4) digital photos to appreciate the amount flexed posture.

Outcomes: Screening spirometry revealed an 18% increase in FVC after the intervention. The kyphotic index (KI) improved by 0.7 (17.59 pre-intervention to 16.89 post-intervention). Improvement in cervical spine alignment was found in the blocks method by 2.0cm (2.5cm pre-intervention to 0.5cm post-intervention). Overall, the patient’s posture improved as seen in pre- and post- digital photos.

Discussion: Manual therapy and therapeutic exercise (strengthening and stretching) demonstrated improvements in postural alignment and respiratory function in a 62-y.o. woman. These findings suggest this intervention may be helpful for improving postural alignment and pulmonary function in older adults. Further research is needed to validate these findings in more medically complex populations.
MULTIPROTEIN COMPLEXES IN MEMORY

Egide Ishimwe, MS, Department of Neurology
IbDanelo Cortez, BS, Department of Neuroscience and Cell Biology
Ekram Hossain, PhD, Department of Internal Medicine
Yeswanth Attoti, MD, Department of Neurology
Larry Denner, PhD, Department of Internal Medicine - Endocrinology
Kelly Dineley, PhD, Department of Neurology

Multiprotein complexes allow rapid, fine-tuned integration and processing of diverse stimuli driving cellular responses that underlie physiological processes. In the periphery, ERK MAPK (extracellular-signal regulated kinase) forms a central node in multiprotein complexes that execute cellular processes as ubiquitous, yet diverse, as cell proliferation, differentiation, transformation, and death. The composition of these transcription complexes is key to conferring specificity between extracellular signals and the nucleus through temporally dynamic assembly of scaffolds to affect nuclear localization and recruitment of coregulators for new gene transcription. A fundamental problem is that we lack an understanding of ERK multiprotein transcription complexes in the CNS at the necessary resolution to achieve biologically relevant interventions (e.g., cognitive enhancement).

Dysfunctional ERK multiprotein complexes contribute to neurological diseases such as Huntington’s, Parkinson’s, and Alzheimer’s disease and it is clearly established many forms of memory consolidation require ERK-dependent gene transcription. We recently discovered that, in animal models of aging and disease, PPARγ (peroxisome proliferator activated receptor-γ) establishes a nuclear multiprotein complex with ERK that is necessary for hippocampal memory consolidation.

In this study, we established an in vitro model system to recapitulate ERK-PPARγ multiprotein complexes for transcriptional competency. We found that: 1) PPARγ transcriptional activity is ERK-dependent, 2) nuclear co-localization of ERK-PPARγ complexes requires ERK activity (pERK), 3) PPARγ phosphorylation occurs during this process, and 4) CREB binding protein (CBP) is a component of ERK-PPARγ complexes. Thus, we have evidence of recapitulating the MEK/ERK/CREB/CBP signaling pathway. This model system forms the launching point for subsequent studies interrogating ERK-PPARγ multiprotein complexes in plasticity and memory formation.
OXIDATIVE STRESS AND SENESCENCE IN HUMAN PRIMARY DECIDUAL CELLS

Jin Jin, MD, Department of Obstetrics and Gynecology
Man Ling Luo, MD
Samantha Sheller-Miller, BS, Department of Obstetrics and Gynecology
Nanbert Zhong, MD, PhD, Peking University Center for Medical Genetics
Ramkumar Menon, PhD, Department of Obstetrics and Gynecology

OBJECTIVE: Oxidative stress (OS) and inflammation are major triggers for parturition. OS can cause stress response through p38 mitogen activated protein kinase (p38 MAPK) pathway, leading to senescence and senescence associated inflammation in fetal cells. Herein, we tested the hypothesis that OS can cause senescence in maternal decidua either through the activation of either p38MAPK or proapoptotic p53 pathway.

METHODS: Decidual cells isolated from normal term, not in labor fetal membranes were exposed to OS inducer cigarette smoke extract (CSE) prepared in cell culture medium for 3, 6 and 24 hours. Changes in ROS levels were detected using 2′7′-dichlorodihydro-fluorescein. DNA damage was determined using Fragment Length Analysis using Repair Enzymes (FLARE) assay. Western blot determined activated p38 (P-p38 MAPK) and p53 (P-p53) expression and flow cytometry using probes for senescence-associated β-galactosidase (SA-β-gal) measured senescence. Co-treatment of cells with antioxidant N-acetyl cysteine (NAC) or p38MAPK inhibitor SB203580 was performed to test specificity.

RESULTS: ROS increased in CSE-exposed decidual cells within 2 min and significantly at all-time points up to 60 mins (p<0.05). This effect was reduced by NAC (p<0.05). In FLARE assays, CSE treatment produced cells with comet like appearance indicating DNA damage and activated p38MAPK (p<0.05) while p53 activation was not seen. Senescence (SA-β-Gal stained cells) in decidual cells was increased after CSE-exposed compared to control. Senescence was reduced by both p38 inhibitor SB203580 and SB+NAC (p<0.05) but not NAC alone.

CONCLUSION: Our findings support the hypothesis that OS induce decidual cell senescence by increasing OS mediated DNA damage and activation of p38MAPK. We postulate that OS induce both feto-maternal tissue senescence through p38MAPK pathway that can contribute to parturition-associated change at term and preterm.
INTRACELLULAR ACYL Carnitine Metabolism Leads to In Vivo Activation of Pro-Inflammatory and Autophagy Pathways in Peripheral Blood Mononuclear Cells in Early Stages of Weight Gain

John Lowry, DVM, MPH, MS, Animal Resource Center
Batbayar Tumurbaatar, PhD, Department of Neurorscience and Cell Biology
Claudia Solorzano
Erika Main, BS, LVT, RLAT, Animal Resource Center
Travis Wright, PhD, Department of Internal Medicine
Edgar Dillon, PhD, Department of Internal Medicine
Tais Saito, DVM, MS, PhD, School of Medicine
Craig Porter, PhD, Department of Surgery
Douglas Brining, DVM, Animal Resource Center
Janice Endsley, PhD, School of Medicine
Melinda Sheffield-Moore, PhD, Texas A & M University
Elena Volpi, MD, PhD, Sealy Center on Aging
Demidmaa Tuvdendorj, MD, PhD, Division of Internal Medicine – Endocrinology
Nicola Abate, MD, Division of Internal Medicine – Endocrinology

Background: Aging associates with higher rates of obesity, type 2 diabetes and cardiovascular diseases. Systemic low-grade inflammation contributes to the pathogenesis of obesity-related atherogenic lipid profile, and the earlier onset of type 2 diabetes. Although it is known that activation of immune cells plays a significant role in obesity-related inflammatory processes, the initial events leading to immune cell activation remain elusive. Thus, in the current study we aimed to determine the effect of short-term high fat diet (HFD) on lipid (i.e., acylcarnitine) metabolism and pro-inflammatory activation in peripheral blood mononuclear cells (PBMCs) of rabbits.

Method: Rabbits (n=6 per group) were fed with regular chow diet only or enriched with 10% lard and 8% corn oil for 5 weeks. Thereafter, fasting blood samples were collected to measure the ex vivo absolute synthesis rate (ASR) of C16-carnitine, and the activation of pro-inflammatory pathways within PBMCs. 13U16-palmitate was infused to measure the in vivo lipolysis rate, and muscle and liver samples were collected to quantitate the lipid contents.

Results: HFD significantly increased the body weight (p=0.019), while no changes in lipolysis rate or lipid contents of the liver and muscle were observed (p>0.05). The ASR of C16-carnitine was significantly higher in obese animals (p=0.037). The expressions of p38, ERK, IL-1β and LC3 in PBMCs were significantly increased in obese animals (p<0.05). In vitro pilot studies showed that exogenous C14-carnitine increases the expressions of p38, ERK, IL-1β, and LC3 in human monocytic cell lines.

Conclusions: Our studies demonstrated that short-term HFD may affect the acylcarnitine metabolism in PBMCs and activate the intracellular pro-inflammatory and autophagy pathways, while no changes in tissue lipid metabolism have occurred.
DEFINING AGE DEPENDENT FACTORS DRIVING CORONAVIRUS PATHOGENESIS

Vineet Menachery, PhD, Department of Microbiology and Immunology
Lise Gralinski, PhD, University of North Carolina
Eileen McAnarney, BS, Department of Microbiology and Immunology
Martin Ferris, PhD, University of North Carolina
Kara Jensen, PhD, University of North Carolina
Ralph Baric, PhD, University of North Carolina

The emergence of Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and Middle-East Respiratory Syndrome (MERS)-CoV in the past two decades underscores the importance in identifying host factors that drive age dependent susceptibility. Both zoonotic pathogens cause severe acute respiratory tract infection, pneumonia, and high rates of mortality. Importantly, disease severity for both viruses has been linked with age as mortality rates exceed 50% in individuals over the age of 50. Notably, age-related susceptibility is conserved in mouse models of SARS-CoV with aged mice inducing more weight loss, respiratory dysfunction, and lethality than young. However, increased susceptibility is not a product of augmented viral load, suggesting changes in the host responses are driving differential disease.

With this in mind, our study takes a systems biology based approach to compare and contrast changes in the host immune response as a product of aging. Modeling RNA, protein, and pathogenesis data from young (10 week), middle aged (12 month), and aged (>20 month) mice, we focus on changes on early innate and tissue specific responses. Cytokine analysis suggests that aged animals induce an inflammatory cascade that crests two days post infection. Ongoing work seeks to confirm inflammatory pathway activation by RNA expression and flow cytometry analysis. Validation approaches disrupt these pathways using knockout animals and drug strategies. Importantly, we extend studies to the collaborative cross, a genetically diverse mouse resource, to determine if host polymorphisms contribute to differences in the inflammatory cascade. Finally, we examine primary human airway and immune cells to extend in vivo findings to human models of disease. Together, this approach has the potential to yield important findings critical to treating virus infections in aged populations.
NOVEL MOUSE MODEL OF VIRAL-INDUCED COPD EXACERBATIONS EXHIBITS REDUCED FUNCTIONAL CAPACITY AND SKELETAL MUSCLE ADAPTATIONS MIMICKING HUMAN COPD CACHEXIA

Ted Graber, PhD, Department of Nutrition & Metabolism
Brandy Rawls, MS, Department of Nutrition & Metabolism
Bing Tian, PhD, Department of Internal Medicine
William Durham, PhD, Department of Internal Medicine
Camille Brightwell, MS, Department of Nutrition & Metabolism
Allan Brasier, MD, Department of Internal Medicine
Blake Rasmussen, PhD, Department of Nutrition & Metabolism
Christopher Fry, PhD, Department of Nutrition & Metabolism

Chronic obstructive pulmonary disease (COPD) causes progressive pulmonary insufficiency and skeletal muscle cachexia. Incidence of COPD increases with age. COPD is punctuated by viral respiratory infections that produce exacerbations of disease, accelerating pulmonary insufficiency. We established a mouse (C57BL/6) model of viral exacerbations produced by intranasal polyinosinic-polycytidylic acid [Poly(I:C)] administration and tested whether repetitive viral inflammation produced COPD-like muscle atrophy and weakness. We determined skeletal muscle morphological properties (e.g. fiber-type, fiber cross-sectional area, muscle wet mass, etc.) from a treated group (Poly(I:C), n=9) and a sham-treated control group (PBS, n=9); age approximately 5 months. In a subset (n=4 for both groups), we determined in vivo physical function (using grip test for strength, rotarod for overall motor function, and treadmill for endurance) and muscle contractile properties with in vitro physiology (in the EDL, soleus and diaphragm). Our findings show Poly(I:C)-treated mice exhibit significant skeletal muscle morphological alterations and functional deficits. Changes of note when comparing Poly(I:C)-treated mice to the sham PBS-treated controls include: reduced fiber cross-sectional area (-27% gastrocnemius, -25% soleus, -16% diaphragm), contractile dysfunction (soleus peak tetanic force, -26%), reduced muscle mass (gastrocnemius -19%, soleus -23%) and body mass (-21%), reduced physical function (grip test -34%, and treadmill run time -42%), and altered oxidative capacity (i.e., 140% increase in succinate dehydrogenase in the diaphragm but 66% lower in the gastrocnemius and a shift to more oxidative muscle fibers in the diaphragm). The observed changes in Poly(I:C) treated animals were similar to clinical cachectic presentation of COPD. We conclude that the data is supportive of a new model of COPD-induced cachexia/sarcopenia which has great potential for future research into the mechanisms underlying COPD-induced muscle wasting.
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Neuroscience Research - Post-Doctoral Graduate

EARLY DEPOSITION OF TAU AND AMYLOID-B OLIGOMER PATHOLOGY IN RETINAL GANGLION CELL LAYER AND VESSELS IN A MOUSE MODEL OF ALZHEIMER’S DISEASE

Mauro Montalbano, PhD, Center for Biomedical Engineering
Jonathan Luisi, Other, Graduate School of Biomedical Sciences
Hossein Nazari, MD, Department of Ophthalmology
Giulio Taglialatela, PhD, Department of Neurology
Gracie Vargas, PhD, Department of Neuroscience and Cell Biology
Massoud Motamedi, PhD, Center for Biomedical Engineering

Background: Alzheimer’s disease (AD) affects 44 million people worldwide, which is growing in incidence and it results in a substantial economic burden of estimated $605 billion in 2016. This increase in incidence and limitations in early detection is driving efforts to identify and characterize early biomarkers. There is increasing evidence that retinal changes may occur early in the disease and could potentially correlate to pathology in the brain, opening new possibilities in investigating and monitoring the onset and progression of AD.

Methods: This study incorporated in vivo imaging to evaluate retina structure and vessels coupled with ex vivo immunofluorescence evaluation on retinal whole mounts. Mice were assessed at ages 4, 8, and 12 months. In vivo imaging was performed by Optical Coherence Tomography (OCT). Confocal and multiphoton microscopy of immunolabeled retinas were performed to evaluate the time-dependent deposition of Aβ oligomers and Tau protein in the 3xTg-AD model. Immunofluorescence was performed targeting expression and location of these proteins in the retinal nerve fiber layer (RNFL) and GCL. Microvasculature changes were assessed by Collagen IV staining.

Results: An age-related increase of retinal Amyloid and Tau in 3xTg mainly in the RNFL and GCL as early as 4-months was observed, prior to the reported onset of behavioral deficits, and preceding Amyloid and Tau aggregation in the brain. Importantly, we showed that Amyloid and Tau promotes impairment of ganglion cells and reduction of thickness in-vivo of NFL with progressive intraluminally accumulation of markers of AD in the retinal vessels from 8-months old mice.

Conclusions: Our study reveals the presence of Tau-pathy and Aβ-pathy leading to early retinal changes in a mouse model of AD in the 3xTg model.
DECREASED PRESENCE OF TAU OLIGOMERS IN THE CNS IS ASSOCIATED WITH PRESERVED COGNITION IN NON-DEMENTED INDIVIDUALS WITH ALZHEIMER’S DISEASES NEUROPATHOLOGY

Ayush Singh, MD, Department of Internal Medicine
Dyron Allen, BS, School of Medicine
Randy Woltjer, MD, PhD, Oregon Health & Science University
Rakez Kayed, PhD, Department of Neurology
Giulio Taglialatela, PhD, Department of Neurology

Non-demented subjects with Alzheimer’s disease Neuropathology (NDAN) are a group of individuals who, despite displaying the pathological hallmarks of Alzheimer’s disease (AD), remain cognitively intact. What allows these individuals to be resistant to the cognitive decline associated with AD pathology remains unknown. In an effort to answer this question, we explored the presence of early toxic aggregates of tau protein, tau oligomers, in NDAN brain samples. Our results indicate that there is a decreased concentration of tau oligomers in the brains of NDAN versus AD patients. This result contributes one possible mechanism for the preserved cognition found in NDAN individuals.
EFFECT OF RESISTANCE EXERCISE TRAINING ON NUTRIENT SENSING AND PROTEIN SYNTHESIS IN SKELETAL MUSCLE OF OLDER ADULTS

Tatiana Moro, PhD, Sealy Center on Aging
Camille Brightwell, MS, Graduate School of Biomedical Sciences
Rachel Deer, PhD, Division of Rehabilitation Sciences
Ted Graber, PhD, Division of Rehabilitation Sciences
Christopher Fry, PhD, Department of Nutrition & Metabolism
Elena Volpi, MD, PhD, Sealy Center on Aging
Blake Rasmussen, PhD, Department of Nutrition & Metabolism

Aging induces a mild but significant reduction in the response of muscle proteins to appropriate anabolic stimulation. This phenomenon, termed “anabolic resistance” may account for the slow loss of muscle mass with advancing age. Acute bouts of exercise can improve the ability of amino acids to stimulate mTORC1 signaling, which is the primary regulator of skeletal muscle protein synthesis (MPS). It is not known whether chronic exercise training will reverse anabolic resistance to amino acids in human skeletal muscle. Therefore, the aim of this study was to determine if resistance exercise training (RET) in older adults improves mTORC1 signaling, restores amino acid sensing, and reverses anabolic resistance. To test our hypothesis 20 healthy older adults were trained for 12 weeks with a progressive RET training program. Pre and post-training measurements of muscle mass, strength and metabolic health were obtained. Study days also included a stable isotope infusion trial wherein subjects ingested an essential amino acids (EAA) mixture and skeletal muscle biopsies were taken at rest, 1 hr and 3 hr after EAA ingestion. Muscle biopsies were obtained to measure markers of amino acid sensing and to assess protein synthesis. Pre-training MPS and mTORC1 signaling increased after EAA ingestion (P<0.05). RET increased basal MPS (P<0.05). However, the increase in Post-training MPS and mTORC1 signaling in response to EAA ingestion was not altered by RET. Our data suggests that RET can improve basal MPS in healthy older adults. This may be one mechanism for how RET can be an effective therapeutic strategy to counteract sarcopenia. On the other hand, our data indicates that anabolic resistance to amino acids is not a significant problem in healthy older adults.
SKELETAL MUSCLE MITOCHONDRIAL RESPIRATORY CAPACITY AND FUNCTION ARE DIMINISHED IN PATIENTS WITH ADVANCED PERIPHERAL ARTERY DISEASE AND CRITICAL LIMB ISCHEMIA

Victoria Rontoyanni, PhD, Department of Surgery
Omar Nunez Lopez, MD, Department of Surgery
Grant Fankhauser, MD, Department of Surgery
Zulfiqar Cheema, MD, Department of Surgery
Charlie Cheng, MD, Department of Surgery
Blake Rasmussen, PhD, Department of Nutrition & Metabolism
Elisabet Borsheim, PhD, University of Arkansas for Medical Sciences
Craig Porter, PhD, Department of Surgery

Introduction: Peripheral artery disease (PAD) is associated with a marked reduction in functional capacity, where progression to critical limb ischemia (CLI) is the most severe clinical presentation of the disease. Current evidence suggests diminished skeletal muscle oxidative capacity in patients with PAD. To our knowledge, no study has simultaneously assayed mitochondrial oxidative capacity and mitochondrial quality to compressively determine the role of mitochondrial dysfunction in PAD. We set out to compare mitochondrial oxidative capacity and mitochondrial quality in PAD patients with CLI versus healthy controls.

Methods: To date, we have recruited and studied 12 PAD patients with CLI undergoing revascularization procedures or amputation (57±13 y; PAD) and 11 healthy adults (58±4 y; Control). Skeletal muscle samples were collected from the leg, and mitochondrial respiratory capacity and function were determined in permeabilized myofibers by high-resolution respirometry. Results are presented as means±SD.

Results: Mitochondrial respiration coupled to ATP production and leak (thermogenic) respiration were markedly diminished in PAD patients with CLI when compared to healthy controls (19.6±9.2 vs. 35.0±9.6 pmol/s/mg, and 9.3±4.6 vs. 18.9±6.9 pmol/s/mg, P<0.01, respectively). The respiratory control ratio for ADP, a marker of mitochondrial coupling control, was significantly lower in PAD patients compared to controls (1.5±0.1 vs 2.4±0.2, P<0.01), indicating lower capacity for oxidative phosphorylation in CLI.

Conclusion: Our preliminary results show that skeletal muscle respiratory capacity, primarily for oxidative phosphorylation, is substantially lower in PAD patients with CLI when compared to healthy controls. Collectively, reduced skeletal muscle respiratory capacity and mitochondrial quality likely contribute to impaired functional capacity in PAD patients with CLI. The mitochondrion may represent a therapeutic target to alter disease progression and/or improve functional capacity in patients with PAD.
DECREASED SYNAPTOSOMAL INSULIN RESPONSIVENESS IN THE HIPPOCAMPUS OF TRAUMATIC BRAIN INJURED RATS

Whitney Franklin, BS, Department of Neuroscience and Cell Biology
Giulio Taglialetela, PhD, Department of Neurology

Alterations of insulin signaling in neurons have been linked to many disorders including Alzheimer’s disease (AD). Decreased insulin signaling increases synaptic sensitivity to amyloid beta (Aβ), a toxic protein in AD, thus contributing to the cognitive decline that characterizes this neurodegenerative disorder. Traumatic brain injury (TBI) is a risk factor for later development of Alzheimer’s disease (AD), although the mechanisms contributing to this increased risk are unknown. To look at whether decreased insulin responsiveness in TBI animals is playing a role in the synaptic vulnerability to AD pathology, we developed a method for studying the insulin responsiveness at the synaptic level. We isolate functional synaptosomes from fresh or frozen rodent brain tissue and expose them to insulin in the presence of ATP to detect insulin receptor (IR) activation. Using this method coupled to Western blot analysis, we were able to detect insulin-driven phosphorylation of the IR. After optimizing this method, we analyzed synaptosomal insulin responsiveness in the hippocampi of SHAM and TBI animals that underwent a lateral fluid percussion injury at acute (2 days and 7 days), intermediate (1 month), and chronic (3 months) time-points. We were able to detect acute decrease in insulin responsiveness in the brain of rats after traumatic brain injury that extends to longer time points warranting further experiments looking at downstream elements, inhibitory factors, and addressing the mechanism of action putatively involving increased synaptic sensitivity to the damaging impact of AD. The results support the idea that synaptic insulin resistance that ensues after TBI may be a risk factor for later development of AD.
SATELLITE CELL DEPLETION IMPACTS SKELETAL MUSCLE RECOVERY FOLLOWING A BURN INJURY

Colleen McKenna, BS, Department of Nutrition & Metabolism
Celeste Finnerty, PhD, Department of Surgery
Lauren Cambias, Department of Nutrition & Metabolism
Camille Brightwell, MS, Department of Nutrition & Metabolism
Anesh Prasai, Department of Surgery
Ye Wang, Department of Surgery
Amina El Ayadi, Department of Surgery
Oscar Suman, PhD, Department of Surgery
David Herndon, MD, Department of Surgery
Christopher Fry, PhD, Department of Nutrition & Metabolism

Severe burns result in profound skeletal muscle atrophy; persistent muscle atrophy and weakness are major complications that hamper recovery from burn injury. Many factors contribute to the erosion of muscle mass following burn trauma, and we previously showed concurrent activation and apoptosis of muscle satellite cells (SC) following a burn injury in pediatric patients. To determine the necessity of satellite cells during muscle recovery following a burn injury, we utilized a genetically modified mouse model (Pax7-DTA) that allows for the conditional depletion of satellite cells in skeletal muscle. Additionally, mice were provided 5-ethyl-2-deoxyuridine (EdU) to determine satellite cell proliferation, activation and fusion. Juvenile SC-wild type (SC-WT) and SC-depleted (SC-Dep) mice (8 weeks of age) were randomized to sham or burn injury, consisting of a dorsal scald burn injury covering 30% of total body surface area. Both hind-limb and dorsal muscles were studied at 7, 14 and 21 days post-burn. SC-Dep mice had >93% fewer SC than SC-WT (P<0.05). Burn injury induced robust atrophy in muscles located both proximal and distal to the injury site (~30% decrease in fiber cross-sectional area, P<0.05). Additionally, burn injury induced skeletal muscle regeneration, satellite cell proliferation and fusion. Depletion of satellite cells impaired post-burn muscle recovery. These findings support an integral role for satellite cells in the etiology of lean tissue recovery following a severe burn injury.

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NOVEL DOPAMINE D1 RECEPTOR AGONISTS WITH UNIQUE SIGNALING AND PROMISE FOR NORMALIZING IMPAIRMENTS IN WORKING MEMORY

Ashley Nilson, BS, Department of Neuroscience and Cell Biology
Manish Jain, PhD, Department of Pharmacology and Toxicology
John Allen, PhD, Department of Pharmacology and Toxicology

The Dopamine D1 Receptor (D1R) is a promising therapeutic target for improving cognition, motivation and reward processing. Both neurological and neuropsychiatric disorders have altered D1R function and normal aging shows decreased D1R in the frontal cortex. The mesocortical dopamine pathway activates the D1R in medial prefrontal cortex to regulate working memory. Furthermore, all previous D1R agonists have been catechols, which are not orally bioavailable and rapidly induce desensitization and tolerance. Here, we explore novel D1R non-catechol agonists which signal at the D1R in a biased manner through the Gs/cAMP pathway but have greatly reduced Beta-arrestin engagement. We hypothesize that biased agonism of the D1R will improve working memory after agonist administration due to decreased receptor endocytosis and sustained signaling activity. We used HEK293 cells to study receptor endocytosis and primary neurons to study D1R desensitization in response to existing and novel D1R agonists. A cell surface ELISA assay and antibody feeding/confocal imaging were used to determine D1R endocytosis and a cAMP HTRF assay was used to determine D1R-Gs/cAMP signaling in primary neurons. Activation of the D1R by catechol agonists significantly induced D1R endocytosis and receptor desensitization. In contrast, the novel D1R non-catechol agonists did not significantly induce D1R endocytosis or receptor desensitization in neurons. In future studies, we plan to examine the molecular mechanisms which could explain this lack of agonist-induced D1R endocytosis and desensitization. In addition, we plan to determine if these novel D1R agonists rescue working memory deficits in rat behavioral models after acute and chronic agonist administration. Together, these studies will aid in the development of novel therapeutics to address cognitive impairments in neurodegenerative and psychiatric disorders and perhaps age-related cognitive decline.
THE EFFECT OF RESISTANCE TRAINING ON CAPILLARIZATION AND SATELLITE CELL CONTENT IN OLDER ADULTS

Danielle Phalen, BS, Department of Nutrition & Metabolism
Tatiana Moro, PhD, Sealy Center on Aging
Christopher Fry, PhD, Department of Nutrition & Metabolism

The molecular mechanisms contributing to age-related muscle loss, or sarcopenia, and its associated functional losses are not well understood. Satellite cells (SC), muscle stem cells, contribute to muscle maintenance and exhibit an age-related decline in function and abundance. The capillary beds, responsible for delivering oxygenated blood and nutrients to muscle fibers and associated cells, decline in density with age as well. Recent work in older adults has suggested that with age, satellite cells are located farther from their nearest capillary which attenuates their ability to properly activate. Our purpose in the current study was to quantify SC and capillary density in addition to the distance between SC and the nearest capillary. Healthy older adults (n=19; age =70.1±4.2 years) underwent 12 weeks of progressive resistance training (RT). Immunohistochemistry was utilized to analyze biopsies for the satellite cell marker Pax7, myosin heavy chain (MHC) type 1, laminin, and capillary density. Following RT we found a trend for greater proximity of type 2 SC to the nearest capillary after RT, not previously found in the literature. At baseline, the distance between type 1 SC and the nearest capillary was shorter than the type 2 SC-capillary distance, which is consistent with previous research. It would appear that RT is able to modulate Type 2 SC – capillary distance, which may promote greater adaptive ability to aging skeletal muscle. The enhanced ability of older adults to mobilize type 2 SC would offer greater protection from injury.
EXPRESSION OF PHOSPHO-GSK3BETA CORRELATES WITH P38MAPK ACTIVATION IN HUMAN AND MOUSE GESTATION

Lauren Richardson, BS, Department of Obstetrics and Gynecology
Elizabeth Bonney, PhD
Ramkumar Menon, PhD, Department of Obstetrics and Gynecology

Objective: Human parturition is known to be associated with oxidative stress (OS) induced fetal cell senescence at term commonly activated by stress signaler p38 mitogen activated protein kinase (MAPK). p38MAPK activation is often associated with phosphorylation and deactivation of Glycogen synthase kinase 3 β (GSK3β) to promote cell survival. This study determined deactivation of GSK3β due to phosphorylation and its correlation with p38MAPK expression in mice (placenta and fetal membranes) and human (fetal membranes) parturition as a mechanism of cell survival property during gestation and labor.

Methods: C57BL/6 Mice were sacrificed at days 9.5, 10, 12, 15, 17, 18 and fetal membranes and placentas were harvested. Primary AECs were isolated from normal term, not-in-labor human placental membranes and stimulated with OS inducer CSE for 48 hours to mimic conditions at term labor. Phosphorylated and total -GSK3β and p38MAPK expressions were determined in both mice (S389) and human (S9) samples using western blot.

Results: P-GSK3β expression was seen in human and mice samples. Western blot analysis of mouse placenta showed P-GSK3β gradually increased from day 10 until day 18. While, mouse fetal membranes showed expression of P-GSK3β by day 15 that remained until day 18. P-p38MAPK expression correlated with this data in both tissues. Human AECs also showed the same trend of increasing P-GSK3β correlated with P-p38MAK in OS induced AECs.

Conclusion: Here we show that P-GSK3β correlates with increased p38MAPK activation towards term in human (membranes) and mice (placenta and membranes) suggesting that a synergy between the two signals to provide a homeostatic balance to promote cell survival in wake of senescence activation.
Neuroscience Research - Faculty Member

BRAIN REGION SPECIFIC CHANGES IN GENE EXPRESSION AFTER FLUID PERCUSSION INJURY AND TAU OLIGOMER TARGETED IMMUNOTHERAPY IN RATS

Satoshi Yamamoto, MD, Department of Anesthesiology
Ian Bolding, Department of Anesthesiology
Debbie Boone, Department of Anesthesiology
Kathia Johnson, Department of Anesthesiology
Margaret Parsley, Department of Anesthesiology
Clark Andersen, MS, Office of Biostatistics
Donald Prough, MD, Department of Anesthesiology
Douglas DeWitt, PhD, Department of Anesthesiology
Bridget Hawkins, PhD, Department of Anesthesiology

Traumatic Brain Injury (TBI) is considered an event that can lead to the development of chronic disease pathology and is thought to induce a predisposition towards dementia. Evidence suggests that formation of soluble tau oligomers may be an early event responsible for the spread of pathology. We designed this study to look at the molecular connections between TBI and Alzheimer’s Disease (AD) by using a real-time PCR array following treatment with an immunotherapy designed to reduce the soluble tau oligomers that occur after TBI. Adult male Sprague Dawley rats received either a single fluid percussion or sham injury and the return of righting reflex was assessed. An intracerebroventricular injection of either anti-tau oligomer-specific monoclonal antibody (TOMA) or IgG control was administered 1 hour post TBI. Fifteen days later, brain regions (cortex near the injury site, hippocampus and thalamus) were dissected and homogenized separately. AD pathway-focused PCR arrays for rats, containing 84 genes implicated in AD development, were performed. Normalized gene expression was analyzed by ANOVA for each gene, and differences among treatment groups were assessed by Tukey-adjusted contrasts, followed by Benjamini-Hochberg control of false discovery rate. Results suggest that down-regulation of neurodegenerative genes in the TOMA treated animals was brain region specific, indicating different processes might be occurring and additional time points should be studied. These studies were funded by The Moody Project for Translational TBI Research, Darrell K Royal Research Fund for Alzheimer's Disease, Mission Connect (TIRR Foundation) and the UTMB Technology and Commercialization Program.
ACCUMULATION OF ACTIVE ZONE PROTEIN BRP WITHIN AXONS IS SUFFICIENT TO INDUCE SYNAPSE DYSFUNCTION AND INSTABILITY

Kara Barber, BS, Department of Neuroscience and Cell Biology
Martin Hruska, PhD, Thomas Jefferson University
Keegan Bush, BS, Department of Neurology
Jade Martinez, BS, Department of Neurology
Matthew Dalva, PhD, Thomas Jefferson University
Irwin Levitan, PhD, Thomas Jefferson University
Yogesh Wairkar, PhD, Department of Neurology

Precise localization of synaptic proteins is essential for proper synaptic function, which is compromised in many neurodevelopmental and neurodegenerative diseases. While the role of axonal transport and localization of synaptic vesicles and mitochondria are relatively well studied, little is known about the mechanisms that regulate the localization of active zone-bound proteins. Our recent study suggested that mechanisms involved in transporting active zone proteins are different from those that transport synaptic vesicles or mitochondria. Furthermore, our study also suggested that levels of Par-1 kinase might be important determinant in ensuring proper localization of Bruchpilot (BRP) - an essential component of active zones in Drosophila. Here we show that accumulation of BRP can happen within hours of Par-1 kinase expression. Interestingly, accumulation of BRP within the axons preceded the loss of synaptic function or synaptic BRP. Since our previous study indicated that tau does not mediate the effect of Par-1 on BRP accumulation, we investigated whether another microtubule binding protein Futsch might be the mediator increased Par-1 levels. While we observed a decrease in synaptic Futsch in flies overexpressing Par-1, there was no evidence to support that it was the primary determinant of BRP accumulation. Mechanistically, we find that Par-1 can bind BRP in situ raising the possibility of a novel mechanism for the selective localization of BRP. Taken together, these data suggest an intriguing possibility that accumulation of active zone proteins like BRP might be one of the earliest signs of perturbation of synapses that precede many synaptic disorders.
DROSOPHILA EXPLORATION OF ANTI-RETROVIRAL THERAPY-INDUCED NEUROPATHY

Keegan Bush, BS, Graduate School of Biomedical Sciences
Kara Barber, BS, Department of Neurology
Jade Martinez, Department of Neurology
Yogesh Wairkar, PhD, Department of Neurology

Current and past treatments for HIV involving nucleoside analogue reverse transcriptase inhibitors (NRTI) are known to be involved in the development of neuropathy induced allodynia in roughly one third of patients. Mitochondrial DNA replication inhibition has been proposed as one factor in the development of the neuropathy. However, mitochondrial dysfunction alone does not explain the typical development of allodynia in these patients. Thereby, either a secondary mechanism is being disrupted by the NRTIs or some compensatory mechanism or mechanisms are resulting in the development of increased pain sensation.

Mouse models have been used to somewhat explore the effects and some possible mediators of NRTI induced neuropathies. However, no screens exploring the specific effect of individual proteins on the development of NRTI induced allodynia have been performed. Therefore, we propose a drosophila based nociception screen involving the modified expression of both genomic and mitochondrial proteins. Drosophila have previously been used to screen for genes involved in noxious stimulus. Specially one thermal nociception screening method using drosophila larvae will allow for unbiased high throughput screening of specific protein mutations.

Using this thermal nociception screening method, we have shown increased noxious stimuli response in larvae fed on NRTI laced food in a dose dependent manner. We have also shown that this response is not due to a developmental effect of the NRTI on the larvae. Our current study therefore, is to perform the drosophila based screen and identify mutants that inhibit or enhance the allodynia effect of the NRTIs.
THE SYNAPTIC BINDING AND DYSFUNCTIONAL IMPACT OF AMYLOID BETA AND TAU Oligomers Are MODULATED BY NEAR INFRARED LIGHT TREATMENT

Michele Comerota, BS, Department of Neuroscience and Cell Biology
Giulio TagliaLatela, PhD, Department of Neurology

Alzheimer’s disease (AD) is the most prevalent age related neurodegenerative dementia for which there is currently no cure. Cognitive decline in early stages of AD is attributed to the synaptic dysfunction initiated by the binding of small oligomeric amyloid beta (Aβ0), which further promotes the production of toxic tau oligomers (tau-o), leading to a further exacerbation of synaptic dysfunction. Thus, identifying interventions that target both proteins may be the most effective way to slow the progression of AD. In the present study, we focused on near infrared (NIR) light treatment (600-1000nm), a novel noninvasive therapeutic previously shown to reduce the mature forms of Aβ and tau. However, the impact of NIR light on synaptic health and neuroprotection against Aβ0 and tau-o induced toxicity is unknown. We investigated the presence of Aβ0 and tau-o at synapses, the susceptibility of synapses to Aβ0 and tau-o binding and the changes in long term potentiation (LTP) after NIR light treatments (670 nm; 90 sec/day for 4 weeks). We found that after NIR light treatment, Aβ1-42 was significantly reduced at synapses of APP transgenic (Tg2576) and 3xTg-AD mice. Further, tau oligomers were also reduced at the synapses in both the 3xTg-AD and htau mice after NIR light treatment. We further found that the synapses of wild type mice treated with NIR light showed a reduction in ex vivo Aβo binding and Aβo induced depressed LTP. Collectively, these results indicate that NIR light promotes reduction of Aβ and tau pathology, as well as, synaptic resistance to Aβ oligomer binding thus alleviating the ensuing synaptic impairments. These results foster further development of NIR light as a possible novel therapeutic approach in AD.
PPARγ AGONISM CONSERVES PATTERN SEPARATION LEARNING AND MEMORY IN AGED ANIMALS EXPOSED TO CRANIAL IRRADIATION

Danelo Cortez, BS, Department of Neuroscience and Cell Biology
Larry Denner, PhD, Department of Internal Medicine - Endocrinology
Kelly T. Dineley, PhD, Department of Neurology

A major function of the hippocampal network is to perform pattern separation; the ability to process overlapping environmental cues into unique representations and distinguish similar, yet non-identical contexts. Pattern separation is dependent on continued adult neurogenesis within the subgranular zone of the Dentate Gyrus (DG). We and others have demonstrated that PPARγ agonism conserves cognition in hippocampal dependent memory tasks in AD models and human MCI patients. PPARγ is a nuclear receptor and transcription factor that can be activated with FDA-approved drugs. Since we have found that the PPARγ transcriptome and proteome contains mediators and markers for neurogenesis, we postulated that cognitive tests that require continued adult neurogenesis (e.g., context discrimination) would be altered in irradiated mice compared to littermate controls and that (rosiglitazone) RSG treatment would normalize pattern separation behavior.

As expected, adult hippocampal neurogenesis was eradicated by cranial irradiation but was only slightly conserved with RSG treatments. Interestingly, RSG treatment stimulated proliferating cells marked with Ki67 and BrdU in aged wild type mice but had no effect on immature neurons. In our pattern separation task, wild type control and RSG treated groups performed superiorly to cranial irradiation only subjects. Further, RSG treated subjects significantly exhibited reduced context generalization supporting previous evidence that RSG conserves pattern separation in these groups. Lastly, RSG treatment reduced microglial response stimulated by cranial irradiation in the hippocampus. This may be due to a reduction in soluble inflammatory cytokines measured in the hippocampus of RSG-irradiated subjects. We are the first to demonstrate PPARγ’s role in pro-inflammation can conserve pattern separation behavior in aged animals exposed to cranial irradiation.
COGNITIVE ENHANCING GENE EXPRESSION IN A MOUSE MODEL FOR ALZHEIMER’S DISEASE

Andrea Dimet, BS, Institute for Translational Sciences
Daniel Aragon, BS, School of Medicine
IbDanelo Cortez, MS, Department of Neuroscience and Cell Biology
Larry Denner, PhD, Department of Internal Medicine - Endocrinology
Kelly Dineley, PhD, Department of Neurology

Alzheimer’s disease (AD) is the most common cause of dementia in those aged 65 and older, and is reaching epidemic proportions. One model for AD pathology, the Tg2576 mouse model, shows age-dependent decline in hippocampus-dependent cognitive function, including poor performance in contextual fear conditioning. Treatment with a PPARγ agonist (rosiglitazone, RSG) markedly improves performance on this task.

PPARγ is a nuclear receptor and transcription factor that binds PPAR response elements (PPAREs) to alter gene expression. PPARγ participates in a multiprotein complex with ERK MAPK, a critical mediator of hippocampal learning and memory which alters gene expression via cAMP response elements (CREs). Our work focuses on the dentate gyrus since it is the first weigh station in the tripartite synaptic network of the hippocampus essential to performance of hippocampus-dependent memory tasks. We combined RNA-sequencing with bioinformatic analyses to identify genes with putative PPAREs and/or CREs and, using Ingenuity® Pathway Analysis, analyzed the nodes and resulting networks underlying improved cognition in RSG-treated Tg2576 mice.

We found that the ‘learning’ network is most pertinent to our behavioral phenotype, and within this network we identified 43 genes altered by PPARγ agonism: 10 with putative PPAREs, 23 with putative CREs, 10 with neither, and 3 with both. Published literature demonstrates that the 3 with both are connected to amyloid precursor protein/amyloid beta in vivo, while the other 40 genes are highly involved in synaptic plasticity.

In conclusion, we distilled a large RNA-seq dataset by rationally using bioinformatics and published literature sources to identify gene nodes and emanating networks with the greatest likelihood of influencing the cognitive improvement observed in Tg2576 mice treated with RSG.
P53 AGGREGATES AND INTERACTS WITH TAU OLIGOMERS IN ALZHEIMER’S DISEASE

Kathleen Farmer, BS, Department of Neuroscience and Cell Biology
Rakez Kayed, PhD, Department of Neurology

P53 is a homotetrameric tumor suppressor and is known as the “guardian of the genome” due to its role as a master regulator of cell cycle control, apoptosis, and DNA repair. P53 loss of function is associated with over 50% of cancers, but p53 also plays a substantial role in aging. An increase in p53 can lead to premature aging, the primary risk factor for the most prevalent neurodegenerative diseases, such as Alzheimer’s disease (AD). Toxic tau oligomers are one of the major contributors to cell death in AD and have also been found to sequester and/or cause the aggregation of other proteins. We hypothesize that p53 forms oligomers in AD, possibly due to an interaction with tau oligomers. Previous research has shown that p53 can form oligomers and gain toxic function in cancer. Moreover, co-expression of p53 with tau in HEK293 cells causes an increase in tau phosphorylation.

Using brains from AD patients and Tg2576 mice, a mouse model of AD, we investigated if p53 and/or phosphorylated p53 (p-p53) form oligomers in AD and if p53 interacts with tau oligomers. Immunofluorescence experiments using both commercial and novel antibodies with conformational epitopes common to oligomers of aggregated proteins demonstrated that p53 and p-p53 form oligomers in the brains of both human AD and Tg2576 mice as compared to control brain tissue. Furthermore, we found that p53 and p-p53 colocalize with tau oligomers in the brains of AD patients and Tg2576 mice, suggesting a potential interaction between tau oligomers and p53 in AD. Future studies will determine the activity of p53 oligomers in AD as well as the impact of p53-tau oligomer interactions.
TOXIC TAU OLIGOMERIC STRAINS MODULATED BY NOVEL CURCUMIN DERIVATIVES

Filippa Lo Cascio, MS, Department of Neuroscience and Cell Biology
Urmi Sengupta, MS, Department of Neurology
Rakez Kayed, PhD, Department of Neurology

Tauopathies are devastating age-related neurodegenerative disorders, characterized by the pathological aggregation and accumulation of the microtubule-associated protein tau and its subsequent deposition in different aggregated forms. Recently, it has been shown that neurofibrillary tangles are the least toxic form of tau aggregates as compared to the smaller and hydrophobic tau oligomers. Furthermore, it has been suggested that tau oligomers may be present in many different conformations known as strains which may explain how the aggregation of the same protein causes different diseases, progression rates and phenotypes. Depleting the disease-relevant structures by using small molecules could be a powerful therapeutic strategy that targets toxicity regardless of other factors involved in the formation of tau oligomeric strains. We screened newly synthesized curcumin derivatives to target and modulate tau oligomeric strains toxicity. Modulating tau oligomeric conformations through the use of novel curcumin derivatives could be useful to neutralize their formation and toxicity. Herein, we used in vitro techniques such as Western Blot and direct ELISA as well as biophysical assays to characterize tau oligomeric strains and their reactivity with tau oligomer specific polyclonal and monoclonal antibodies, T22 and TOMA respectively, in the presence and absence of curcumin derivatives. Interestingly, curcumin analogs interact and alter tau aggregation pathways, resulting in the formation of tau aggregates with decreased toxicity. Further investigations on the capability of curcumin derivatives to target toxic oligomeric tau strains associated with different neurodegenerative tauopathies will deliver compelling evidence moving the tau field forward. Therefore, curcumin derivatives could aid both in the development of novel therapeutic approaches for AD and other tauopathies as well as imaging agents to detect toxic tau oligomeric strains.
THE ROLE OF HSP60 IN AMYLOID B TOXICITY: RELEVANCE TO ALZHEIMER’S DISEASE

Claudia Marino, MS, Department of Neuroscience and Cell Biology
Francesco Cappello, MD, University of Palermo
Pier Luigi San Biagio, PhD
Giulio Taglialatela, PhD, Department of Neurology

Alzheimer’s disease (AD) is the most common form of dementia worldwide, affecting more than 40 million individuals. Despite AD is clinically and histologically well characterized, the multitude factors leading to AD pathogenesis made so far unsuccessful the design of disease-modifying therapies. Among all hypotheses suggesting possible mechanisms involved in AD pathology, the pro-amyloidogenic processing of amyloid precursor protein (APP), leading to the release of the amyloid beta peptide (Aβ) formation and subsequent neurotoxic oligomerization, remains one of the most supported theories. Additionally, aging and the linked failure of the protein quality control machinery play a crucial role in AD. One important component of the protein quality control machinery is the family of chaperones. Particularly, the focus of this investigation is on the evolutionary conserved chaperone Hsp60. Hsp60 is known to protect mitochondria from damage induced by misfolded proteins, and there is evidence of the direct interaction between Hsp60 and APP/A, thus suggesting a role of this chaperone in protecting mitochondria from Aβ-induced damage. However, the mechanism of action of Hsp60 is poorly understood. Therefore, in the present work, we investigated the effect of Hsp60 on Aβ release by western blotting and ELISA using a cell line overexpressing a variant of APP known to release toxic Aβ oligomers (7PA2 cell line). Further, we investigated changes in toxicity of toxic Aβ oligomers either in vitro by testing changes in cytotoxicity on neuroblastoma cell line, and ex vivo by testing changes in long term potentiation on hippocampal brain slices. Our data suggest that Hsp60 has an effect in reducing both Aβ release and cytotoxicity thus proposing Hsp60 as a potential candidate for future therapies targeting Aβ neurotoxicity.
Compelling evidence indicates that Type 2 Diabetes (T2D) and Alzheimer’s Disease (AD) may possibly share a common pathological origin, but the underlying mechanisms remain poorly understood. T2D is a known risk factor for AD, while insulin resistance (hallmark of T2D) has been extensively documented in AD patients while insulin has an important role in learning and memory.

We developed a mouse model (AtENPP1Tg mouse) that recapitulates typical characteristics of human metabolic syndrome and insulin resistance, as well as hippocampal dysfunction, thus offering a unique chance to explore which mechanistic pathways connect diabetes with AD.

Interestingly, in the adipose tissue of diabetic patients the number and the regenerative potential of mesenchymal stem cells (MSCs) is significantly reduced. We hypothesize the existence of an axis between adipose tissue and CNS, in which adipose tissue-residing-MSCs deliver messages to CNS. When adipose tissue becomes insulin resistant, the amount of MSCs reduces, hence the adipose tissue-brain axis is impaired resulting in systemic insulin resistance.

Therefore, in order to investigate this relationship, we injected via subcutaneous route, human umbilical cord-derived Wharton’s Jelly (WJ) mesenchymal stem cells (MSCs), directly into the adipose tissue, thus reestablishing the cross-talking between peripheral organs and brain. First, we evaluated blood glucose levels in transgenic transplanted mice compared to not–transplanted; then, we assessed the LTP response in hippocampus between the two groups; finally, we investigated if insulin signaling was restored in synaptosomes isolated from both transplanted and not-transplanted mice.

It is conceivable that these beneficial effects are mediated by MSC-derived exosomes, delivered to CNS from the periphery, therefore the replenishment of MSCs may restore insulin signaling both in periphery and CNS, thus reestablishing adipose tissue-brain cross-talking.
MUTANT HUNTINGTIN IMPAIRS TRANSCRIPTION-COUPLED DNA REPAIR BY INACTIVATING DNA STRAND BREAK REPAIR ENZYME PNKP

Jeffrey Snowden, BS, Department of Neuroscience and Cell Biology
Rui Gao, MD, Department of Neurology
Aniran Chakraborty, PhD, Department of Internal Medicine
Tapas Hazra, PhD, Department of Internal Medicine
Kara Gordon, PhD, University of California – San Diego
Albert La Spada, MD, PhD, University of California – San Diego

An expansion of the CAG repeat-tract in the genes for Huntingtin (Htt) and Ataxin3 (Atxn3) cause Huntington’s disease (HD) and Spinocerebellar Ataxia Type 3 (SCA3), respectively. HD and SCA3 share overlapping disease phenotypes and molecular markers with other neurodegenerative disease; each presenting with accumulation of DNA damage, transcriptional dysregulation, mitochondrial dysfunction, and overall metabolic deficiency. However, the mechanism by which expanded trinucleotide repeats causes these, and other neurodegenerative diseases, is still heavily debated. Here we report that both WT and mutant forms of Htt and Atxn3 functionally interact with the DNA repair enzyme, PNKP; a bifunctional 3’-phosphatase 5’-kinase, which is required for the processing of non-ligatable strand break ends. We confirm the interaction of these proteins via co-immunoprecipitation (IP). In addition to PNKP, we identify RNAPolII Subunit A and DNA Ligase III as members of the IP complex. Expression of WT Htt stimulates the 3’-phosphatase activity of PNKP in both cell culture and animal models; conversely, the expression of mutant Htt abrogates this same activity. Reduced PNKP activity facilitates an accumulation of DNA strand breaks in transcribed regions of the genome, and chronic activation of the DNA damage response pathway through Ataxia-Telangiectasia Mutated (ATM) signaling. Based on these findings, we propose that Htt, Atxn3, and PNKP form part of the Transcription-Coupled DNA Repair complex. This work is significant in that it establishes a novel function for Htt and Atxn3 in DNA repair; linking their mutations to some of the earliest cellular markers of HD and SCA3.
AMYLOID BETA SYNAPTOTOXICITY IS REGULATED BY MIRNA-4723 AND -485 IN ALZHEIMER’S DISEASE

Olga Zolochevska, MS, Department of Neurology
Giulio Taglialetela, PhD, Department of Neurology

Alzheimer’s Disease (AD), the sixth leading cause of death in the US, is the most common form of age-associated dementia, accompanied by synaptic loss at early stages, and neuronal death at late stages of the disease. Amyloid beta (Abeta) and tau oligomeric aggregates are considered to be the most toxic species of the two hallmark proteins in AD, capable of targeting and disrupting synapses and thus driving cognitive decay. Certain individuals (here referred to as Non-Demented with Alzheimer’s Neuropathology – NDAN) are capable to withstand the toxicity caused by Abeta and tau, and thus preserve cognitive competency despite the presence of AD neuropathology. Understanding the involved mechanism(s) would reveal new, effective treatment targets. Proteomic studies of PSD fractions of hippocampi of control, AD and NDAN revealed 31 unique proteins that are significantly different in AD vs. NDAN. Potential drivers of these changes, microRNA-485, -4723 and -149 were predicted by Ingenuity Pathway Analysis and experimentally confirmed to be differentially expressed in AD vs. control and NDAN brains. We hypothesize that changes in microRNA have an important role in either synapse protection, or sensitization to Abeta binding. To test our hypothesis, we used SH-SY5Y cells to determine if modulation of these microRNAs had an effect on the ability of Abeta to associate with synaptic elements. SH-SY5Y cells were transfected with miRNA-4723 mimic and microRNA-485 inhibitor, and then treated with 647-labeled Abeta oligomers. Abeta binding was evaluated using flow cytometry. Taken together, our findings suggest that there is a unique regulation of microRNA in NDAN which could be responsible for protection of synapses from Abeta toxicity, thus contributing to retention of cognitive ability.

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MARKERS OF MITOCHONDRIAL ANTIOXIDANT CAPACITY IN INACTIVE OLDER ADULTS

Emily Arentson-Lantz, PhD, Department of Nutrition & Metabolism
Jasmine Mikovic, MS, Deakin University
Severine Lamon, PhD, Deakin University
Doug Paddon-Jones, PhD, Department of Nutrition & Metabolism

Aging and physical inactivity reduce mitochondrial oxidative capacity and increase oxidative stress from accumulated reactive oxygen species (ROS). However, the molecular mechanisms underlying this decrease in mitochondrial function are unknown. The aim of this study was to investigate the skeletal muscle protein levels of key markers of mitochondrial oxidative phosphorylation and ROS production in healthy older adults subjected to our bed rest/rehabilitation protocol.

As part of an ongoing NIH funded study, we obtained vastus lateralis muscle samples from 13 older adults (67±1.45 years, BMI 26.3±0.7) before and after 7 days of bed rest and again following 7 days of inpatient rehabilitation. Mitochondrial respiration was assessed in permeabilized muscle fibres using an OROBOROS® O2K oxygraph. Markers of mitochondrial oxidative phosphorylation (Mitochondrial Oxidative Phosphorylation System, OXPHOS, primary anti-body cocktail) and antioxidant capacity (Superoxide dismutase 2, mitochondrial (SOD2) and Catalase) were assessed using Western blotting.

Specific components of mitochondrial respiration were decreased following seven days of bed rest, but restored after 7 days of rehabilitation. Catalase protein levels significantly decreased following 7 days of bed rest and remained low after 7 days of rehabilitation; however SOD2 protein abundance did not change. The protein expression levels of electron transport chain components, CV–ATP5a, CI–UQCRC2 and CI–NDUFB89, were not affected by bed-rest or rehabilitation.

Seven days of bed rest decreases mitochondrial oxidative capacity without altering markers of mitochondrial oxidative phosphorylation. This might reflect a delay between the acute effects of inactivity on oxidative capacity and longer-term impacts on the mitochondrial oxidative machinery. Identifying the pathways that contribute to skeletal muscle dysfunction is essential to preserve mitochondrial oxidative capacity and reduce oxidative stress during periods of inactivity.
PROTECTING AGAINST SKELETAL MUSCLE ANTIOXIDANT STRESS IN OLDER ADULTS DURING PHYSICAL INACTIVITY

Emily Arentson-Lantz, PhD, Department of Nutrition & Metabolism
Christopher Fry, PhD, Department of Nutrition & Metabolism
Doug Paddon-Jones, PhD, Department of Nutrition & Metabolism

During the aging process, mitochondrial oxidative capacity decreases while reactive oxygen species (ROS) production increases. This culminates in a net increase in cellular oxidative stress. We hypothesize that: i) extended inactivity in older adults will increase skeletal muscle ROS production and ii) leucine supplementation during bed rest will reduce ROS production and protect against oxidative damage by improving mitochondrial health. As a part of an ongoing NIH-funded study, men and women (average age: 67.2 years) were randomized to a control (CON, n=10) or leucine-supplemented (LEU, n=7) group and admitted to the Institute for Translational Sciences' Clinical Research Center for 7 days of bed rest followed by 7 days of inpatient rehabilitation. Using skeletal muscle tissue collected from biopsies pre- and post-bed rest, we used immunohistochemistry to quantify production of ROS species, 4-hydroxynonenol (4HNE) and 8-hydroxyguanosine (8OH-dG). Preliminary results indicate subjects in the CON group exhibited a 60% increase in 4HNE modification of cellular proteins during bed rest, which was not observed in the LEU group. Further, the increase in 4HNE oxidation relative to muscle lipid content increased by 100%, suggesting the increase in oxidative stress is not related to increased substrate (lipid) availability, but rather a decrease clearance by mitochondrial antioxidant defense systems. These data suggest dietary leucine supplement may be used to support antioxidant capacity and muscle health in older adults during periods of physical inactivity.
POST-HOSPITAL INTERVENTIONS IN COMMUNITY DWELLING OLDER ADULTS TO ACCELERATE RECOVERY OF PHYSICAL FUNCTION AS MEASURED BY THE SHORT PHYSICAL PERFORMANCE BATTERY

Rachel Deer, PhD, Division of Rehabilitation Sciences
Jared Dickinson, PhD, Arizona State University
Steve Fisher, PT, PhD, Department of Physical Therapy
Jacques Baillargeon, PhD, Preventive Medicine and Community Health
Elena Volpi, MD, PhD, Sealy Center on Aging

Acute hospitalization can have devastating effects on physical function and levels of independence in older adults. Post-hospital syndrome, the inability to regain function following a hospital stay, is a strong predictor of re-hospitalization and mortality. In healthy older adults, we have previously shown, that interventions (including protein/nutrition, rehabilitation/exercise, and anabolic steroids) can independently increase muscle size and function, and thus represent promising therapeutic strategies.

The goal of this pilot study was to collect preliminary data on the efficacy of post-hospitalization interventions [isocaloric placebo (p), whey protein supplement (w), in-home rehabilitation + placebo (r+p), rehabilitation + whey (r+w), or testosterone (t)] to accelerate recovery of physical function in older adults. Subjects (≥65 years, n=100) were recruited from Jan 2014-July 2016 during an acute hospitalization at UTMB. Demographics and short physical performance battery (SPPB) were collected prior to hospital discharge (baseline) and 1-month post discharge (follow-up).

No significant differences between groups at baseline in SPPB total score or SPPB component scores (balance, gait speed or chair rise). Mean baseline score was 6.93 ± 0.33 indicating moderate functional impairment. At follow-up testing, improvements in all groups in raw SPPB score (P:1.3, N:2.7, E+P:2.0, E+N:2.8, T:2.8) and in the percent of subjects with a clinically meaningful improvement (P:54%, N:80%, E+P:82%, E+N:75%, T:94%). Interventions, when grouped together, significantly increased SPPB total score improvement as compared to placebo. At follow-up, there was a significantly greater number of subjects with a clinically meaningful improvement in the intervention groups compared to placebo.

Data from this pilot clinical trial suggest that post-hospitalization interventions in acutely ill older adults are feasible and can improve physical function in older adults.
SLEEP CHARACTERISTICS ARE ASSOCIATED WITH PHYSICAL FUNCTIONING DURING ACUTE HOSPITALIZATION AND PREDICT FUNCTIONAL RECOVERY FOLLOWING DISCHARGE IN OLDER ADULTS

Rachel Deer, PhD, Division of Rehabilitation Sciences
Elena Volpi, MD, PhD, Sealy Center on Aging
Sara Nowakowski, PhD, Department of Obstetrics and Gynecology

Introduction: Poor sleep quality, a frequent problem in older adults, has been shown to be associated with reduced physical function and wellbeing. However, little is known about the relationship between sleep quality and the recovery of physical function after hospitalization. Thus, we conducted this study to examine the association between sleep quality and functional recovery after an acute hospitalization in community dwelling older adults.

Methods: Older adult patients (N=27, mean age= 74± 8) were recruited during an acute hospitalization with testing performed prior to discharge (baseline) and 1-month post-discharge. Functional performance was measured using the Short Physical Performance Battery (SPPB) which consists of three tests of lower body function: a short timed walk at usual gait speed, five repeated chair stands, and a standing balance exercise. Each of the three performance measures was scored from 0 to 4, with 0 indicating inability to complete the test and 4 indicating the highest level of performance. Sleep quality was measured using Pittsburgh Sleep Quality Index (PSQI).

Results: Pearson correlations revealed significant associations between PSQI and SPPB total (r = -.40, p=.044) and SPPB gait (r=-.52, p=.007) scores at baseline. Separate regression models revealed baseline PSQI score predicted change scores from baseline to 1-month post-discharge for SPPB balance (β=.55, p=.012) and SPPB gait (β=.60, p=.005); with a trend toward significance for SPPB total (β=.43, p=.057).

Discussion: For older adults, poorer sleep quality is associated with worse physical functioning during acute hospitalization. Baseline sleep quality also predicted recovery of physical functioning following hospitalization. These results suggest that interventions to improve sleep quality might help enhance functional recovery from hospitalization and increase physical function levels.

Compared to a more comprehensive evaluation tool the Subjective Global Assessment (SGA). For this analysis, nutritional status was scored as either "normal" or "at-risk/malnourished."

The prevalence of malnutrition varied greatly depending on which nutritional assessment tool was used, indicating a vast difference in specificity and sensitivity of the tools. According to the SGA 53.6% of our cohort was at-risk of malnutrition/malnourished. The highest prevalence of subjects “at-risk/malnourished” was obtained with MNA-SF (78.6%), NRS (56.4%), MUST (28.6%) and MST (18.6%). Sensitivity: MNA-SF (93%), NRS (77%), MUST (45%) and MST (29%). Specificity: MST (94%), MUST (91%), NRS (68%) and MNA-SF (38%). Positive predictive values were high in all groups (MUST and MST 85%, NRS 73%, MNA-SF 64%). Negative predictive values were highest in MNA-SF (83%), NRS (72%), MUST (59%), and MST (54%).

These preliminary data indicate that malnutrition varies greatly depending on which tool is used for diagnosis (18.6% to 78.6%). NRS had acceptable sensitivity, specificity, positive and negative predictive values and thus could be an appropriate screening tool. Further research is ongoing to determine the most valid and practical nutritional screening tool for use in this specialized population.
SURVIVAL DIFFERENCES AMONG PATIENTS WITH BLADDER CANCER ACCORDING TO SEX: CRITICAL EVALUATION OF RADICAL CYSTECTOMY USE AND DELAY TO TREATMENT

Preston Kerr, MD, Department of Surgery
Stephen Williams, MD, Department of Surgery
Tamer Dafashy, MD, Department of Surgery
Cameron Ghaffary, MD, Department of Surgery
Christopher Kosarek, MD, Department of Surgery
Jacques Baillargeon, PhD, Preventive Medicine and Community Health
Edwin Morales, MD, MD Anderson Cancer Center
Simon Kim, MD, University Hospitals Cleveland Medical Center
Yong-Fang Kuo, PhD, Preventive Medicine and Community Health
Eduardo Orihuela, MD, Department of Surgery
Douglas Tyler, MD, Department of Surgery
Ashish Kamat, MD, MD Anderson Cancer Center

Objective: Sex differences in bladder cancer survival are well known. However, the effect of type of treatment, timing to surgery when rendered, and survival outcomes according to sex have not been extensively examined. In this study, we sought to characterize the effect of use and timing of radical cystectomy (RC) according to sex and survival outcomes.

Methods: A total of 9,907 patients aged 66 years or older diagnosed with clinical stage II to IV N0M0 bladder cancer from January 1, 2001 to December 31, 2011 from Surveillance, Epidemiology, and End Results-Medicare data were analyzed. We used multivariable regression analyses to identify factors predicting the use and delay of RC. Cox proportional hazards models were used to analyze survival outcomes.

Results: Of the 9,907 patients diagnosed with bladder cancer, 3,256 (32.9%) were females. Women were significantly more likely to undergo RC across all stages compared to their male counterparts (stage II: relative risk [RR] ¼ 1.48, 95% CI: 1.33–1.65, P o 0.001; stage III: RR ¼ 1.24, 95% CI: 1.13–1.37, P o 0.001; and stage IV: RR ¼ 1.33, 95% CI: 1.19–1.49, P o 0.001). Moreover, there was no significant difference in delay to RC according to sex across all clinical stages. Using propensity score matching, women had worse overall (hazard ratio ¼ 1.07; CI:1.01–1.14; P ¼ 0.024), and worse cancer-specific survival (hazard ratio ¼ 1.26; CI: 1.17–1.36, P o 0.001) than men.

Conclusion: Sex differences persist with women who are significantly more likely to undergo RC independent of clinical stage. However, women have significantly worse survival than men. Delay from diagnosis to surgery did not account for this decreased survival among women.
INCREASED UTILIZATION OF POSITRON EMISSION TOMOGRAPHY/COMPUTED TOMOGRAPHY (PET/CT) IMAGING AND ITS ECONOMIC IMPACT FOR PATIENTS DIAGNOSED WITH BLADDER CANCER

Preston Kerr, MD, Department of Surgery
Jinhai Huo, MD
Yiyi Chu, PhD, MD Anderson Cancer Center
Karim Chamie, MD, University of California – Los Angeles
Marc Smaldone, MD, Fox Chase Cancer Center
Stephen Boorjian, MD, Mayo Clinic
Jacques Baillargeon, MD, Sealy Center on Aging
Yong-Fang Kuo, PhD, Preventive Medicine and Community Health
Padraic O’Malley, MD, Dalhousie University
Eduardo Orihuela, MD, Department of Surgery
Douglas Tyler, MD, Department of Surgery
Stephen B. Williams, MD, Department of Surgery

Background: The purpose of this study was to examine temporal nationwide utilization patterns and predictors for use of positron emission tomography/computed tomography (PET/CT) in comparison with magnetic resonance imaging (MRI) and computed tomography (CT) among patients diagnosed with bladder cancer.

Methods: A total of 36,855 patients aged 66 years or older diagnosed with clinical stage TI-IV, N0M0 bladder cancer from 2004 to 2011 were analyzed. We used multivariable logistic regression analyses to discern factors associated with receipt of imaging within 12 months from diagnosis. The Cochran-Armitage test for trend was used to determine changes in the proportion of patients receiving imaging after cancer diagnosis.

Results: Independent of clinical stage, there was marked increase in use of PET/CT throughout the study period (2011 vs. 2004: odds ratio, 17.55; 95% confidence interval, 10.14-30.38; P < .001). Although use of CT imaging remained stable during the study period, there was significantly decreased utilization of MRI (odds ratio, 0.60; 95% confidence interval, 0.49-0.75; P < .001) in 2011 versus 2004. The mean incremental cost of PET/CT versus CT and MRI was $1040 and $612 (in 2016 dollars), respectively. Extrapolating these findings to the patients with bladder cancer in the United States results in excess spending of $11.6 million for PET/CT imaging.

Conclusion: We identified rapid adoption of PET/CT imaging independent of clinical stage, resulting in excess national spending of $11.6 million for this imaging modality alone. Further value-based research discerning the clinical versus economic benefits of advanced imaging among patients with bladder cancer are needed.
AGE-RELATED CONTROL STRATEGIES TO EXECUTE THE FIRST STEP FROM STANDING IN OLDER ADULTS

Mansoo Ko, PhD, Department of Physical Therapy

Aging can lead to lifestyle changes such as increased obesity and reduced fitness status, which could be due to general de-conditioning, muscle weakness, decreased joint mobility, and compromised peripheral sensory information. Those motor and sensory deficiencies in older adults can further result in kinematic alternations in gait, postural instability, and an increased risk of falling. Therefore, the purpose of this study was to identify the effect of aging on the dynamic balance of gait initiation (GI) in older adults.

Total 17 subjects, 8 healthy elderly and 9 young adults were recruited from the local community. EMG sensors (Biometrics Ltd., Ladysmith, VA, USA) were attached to the tibialis anterior (TA) muscles bilaterally. Participants were instructed to stand comfortably while barefoot on the High Resolution (HR) foot pressure mat (Tekscan Inc., South Boston, MA, USA). The subjects were then given a verbal cue to start walking from a quiet standing. Subjects performed 3 trials of GI, always starting with their dominant foot. This study used descriptive analysis. Center of Pressure (COP) area and COP backward motion distance were measured by HR mat during GI. Peak amplitude and time to peak amplitude on TA muscles were measured by wireless EMG system during GI.

The older adults illustrated significantly limited backward movement of COP (older vs young: 3.55cm vs 4.43cm) with reduced and slow rate of force generation of bilateral TA muscles compared to healthy young adults during GI. This finding suggests that sway analysis during GI could be used as a screening tool to identify the impaired control strategies related to dynamic balance in older adults.
ESTIMATION OF APPENDICULAR SKELETAL MUSCLE MASS USING BIOELECTRICAL IMPEDANCE IN HOSPITALIZED GERIATRIC PATIENTS

Leyla Akhverdiyeva, BS, School of Medicine
Rachel Deer, PhD, Sealy Center on Aging
Shawn Goodlett, Sealy Center on Aging
Elena Volpi, MD, PhD, Sealy Center on Aging

Background: Age-associated loss of skeletal muscle mass and function is exacerbated in geriatric patients due to multiple catabolic stressors. The objective of this study was to develop an appendicular skeletal muscle mass (ASMM) prediction model using bioelectrical impedance analysis (BIA) with dual energy X-ray absorptiometry as the reference measurement.

Methods: Subjects (n=118, ≥65 yrs) were enrolled during an acute hospitalization in an urban hospital. Testing included measurements of demographics, body composition, physical function, independence questionnaires, and chart review.

Results: Preliminary analysis from this ongoing study showed BIA underestimated fat mass when compared to DXA with a mean difference of 3.82 ± 5.56%, p <0.05. Stepwise regression was run to develop the ASMM prediction model. Scatterplots for linearity were run on all testing measures. The following correlated variables were included into the model: sex, BMI, max grip strength, and FM-BIA2. R2 and SEE for the equation were 0.67 and 2.44, respectively. Sex explained 35.2% of the variance seen in the model. Validation was confirmed with a 10 K-fold cross validation revealing a 10 group R2 of 0.67 ± 0.03 with a mean absolute error of 1.97 ± 0.49 kg.

Finally, we tested our model as a screening tool for sarcopenia. Using the Foundation of NIH Sarcopenia Project definition for weakness + low lean mass, our model had a sensitivity of 80.0% and a specificity of 89.7%.

Conclusion: The developed model can be used to estimate ASMM using provider-friendly measurements. It can be implemented as a sensitive screening tool for identifying patients at risk for sarcopenia. Those identified to be at risk could then undergo further functional testing for diagnosis and treatment of sarcopenia.
ALTERED MACROPHAGE POLARITY PROMOTES PROGENITOR CELL DYSFUNCTION AND REDUCES MUSCLE QUALITY IN PATIENTS WITH CHRONIC KIDNEY DISEASE

Julia Newsom, BS, Department of Nutrition & Metabolism
Camille Brightwell, MS, Department of Nutrition & Metabolism
Tatiana Moro, PhD, Sealy Center on Aging
Matthew Abramowitz, PhD
Christopher Fry, PhD, Department of Nutrition & Metabolism

Muscle wasting and weakness increase the risk of mortality in patients with Chronic Kidney Disease (CKD). Deficits in the cellular mechanisms that regulate repair and differentiation within muscle likely contribute to muscle atrophy in CKD patients. Macrophages regulate muscle reparative processes and exist along an anti- or pro-inflammatory continuum (termed macrophage polarity). Pro-inflammatory macrophages, via TNF-α secretion, can influence muscle quality through regulation of fibrogenic-adipogenic progenitor (FAP) cells, which have the ability to proliferate into fibrogenic cells or adipocytes. Our purpose was to assess the abundance and polarity of macrophages within skeletal muscle of CKD patients to provide information on the activation of regenerative pathways. Expression of TNF-α, FAP cell abundance, and muscle tissue quality were also assessed to examine how macrophage density and polarization may impact muscle tissue quality. Skeletal muscle biopsies of the m. vastus lateralis were collected from pre-dialysis CKD patients (n=10) along with age-matched healthy controls (n=10) and were analyzed using qRT-PCR, IHC and histology, and were quantified in a blinded manner. An independent t-test was used to determine differences between groups. Total macrophage density (p=0.10), pro-inflammatory macrophage density (p=0.08), and mRNA expression of TNF-α (p<0.05) was reduced, while FAP abundance (p=0.06), % lipid area (p=0.10), and % collagen area (p<0.05) were increased in the skeletal muscle of patients with CKD. The reduction in pro-inflammatory macrophage density in patients with CKD may lead to reduced secretion of TNF-α which may promote FAP proliferation. Greater FAP activity may lead to degenerative deposition of adipose and fibrotic tissue within skeletal muscle in patients with CKD, diminishing muscle quality and contributing to weakness.
Clinical Trial - Student

PROTEIN CONSUMPTION IN THE ELDERLY 30-DAYS AFTER ACUTE HOSPITALIZATION

Kristen Poynor, BS, Department of Nutrition & Metabolism
Shawn Goodlett, Sealy Center on Aging
Elena Volpi, MD, PhD, Sealy Center on Aging
Rachel Deer, PhD, Sealy Center on Aging

Muscle loss is rampant in hospitalized patients. This is of particular concern for the elderly population as sarcopenia, a natural part of aging, leads to loss of function, muscle strength, and muscle mass. Protein supplementation post-hospitalization has been shown to increase muscle strength and decrease fall incidence in the elderly population.

This analysis is a part of a larger pilot randomized control trial conducted on patients admitted to the ACE (Acute Care for Elderly) unit at UTMB hospital (IRB #13-038).

Our research questions, primary outcomes and hypotheses for this project are:
1. How does the protein content differ between meals? Protein consumption reported by mealtime will be analyzed to determine differences between meals. We hypothesize that protein content will be different between meals.
2. Are there differences in protein consumption between placebo supplemented (PLA), whey supplemented (WHEY), and testosterone (TES) groups after supplementation? We hypothesize that protein supplementation will cause a change in protein consumption between groups.
3. Does supplementation help participants meet their estimated protein needs? The DRI for protein is 0.8 g/kg body weight. We hypothesize that protein supplementation will help participants meet estimated protein needs. We will also run secondary analysis examining if supplementation helps more subjects meet the recommended DRI for protein of 1.2 g/kg body weight.

The main findings of this analysis was that protein content between meals is different with lower protein consumption at breakfast and similar consumption at lunch and supper. We also found that protein consumption differed between WHEY and TES groups, but not between WHEY and PLA groups, and that protein supplements significantly helped acutely ill older adults meet their protein needs.
EXERCISE TRAINING FOR THE TREATMENT OF ACCELERATED SARCOPENIA IN ELDERLY DIABETICS

Amanda Randolph, MS, Graduate School of Biomedical Sciences
Elena Volpi, MD, PhD, Sealy Center on Aging

Sarcopenia is an age-related loss of muscle mass contributing to frailty, falls, disability, and mortality. It is associated with a decreased ability to maintain muscle protein content, which results in diminishing strength. It is also associated with anabolic resistance at multiple levels. Here, we provide an overview of what is currently known about sarcopenia and identify knowledge gaps in the field. Additionally, we detail the design of an ongoing study which will examine the chronic acceleration of sarcopenia in elderly diabetics. The specific aims of this study are 1) to determine the effects of chronic resistance exercise on anabolic resistance in older diabetics; and 2) to determine whether improvement in anabolic resistance is associated with changes in muscle protein synthesis, mTORC1 signaling, or muscle mass/strength.
EFFECTS OF EXERCISE AND SUPPLEMENTATION ON PHYSICAL FUNCTION AND GLUCOSE METABOLISM IN HEALTHY OLDER ADULTS

Amanda Randolph, MS, Graduate School of Biomedical Sciences
Melissa Markofski, PhD, University of Houston
Kyle Timmerman, PhD, Miami University
Jared Dickinson, PhD, Arizona State University
Blake Rasmussen, PhD, Department of Nutrition and Metabolism
Elena Volpi, MD, PhD, Sealy Center on Aging

BACKGROUND: Sarcopenia contributes to frailty, disability, and dependence in older adults. Aerobic exercise and dietary amino acid supplementation may aid in sarcopenia prevention by enhancing insulin sensitivity either directly or via increases in lean mass. We hypothesize that the addition of essential amino acid supplementation to aerobic exercise would attenuate insulin resistance more than aerobic exercise alone. METHODS: Older adults were randomized into one of four groups for a six-month intervention: 1h of supervised treadmill walking with 15g of essential amino acid supplementation (Ex+EAA, n=13; age=71.17 ± 1.15y); 1h of supervised treadmill walking with placebo (Ex+PLA, n=11; age=73.64 ± 1.38y); 15g of essential amino acid supplementation only (EAA, n=13; age=72.38 ± 1.33y); or placebo only (PLA, n=11; age=72.18 ± 1.59y). All exercise subjects participated in supervised treadmill walking at 70% maximum heart rate 3d/wk. Supplement or placebo was double-blinded and ingested daily. Measures of muscle strength, physical function, aerobic fitness, and glucose tolerance were collected at baseline and 6 months. Changes in insulin resistance were calculated using the Matsuda index. RESULTS: After six months, both exercise groups increased (p<0.05) VO2peak (Ex+EAA=15.3 ± 4.1%, Ex+PLA=16.3 ± 4.2%) and fast walking speed (Ex+EAA=5.4 ± 1.1%, Ex+PLA=4.6 ± 1.7%). In contrast, only the Ex+EAA increased (p<0.05) leg strength (Ex+EAA=17.9 ± 6.4%). Our preliminary results for insulin resistance contradict our hypothesis: while exercise and EAA supplementation improved insulin resistance when administered separately, the combined intervention negated these improvements. CONCLUSION: Aerobic exercise with EAA supplementation increases muscle function and does not increase insulin resistance. This treatment is a possible option for reducing the risk of developing sarcopenia without worsening metabolic health.

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RECOMBINANT HUMAN GROWTH HORMONE PROTECTS AGAINST MUSCLE ATROPHY DURING TWO WEEKS OF DISUSE IN OLDER ADULTS

Katy Richards, BS, Department of Nutrition & Metabolism
Camille Brightwell, MS, Graduate School of Biomedical Sciences
Yuan Wen, PhD, University of Kentucky
Charlotte Peterson, PhD, University of Kentucky
Abigail Mackey, PhD
Michael Kjaer, MD

Background: Periods of muscle inactivity will induce skeletal muscle atrophy that attenuates muscle strength and functional capacity. This happens at an accelerated rate among older adults (>65 yr). Recombinant Human Growth Hormone (GH) has previously been shown to be effective at mitigating muscle atrophy and weakness in older adults.

Purpose: To determine the effects of GH on inactivity-induced declines in muscle fiber size, myonuclear content, satellite cells, and capillaries in older adults to improve muscle health after a period of inactivity.

Methods: 12 healthy adult men, aged 65-80 years old, were randomly assigned in a double-blinded fashion to receive either GH (n=6) or a placebo (n=6) during 2 weeks of simulated bedrest (via cast immobilization from hip to ankle in one leg) and 6 weeks of exercise rehabilitation. Muscle biopsies were collected from the m. vastus lateralis at baseline, following 2 weeks of immobilization, and after 6 weeks of exercise rehabilitation, then stained using immunohistochemistry for imaging and analysis.

Results: Older adults receiving placebo experienced a 22% decline in muscle fiber cross-sectional area that was prevented with the provision of GH (p<0.05). GH provision attenuated inactivity-induced loss of satellite cell abundance and promoted an increase in myonuclear content (25%, p<0.05), which may have been protective of muscle fiber size during inactivity.

Conclusion: The provision of GH to older adults during a period of lower limb disuse protected against inactivity-induced muscle fiber atrophy by increasing Type II muscle fiber CSA, activation of satellite cells, and promotion of myonuclear accretion.
Background: Hypogonadism is posited as a risk factor for depression. A large body of current literature focuses on metabolic and physical health effects of testosterone therapy in hypogonadal men however relatively few studies investigated psychiatric health outcomes. Current evidence from large scale, population based studies of the effects of testosterone therapy on depression, anxiety and substance use disorder in middle age and older hypogonadal men is lacking.

Objectives: The proposed study examines the risk of depression, anxiety and substance use disorder in middle age and older hypogonadal men receiving testosterone therapy.

Methods: Data source & study design – We propose a retrospective cohort study of hypogonadal men between 40 and 65 years of age enrolled in one of the nation’s largest commercial health insurance programs (Clinformatics Data Mart; Optum Insight) between January 1, 2005-December 31, 2015.

Cohort - Exposure will be defined as number of days of testosterone therapy (measured using NDC and HCPCS codes) within 6 months after index date. Incident depression, anxiety and substance use disorder (measured using ICD 9 and NDC codes) will be the outcomes of interest.

Statistical analysis: Cox proportional hazards analysis will be used to calculate the adjusted hazard ratios of depression, anxiety and substance use disorder associated with prior exposure to testosterone therapy.

Policy implications: This study will improve current understanding of potential effects of testosterone therapy on psychiatric health in middle age and older hypogonadal men. Our findings, based on a large, population based sample of hypogonadal men will help both physicians and testosterone recipients make an informed decision prior to initiating testosterone therapy for potential psychiatric benefits.
IMPACT OF PSYCHIATRIC ILLNESS ON DECREASED SURVIVAL IN ELDERLY PATIENTS WITH BLADDER CANCER IN THE UNITED STATES

Usama Jazzar, BS, School of Medicine
Stephen B. Williams, MD, Department of Surgery
Shan Yong, PhD, Department of Surgery
Zachary Klaassen, MD, Department of Surgery
Jinhai Huo, PhD
Byron D. Hughes, MD, Department of Surgery
Edgar Esparza, BS, Department of Surgery
Hemalkumar B. Mehta, PhD, Department of Surgery
Simon P. Kim, MD, University Hospitals Cleveland Medical Center
Douglas S. Tyler, MD, Department of Surgery
Stephen J. Freedland, MD, Cedars-Sinai
Ashish M. Kamat, MD, MD Anderson Cancer Center

Objective: Treatments for muscle-invasive bladder cancer are multimodal, complex and often carry significant physical and psychological morbidity risks. We sought to define the incidence and types of psychiatric illnesses diagnosed following treatment and determine the impact on survival outcomes.

Patients and Methods: A total of 3,709 patients diagnosed with clinical stage T2-T4a bladder cancer from January 1, 2002 to December 31, 2011 from the Surveillance, Epidemiology, and End Results (SEER)-Medicare were analyzed. We used multivariable analysis and cox proportional hazards models to determine predictors associated with psychiatric diagnosis and impact on survival outcomes.

Results: Of the 3,709 patients, 1,870 (50.4%) were diagnosed with post-treatment psychiatric disorders. Patients who underwent radical cystectomy were found to be at a significantly greater risk of having a post-treatment psychiatric illness in comparison to patients who underwent radiotherapy and/or chemotherapy (Hazard Ratio (HR) 1.19, 95% CI = 1.08 - 1.32, P < 0.001). In adjusted analyses, diagnosis of a psychiatric disorder resulted in significantly worse overall (HR 2.80, 95% CI 2.47 - 3.17, P < 0.001) and cancer-specific (HR 2.39, 95% CI 2.05 - 2.78, P < 0.001) survival, respectively.

Conclusions: Half of muscle-invasive bladder cancer patients who underwent treatment were diagnosed with a psychiatric disorder which resulted in worse survival outcomes as compared to patients without a post-treatment psychiatric diagnosis. This information can be used to inform interventions to educate patients with muscle-invasive bladder cancer regarding the impact of different treatments on mental health.
RADICAL CYSTECTOMY PROVIDES IMPROVED SURVIVAL OUTCOMES AND DECREASED COSTS COMPARED WITH TRIMODAL THERAPY FOR PATIENTS DIAGNOSED WITH LOCALIZED MUSCLE-INVASIVE BLADDER CANCER

Usama Jazzar, BS, School of Medicine
Stephen B. Williams, MD, Department of Surgery
Yong Shan, PhD, Department of Surgery
Hemalkumar B. Mehta, PhD, Department of Surgery
Jacques G. Baillargeon, PhD, Preventive Medicine and Community Health
Jinhai Huo, PhD
Anthony J. Senagore, MD, Department of Surgery
Eduardo Orihuela, MD, Department of Surgery
Douglas S. Tyler, MD, Department of Surgery
Todd A. Swanson, MD, PhD, Department of Radiation Oncology
Ashish M. Kamat, MD, MD Anderson Cancer Center

Purpose: Radical cystectomy is the guideline-recommended treatment for muscle-invasive bladder cancer. Recently there has been a resurgence in trimodal therapy with limited data on comparative outcomes, and especially attributable costs.

Methods: A total of 3,200 patients aged 66 years or older diagnosed with clinical stage T2-4a bladder cancer from January 1, 2002- December 31, 2011 from the Surveillance, Epidemiology, and End Results (SEER)-Medicare data were analyzed. Cox regression analysis and propensity score matching methods were used to determine predictors for overall and cancer-specific survival.

Results: A total of 3,200 patients met inclusion criteria. After propensity score matching, 687 patients underwent trimodal therapy and 687 patients underwent radical cystectomy. Patients who underwent trimodal therapy had significantly decreased overall (Hazard Ratio (HR) 1.49, 95% Confidence Interval (CI), 1.31-1.69, p<0.001) and cancer-specific (HR 1.55, 95% CI 1.32-1.83, p<0.001) survival, respectively. While there was no difference in costs at 30 days, we noticed significant increased healthcare costs associated with trimodal therapy than radical cystectomy at 90 and 180 days. Extrapolating these figures to the total US population results in excess spending of $709 million for trimodal therapy compared to less costly radical cystectomy for patients diagnosed in 2011.

Conclusions: Trimodal therapy was associated with significantly decreased overall and cancer-specific survival resulting in excess national spending of more than $700 million in 2011 compared with radical cystectomy. These findings have important health policy implications regarding appropriate use of high-value based care among patients who are candidates for either treatment.
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Clinical Epidemiology Research - Student

HISTOLOGICALLY AGGRESSIVE BASAL CELL CARCINOMAS ARE MORE COMMON ON THE EAR AND NOSE

Jay Truitt, Graduate School of Biomedical Sciences
Alison Lowe, MD, Department of Dermatology
Rebecca Philips, MD, Department of Dermatology
Janice Wilson, MD, Department of Dermatology
Brent Kelly, MD, Department of Dermatology

Histological classification of basal cell carcinoma (BCC) is essential for the determination of the tumor type and its biological behavior. High risk types of BCC, such as morpheaform, infiltrative, and sclerotic, have a greater likelihood of subclinical spread, aggressive local behavior, and an increased probability of local recurrences and incomplete excision. Thus, it is clinically important to know which areas of the body are more likely to have these histologically aggressive BCCs. We hypothesize that the ear and nose are the most probable sites for histologically aggressive BCCs. Information was collected for all the biopsy proven BCCs from the University of Texas Medical Branch (UTMB) from August 2011 to September 2016 that included age, gender, location, specimen size, and tumor subtype. During this period, there were 1504 BCCs in either the nasal or periauricular areas with 3.7% of the nasal BCCs and 6.3% of the periauricular BCCs classified as histologically aggressive (i.e., morpheaform, infiltrative, and sclerotic). These high-risk types of BCC were overrepresented in the nasal and periauricular areas as compared to the rest of the body and had a male preponderance. For example, of the 242 histologically aggressive BCCs from all body areas during this period, 29.3% were located on either the nasal or periauricular areas and 71.4% were in males. These results give evidence that histologically aggressive BCCs are more common on the ears and nose, and although these areas only comprise approximately 2% of the total body surface area, they are more likely to be affected by histologically aggressive BCCs relative to other areas of the body. Knowledge of this information will help guide a physician’s clinical judgment in providing appropriate management.
INCREASING THE USE OF PHARMACOGENETIC TESTING AS A TOOL TO REDUCE POLYPHARMACY IN LONG-TERM CARE NURSING HOME RESIDENTS

Josie Tombrella, MS, School of Nursing

Objective: Poor outcomes associated with polypharmacy warrant action to reduce its occurrence in the geriatric population. While deprescribing medication is an obvious solution, it is often difficult to know which medications are helping and which are harmful. Pharmacogenetic testing predicts how an individual will metabolize certain medications based on his or her unique genetic profile, allowing healthcare providers to prescribe more safely and effectively. The purpose of this DNP project is to evaluate the use of pharmacogenetic testing to identify medication change opportunities for long-term care nursing home residents with polypharmacy.

Methods: A retrospective chart review for 34 long-term care nursing home residents that underwent pharmacogenetic testing in November of 2016 will be performed. Data to be collected for analysis include the number of medications taken one month prior to and six months after testing. Additionally, potential and actual cost savings will be calculated for each resident based on the number of medication changes recommended in addition to the actual changes made. Medication costs will be estimated using national data sources.

Results: Expected outcomes include a decrease in the number of prescribed medications for long-term care nursing home residents with polypharmacy that underwent pharmacogenetic testing and significant cost savings based on recommended medication changes.

Conclusion: Polypharmacy is a challenging problem for healthcare providers but pharmacogenetic testing is an evidence-based solution with promising potential. Implementation of this testing offers healthcare providers the realization of individualized medication profiles that allow for a more personalized approach to patient care. Through dissemination of project results, the author hopes to increase understanding and use of this tool to guide prescribing and describing practices, ultimately decreasing polypharmacy.
ANTI-PSYCHOTIC REDUCTION IN THE NURSING HOME

Jennifer Young, MSN, APRN, Department of Internal Medicine - Geriatrics
Vinod Kaushik, MD, Department of Internal Medicine - Geriatrics

Background:
In 2015, CMS established the goal to reduce the percent of Long Term Care nursing home patients receiving anti-psychotic medication (%LTC AP) by 25% by the end of 2015 and by 30% the end of 2016 and focus on non-pharmacological interventions. We aimed to reduce the nursing home %LTC AP to below state average over 6 months.

Project Description:
Quarterly medication reviews were done for all patients under our team’s care. We created a log of those on anti-psychotics, order, diagnosis, last prn use date, and last gradual drug reduction. Gradual dose reductions were performed on all patients on Anti-Psychotics at least annually. All orders from other prescribers such as the facility psychiatry team were screened by our team for appropriate use and dosage. We discussed our goal of reducing anti-psychotics with our facility psychiatry team and gave nursing staff in-service instruction on reduction of anti-psychotic use, recognizing pain in dementia, assessment of behavior changes, and using non-pharmacological measures instead of anti-psychotics.

Outcomes:
At baseline in Q3 of 2015, the %LTC AP at NH 1 was 31%, compared to 19.8% in Texas and 16.9% nationally. By Q1 2016, the %LTC AP at NH 1 dropped to 15.1%. As of Q2 2017, this rate has remained below state and national levels since Q3 2016.

Discussion:
This QI project successfully reduced the level of anti-psychotic medication at NH 1. We plan to continue quarterly monitoring anti-psychotic medication use in our nursing home patients for appropriate diagnosis, dose reduction, and elimination when possible. We also plan to continue educating nursing staff on pain assessment, assessment of behavior changes, and non-pharmacological alternatives to anti-psychotic medications.
ZINC DEFICIENCY RELATED ANOREXIA IN PATIENT WITH RA ASSOCIATED WITH SEVERE CHRONIC DIARRHEA TRIGGERED BY LEFLUNOMIDE.

Anna Rotkiewicz, MD, Department of Internal Medicine - Geriatrics
Jonathan Hommel, PhD, Department of Pharmacology
Mukaila Raji, MD, Department of Internal Medicine - Geriatrics

Case Presentation: 79-year-old male seen in clinic for evaluation of anorexia with 20 pounds weight loss who was discharged 2 times from the hospital without finding the cause of sudden onset chronic diarrhea. His problem started 1 week after he started leflunomide. He developed diarrhea for which he was admitted to the hospital 2 weeks later. Stool frequency did not decrease with discontinuation of leflunomide. He was readmitted few weeks later with continuing diarrhea and weight loss. After extensive work-up despite taking Imodium after every bowel movement, he still reported 4 loose BMs a day, nausea, lack of appetite, dysphagia and loss of taste.

Diagnosis and Treatment: Patient was diagnosed with protein-calorie malnutrition due to acute on chronic zinc deficiency related diarrhea, causing multiple geriatric syndromes: anorexia, weight loss, frailty with inability to walk, depression, cognitive impairment, insomnia. After given zinc carnosine, supplemental protein with multivitamins, within one week, patient bowel function had improved so we discontinued Imodium; by 4 months, the patient had gained back 20 pounds.

Discussion: The case highlights importance of knowledge of zinc deficiency symptomatology. Lack of reliable laboratory testing of Zinc deficiency prompts us to make diagnosis on clinical grounds.

The mechanism of leflunomide action is blockage of metalloenzyme dihydroorotate dehydrogenase containing zinc. Interestingly zinc deficiency symptomatology strongly resembles leflunomide frequent side effects (diarrhea, loss of smell and taste, hair loss, loss of appetite, nausea, confusion, sleeplessness, acne, itching, spontaneous wounds, fatigue, tingling sensation, muscle spasm, depression, horizontal nail lines, tinnitus). It raises research question if leflunomide might be causing zinc deficiency.
WHEN BACK PAIN BECOMES OMINOUS: A CASE OF HIGH GRADE NEUROENDOCRINE CARCINOMA OF KIDNEY ORIGIN IN A GERIATRIC PATIENT.

Olusola Onoviran, MD, Department of Internal Medicine - Geriatrics

Background: Back pain is a common but disabling disorder in the elderly. Causes are mostly benign. However, back pain can herald the onset of serious pathologies, especially when it starts with minimal injury or is associated with unintentional weight loss. We present back pain due to diffuse neuroendocrine neoplasm of kidney origin.

Case presentation: NE, 71 year old male who presented to his chiropractor with back pain after a strenuous exercise. Despite initial relief, he progressed to dyspnea, abdominal pain radiating to the back, constipation and a 15-pound weight loss.

Physical and laboratory evaluation were normal. Chest radiograph showed a pathological compression fracture of T9. CT thorax demonstrated a large left renal mass invading the left kidney and collecting system, with evidence of nodal and bony metastasis. MRI thoracic confirmed these.

Fine needle biopsy of T2 revealed high grade neuroendocrine tumor consistent with metastatic small cell carcinoma. Renal biopsy was not done because patient opted for hospice care after discussion about prognosis. Despite spinal radiation, patient died within 3 months of presentation.

Discussion: Poorly differentiated neuroendocrine carcinomas from the kidneys are extremely rare. Only 42 cases were reported in literature as of 2009. Neuroendocrine neoplasms are epithelial neoplasms, which may arise in any organ. Many features are characteristic of the organ of origin. These tumors have aggressive course and poor prognosis, especially when of small cell non-pulmonary origin. Recurrence rate is high.

This demonstrates that vigilant for red flag symptoms in back pain patients is important. Requiring additional workup early. Even when earlier detection may not lead to curative treatment, prompt diagnosis will lead to appropriate palliative measures at end of life.
OUTCOMES-BASED REHABILITATION USING ACUPUNCTURE FOR CHRONIC PAIN AND ANXIETY: A CASE REPORT

Donald Lefeber, MSOM
Jiazhen Li, MD, LAc
William Paske, PhD

Objective: This case reports on the use of acupuncture for osteoarthritis of the lower back co-presenting with chronic anxiety in a 90-year-old female patient.

Methods: Acupuncture treatment was administered on this patient for seven months. Treatment frequency began at 1x/week and after 3 months was reduced to every other week following. Physical measurements by FDA-approved medical instrument RU-Fit™, obtained data based on fine motor control (FMC), reaction time, hand strength and coordination variation before and after acupuncture treatments. Assessment and evaluation of mental health condition regarding chronic anxiety was done by the Geriatric Anxiety Scale (GAS) version 2.0. In addition, anecdotal evidence from acupuncture treatment outcomes and effects was collected by practitioner’s observation and reports from patient’s caretaker (daughter).

Results: FMC measurements from RU-Fit™ were: in the left hand started at 8% and the right hand at 15% and within one month we saw improvements rise to 79% in the left hand and 91% in the right hand; throughout entire treatment period FMC measurements remain significantly higher than original scores. After 3 months of acupuncture treatment, GAS scores improved by 37% as a whole, while sub-scores improved as follows, somatic improved by 47.1%, cognitive by 16.7%, affective by 47.4%.

Conclusion: Data gathered from investigative tools indicate that physical and mental health improvements are derived from acupuncture treatments and may possess a reciprocal relationship. Further investigations and studies are needed for the understanding of effectiveness of acupuncture in order to establish optimal treatment protocols and outcomes for patients with co-morbid conditions in the older adult population.

Key Words: Holistic intervention, Integrative Medicine, Acupuncture, Chronic pain, Anxiety, Mind-body-spirit
UTILIZING ACADEMIC HEALTH CARE ARENAS TO SUPPORT SENIORS AGING IN PLACE WITHIN OUR COMMUNITIES

Linda Moore, Other, School of Nursing

Seniors remaining in their homes, opting out of moving into assisted living is more the norm rather than the exception. Estimates indicate that the numbers of seniors over the age of 65 will rise to greater than 72 million by the year 2030, residing in their homes until death. Healthy People 2020 realizes this as a primary concern in terms of over-all health, function and quality of life of older adults. Recent reports indicate that we are at a precipice in terms of how our older Americans will be cared for. Creating partnerships with interested health-care community partners and institutions of higher education is a practical and engaging option. An untapped opportunity, young adults studying toward goals of becoming health care professionals (nurses, physicians, and other fields of health care) may find this to be a viable clinical opportunity by going out to the aging individuals' homes performing health-welfare evaluations. The purpose of this study was to develop a clinical nursing partnership with a community-based organization which had home-bound seniors. Utilizing evidence-based tools, students traveled to selected groups of seniors’ homes that allowed them to engage in direct dialogue and assessment to include education regarding medications, exercise and nutrition. Information collected by the students was maintained in the senior’s home. At the end of the clinical rotation, both seniors and students completed a survey that allowed mixed method results. Findings revealed positive outcomes for both seniors as well as students who expressed the importance of this experience. Future projects hint toward expansion of partnerships, linking students in multiple health care disciplines to make visits to home-bound individuals having high risk health conditions reducing hospital readmissions.
STUDENT ACCEPTANCE OF AN ONLINE MCAT GUIDED PROGRAM

Berengaria Navarre, MS, School of Medicine
Norma Perez, MD, DrPH, Hispanic Center of Excellence
Sarah Toombs Smith, PhD, Sealy Center on Aging

PURPOSE: We developed a 12-week online program to prepare primarily underserved Hispanic undergraduates for the Medical College Admission Test (MCAT). We asked those who completed the program to assess their improvement after the program, rate the program elements, and describe their general acceptance of the program.

METHODS: Six cohorts of undergraduate premed students (N=49) took the online course, from February 2014 to May 2016; 46 (93%) finished the program. Of those who finished, 56% (N=26) completed a short online questionnaire; these students were demographically similar to the entire cohort. Using a 5-point Likert scale, students assessed their preparation for the MCAT before and after the program; their level of study before and during the program; their preparation for the Verbal Reasoning section before and after the program; and the overall effectiveness of the program and that of the science content, announcements, additional resources and discussions. They rated the Verbal Reasoning section, specially prepared for this program, using a 5-point Likert scale, in terms of the presenter’s expertise and the extent to which it helped them with engagement, preparation, strategy, organization, motivation and focus. They were asked whether they would take a class from the presenter in the future.

RESULTS: Students rated their preparation and level of study higher after the program. They rated the program and its elements Very Good to Excellent. They rated the Verbal Reasoning component highly and agreed that it helped them prepare for the MCAT. They would take a class or watch more tutorials from the Verbal Reasoning presenter.

CONCLUSIONS: Students responded well to an online program which included many features designed to reinforce engagement with learning.
IDENTIFYING PREDATORY JOURNALS

Sarah Toombs Smith, PhD, Sealy Center on Aging

Problem: Predatory journals are on the rise. How can you identify them?

Methods: Beall’s List of Predatory Publishers indicated an alarming rise in their number. The World Association of Medical Editors developed a checklist of criteria to check for in potential journals. A brief inspection of journal attributes can help you spot predatory publishers.

Results: Predatory journals differ from legitimate ones in important ways. In the title, they often encompass disparate fields of study. They may have a small or nonexistent Editorial Board, or members from only a few countries/institutions. The review period or instructions to authors may be suspiciously brief. Most tellingly, the most important instruction may be the cost of publication.

Conclusion: A brief critique of journal attributes may help you spot predatory journals. Reputable publishers do not charge for review.
EDITORIAL SERVICES IN THE SEALY CENTER ON AGING

Sarah Toombs Smith, PhD, Sealy Center on Aging

Faculty, students & fellows in the Sealy Center on Aging access advanced editorial and development services to help them write grants and produce journal articles. Dr. Toombs Smith uses her extensive experience in writing, grant writing and editorial mentoring to help in development, planning, writing and editing journal articles, as well as such post-submission issues as responding to reviewers’ comments. She helps support large, multi-investigator grants; helps with development and writing of individual proposals; and helps develop and maintain the SCoA communication infrastructure. A SCoA Fellow and board-certified Editor in the Life Sciences, Dr. Toombs Smith (PhD, 1986, University of Notre Dame) joined the Center in December 2003 after eight years at UTMB as an Institutional Coordinator and Director (Office of Institutional Research). In addition to her regular lectures for geriatric fellows, she has lectured and conducted workshops for the UTMB Hispanic Center of Excellence, the Clinical Research Scholars Program (CRSP), the Bridging Interdisciplinary Research Careers in Women’s Health (BIRCWH), Grants for Lunch, as well as nationally (Hampton University Minority Mens Health Initiative) and internationally (Xuzhou Medical College, China). She is author of the MCAT preparation guide 12 Week Plan for Verbal Reasoning Success, the MMHI Grant Writing Workbook and the popular 30 Secrets to Success in Academic Medicine.
Geriatric Medicine Fellowship Program

Mukaila Raji, MD – Director

This program is a fully accredited training program in geriatric medicine for graduates of internal medicine or family medicine residencies. Fellows become board-eligible after completion of the first year of the program that concentrates on clinician education. Clinical training is obtained in various settings including a geriatric outpatient clinic, an acute geriatric inpatient unit, a multidisciplinary consultation service, and a community-based long-term care program. Fellows may pursue a second year in the program with emphasis on geriatric clinical research.

**Clinical Training**

The Fellowship provides clinical training in various settings including:
- Geriatric Outpatient Clinic
- Acute Geriatric Inpatient Unit
- Community Long-Term Care Program
- Skilled Nursing Facility Service
- Home Visit Program
- Hospice
- Geriatric Psychiatry Service
- Additional training in rehabilitation, rheumatology, wound care

**Geriatric Medicine Conferences**

The Geriatric Conferences are a series of case conferences, board reviews, journal clubs or lectures designed to provide the Geriatric Medicine Fellows with a broad scope of Geriatric education.

**GERIATRIC LECTURE SERIES**

The Geriatric Lecture Series is designed to provide trainees with in-depth, formal instruction covering a wide range of topics in Geriatric Medicine. The Geriatric Lecture Series is a detailed, factual and formal lecture series by expert presenters from UTMB which allows for individual instruction to the fellows. The only required audience will be the fellows in the Geriatric program, although this series is open to all interested individuals including trainees from other programs, individuals of non-physician disciplines with interests in aging, and faculty in Geriatric Medicine.

**GERIATRICS JOURNAL CLUB**

The Geriatric Medicine Journal Club is designed to provide trainees with an increased knowledge of recent medical literature related to geriatric medicine and an improved ability to read in a critical manner. The Geriatric Medicine Journal Club is an interactive discussion of recently published literature presented by a fellow and another individual, who will present and lead discussion to an audience of all fellows in the program, trainees from other programs, individuals of non-physician disciplines with interests in aging, and faculty in Geriatric Medicine.

**GERIATRIC MEDICINE BOARD REVIEW COURSE**

The Geriatric Medicine Board Review Course is designed to provide trainees with a comprehension review of the clinical approach to illnesses of special interest to geriatric medicine and diseases prominent in the elderly. The Geriatric Medicine Board Review Course is an interactive presentation by the fellow in a review format. The audience is all fellows in the program, trainees from other programs, and faculty in Geriatric Medicine.

**GERIATRICS CASE CONFERENCE**

The Geriatrics Case Conference is designed to provide trainees a meaningful exposure to complex and challenging diagnostic and treatment issues for clinical and psychosocial problems of older patients. The Geriatrics Case Conference is an interactive presentation of actual clinical cases by the fellow or a faculty in the Division of Geriatric Medicine. The audience is all fellows in the program, trainees from other programs, and faculty in Geriatric Medicine.

Contact Vicki Hudson at (409) 772-1756 or vilhudso@utmb.edu for more information.
Medical Student Training in Aging Research (MSTAR)

The Medical Student Training in Aging Research (MSTAR) Program offers an 8-12 week intensive experience in aging research for first-year medical students. The goals are to: 1) include trainees from diverse backgrounds, 2) offer individualized, structured training that includes a mentor, a research project, didactics and supplementary experiences that result, at minimum, in an abstract presentation at AGS or at a National Student Research Forum, 3) promote a sense of identity and membership with the field of aging research, 4) incorporate responsible conduct of research into the experience and 5) develop and refine innovative approaches to promotion, training and evaluation. The program exposes students early in their careers to exciting opportunities and engaging mentors, and offers support to remain engaged after the experience. It helps prepare a new generation of mentors through the supervised junior mentor program. It provides partnerships between aging and numerous medical specialties. It is based on a structured, successful didactic sequence that focuses on the trainee’s concerns as they implement their own project. Training plans are developed for each student to reflect their individual research interests and progress is monitored by mentors chosen specifically with expertise to match the student's research topic. The training plan includes a preparatory phase, the summer experience and post-experience support.

MSTAR, Grant #: T35 AG038048
A collaborative effort between the University of Texas Health Science Center-San Antonio & the University of Texas Medical Branch

2017  MSTAR Students, topics & mentors:

1) Edgar Esparza (UTMB)
Antidiabetic Prescription Drug Trends in the United States from 2007 to 2014
Mentor: Hemalkumar Mehta, PhD

2) Usama Jazzar (UTMB)
Population-Based Assessment of the Impact of Psychiatric Illness and Survival Outcomes Following Treatment for Patients with Muscle-Invasive Bladder Cancer
Mentor: Stephen B. Williams, MD

2016  MSTAR Students, topics & mentors:

1) Leyla Akhverdiyeva (UTMB)
Estimation of Appendicular Skeletal Muscle Mass Using Percent Body Fat Determined by Bioelectrical Impedance Analysis in Acutely Ill Elderly Adults
Mentors: Elena Volpi, MD, PhD & Rachel Deer, PhD

2) Justin Howard (UTMB)
A Mouse Model of Chronic Obstructive Pulmonary Disorder Induces Skeletal Muscle Atrophy and Alters Oxidative Capacity
Mentor: Christopher Fry, PhD

3) Jason Livingstone (UT Health Science Center – San Antonio)
Effect of Near-Infrared Light on CREB Phosphorylation in the Hippocampus of Tg2576 Mice
Mentors: Giulio Taglialetela, PhD & Michele Comerota
2015 MSTAR Students, topics & mentors:

1) Mohammad Ali (UTMB)
   Age-Related Functional and Molecular Changes in White Adipose Tissue
   Mentors: Labros Sidossis, PhD & Maria Chondronikola, PhD, RDN

2) Abida Hasan (A.T. Still University School of Osteopathic Medicine - Mesa, AZ)
   Development of a Pilot Survey: Addressing Patient-Centered Outcomes for Rehabilitation Post Stroke
   Mentors: Timothy Reistetter, OTR, PhD & Shilpa Krishnan, PT, PhD

3) Jacob Moran (UTMB)
   Quality Improvement Project: Improving the Number of Times Geriatric Patients Bring Their Medication Bottles into Clinic
   Mentor: Elizabeth Jaramillo, MD

2014 MSTAR Students, topics & mentors:

1) Joseph Gotesman (MS II at Albert Einstein School of Medicine)
   The Effect of Reactivation of Telomerase on the Regenerative Potential of Adult Stem Cells
   Mentors: Ronald DePinho, MD & Deepavali Chakravarti, PhD (MD Anderson)

2) Destiny Pegram (UTMB)
   The Effect of Aging on the Metabolic Response to Severe Burn Injury
   Mentors: Maria Chondronikola, MS, RDN & Labros Sidossis, PhD

3) Amanda Randolph (UTMB)
   Metabolic Effects of Aerobic Exercise and Post-Exercise Amino Acid Supplementation in Healthy Older Adults
   Mentors: Melissa Markofski, PhD & Elena Volpi, MD, PhD

4) Abigail Richison (UTMB)
   A Randomized Controlled Double Blind Acute Study: Effects of Protein Blend Supplementation After Exercise on Muscle Protein Synthesis in Older Adults
   Mentors: Michael Borack, MSc & Blake Rasmussen, PhD

5) Travis Urban (UTMB)
   Developing an Investigational and Screening Assay for Cognitively Enhancing Protein Complexes
   Mentors: Kelly Dineley, PhD & Larry Denner, PhD
Research Services

**Mission:** Facilitate the UTMB research mission, from funding identification through project completion by:

- Providing research-specific resources and education
- Promoting the responsible conduct of research
- Advising and assisting with administrative policies and regulations

**Who we are:**

- Animal Resources Center (ARC)
- Clinical Research (OCR)
- Institutional Care and Use Committee (IACUC)
- Institutional Review Board (IRB)
- Office of Sponsored Programs
- Post Approval Monitoring (PAM)
- Research Education

**How we meet our mission:**

**Website**

The Research Resources website [https://research.utmb.edu/](https://research.utmb.edu/) allows researchers to access tools to help them wherever they are in the project process.

These tools include:

- Links to required forms
- Policies & Procedures
- Toolkits
- Find Funding Tools
- Calendar of Workshops
- News & Announcements
- Directory to Personnel
- Much more ...

**Blog**

The Research Resources blog [https://research.utmb.edu/researchresourcesblog](https://research.utmb.edu/researchresourcesblog) provides current – updated funding opportunities, news for researchers on and off campus, NIH updates and other relevant news for researchers.

**Education/Training**

Education and training are offered through programs and monthly forums. For current education/training opportunities, visit [https://research.utmb.edu/educationprograms](https://research.utmb.edu/educationprograms)

Updates, reminders & new courses are communicated via the Research Listserv and the UTMB Daily Announcements.
Open Door:
Anyone in Research Services can be contacted at any time. Employee lists with phone and email information can be found under relevant sections.

Or you may visit our offices:
4.400 Rebecca Sealy Hospital
Mailing Route 0156
(409) 266-9400
Research.office@utmb.edu

Tools on our Website:

Find Funding & Collaborations
https://research.utmb.edu/findfunding

Influen
t
http://utmb.influent.utsystem.edu

SciVal Funding
http://www.funding.scival.com/home

Proposal Central
https://proposalcentral.altum.com/

Communicate with UTMB Research Community (NEW! ListServ to debut in October 2017)
Effort Reporting
https://research.utmb.edu/effort

Institutional Review Board
https://research.utmb.edu/irb

Institutional Animal Care and Use Committee
https://research.utmb.edu/IACUC

Policies & Procedures
https://research.utmb.edu/policies

Online Forms
https://research.utmb.edu/forms

Pre-Award Toolkit
https://research.utmb.edu/preaward-toolkit

Post-Award Toolkit
https://research.utmb.edu/postaward-toolkit

Training Grant
https://research.utmb.edu/traininggrants

Research Education Class Registration
https://my.utmb.edu/pstraining

Grants & Contracts Accounting
https://www.utmb.edu/finance/grantscontracts/default.asp
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<td>Berenson, Abbey B</td>
<td>Interdisciplinary Women’s Reproductive Health Fellowship</td>
<td>NICHD T32</td>
<td>09/16/13 - 04/30/18</td>
<td>$920,062</td>
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<td>Bhavnani, Suresh</td>
<td>Leveraging Visual Analytics for the Identification of Patient Subgroups: Applications to Improve the Prediction of Hospital Readmission in the Elderly</td>
<td>Patient-Centered Outcomes Research Institute</td>
<td>4/1/17 - 3/31/22</td>
<td>$525,000</td>
<td>$105,000</td>
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<td>Branski, Ludwik K</td>
<td>Growth Hormone Therapy for Muscle Regeneration in Severely Burned Patients</td>
<td>Army Medical Research Acquisition Activity</td>
<td>04/15/15 - 04/14/20</td>
<td>$2,426,293</td>
<td>$485,259</td>
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<td>Bryant, Mon S</td>
<td>Multidirectional treadmill walking in Parkinson’s disease</td>
<td>VA Rehabilitation Research &amp; Development</td>
<td>07/2012 - 06/2017</td>
<td>$896,734</td>
<td>$179,347</td>
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<td>Cai, Jiyang</td>
<td>Mechanisms of Age-Related RPE Dysfunction and CNV</td>
<td>NEI R01</td>
<td>07/01/12 - 06/30/17</td>
<td>$1,980,570</td>
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<td>Chen, Yan</td>
<td>mTORC1-TFEB pathway in degeneration of the RPE</td>
<td>NEI R01</td>
<td>8/31/17 - 9/1/22</td>
<td>$1,941,225</td>
<td>$388,245</td>
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<td>Chen, Yan</td>
<td>Metabolic Regulation by Mechanistic Target of Rapamycin in the Retinal Pigment Epithelium</td>
<td>BrightFocus Foundation</td>
<td>10/01/17 - 9/30/19</td>
<td>$160,000</td>
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<td>Deer, Rachel</td>
<td>Nutritional supplementation and testosterone therapy to enhance recovery from hospitalization in older adults</td>
<td>UTMB CTSA TL1</td>
<td>1/1/16 - 12/31/17</td>
<td>$56,618</td>
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<td>Fujise, Kenichi</td>
<td>Fortilin, P53, and Atherosclerosis</td>
<td>NHLBI</td>
<td>1/5/13 - 12/31/17</td>
<td>$1,878,050</td>
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<td>Gelman, Benjamin</td>
<td>Age related determinants of HAND: A 12 year follow-up of CHARTER participants</td>
<td>NIMH R01 (Univ Ca, San Diego)</td>
<td>9/24/15 - 6/30/17</td>
<td>$519,250</td>
<td>$259,625</td>
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<td>Goodwin, James S.*</td>
<td>Patient Centered Outcomes Research in the Elderly</td>
<td>AHRQ</td>
<td>5/1/13 - 01/31/18</td>
<td>$4,970,000</td>
<td>$997,410</td>
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<td>Goodwin, James S.*</td>
<td>Care of the Elder Hospitalized Patient: The Role of Hospitalists</td>
<td>NIA R01</td>
<td>5/31/08 - 6/1/19</td>
<td>$2,433,000</td>
<td>$266,271</td>
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<td>Goodwin, James S.*</td>
<td>Comparative Effectiveness Research of Cancer in Texas (CERCIT) RP101207</td>
<td>Cancer Prev Res Inst TX (CPRIT)</td>
<td>9/1/16 - 8/31/21</td>
<td>$6,000,000</td>
<td>$1,242,125</td>
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<td>Goodwin, James S.*</td>
<td>Established Investigator Award in Cancer Prevention &amp; Control</td>
<td>NCI K05</td>
<td>12/1/08 - 04/14/20</td>
<td>$1,002,989</td>
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<td>Ha,Yonju</td>
<td>The Role of CXCL10/CXCR3 in Neurodegeneration during Glaucoma</td>
<td>BrightFocus Foundation</td>
<td>04/15/15 - 04/14/17</td>
<td>$100,000</td>
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<td>Hawkins, Brigit E.</td>
<td>Using a novel tau monoclonal antibody immunotherapy to prevent dementia after TBI</td>
<td>Darrel K. Royal Research Fund for Alzheimer's Disease</td>
<td>6/1/16 - 5/30/18</td>
<td>$150,000</td>
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<td>Hazra, Tapas K.</td>
<td>Preferential Single-Strand Break Repair in the Active Genes of Mammalian Cells</td>
<td>NIGMS R01</td>
<td>07/01/12-06/30/17</td>
<td>$1,673,440</td>
<td>$334,688</td>
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<td>Hazra, Tapas K.</td>
<td>Preferential Single-Strand Break Repair in the Active Genes of Mammalian Cells Supplement</td>
<td>NIGMS R01 Supplement</td>
<td>07/01/12-06/30/17</td>
<td>$219,810</td>
<td>$43,962</td>
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<td>Hellmich, Mark</td>
<td>Surgical Research Training in Gastrointestinal Disease</td>
<td>NIDDK T32</td>
<td>07/01/13-06/30/18</td>
<td>$916,195</td>
<td>$183,239</td>
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<td>Herndon, David N</td>
<td>Mechanisms of fenofibrate alone or combined with propranolol in burned patients</td>
<td>NIGMS R01</td>
<td>08/05/14-04/30/18</td>
<td>$4,346,384</td>
<td>$1,102,701</td>
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<td>Karmarkar, Amol</td>
<td>Comparing access and effectiveness of post-acute care settings among Medicare beneficiaries</td>
<td>NICHD K01</td>
<td>4/15/16-4/14/21</td>
<td>$636,235</td>
<td>$127,247</td>
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<td>Kayed, Rakez</td>
<td>Tau oligomers toxicity and spreading through the eye brain axis</td>
<td>UT Systems grant</td>
<td>6/1/16-5/30/17</td>
<td>$100,000</td>
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<td>Kayed, Rakez</td>
<td>Formation and propagation of tau oligomeric strains in Alzheimer's disease</td>
<td>NIA R01</td>
<td>7/1/16-6/30/21</td>
<td>$1,937,500</td>
<td>$387,500</td>
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<td>Kayed, Rakez</td>
<td>Intersection of alpha synuclein and tau contribution to neurotoxicity</td>
<td>NINDS R01</td>
<td>7/1/16-6/30/21</td>
<td>$2,820,750</td>
<td>$564,150</td>
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<td>Kuo, Yong Fang*</td>
<td>Assessing the Role of Nurse Practitioner in Primary Care of Older Adults</td>
<td>AHRQ R01</td>
<td>6/1/16-05/31/20</td>
<td>$745,575</td>
<td>$186,394</td>
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<td>Kuo, Yong Fang*</td>
<td>Pattern, Variation and Outcomes of Opioid Prescription in Older Adults</td>
<td>NIDA R01</td>
<td>6/1/16-05/31/20</td>
<td>$1,390,000</td>
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<td>Lewis-Powell, Zakkoyya H.</td>
<td>TAME health: Technology Activity Monitors Effect on Health</td>
<td>American Heart Association (Southwest)</td>
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<td>Liu, Hua</td>
<td>The Role of Epac1 in Ischemic Retinopathy</td>
<td>American Heart Association (Southwest)</td>
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<td>$109,312</td>
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<td>Lyons, Elizabeth</td>
<td>Self-Monitoring Activity: A Randomized Trial of Game-Oriented Applications</td>
<td>American Cancer Society</td>
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<td>$712,000</td>
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<td>LEVEL UP: Video Games for Activity in Breast Cancer Survivors</td>
<td>NCI K07</td>
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<td>$496,992</td>
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<td>Markides, Kyriakos S</td>
<td>Longitudinal Study of Mexican American Elderly Health</td>
<td>National Inst on Aging</td>
<td>02/15/15-02/14/20</td>
<td>$2,144,678</td>
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<td>Markides, Kyriakos</td>
<td>Clinical and Behavioral Science training in Aging and Health Disparities</td>
<td>National Inst on Aging</td>
<td>04/15/15-04/14/20</td>
<td>$661,567</td>
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<td>Markides, Kyriakos S</td>
<td>Cognitive aging in a population-based sample of older adults in Puerto Rico</td>
<td>NIA (Univ Alabama)</td>
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<td>$55,913</td>
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<td>Mehta, Hemalkumar B</td>
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<td>UT System grant</td>
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<td>Micci, Mari</td>
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<td>NIA R03</td>
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<td>Nowakowski, Sara</td>
<td>Cognitive Behavioral Therapy for Insomnia and Nocturnal Hot Flashes in Menopause</td>
<td>NINR K23</td>
<td>9/27/12 - 05/31/16</td>
<td>$644,445</td>
<td>$128,889</td>
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<td>Oberhauser, Andres F.</td>
<td>The UNC-45 chaperone as a modulator of myosin biogenesis and function</td>
<td>NIGMS R01</td>
<td>7/1/16 - 6/30/20</td>
<td>$1,282,568</td>
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<td>Ottenbacher, Kenneth J.</td>
<td>Long-term health outcomes in Mexican American older adults</td>
<td>NIMHD R01</td>
<td>2/10/16 - 2/9/20</td>
<td>$1,550,000</td>
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<td>Ottenbacher, Kenneth J.</td>
<td>Center for Large Data Research &amp; Data Sharing in Rehabilitation</td>
<td>National Institute on Disability Independent Living and Rehabilitation Research</td>
<td>10/01/15 - 09/30/20</td>
<td>$5,200,000</td>
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<td>NICHD K12</td>
<td>10/16/07 - 08/31/17</td>
<td>$9,722,358</td>
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<td>NIDRR H133</td>
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<td>Hospital Readmission and Inpatient Medical Rehabilitation</td>
<td>NICHD R01</td>
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<td>$1,259,072</td>
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<td>Ottenbacher, Kenneth J.</td>
<td>Readmission and Disability Outcomes Related to Post Acute Care</td>
<td>Dept of Education</td>
<td>10/01/14 - 09/30/17</td>
<td>$598,819</td>
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<td>Paddon Jones, D.</td>
<td>Preserving muscle mass and function in bedridden older adults</td>
<td>NINR K23</td>
<td>02/15/12 - 12/31/17</td>
<td>$2,683,190</td>
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<td>Rasmussen, Blake</td>
<td>University of Texas Adult Clinical Center: Molecular Transducers of Physical Activity Consortium (MoTrPAC)</td>
<td>NIAMS</td>
<td>12/07/16 - 11/30/22</td>
<td>$1,036,818</td>
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<td>Rasmussen, Blake</td>
<td>A Randomized, Controlled Double Blind Longitudinal Study</td>
<td>DuPont Nutrition and Health</td>
<td>01/01/12 - 6/1/17</td>
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<td>Development and Evaluation of Rehabilitation Service Areas</td>
<td>AHRQ</td>
<td>8/31/17 - 9/1/22</td>
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<td>Rodriguez, Ana</td>
<td>Supplemt to UTMB’s Clinical and Translational Science Awards (CTSA) Program</td>
<td>NIH KL2 Mentored Career Development Award</td>
<td>9/1/2016 – 8/31/2018</td>
<td>$277,012</td>
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<td>Rodriguez, Ana</td>
<td>School-Based Human Papillomavirus Vaccination Program in the Lower Rio Grande Valley</td>
<td>CPRIT Prevention</td>
<td>08/31/2016–08/30/2019</td>
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<td>Sarkar, Partha S</td>
<td>The Pathogenic Role of DNA-Damage Response Pathway in the Diabetic Retina</td>
<td>NEI R01</td>
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<td>Sidossis, Labros</td>
<td>Mitigation of the Catecholamine Surge in Severely Burned Patients</td>
<td>NIGMS P50 (Herndon)</td>
<td>05/01/12-08/31/17</td>
<td>$1,748,223</td>
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<td>Srivastava, Satish K</td>
<td>Role of Aldose Reductase in Diabetic Complications</td>
<td>National Inst of Diabetes &amp; Digestive &amp; Kidney Diseases</td>
<td>03/15/15 - 03/14/20</td>
<td>$2,218,156</td>
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<td>Starkey, Jonathan M</td>
<td>Predictive model of chronic kidney disease in a Hispanic population</td>
<td>NLM K22</td>
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<td>$397,044</td>
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<td>Early Exercise in the Burn Intensive Care Unit</td>
<td>Army Medical Research</td>
<td>09/15/14 - 09/14/18</td>
<td>$1,079,350</td>
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<td>Suman, Oscar E</td>
<td>Oxandrolone and Exercise: A potent therapy in the rehabilitation from burns</td>
<td>NICHD</td>
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<td>$2,899,957</td>
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<td>Szczesny, Bartosz</td>
<td>Mitochondrial DNA: a target and effector of pulmonary epithelial cell injury</td>
<td>National Institute of Environmental Health Sciences</td>
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<td>Szczesny, Bartosz</td>
<td>Etiological link of mitochondrial genome damage and inflammatory response in airway epithelial cells.</td>
<td>American Lung Association. Lung Cancer Discovery</td>
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<td>Taglialetola, Giulio</td>
<td>Mechanisms of Resistance to Cognitive Decline in Alzheimer’s Disease</td>
<td>NIA R01</td>
<td>10/01/13 - 09/30/18</td>
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<td>Taglialetola, Giulio</td>
<td>Promoting resistance to Alzheimer's neuropathology with miRNAs from neural stem cell - derived exosomes</td>
<td>Kleberg Foundation</td>
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<td>NINDS</td>
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<td>NIA R56</td>
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<td>$725,531</td>
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<td>Volpi, Elena*</td>
<td>Identifying therapeutic targets of accelerated sarcopenia</td>
<td>NIA R01</td>
<td>8/1/16 - 7/31/21</td>
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<td>Volpi, Elena*</td>
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<td>UTMB Claude Pepper Older Americans Indepence Center</td>
<td>NIA P30</td>
<td>6/1/10 - 4/30/20</td>
<td>$ 8,787,810</td>
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<td>Volpi, Elena *</td>
<td>ASPIRE: ASPIrin to Reduce the Effects on the Elderly</td>
<td>NIA U01</td>
<td>10/10/11- 01/31/17</td>
<td>$ 408,000</td>
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<td>Volpi, Elena *</td>
<td>A Randomized Trial of a Multifactorial Fall Injury Prevention Strategy</td>
<td>NIA U01 (site PI)</td>
<td>06/01/14- 05/31/19</td>
<td>$ 100,841</td>
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<td>Wong, Rebeca</td>
<td>MHAS Cognitive Aging Ancillary Study</td>
<td>National Institute on Aging</td>
<td>9/1/15 – 5/31/18</td>
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<td>Wong, Rebeca</td>
<td>The Mexican Health and Aging Study - II (MHAS)</td>
<td>NIA R01</td>
<td>4/15/11- 4/14/21</td>
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<td>Wong, Rebeca</td>
<td>Health of Older Minorities - Training Grant</td>
<td>NIA T32</td>
<td>06/01/14- 06/01/18</td>
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<tr>
<td>Wu, Ping</td>
<td>Novel neuromuscular junction model to study mechanisms of muscle atrophy</td>
<td>UT System (UTHSC-Hou)</td>
<td>6/1/16 - 5/31/17</td>
<td>$ 35,000</td>
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<td>Wu, Ping</td>
<td>Etiological linkages of DNA/repair deficiencies in neurodegenerative disease</td>
<td>NINDS (Methodist Hospital Research Institute)</td>
<td>6/1/16 - 5/31/17</td>
<td>$ 155,000</td>
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<tr>
<td>Ye,Yumei</td>
<td>Ticagrelor improves remodeling, reduce apoptosis, inflammation and fibrosis and increase the number of progenitor stem cells after myocardial infarction</td>
<td>AstraZeneca LP</td>
<td>9/1/17-8/31/19</td>
<td>$ 175,215</td>
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<td>Ye,Yumei</td>
<td>DPP-4 inhibition by Saxagliptin prevents inflammation and renal injury by targeting the Nipr3/ASC</td>
<td>AstraZeneca LP</td>
<td>11/15/14</td>
<td>$ 164,024</td>
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<td>$ 1,833,425</td>
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<td>Zolochevska, Olga</td>
<td>Epigenetic Modulation of Amyloid Beta-resistant Synapses in Non-demented Subjects with Alzheimer's Neuropathology</td>
<td>NIA F31</td>
<td>7/21/17- 7/20/19</td>
<td>$ 64,268</td>
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**TOTAL AMOUNTS**

* Indicates primary appointment in Geriatrics

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<td><strong>$ 91,982,631</strong></td>
<td><strong>$ 22,581,546</strong></td>
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Aging Funding at UTMB, 2017

- **NIA**, $5,728,486, 25%
- **Non-NIH funding**, $5,888,137, 26%
- **Other NIH Institutes**, $10,964,923, 49%
<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
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<tbody>
<tr>
<td>Raju Bishwakarma</td>
<td>PCOR &amp; Medical Effectiveness</td>
<td>2015-2016</td>
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<tr>
<td>Rachel Deer</td>
<td>Clinical Trials &amp; Implementation</td>
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<td>Elfego Galvan</td>
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<td>Emily Hadley</td>
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<td>Ickpyo Hong</td>
<td>Health Disparities</td>
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<td>Ayodele Osasona</td>
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<td>Faranak Behnia</td>
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<td>Brian Downer</td>
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<td>Carrie Simmons</td>
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<td>Nina Tamirisa</td>
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<td>Melissa Markofski</td>
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<td>Gabriella Vargas</td>
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# Forum on Aging Student Awards

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<td>Leyla Akhverdiyeva</td>
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<td>Kara Barber</td>
<td>Neuroscience</td>
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<td>Jacqueline Contrera Avila</td>
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<td>Danelo Cortez</td>
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<td>Mary Margaret King</td>
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<tr>
<td>Kay Kulkarni</td>
<td>Rehabilitation</td>
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<td>Claudia Marino</td>
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<td>Keli Perino</td>
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<td>Michele Comerota</td>
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<td>Amit Kumar</td>
<td>Rehabilitation &amp; Disability</td>
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<td>Zakkoyya Lewis</td>
<td>Minority Health/Health Disparities</td>
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<td>Figaro Loresto</td>
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<td>Jacob Moran</td>
<td>CER/PCOR</td>
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<td>Ashley Nilson</td>
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<td>Joseph Saenz</td>
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<td>Samantha Sheller</td>
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<td>Michael Borack</td>
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<td>Kelsey English</td>
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<td>Amit Kumar</td>
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## Forum on Aging Student Awards

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<td>Amanda Randolph</td>
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<td>Vanessa Danquah</td>
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<td>Paul Reidy</td>
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<td>Kevin Barnes</td>
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<td>A. Varma</td>
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<tr>
<td>David Briley</td>
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SEALY CENTER ON AGING
LEFEBER SCHOLAR IN GERONTOLOGY

The Edward J. and Ellie Weisiger Lefeber, Sr. fund will be used to endow an annual academic prize for students in the School of Medicine at UTMB who earn the privilege of completing a special elective course in gerontology within the Department of Internal Medicine during their fourth year of studies at the School. The endowment will be used to fund a competitive prize of $500 with a match of $500 from the Sealy Center on Aging.

The successful applicant for the Lefeber Prize is given to the student who has demonstrated scholarly work in aging research. This may include participating in the Geriatric Research Elective, was a scholar in our Medical Student Training in Aging Research Program (MSTAR), and/or participated in mentored research related to aging.

Faculty members may nominate eligible students by submitting a one-page letter of nomination giving a brief explanation of:

- Student’s interests in Gerontology
- His/her learning objectives for the elective course

Nominations will be judged on the basis of clarity and feasibility by a committee made up of the Director of the Division of Geriatric Medicine, physicians from the Division of Geriatric Medicine, and faculty members from the Sealy Center on Aging.

The selected student shall be known as the Lefeber Scholar in Gerontology.

**Application Deadline: February 1, 2018**

Please forward nominations to Stephanie Burt at (409) 266-6975 or stburt@utmb.edu

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**Lefeber Scholar Awardees**

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Academic Year</th>
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<tbody>
<tr>
<td>Floyd Clinton Watson</td>
<td>School of Medicine</td>
<td>2003-2004</td>
</tr>
<tr>
<td>Jeffrey Clinton Lowry</td>
<td>School of Medicine</td>
<td>2004-2005</td>
</tr>
<tr>
<td>Terrence Min-Yee Chang</td>
<td>School of Medicine</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Alvaro Gerardo Moreira</td>
<td>School of Medicine</td>
<td>2006-2007</td>
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<tr>
<td>Jennifer Koval</td>
<td>School of Medicine</td>
<td>2007-2008</td>
</tr>
<tr>
<td>Rachel Finehout</td>
<td>School of Medicine</td>
<td>2008-2009</td>
</tr>
<tr>
<td>Lindsay Proctor-Tamborello</td>
<td>School of Medicine</td>
<td>2009-2010</td>
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<tr>
<td>Melanie Ketchandji</td>
<td>School of Medicine</td>
<td>2009-2010</td>
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<tr>
<td>Gloria Li</td>
<td>School of Medicine</td>
<td>2010-2011</td>
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<tr>
<td>Donald B. Warren</td>
<td>School of Medicine</td>
<td>2011-2012</td>
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<tr>
<td>Diana Torres</td>
<td>School of Medicine</td>
<td>2012-2013</td>
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<tr>
<td>Cody Gomez</td>
<td>School of Medicine</td>
<td>2013-2014</td>
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<tr>
<td>Nathaniel DeLaCruz</td>
<td>School of Medicine</td>
<td>2014-2015</td>
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<tr>
<td>Leyla Akhverdiyeva</td>
<td>School of Medicine</td>
<td>2015-2016</td>
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<tr>
<td>Chika Victoria Egbe</td>
<td>School of Medicine</td>
<td>2016-2017</td>
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<tr>
<td>Chiemeziem G. Eke</td>
<td>School of Medicine</td>
<td>2016-2017</td>
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