20th Annual Forum on Aging

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

October 20, 2016
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 20th 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 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
TABLE OF CONTENTS

Poster Index by First Author/Board Number Index………………... I

Poster Presentation Abstracts.................................................. II

Programs & Services/Award Winners ..................................... III

* Editorial Services
* Geriatric Medicine Fellowship Program
* MSTAR Program
* Research Services
* UTMB Aging-Related Grant Funding
* Forum on Aging Award Winners
* Lefeber Scholar Award Winners
# Presenting Author Index

Abstract/Board Number follows author’s name

* = Student poster

** = Post-doctoral poster

<table>
<thead>
<tr>
<th>Author</th>
<th>Board Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abumaria, Ibrahim</td>
<td>75*</td>
</tr>
<tr>
<td>Akhverdiyeva, Leyla</td>
<td>76*</td>
</tr>
<tr>
<td>Altamirano, Ariana</td>
<td>60*</td>
</tr>
<tr>
<td>Anderson, Elizabeth</td>
<td>9</td>
</tr>
<tr>
<td>Arentson-Lantz, Emily</td>
<td>74</td>
</tr>
<tr>
<td>Ayad, Martina</td>
<td>27, 28</td>
</tr>
<tr>
<td>Barber, Kara</td>
<td>12*</td>
</tr>
<tr>
<td>Bishwakarma, Raju</td>
<td>66, 67**</td>
</tr>
<tr>
<td>Bodani, Riddhi</td>
<td>13*</td>
</tr>
<tr>
<td>Bores, Juliana</td>
<td>38*</td>
</tr>
<tr>
<td>Briley, David</td>
<td>14*</td>
</tr>
<tr>
<td>Chamberlain, Albert</td>
<td>68**</td>
</tr>
<tr>
<td>Chondronikola, Maria</td>
<td>73</td>
</tr>
<tr>
<td>Chung, Tina</td>
<td>61*</td>
</tr>
<tr>
<td>Comerota, Michele</td>
<td>15*</td>
</tr>
<tr>
<td>Contrera Avila, Jaqueline</td>
<td>48*</td>
</tr>
<tr>
<td>Cortez, Danelo</td>
<td>30*</td>
</tr>
<tr>
<td>Deer, Rachel</td>
<td>81, 82**</td>
</tr>
<tr>
<td>Dierking, Leah</td>
<td>49, 50*</td>
</tr>
<tr>
<td>Dixon, Christopher</td>
<td>29</td>
</tr>
<tr>
<td>Downer, Brian</td>
<td>43</td>
</tr>
<tr>
<td>Downer, Paige</td>
<td>51*</td>
</tr>
<tr>
<td>Eslami, Vahid</td>
<td>58, 59</td>
</tr>
<tr>
<td>Farmer, Kathleen</td>
<td>16*</td>
</tr>
<tr>
<td>Flores, David</td>
<td>44</td>
</tr>
<tr>
<td>Fracassi, Anna</td>
<td>17*</td>
</tr>
<tr>
<td>Franklin, Whitney</td>
<td>18*</td>
</tr>
<tr>
<td>Galvan, Elfigo</td>
<td>83*</td>
</tr>
<tr>
<td>Garcia, Marc</td>
<td>55, 56**</td>
</tr>
<tr>
<td>Goodlett, Shawn</td>
<td>2</td>
</tr>
<tr>
<td>Goodwin, James</td>
<td>6</td>
</tr>
<tr>
<td>Graber, Ted</td>
<td>24**</td>
</tr>
<tr>
<td>Hadley, Emily</td>
<td>25**</td>
</tr>
<tr>
<td>Hasan, Tasneem</td>
<td>10</td>
</tr>
<tr>
<td>Hommel, Erin</td>
<td>87</td>
</tr>
<tr>
<td>Hong, Ickpyo</td>
<td>57**</td>
</tr>
<tr>
<td>Javed, Zulqarnain</td>
<td>52*</td>
</tr>
<tr>
<td>King, Mary Margaret</td>
<td>53*</td>
</tr>
<tr>
<td>Krishnan, Balaji</td>
<td>11</td>
</tr>
<tr>
<td>Kulkarni, Kshitija</td>
<td>39*</td>
</tr>
<tr>
<td>Kuo, Yong-Fang</td>
<td>7</td>
</tr>
<tr>
<td>Lo Cascio, Filippa</td>
<td>19*</td>
</tr>
<tr>
<td>Loresto, Figaro</td>
<td>62*</td>
</tr>
<tr>
<td>Luisi, Jonathan</td>
<td>31*</td>
</tr>
<tr>
<td>Marino, Claudia</td>
<td>20*</td>
</tr>
<tr>
<td>Middleton, Addie</td>
<td>35</td>
</tr>
<tr>
<td>Moro, Tatiana</td>
<td>84**</td>
</tr>
<tr>
<td>Nilson, Ashley</td>
<td>21*</td>
</tr>
<tr>
<td>Onoviran, Olusola</td>
<td>88, 89</td>
</tr>
<tr>
<td>Osasona, Ayodele</td>
<td>69**</td>
</tr>
<tr>
<td>Ottenbacher, Kenneth</td>
<td>4, 5</td>
</tr>
<tr>
<td>Penton, Rebekah</td>
<td>77*</td>
</tr>
<tr>
<td>Perino, Keli</td>
<td>63*</td>
</tr>
<tr>
<td>Perry, Rachel</td>
<td>54*</td>
</tr>
<tr>
<td>Prochaska, John</td>
<td>45</td>
</tr>
<tr>
<td>Randolph, Amanda</td>
<td>78, 79*</td>
</tr>
<tr>
<td>Rawls, Brandy</td>
<td>32*</td>
</tr>
<tr>
<td>Reistetter, Timothy</td>
<td>36, 37</td>
</tr>
<tr>
<td>Richardson, Lauren</td>
<td>33*</td>
</tr>
<tr>
<td>Rogers, Hayley</td>
<td>80*</td>
</tr>
<tr>
<td>Rontoyanni, Victoria</td>
<td>85**</td>
</tr>
<tr>
<td>Salameh, Habeeb</td>
<td>64*</td>
</tr>
<tr>
<td>Sengupta, Urmila</td>
<td>22*</td>
</tr>
<tr>
<td>Sheller-Miller, Samantha</td>
<td>34*</td>
</tr>
<tr>
<td>Singh, Ayush</td>
<td>26**</td>
</tr>
<tr>
<td>Sodhi, Jaspreet</td>
<td>40*</td>
</tr>
<tr>
<td>Sonnenfeld, Mandi</td>
<td>41*</td>
</tr>
<tr>
<td>Stutz, Sonja</td>
<td>72</td>
</tr>
<tr>
<td>Swartz, Maria</td>
<td>70**</td>
</tr>
<tr>
<td>Taibbi, Giovanni</td>
<td>71**</td>
</tr>
<tr>
<td>Valderrama Hinds, Luis Miguel</td>
<td>46, 47</td>
</tr>
<tr>
<td>Vickers, Ben</td>
<td>65*</td>
</tr>
<tr>
<td>Volpi, Elena</td>
<td>1, 3</td>
</tr>
<tr>
<td>Wong, Rebecca</td>
<td>8</td>
</tr>
<tr>
<td>Wright, Traver</td>
<td>86**</td>
</tr>
<tr>
<td>Zolochevska, Olga</td>
<td>23*</td>
</tr>
</tbody>
</table>
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. Melinda Sheffield-Moore and Kyriakos Markides; the Clinical Research Resource Core, led by Drs. Elena Volpi, Douglas Paddon-Jones and Gulshan Sharma; the Metabolism and Biology Resource Core, led by Dr. Blake Rasmussen 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.
2

Program Information

GERIATRIC RESEARCH ON THE ACUTE CARE FOR ELDERS (ACE) UNIT

Shawn Goodlett, Sealy Center on Aging
Rachel Deer, PhD, Sealy Center on Aging
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, BSN, Sealy Center on Aging
Roxana Hirst, MS, Sealy Center on Aging
Maria Medina, 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.
4

Program Information

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://rehabsciences.utmb.edu/cldr/
5

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/.
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
STATISTICAL HELP IS AVAILABLE, OFFICE OF BIOSTATISTICS

Yong-Fang Kuo, PhD, Office of Biostatistics

Ewing Hall Suite 1.134 700 Harborside Dr. 409-772-6355 http://pmch.utmb.edu

Faculty members:
J. Baillargeon, N. Chen, K. Jennings, D. Jupiter, Y. Kuo (director), H. Spratt, D. Zhang

Staff:
D. Adhikari, C. Andersen, G. Baillargeon, W. Chan, S. Li, Y. Lin, W. Zhang, J. Zhou

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 Office of Biostatistics, OBIOS can provide developmental procedures that will produce improved methods and procedures to collect, manage, analyze and interpret biomedical data. OBIOS is the point of contact for the statistical software SAS® (Statistical Analysis System) as well as nQuery Advisor® campus-wide. nQuery Advisor® sample size software calculates sample size and power for Means, Proportions, Agreement, Regression, Survival Analysis, Nonparametric Test, etc. OBIOS maintains an insurance claims database (Clininformatics DataMart), which contains the medical and pharmacy claims for approximately 56 million enrollees. This database offers numerous opportunities for researchers who are interested in population studies. OBIOS provides support to the Institute for Translational Science through the Biostatistics, Epidemiology and Research Design (BERD) resource.
THE MEXICAN HEALTH AND AGING STUDY (MHAS)

Rebeca Wong, PhD, Preventive Medicine and Community Health

The Mexican Health and Aging Study (MHAS) started as a longitudinal prospective study of Mexican aging with a national sample of persons aged 50 and older (n=15,186), using study protocols and survey instruments that were highly comparable to the U.S. Health and Retirement Study. 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.

The third wave of the study was fielded in the Fall 2012, which involved re-contacting the follow-up sample and adding new sample, for a total of n=21,371 study subjects distributed throughout Mexico. Objective markers (height, weight, other anthropometric measures; grip strength, walking speed, and a blood sample) were obtained from a sub-sample of approximately 2,000 subjects. The fourth wave was completed in the Fall 2015. 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 INEGI in Mexico. Institutions collaborating in the study are the University of Texas Medical Branch (UTMB), the University of Wisconsin, the Instituto Nacional de Estadística y Geografía (INEGI, Mexico), the Instituto Nacional de Geriatría (INGER, Mexico), and the Instituto Nacional de Salud Pública (INSP, Mexico).

ANCILLARY STUDY

The MHAS also serves as the basis for a timely Cognitive Aging Ancillary Study (Mex-Cog), in which a sub-sample (n=2500) of the MHAS 2015 national sample was selected to receive an in-depth cognitive assessment 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 is conducted 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).
THE CENTER FOR SPIRITUALITY OF AGING AT THE SEALY CENTER ON AGING

Elizabeth Anderson, DrPH, Sealy Center on 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 health-promoting activities, spiritual articles, and educational publications/presentations, including a Lunch and Learn series on the Prevention of Falls and a dinner series on Dealing with Alzheimer’s Disease.

We believe the gift of years is for living life to the fullest, a time for creativity, serving others and lifelong learning.
TAU OLIGOMER TARGETED INTRAVENOUS IMMUNOGLOBULIN (IVIG) ANTIBODIES IN THE TREATMENT OF ALZHEIMER’S DISEASE

Tasneem Hasan, MD, Department of Neurology
Urmi Sengupta, PhD, Department of Neurology
Rakez Kayed, PhD, Department of Neurology

Alzheimer’s disease (AD) is one of the most common causes of dementia. AD is classically characterized by senile plaques which are composed of amyloid-beta protein and neurofibrillary tangles (NFTs), which is comprised of hyperphosphorylated tau protein. Tau is a microtubule associated protein which is crucial in stabilizing the microtubule in the central nervous system. Recently, it was demonstrated that an intermediate form of NFT formation, known as tau oligomers, are pivotal in the pathogenesis of AD, causing toxicity and degeneration of brain cells. Pilot studies have demonstrated that naturally occurring anti-amyloid antibodies, such as intravenous immunoglobulin (IVIG), have been used for passive vaccination therapy in AD.

It is well known that IVIG has been used to treat various autoimmune diseases. The primary immunoglobulin that is present in IVIG is IgG. Although IgG is known for its anti-inflammatory effect, recent studies have shown that IgG also contains antibodies against amyloid-beta and alpha-synuclein, found in AD and PD, respectively. Therefore, we hypothesize that IVIG may possess antibodies targeted against tau oligomers. The objective of this study was to detect the antibodies against tau oligomers and to identify the role of IVIG in combating toxicity caused by tau oligomers. We used three different IVIG preparations: Gamunex, Gammagard, and Privigen. Through biochemical analyses, such as dot blots and Western blots, these IVIG preparations were tested against tau oligomers. Moreover, we were able to immunoprecipitate tau oligomers from the brain homogenates of AD patients. Through demonstrating the presence of antibodies against tau oligomers from IVIG in our study, this will help broaden the understanding of the underlying disease mechanism of AD and enable standardization of the therapeutic approach towards tauopathies.
INHIBITION OF MAMMALIAN PHOSPHOLIPASE D ISOFORM 1 PREVENT AMYLOID BETA OLIGOMER DRIVEN SYNAPTIC DYSFUNCTION AND MEMORY DEFICITS IN RODENTS

Balaji Krishnan, PhD, Department of Neurology
Wen-Ru Zhang, BS, Department of Neurology
Giulio Taglialatela, PhD, Department of Neurology

Alzheimer’s disease (AD), the most common and severe age-associated neurodegenerative dementia, currently affects one in every nine Americans >65 years of age and one in every three >85 years. There is currently no cure and the need to identify innovative targets for prevention and treatment are an urgent need. The accumulation of β-amyloid peptides (Aβ) at the synaptic level is an important mechanism that leads to the progression of cognitive decline, subsequent neuronal degradation and other hallmarks that characterize the loss of long-term memory mechanisms in the progression of AD. Recent studies from our group have demonstrated a role for phospholipase D (PLD) as a key signaling element in the maintenance of long-term memory. Previously, we presented data showing differential expression of PLD isoforms (PLD1 and PLD2) in synaptosomal fractions in AD brains suggesting a role for PLD isoforms in mediating synaptic dysfunction associated with AD progression. In the present study, we demonstrate a role for PLD1 inhibition in blocking Aβ oligomer (Aβo) mediated synaptic dysfunction using electrophysiological and behavioral studies. Using Novel Object Recognition, we observed that the deficit in object discrimination associated with intracerebroventricular injections of Aβo was prevented by intraperitoneal injection of PLD1 inhibitor. We, further, explore the epigenetic regulation of PLD1 and downstream signaling supporting our rationale for exploring the role of PLD1 signaling as a possible biomarker/therapeutic target in preventing the progression of memory deficits in AD.
ACTIVE ZONE PROTEINS ARE TRANSPORTED VIA DISTINCT MECHANISMS REGULATED BY PAR-1 KINASE

Kara Barber, BS, Department of Neurology
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Disruption of synapses underlies a plethora of neurodegenerative diseases. Presynaptic specialization called the active zone plays a critical role in the communication with postsynaptic neuron. While the role of many proteins at the active zones in synaptic communication is relatively well studied, very little is known about how these proteins are transported to the synapses. For example, are there distinct mechanisms for the transport of active zone components or are they all transported in the same transport vesicle? Is active zone protein transport regulated? In this study we show that overexpression of Par-1/MARK kinase, a protein whose misregulation has been implicated in Alzheimer's disease, lead to a specific block in the transport of an active zone protein component- Bruchpilot at Drosophila neuromuscular junctions. Consistent with a block in axonal transport, we find a decrease in number of active zones and reduced neurotransmission in flies overexpressing Par-1 kinase. Interestingly, we find that Par-1 acts independently of tau-one of the most well studied substrates of Par-1, revealing a presynaptic function for Par-1 that is independent of tau. Thus, our study strongly suggests that there are distinct mechanisms that transport components of active zones and that they are likely regulated.
CO-OCCURRENCE OF AMYLOID BETA-42 OLIGOMERS AND OTHER PROTEIN PATHOLOGIES IN ALZHEIMER’S DISEASE

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Alzheimer’s disease (AD), the most prevalent age-related neurodegenerative disorder, is classically characterized by the presence of amyloid-β (Aβ) plaques and neurofibrillary tangles (NFTs) comprised of tau protein. However, studies have shown that protein aggregates considered unique to other neurodegenerative diseases, including α-synuclein (α-syn) in Parkinson’s Disease (PD), prion protein (PrP) in prion diseases (PrD), and TAR DNA-binding protein 43 (TDP-43) in frontotemporal lobar dementia-TDP (FTLD-TDP or FTLD-U) and amyotrophic lateral sclerosis (ALS) may also be present in patients with AD and co-exist with Aβ plaques and NFTs. Although interactions between Aβ and the proteins mentioned (α-syn, TDP-43, etc..) have been described previously, the nature and relevance of these interactions in AD is unknown. Furthermore, conformationally-distinct, soluble aggregates of pathogenic proteins, called oligomers have emerged as the more toxic species compared to insoluble aggregates for neurodegenerative diseases. Using a previously developed conformation-dependent antibody shown to be specific to Aβ-42 oligomers, called VIA, we investigated the role of Aβ-42 oligomers in protein co-aggregation in AD. Aβ-42 oligomers were shown to co-localize with other aggregation-prone proteins in AD, including tau and α-synuclein. Moreover, we also noticed co-occurrence of VIA-immunoreactive Aβ-42 oligomers with TDP43- and PrP-immunoreactive species. Our data and previous studies suggest that the interaction between Aβ-42 oligomers and other proteins in AD can be explained by the cross-seeding capability of these oligomers. Aβ-42 oligomers can ultimately cross-seed the formation of other protein oligomers, resulting in the formation of complex pathologies in AD. Thus, targeting a specific aggregation state of Aβ, like Aβ-42 oligomers, using VIA antibody in passive immunotherapy studies may prevent further co-aggregation and be a more beneficial approach than targeting all forms of Aβ.
CONVERGENCE OF SELECT HIPPOCAMPAL MIRNA EXPRESSION IN AD AND A MOUSE MODEL OF METABOLIC SYNDROME

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Intro: Type-II diabetes mellitus (T2D) is a chronic health condition also known to be a significant risk factor for developing Alzheimer’s Disease (AD). One genetic risk factor affiliated with T2D is a SNP in ectonucleotide pyrophosphatase/phosphodiesterase 1 (ENPP1) leading to insulin insensitivity.

We use a mouse model that over-expresses human ENPP1 exclusively in adipose tissues (AtENPP1), yielding those tissues insulin resistant. Exposed to a high-fat diet AtENPP1 also develop insulin insensitivity in the central nervous system by an as-yet unknown mechanism. Further, these animals have been shown to have a significant decrease Morris Water-maze performance, a measure of hippocampal memory function. The decrease in hippocampal memory is of interest as the hippocampus also one of the most severely affected regions in AD.

Methods: Control and AtENPP1 animals were raised on normal or high-fat diets, and injected with BrdU prior to sacrifice. Animals were sacrificed at 1 or 28 days after the last injection and brains collected, with one hemisphere for immunofluorochemistry and the other for prepared for real-time PCR.

Results: BrdU staining was not found to be substantially different between groups. Some of the evaluated miRNA showed significant changes in expression between groups.

Conclusions: Neuronal proliferation may not explicitly play a role in the memory impairment seen in the AtENPP1 animals exposed to a high-fat diet, yet differences in some of the probed miRNA emerged. Intriguingly, the trends in expression seen in resulting from AtENPP1 being on a high-fat diet are mirrored in our previously published human data for AD. We conclude that the AtENPP1 animals may represent an exciting new approach to investigate cognitive declines in diabetic co-morbid AD.
NEAR INFRARED LIGHT TREATMENT REDUCES AMYLOID BETA OLIGOMER-DRIVEN SYNAPTIC DYSFUNCTION

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Alzheimer's disease (AD), the most common age related neurodegenerative dementia, is characterized by deposits of aggregated amyloid beta (Aβ) plaques and neurofibrillary tangles comprised mainly of hyper-phosphorylated tau protein. A key early event driving the progression of AD is the association of small toxic Aβ oligomers with synapses resulting in dysfunctional synaptic morphological and physiological changes. Because current pharmaceutical therapeutic options have limited efficacy and the prevalence of AD is rising, the development of alternative treatments are imperative. Near infrared (NIR) light treatment (600-1000 nm) is a novel noninvasive therapeutic strategy that has been suggested as an effective option for the treatment of AD. Notably, it has been reported that NIR light treatment on APP/PS-1 transgenic mice induced a reduction of Aβ plaque load and improved memory function. However, the effect of NIR light on the most toxic form of Aβ, oligomers, and their impact on synapses remained undescribed. In the present study, we investigated the presence of Aβ oligomers at synapses, the susceptibility of synapses to Aβ binding and synaptic physiological properties after NIR light treatment at 670 nm (90 sec a day for 4 weeks). We found that after NIR light treatment, the abundance of synaptic Aβ1-42 was significantly reduced in 6 month old APP transgenic mice (tg2576) that was paralleled by an increased retention of long term potentiation induction. We further found that the synapses of wild type mice treated with NIR light showed a reduction in ex vivo Aβ oligomer binding. Collectively, these results indicates that NIR light, in addition to reducing levels of Aβ oligomers, further promotes synaptic resistance to Aβ oligomer binding thus alleviating the ensuing synaptic impairments.
THE AGGREGATION OF P53 OLIGOMERS IN CANCER AND NEURODEGENERATIVE DISEASE

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During impaired proteostasis, proteins misfold, aggregate into soluble oligomers, lose biological function, gain toxic function, and eventually form fibrils that disrupt nearby cell function. It has become widely accepted that the soluble intermediary oligomer is the most toxic contributor to neurodegenerative disease.

Impaired proteostasis has also been implicated as an etiological factor in cancer. P53 is a homotetrameric tumor suppressor that acts as a master regulator of cell cycle control, apoptosis, and DNA repair. The loss of p53 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, including Alzheimer’s disease (AD). Furthermore, degenerating neurons in AD have been shown to cause re-expression of numerous cell cycle regulators and undergo cell-cycle re-entry just before massive neuron death. This suggests a reactivation of the cell cycle, of which p53 is critically involved, in the process of neurodegeneration.

Our lab and others have shown that p53 aggregates into oligomers and fibrils, and gain toxic function similarly to other aggregation-prone proteins implicated in neurodegeneration. We demonstrated that p53 oligomers are the most toxic species in basal cell carcinoma, similar to findings for other amyloid proteins. We then evaluated p53 aggregation status in AD using brain tissue from AD patients by immunohistochemistry using novel antibodies. This data shows p53 oligomers in AD brain tissue, which demonstrates that p53 oligomers may play a role in the progression of AD. These results may have implications for a number of other neurodegenerative disorders and therefore further research is needed to understand the mechanism of p53 aggregation.
LOCALIZATION OF PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR ALPHA IN FRONTAL CORTEX OF ALZHEIMER’S DISEASE PATIENTS AND NON-DEMENTED WITH ALZHEIMER’S DISEASE NEUROPATHOLOGY SUBJECTS

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Alzheimer's disease (AD) is the most common form of dementia, particularly affecting the hippocampus and frontal cortex. The ensuing cognitive and memory impairments are associated with amyloid β-peptide (Aβ) accumulation, oxidative stress, altered lipid metabolism and inflammation. These mechanisms are reported to be regulated by a subfamily of nuclear receptors, referred to as Peroxisome Proliferator-Activated Receptors (PPARs), which include three isoforms α, β/δ and γ. Among these, PPARα has been suggested to play a neuroprotective role in acute and chronic brain pathologies. Indeed, in vivo and in vitro studies have demonstrated the beneficial effects of PPARα agonists in memory consolidation in AD models. In order to begin translating these observations in the actual AD brain, here we used immunofluorescence microscopy to study PPARα localization in the frontal cortex of AD patients (n=4) and Non-Demented with Alzheimer’s disease Neuropathology subjects (NDAN, n=2) compared to control individuals (n=4). Our results showed a significant increase of PPARα in AD as compared to control and NDAN. This enhanced expression represents a response to counteract oxidative stress occurring in AD pathology. Double staining demonstrated a prevalent localization of PPARα in astrocytes suggesting a compensatory action of PPARα in controlling neuroinflammation. The expression of its coactivator PGC1α and the mitochondrial enzyme SOD2, a PPARα target gene, appeared downregulated in AD indicating an impairment of PGC1α and PPARα activities. Conversely we failed to detect any significant changes in NDAN subjects suggesting a role for PPARα and PGC1α in counteracting oxidative stress and their involvement in the resistance to cognitive decline. On the basis of this preliminary study it appears that effective therapeutic intervention against neurodegeneration targeting PPARα and PGC1α should be considered.
DECREASED SYNAPTIC INSULIN RESPONSIVENESS IN THE HIPPOCAMPUS OF TRAUMATIC BRAIN INJURED RATS

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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 AD, although the mechanisms contributing to this increased risk are unknown. To determine 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 isolated synaptosomes from frozen rodent brain and exposed them to insulin in the presence of ATP to detect insulin receptor (IR) phosphorylation (activation). Using this method coupled to Western blot analysis, we were able to detect insulin-driven phosphorylation of the synaptic IR, proportionate to the extent of insulin responsiveness/resistance of the input samples. After optimizing this method, we analyzed synaptosomal insulin responsiveness in the hippocampi of SHAM and TBI animals that underwent lateral fluid percussion injury. Our results indicate that there is decreased insulin responsiveness 2 days post injury that is exacerbated by 7 days, primarily in the hippocampus of the injured hemisphere. In conclusion, we were able to detect acute dysregulation in synaptic insulin responsiveness in the brain of rats after traumatic brain injury warranting further experiments to look at chronic alterations and downstream elements. These initial results further suggest that synaptic insulin resistance may occur as a consequence of TBI, a condition that is know to sensitize synapses to the dysfunctional impact of Aβ oligomeric species and thus increase susceptibility to AD-related cognitive decline.
SMALL MOLECULES PREVENTING TOXIC TAU OLIGOMER FORMATION

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Age-related neurodegenerative disorders are the leading cause of death and disability in the elderly population. Alzheimer’s disease (AD) is the most common neurodegenerative disease and one of over 20 different disorders known as tauopathies, which are characterized by the pathological aggregation and accumulation of the microtubule-associated protein, tau. Recent evidence suggests that tau aggregates are heterogeneous and can be divided into two major groups: large meta-stable neurofibrillary tangles (NFTs) and oligomers, which are small, soluble and dynamic structures that have been shown to be more toxic and efficient seeds for the propagation of pathology as compared to NFTs. Recent findings from our lab and others have demonstrated that oligomers are present in many conformations, known as tau oligomeric strains. Research in this field could potentially explain how the aggregation of the same protein is responsible of different tauopathies and diverse progression and phenotypes in different individuals within the same disorder. We hypothesize that small molecules that target and specifically bind to tau oligomeric strains can neutralize their formation, toxicity or to induce non-toxic conformations, thus preventing the spread of pathology.

We used biochemical and biophysical methods, such as ELISA, WB and AFM with tau oligomer-specific polyclonal and monoclonal antibodies, T22 and TOMA respectively, to evaluate tau oligomers in the presence of small molecules. We identified the first leading compound that is capable of modifying tau oligomeric structures by binding and inhibiting the aggregation pathways and resulting in decreased levels of tau oligomer. We are currently planning to develop new derivatives based on its structure and screening additional compounds able to target and modulate tau oligomeric strains formation and/or toxicity.
APP/ABETA-HSP60 FUNCTIONAL INTERACTION: RELEVANCE TO ALZHEIMER’S DISEASE

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Alzheimer's disease (AD) is a devastating neurodegenerative disorder affecting more than 40 million individuals worldwide. The high number of factors triggering the onset of AD justifies the current absence of disease-curing therapies. Therefore, the finding of effective therapies requires further elucidation of biomolecular mechanisms controlling AD pathogenesis. Particularly, the aberrant amyloidogenic cleavage of amyloid precursor protein (APP), amyloid beta (Aβ) peptide misfolding and oligomerization, and the impairment of the protein quality control machinery are key hallmarks characterizing this disease. Moreover, evidence suggests that the age-related impairments of chaperones, a class of modulatory proteins involved in the protein quality control of the cell, contributes to the neurotoxicity induced by Aβ oligomers, but the underlying mechanism remains unresolved. In the present work, we characterized the functional interaction between Aβ and the mitochondrial chaperon Hsp60 using an in vitro approach to test if up-regulation of Hsp60 can protect against Aβ toxicity. Specifically, a cell line overexpressing human APP751 variant of APP (7PA2 cell line), a model of human Aβ oligomer production, was used, along with immunocytochemistry, ELISA and western blotting techniques, to investigate the effect of Hsp60 overexpression on Aβ production in different sub-cellular environments: intracellular, extracellular and mitochondria. Moreover, the effect of Hsp60 on Aβ oligomer conformation and toxicity on neuronal cell line was also tested. Our data suggest that Hsp60 interferes with Aβ release and conformation, thus resulting in a reduction in toxicity. Based on these initial results, we propose that the understanding of role Hsp60 against Aβ toxicity can contribute to the design of future effective therapeutics for AD centered on reducing the endogenous production of neurotoxic Aβ oligomers. Support: NIH 1R01AG042890 to GT.
A POTENTIAL LINK BETWEEN TAU OLIGOMERS AND INFLAMMATION IN NEURODEGENERATIVE DISEASES

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The role of inflammation has been well-established in age-related neurodegenerative diseases including tauopathies such as Alzheimer’s disease (AD) and frontotemporal lobar dementia (FTLD). While amyloid-β has been studied in relation to inflammation, the contribution of tau protein has not yet been thoroughly investigated. Recent evidence suggests that smaller aggregates of tau known as oligomers, formed prior to tangles, are the more toxic species. Tau oligomers can spread between neighboring cells and synaptically connected brain regions. Here, we examined the relationship of tau oligomers and inflammation which are hallmarks of early disease states. We evaluated brain samples from FTLD, AD, and control subjects using immunofluorescence and biochemical analysis for a potential interaction between tau oligomers and inflammation. We showed that there were elevated levels of inflammation markers and that they are associated with tau oligomers. In addition, we identified a novel interaction of tau oligomers with HMGB1, a pro-inflammatory cytokine when it is secreted. HMGB1 is a chromatin binding protein which can act in a pro-inflammatory capacity when it is secreted and signals through the RAGE receptor to increase NFkB. These results suggest a potential toxic relationship between tau oligomers and inflammation in neurodegenerative disease. The ability of tau oligomers to spread may initiate a feed-forward cycle in which tau oligomers induce inflammation leading to neuronal damage and thus more inflammation. Further mechanistic studies are required to better understand the relationship between tau and inflammation and may have critical implications for the progression and treatment of tauopathies.
TAU OLIGOMERS IN CEREBROSPINAL FLUID IN ALZHEIMER'S DISEASE

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With an increasing incidence of Alzheimer's disease (AD) and neurodegenerative tauopathies, there is an urgent need to develop reliable biomarkers for the diagnosis and monitoring of the disease. Tau levels in cerebrospinal fluid (CSF) are being used as a complementary biomarker and the quantification of both total tau and p-tau181 have been validated by frequent testing of human CSF samples. Recently, several studies have suggested that levels of soluble tau oligomers, mainly in the form of dimers/trimers, are elevated in AD brain tissue and are the toxic aggregates. Here we present our findings from multiple independent studies that demonstrate tau oligomers in the cerebrospinal fluid (CSF) from patients with different cognitive deficits to determine whether tau oligomers could serve a potential biomarker for the disease. Using a highly reproducible indirect ELISA method, we found elevated levels of tau oligomers in AD patients compared to age-matched controls. Western blot analysis confirmed the oligomeric forms of tau in CSF. In addition, the ratio of oligomeric to total tau increased in the order: moderate to severe AD, mild AD and controls, suggesting that tau oligomer may be a sensitive and early biomarker for AD. These assays are suitable for analysis of human CSF samples. CSF tau oligomer levels along with other well established markers may be used for early diagnosis and as pharmacodynamic biomarkers in clinical trials. Moreover, standardization of tau oligomer measurements may be crucial for the guidance and facilitation of drug development.
AMYLOID BETA SYNAPTOTOXICITY IS REGULATED BY MIRNA-4723 AND -485 IN ALZHEIMER’S DISEASE

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Alzheimer’s Disease (AD), the sixth leading cause of death in the US, is the most common form of age-associated dementia. Amyloid beta (Abeta) and tau, the misfolded toxic proteins that accumulate in the AD brain, target and disrupt synapses and thus drive cognitive decay. However, certain individuals (Non-Demented with Alzheimer’s Neuropathology – NDAN) are capable to withstand Abeta and tau toxicity, and thus preserve cognitive competency despite AD neuropathology. It is currently unknown how the NDAN subjects escape dementia, and understanding such protective mechanisms would reveal targets for development of novel, effective treatment for AD. Regulation of gene expression by microRNAs has been identified as important player in the AD pathogenesis. MicroRNAs are small (18-22 nt) noncoding RNAs that regulate gene expression at the post-transcriptional level. We hypothesize that changes in microRNA levels in AD affect gene networks, leading to either synapse protection or sensitization to Abeta binding to the synapses. Based on proteomic studies in our lab, we have selected microRNA-485 and -4723 for the present studies. We have determined that microRNA-485 is upregulated in AD, and microRNA-4723 is inhibited, while the levels of both microRNAs remain unchanged in NDAN vs control. SH-SY5Y cells were transfected with miRNA-4723 and -485 mimics or inhibitors, and treated with HiLyte Fluor 647-labeled Abeta oligomers. Abeta association with the cells was evaluated using flow cytometry. mRNA expression was evaluated using qPCR. Taken together, our findings indicate that modulation of microRNA levels has an effect on Abeta binding to SH-SY5Y, further suggesting that a unique regulation of microRNAs in the NDAN subjects could be responsible for protection of synapses from Abeta toxicity, thus contributing to retention of cognitive ability.
Introduction: Protein synthesis is controlled by mTORC1 (mechanistic target of rapamycin complex 1) in skeletal muscle through a variety of inputs, including amino acid availability. Inhibition of mTORC1 with rapamycin increases longevity in mice but chronic activation of mTORC1 specifically in muscle has not been examined. Using a transgenic mouse model—with a floxed DEPDC5 gene (codes a protein subunit of the GATOR1 upstream inhibitory complex to mTORC1) and Cre-HSA (confers skeletal muscle specific knockout—KO--of the DEPDC5 gene) we propose to test the following hypotheses: 1. DEPDC5 KO in young mice will increase muscle protein synthesis and muscle size. 2. DEPDC5 KO in older mice will reverse sarcopenia. 3. DEPDC5 KO in young mice allowed to age will reduce lifespan.

Methods: This study has 3 arms: 1) KO on ages 4-6 months, 2) KO age 4-6 months and then age (cohort tested every 6 months) up to 28 months of age. 3) KO 24 month old. The KO mice (and 1 control cohort) will be tested for functional ability before KO and then 1 month, 2 months, and 3 months post-KO (n=8 per group), using treadmill running (endurance), voluntary wheel running (activity level), grip test (strength), inverted clinging grip test (strength/endurance) and rotarod (overall motor function). Following the treatment period, the mice will be: retested for function; and then muscle collected for in vitro contractile physiology (force, velocity and power), immunohistochemical analysis (cell size, fiber type, satellite cell proliferation); Western blotting (signaling pathways); and PCR (gene expression). Results: This study is ongoing. We present data on our breeding and genotyping strategy, and some functional testing. Funding: R56-AG051267 (BBR,PI), P30-AG024832 (CSF; Volpi,PI), and TL1-TR001440 (TGG; Hellmich,PI)
EFFECT OF AMNION DERIVED EXOSOMES ON FETO-MATERNAL GESTATIONAL CELLS: NEW SIGNALERS IN THE LABOR CASCADE?

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Objective: Parturition is associated with inflammatory overload in uterine tissues. Term amnion epithelial cells (AECs) are senescent and release exosomes carrying inflammatory signals. We hypothesize AEC exosomes promote parturition by increasing inflammatory load in fetomaternal compartments. We examined the functional role of AEC derived exosomes in promoting inflammation in placental syncytiotrophoblast, decidua and myometrium.

Design: Exosomes were isolated by ultracentrifugation of media from AECs (n=4) from term, non laboring placental membranes grown under normal cell culture (control) and OS (induced by CSE) for 48 hours where the latter mimicked term parturition. Exosome size, shape, and markers were characterized and numbers quantitated using ZetaView and Western blot. Entry of exosomes into each cell type was tracked using fluorescent-labelled exosomes and confocal microscopy. Placental (BeWo), myometrial cell line, and decidual cells were treated with two doses of exosomes derived from control and CSE treated AECs. Entry was blocked using cytochalasinD or exposing to a 2 hour incubation at 4C. IL-6 concentrations were quantitated by ELISA and statistical analysis performed.

Results: AECs produced approximately 923 and 1273 exosomes/cell in control and OS induced cells respectively. After 24 hours, AEC exosomes were localized inside all cell types. Increased IL-6 production compared to control was seen in decidua and myometrium in a dose dependent fashion but not in BeWo. CytochalasinD and cold treatment of cells had IL-6 similar to that of untreated cells.

Conclusion: We report a new exosome mediated feto-maternal signaling mechanism. Term AEC derived exosomes, irrespective of the physiologic status of the cell of origin, caused inflammatory cytokine increase in maternal compartments. We postulate human fetus can signal initiation of parturition by increasing maternal inflammatory load through exosomes.
TAU OLIGOMERS ARE DECREASED IN FRONTAL CORTEX AND HIPPOCAMPUS OF NON DEMENTED INDIVIDUALS WITH ALZHEIMER’S NEUROPATHOLOGY(NDAN) AS COMPARED TO ALZHEIMER’S DISEASE

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Alzheimer’s disease is the 6th leading cause of mortality in the US with a progressively rising incidence. It is characterized by the presence of amyloid beta plaques and tau protein tangles in the neurons which lead to neurodegeneration and decline in cognitive function. In a certain group, called as Non Demented with Alzheimer’s Neuropathology(NDAN), the cognitive function remains preserved despite the presence of Alzheimer’s neuropathology. Why these people do not develop symptoms of Alzheimer’s disease(AD) is still unknown. Recent work from our lab has revealed that amyloid beta oligomers are absent in the post synaptic junctions in NDAN individuals. With recent evidence suggesting soluble early aggregates of tau oligomers to be the toxic species in AD, and with the lack of information about the presence and role of tau oligomers in NDAN, it was important to bridge this gap of knowledge and study tau oligomers in NDAN.

In our project we utilized immunostaining techniques to study frontal cortex and hippocampal sections of human brain of NDAN individuals with antibodies staining for tau oligomers and compared these to tissue sections of patients with Alzheimer’s disease and aged matched control. On microscopic analysis of the slides we found that tau oligomers are decreased in NDAN as compared to AD in both Frontal cortex and Hippocampus. In the Hippocampus, tau oligomers were drastically reduced and were comparable to amount of tau oligomers in control. Our data shines light on the possible reason for the preserved cognitive function in NDAN and opens up the potential role of tau oligomers as therapeutic targets against Alzheimer’s disease.

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PROGESTERONE FAILS TO REDUCE P38MAPK MEDIATED SENESCENCE AND STERILE INFLAMMATION IN HUMAN FETAL MEMBRANES

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Objective: Activation of oxidative stress (OS) associated signaler p38 mitogen activated protein kinase (MAPK) induced senescence and sterile inflammation in fetal membranes has been as associated with preterm premature rupture of the membranes (pPROM) and spontaneous preterm birth (PTB). We tested the effect of progesterone in preventing p38MAPK associated senescence and inflammation.

Study design: Normal term, not in labor, fetal membrane explants (n = 5) and amnion epithelial cells (AECs) derived term not in labor placenta were maintained in an organ explant system were exposed to cigarette smoke extract (CSE - OS inducer) alone or in combination with progesterone (10−6 mol/L). Untreated tissues and progesterone alone were also included. p38MAPK expression was studied by western blot and senescence was determined by senescence associated inflammatory marker IL-6 ELISA analysis.

Results: As expected CSE induced p38MAPK mediated senescence and IL-6 increase in both fetal membranes and AECs. This effect was down regulated by N-acetyl cysteine (antioxidant) or SB 203580 (p38MAPK inhibitor). However, co-treatment with progesterone had no effect on reducing p38MAPK activation or anti-inflammatory cytokine IL-6 in explants cultures or in AECs.

Conclusion:
Progesterone has no effect on oxidative stress-induced p38MAPK activation, senescence and sterile inflammation of fetal membranes and primary AECs. Usefulness of progesterone in reducing oxidative stress induced damages and fetal tissue aging associated pregnancy pathologies are not
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SIMVASTATIN AND ROSUVASTATIN REDUCE P38MAPK MEDIATED SENESCENCE AND STERILE INFLAMMATION IN HUMAN FETAL MEMBRANES

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Objective: Chorioamniotic senescence and sterile inflammation (senescence associated secretory phenotype [SASP]), mediated by oxidative stress (OS) signaler p38 mitogen activated protein kinase (p38MAPK), are associated with human parturition. Premature senescence in response to various risk factors contributes to adverse pregnancy outcomes. Herein, we determined the effect of simvastatin, and rosvavastatin in down regulating p38MAPK mediated fetal membrane senescence and SASP.

Study design: Normal term, not in labor, fetal membrane explants (n = 8) maintained in an organ explant system were exposed to cigarette smoke extract (OS inducer) alone or in combination with simvastatin (100 and 200 ng/ml) and rosuvastatin (100 and 200 ng/ml). Untreated tissues or simvastatin and rosuvastatin alone were also included. p38MAPK expression changes were studied by western blot followed by densitometric analysis, senescence was determined by senescence associated β-galactosidase (SA-β-Gal)staining and multiplex analysis determined changes associated with 4 SASP markers (IL-8, IL-10, TNF-α and GM-CSF). Pairwise comparison between different groups was conducted by ANOVA.

Results: As expected CSE induced p38MAPK mediated senescence and SASP markers. Co-treatment with simvastatin and rosvavastatin produced significant reduction in p38MAPK activation, senescence (reduction in number of SA-β-Gal stained cells) and SASP markers, GM-CSF, TNF while increasing antiinflammatory IL-10 in a dose dependent manner (Figure 1 and Table). IL-8 was not changed. Higher dose of rosvavastatin was more effective than simvastatin and rosuvastatin alone increased antiinflammatory IL-10.

Conclusion: Both simvastatin and rosvavastatin down regulated CSE-induced p38MAPK activation, senescence and sterile inflammation with rosvavastatin showing very pronounced effect. OS induced premature senescence of fetal tissues and its impact on preterm birth and preterm premature rupture of the membranes may be reduced by treatment with simvastatin or rosuvastatin.
DISTINCT MECHANISMS OF SENESCENCE ACTIVATION IN AMNION BY INFECTION, INFLAMMATION AND OXIDATIVE STRESS.

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Objective: Chorioamniotic membrane senescence mediated by p38 mitogen activated kinase (p38 MAPK) in response to oxidative stress (OS) is associated with human parturition. In vivo, term labor fetal membranes showed OS, p38 MAPK activation, senescence and senescence associated inflammation. These findings are recapitulated in vitro in primary amnion epithelial cells (AECs) from term not in labor membranes exposed to OS induced by cigarette smoke extract (CSE). Our objective was to determine p38 induced senescence activation in response to other pathologic (LPS – infection; TNF-α – inflammation) signals associated with preterm birth.

Study Design: AECs from fetal amniotic membranes at term, not in labor were exposed to tumor necrosis factor-alpha (TNF-α 50ng/mL) and lipopolysaccharide (LPS 100ng/mL) for 30 minutes or one hour. CSE (1:10) was used as positive control. Western blot analysis was performed for active and total p38 MAPK followed by densitometric analysis. Senescence was determined by flow cytometry using 5-Dodecanoylaminofluorescein di-b-D-galactopyranoside (C12FDG), a fluorogenic substrate for senescence associated β-galactosidase (SA-β-gal). Data were confirmed by cytological evaluation. Analysis was performed using Mann-Whitney U test.

Results: p38 MAPK activation was increased in cells treated with TNF-α and CSE, but not LPS compared to untreated cells (control)(p=0.04, p=0.007, p=0.56 respectively). The number of senescent cells as detected by C12FDG fluorescence were increased by all stimulants compared to control cells (p<0.05). Senescence was confirmed with cytologic staining.

Conclusions: TNF-α, an inflammatory cytokine produced in response to various preterm birth-associated risk factors, and CSE induced senescence of AECs through the p38 MAPK pathway. LPS induction of senescence was independent of the p38MAPK pathway. Infectious and inflammatory factors may cause premature fetal cell senescence contributing to preterm birth pathophysiology.
AGED DOMINANT NEGATIVE P38A MAPK MICE ARE RESISTANT TO AGE DEPENDENT DECLINE IN ADULT-NEUROGENESIS AND CONTEXT DISCRIMINATION FEAR CONDITIONING

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A major aspect of mammalian aging is the decline in functional competence of many self-renewing cell types, including adult-born neuronal precursors. Since age-related senescence of self-renewal occurs simultaneously with chronic up-regulation of the p38MAPKalpha (p38α) signaling pathway, we used the dominant negative mouse model for attenuated p38α activity (DN-p38αAF/+ ) in which Thr180 and Tyr182 are mutated (T→A/Y→F) to prevent phosphorylation activation (DN-p38αAF/+ ) and kinase activity. As a result, aged DN-p38αAF/+ mice are resistant to age-dependent decline in proliferation and regeneration of several peripheral tissue progenitors when compared to wild-type littermates.

Aging is the major risk factor for non-inherited forms of Alzheimer’s disease (AD); environmental and genetic risk factors that accelerate the senescence phenotype are thought to contribute to an individual’s relative risk. In the present study, we evaluated aged DN-p38αAF/+ and wildtype littermates in a series of behavioral paradigms to test if p38α mutant mice exhibit altered baseline abnormalities in neurological reflexes, locomotion, anxiety-like behavior, and age-dependent cognitive decline. While aged DN-p38αAF/+ and wildtype littermates appear equal in all tested baseline neurological and behavioral parameters, DN-p38αAF/+ exhibit superior context discrimination fear conditioning. Context discrimination is a cognitive task that is supported by proliferation and differentiation of adult-born neurons in the dentate gyrus of the hippocampus. Consistent with enhanced context discrimination in aged DN-p38αAF/+ , we discovered enhanced production of adult-born neurons in the dentate gyrus of DN-p38αAF/+ mice compared to wildtype littermates. Our findings support the notion that p38α inhibition has therapeutic utility in aging diseases that affect cognition, such as AD.
MICROGLIA ACTIVATION IN A MODEL OF AGE-RELATED MACULAR DEGENERATION

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Age-related Macular Degeneration (AMD) is a neurodegenerative disease and a leading cause of blindness in elderly population. Neurodegeneration is linked to multi-stage inflammatory process, which is poorly understood in retina. The immune privilege and anatomical isolation renders the retina inaccessible to many traditional techniques that are used to characterize inflammatory responses. Microglia are the resident immune cells in the retina, and may be impaired with aging. To understand the inflammation dynamics in animal model for AMD, in vivo multimodal non-invasive retinal imaging techniques were used to: 1) monitor changes in structural features of retina using a high resolution Optical Coherence Tomography (OCT) and 2) Track retinal microglia migration and activation state in transgenic macrophage reporter mice, eGFP conjugated to Cx3Cr1, using a fluorescent fundus camera. Using OCT, we defined critical points in the inflammatory process in longitudinal studies that monitor neurodegeneration progression in an established laser photocoagulation model of ‘wet’ AMD. The study utilizes two laser irradiation doses to separate the response of an acute injury from choroidal neovascularization (CNV) induction. With the inflammation dynamics charted, we tracked microglia dynamics to determine localization and cell state. From the OCT data, we determined that the acute inflammation peaks at 24h and begins resolving at 72hrs, while the chronic response continues and shifts to CNV formation at 7-14 days. Microglia acutely stimulated, reaches peak migration at day 3, and returns to resting state around day 14. However, in CNV the microglia exhibit slower migration and remain activated at the site of injury through day 21. In this model, we observed a correlation between the delay of microglia activation and the severity of chronic injury leading to CNV.
MUSCLE ATROPHY AND WEAKNESS IN A MOUSE MODEL OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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Chronic obstructive pulmonary disease (COPD) onset is associated with age, encompasses diseases such as emphysema and chronic bronchitis, makes breathing difficult, increases risk of other age-related chronic diseases, and often results in pulmonary cachexia (20-40% prevalence depending on disease progression and type). Thus, we hypothesized that a mouse (C57BL/6) model of COPD might act as an early-onset sarcopenic model. To test this hypothesis we determined functional (grip strength), contractile (in vitro physiology soleus), and morphological properties (e.g. fiber-type, fiber cross-sectional area, capillary and arteriole quantification, etc.) from a treated group (n=9) and a control group (n=9); age approximately 5 months. We found a preponderance of significant evidence that muscle morphology and function in the treated group was reduced compared to the control and more closely resembled elderly mice. Patterns of fiber-type shift (e.g. increased oxidative fibers in the diaphragm, a +22% shift from 2b to 2x), fiber cross-sectional area (~25% decrease in gastrocnemius, soleus, plantaris and diaphragm), contractile dysfunction (soleus peak tetanic force -35%), and functional testing (grip test -50%) were similar to what would be expected in human COPD-related cachexia or in age-related loss of mass and strength. As a pilot study with a small n, we have generated intriguing data that is supportive of a model of COPD-induced cachexia/sarcopenia.

This work was supported, in part, by NIH grants P30 AG024832, AG051267, AI062885 and UL1TR001439.
OXIDATIVE STRESS INDUCED P38MAPK ACTIVATION IN HUMAN AMNION EPITHELIAL CELLS ARE INDEPENDENT OF ASK1-SIGNALOSOME

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Human parturition at term is associated with oxidative stress (OS) induced fetal cell senescence activated by p38 mitogen activated protein kinase (MAPK). Two independent pathways of p38MAPK activation were investigated: 1) OS induced dissociation of thioredoxin-apoptosis signaling kinase (ASK)-1 complex resulting in ASK1 release and phosphorylation of p38MAPK and 2) TGF-beta mediated activation of TAK1 (TGF-b activated kinase) and TAB 1 (TGF-b activated kinase 1 binding protein) leading to phosphorylated p38MAPK. Existence of these two pathways were tested in human amnion epithelial cells (AECs) exposed to cigarette smoke extract (CSE), an OS inducer.

Methods: Primary AECs were isolated from normal term, not-in-labor placental membranes and stimulated with CSE for 1 hour (N=5). Nuclear and cytoplasmic fractions and total cell lysates were collected from both treated and untreated cells. ASK1-Trx association was determined using pull down assays. Western blots determined ASK1, Trx, TAK1, TAB1, and p38MAPK phosphorylation. Immunofluorescent followed by confocal microscopy localized ASK1 (nuclear and cytoplasmic) and Trx (cytoplasmic) were consistent regardless of treatment; though p38MAPK increased with CSE. TGF-b signaling pathway was shown to be active in CSE treated cells where TAB1 was increasingly co-localized with active p38MAPK.

Results: CSE caused OS induced p38MAPK phosphorylation and increased expression of TAK1 and TAB1 in AECs. Pull down assay did not show existence of ASK1-Trx complex in AECs regardless of treatment. Localization of ASK1 (nuclear and cytoplasmic) and Trx (cytoplasmic) were consistent regardless of treatment; though p38MAPK increased with CSE. TGF-b signaling pathway was shown to be active in CSE treated cells where TAB1 was increasingly co-localized with active p38MAPK.

Conclusion: CSE mediated OS induced p38MAPK activation in human AECs is likely independent of ASK-1-Trx signalosome dissociation and likely facilitated by activation of TGF-b mediated pathway. Analyzing these pathways will improve our understanding of parturition mechanisms due to senescence prompted by p38MAPK at term in response to OS.
AMNION EPITHELIAL CELL-DERIVED EXOSOMES INDUCE INFLAMMATORY CHANGES IN HUMAN MONOCYTIC THP-1 CELLS

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Oxidative stress (OS) at term causes fetal cell senescence with subsequent release of exosomes containing signals of cellular damage. Senescent fetal cell exosomes can enhance inflammation in intrauterine tissues, a prerequisite to initiate labor and delivery, by monocyte activation. We determined the response of THP-1 monocytes treated with exosomes isolated from primary amnion epithelial cell (AEC) cultures under normal and oxidative conditions. AECs were grown in media under standard conditions (control) or treated with cigarette smoke extract (CSE, OS inducer) for 24 hours. Exosomes were isolated using differential ultracentrifugation. Western blot for CD81, HSC70 and Nanog characterized exosomes and amnion specificity, respectively. Human monocyte cell lines (THP-1) were treated with exosomes from AEC grown under OS and normal conditions at 107, 108, and 109 concentrations. Exosome markers CD81 and HSC70, as well as amnion cell marker Nanog, seen in western blots confirmed amnion origin of exosomes. THP-1 cells became adherent, indicating the initiation of differentiation, regardless of exosome treatment. Exosomes from control and OS induced AECs activate both p38 MAPK and NF-κB, although the response was greater in adherent cells treated with OS exosomes. Flow cytometry showed adherent monocytes increased relative expression of CD45 in a dose-dependent manner. Signals carried by exosomes generated from OS induced term fetal cells increased monocyte adherence and relative expression of CD45. Exosomes also induced the expression of stress responder p38MAPK and the activation of pro-inflammatory transcription factor. These data suggest that fetal cell derived exosomes can cause monocyte transition and inflammatory activation. Ongoing characterization of specific exosomal signals will determine the fetomaternal signaling that can contribute to the initiation of parturition at term.
HOSPITAL VARIATION IN RATES OF NEW INSTITUTIONALIZATIONS WITHIN SIX MONTHS OF DISCHARGE

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Background/Objectives: Hospitalization in community-dwelling elderly is often accompanied by functional loss, increasing the risk for continued functional decline and future institutionalization. The primary objective of our study was to examine the hospital-level variation in rates of new institutionalizations among Medicare beneficiaries.

Design: Retrospective cohort study.

Setting: Hospitals and nursing homes.
Participants: Medicare fee-for-service beneficiaries discharged from 4,469 hospitals in 2013 (N=4,824,040).

Measurements: New institutionalization, defined as new long term care nursing home residence (not skilled nursing facility) of at least 90 days duration within six months of discharge.

Results: The overall observed rate of new institutionalizations was 3.6% (N=173,998). Older age, white race, Medicaid eligibility, longer hospitalization, and having a skilled nursing facility stay over the prior six months were associated with higher odds. Observed rates ranged from 0.9-5.9% across states. The variation in rates attributable to the hospital after adjusting for case-mix and state was 5.1%. Odds were higher for patients treated in smaller (OR=1.36, 95% CI: 1.27-1.45, ≤50 vs >500 beds), government owned (OR=1.15, 95% CI: 1.09-1.21 compared to for-profit), limited medical school affiliation (OR=1.13, 95% CI: 1.07-1.19 compared to major) hospitals and lower for patients treated in urban hospitals (OR=0.79, 95% CI: 0.76-0.82 compared to rural). Higher CMS ratings (OR=0.75, 95% CI: 0.67-0.93, five vs one stars) and Overall Hospital Rating (OR=0.62, 95% CI: 0.57-0.67, ratings of 9-10 vs 0) were associated with lower odds of institutionalization.

Conclusion: Hospitalization may be a critical period for preventing future institutionalization among elderly patients. The variation in rates across hospitals and its association with hospital quality ratings suggest some of these institutionalizations are avoidable and may represent targets for care improvement.
COMPARISON OF INDIVIDUALS DISCHARGE FROM ACUTE CARE TO INPATIENT AND SKILLED NURSING REHABILITATION

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Objective: To explore differences in patient discharged to inpatient (IRF) and skilled nursing (SNF) rehabilitation following an ischemic or haemorrhagic stroke

Methods: A secondary analysis of data from the Centers for Medicare and Medicaid Services (CMS). The study included those who sustained an ischemic or haemorrhagic stroke who were discharged to inpatient or skilled nursing rehabilitation from 2012 to 2013. The study linked acute-care data from the Medicare Provider Analysis and Review file with the Inpatient Rehabilitation Facilities Patient Assessment Instrument and the Minimum Dataset 3.0 files. Descriptive analyses were performed to explore patient and hospital differences in discharges to IRF and SNF.

Results: The final sample included 131,132 patients across 3,722 acute hospitals with 3693 hospitals discharging individuals with an ischemic stroke (range 1 to 408 patients) compared to only 1914 hospitals discharging patients with a hemorrhagic events (range 1 to 77 patients). Across the sample, 88.5% of patients had ischemic event with 50.5% of patient being discharged to IRF. Patients 85 years and older were more likely to discharge to SNF. Similarly, there were greater numbers of comorbid conditions among those discharged to SNF. Comparison of self-care and mobility across settings suggest that IRF patients have higher functional abilities at admission to rehabilitation. The intraclass correlation (ICC) values examining variation in discharges to IRF across acute hospital varied by stroke type (Ischemic=0.312, Hemorrhagic=0.165)

Conclusions: This study suggests considerable differences in acute hospital discharge practices for ischemic and hemorrhagic stroke patients who receive IRF and SNF rehabilitation. Furthermore these differences highlight the need for careful consideration and matching of patient and facility characteristics when comparing outcomes of care for post-acute care rehabilitation.
VARIATION IN POST-ACUTE CARE SERVICES: EXPLORING GEOGRAPHIC CLUSTERING FOR REHABILITATION

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Objectives: To develop and implement a method to define rehabilitation service areas as a tool to investigate geographic variation in post-acute care rehabilitation.

Methods: As proof of concept we used 100% 2010 Texas Medicare acute care admission data for 893,028 patients in 335 hospitals. We link Medicare claims data for the MedPAR, Master Beneficiary, and Provider of Service files with zip code census data in ArcGIS 10.3 to identify clusters of facility use by patient zip code. We create a distance measure encompassing physical proximity and overlap in facilities used. Zip codes were clustered into service areas using Ward’s algorithm, and the optimal number of clusters was chosen by maximizing the silhouette statistic. Clusters were evaluated by examining patient homogeneity.

Results: Service areas, as identified by our algorithm, yielded 20 regions. Compared to the Dartmouth Atlas Group’s Hospital Referral Regions (HRR) which contains 22 regions, the resultant 20 regions suggest that our clustering algorithm closely matched HRRs thus supporting the use of the approach for developing rehabilitation service areas.

Conclusion: Health care service areas are a useful tool for the study of small area variation in care. None have been identified to reflect unique service patterns for post-acute care. A next step is to evaluate the utility of Rehabilitation Service areas to describe patterns and outcomes of care after adjustment for individual, community, and facility characteristics compared to alternative available geographic schemes not optimized for post-acute care services. As policy makers move forward with reform efforts for improving transitions through post-acute services, it is critical to have a tool (rehabilitation service areas) for understanding variation in the use, outcomes, and quality of care.
INTERVAL VERSUS STEADY-STATE TRAINING ON THE IMPROVEMENT OF AEROBIC CAPACITY IN ELDERLY ADULTS WITH COPD

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Chronic respiratory diseases, including COPD, is the third leading cause of death in the U.S. Characterized by airflow obstruction and abnormal inflammatory responses, COPD affects the patient’s ability to perform ADLs and be physically active. Exercise training is a cornerstone in pulmonary rehabilitation programs, and various training styles have been used with those with COPD. The aim of this study was to conduct a systematic review of the literature to determine which training style, steady-state or interval training, led to better improvement of aerobic capacity in elderly adults with COPD. A literature search of PubMed, MEDLINE, and the Cochrane Collaboration from the start of the database until November 2015 was performed. Only studies that employed RCTs and used standardized exercise protocols using cycles or treadmills at measurable intensities were reviewed for inclusion. Outcome was aerobic capacity (VO2peak). Participants were diagnosed with COPD as defined as FEV1/FVC <0.7, or FEV1<80% of predicted. Two reviewers screened titles and abstracts for inclusion. The search identified 344 articles; 15 were included for review. Mean age was 66 years. Continuous exercise protocols included 20-60 minutes at 50-80% peak power and intervals of 20 seconds-3 minutes of alternating high- and low-intensity intervals at 30-80% peak power 2-6 days/week for 3 to 12 weeks. No significant difference was found between steady-state and interval training to increase VO2peak. This is possibly due to the absolute low intensity at which interval training is performed in those with COPD. Although interval training better mirrors the effort needed to complete ADLs, severity of COPD and patient preference should be taken into consideration when prescribing steady-state and interval training as part of a comprehensive pulmonary rehabilitation program.
ASSOCIATION OF OBESITY AND HOSPITAL READMISSIONS, AND REASONS FOR READMISSION, FOLLOWING INPATIENT REHABILITATION FOR TOTAL HIP OR KNEE ARTHROPLASTY

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This study examined the effect of obesity on hospital readmission and reasons for these readmissions following discharge from the inpatient rehabilitation facility (IRF). The study population was Medicare beneficiaries 65 years and older, with osteoarthritis, who underwent elective primary total hip (THA) or total knee arthroplasty (TKA) during the years 2012 and 2013 and were directly admitted to IRF. Retrospective secondary data analysis of 100% Medicare Claims data was used as the study design. Occurrence of readmission was deemed as an undesirable outcome after completion of IRF stay. Hospital readmissions occurring within 30 days of discharge from IRF to the community were examined for this purpose. Among the hospital readmissions recorded, the reasons for readmission were identified and classified as local/systemic, and unrelated reasons. Chi-square statistics and one-way ANOVA were used for descriptive statistics. Multivariate logistic regression was used for the outcome of 30-day hospital readmission. Multinomial logistic regression was used to determine the association of obesity status and the reason for readmission. The odds for 30-day readmission was significantly higher among beneficiaries with morbid obesity compared to those in the normal weight category, among the THA cohort. Morbid obesity was also associated with greater odds for occurrence of local/procedure-related reasons for readmission, as compared to the normal weight category, among both the THA and TKA cohorts.
PAIN AND UPPER EXTREMITY DISABILITY IN OLDER ADULT AMERICANS

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Objective: To examine the prevalence of pain and its association with upper extremity functional limitations in older adult Americans.

Methods: We studied 5763 older Americans aged 65 years and older from the National Health and Aging Trends Study (NHATS) round 1. Key variables included sociodemographic characteristics, pain in upper extremity (neck, shoulder, wrist and hand), body mass index (BMI), self-reported physical capacity of upper extremity (carry 10 and 20 pounds, grasp objects, carry heavy objects overhead), health conditions and depression. Logistic regression analysis was used to assess the independent effect of pain on upper extremity functional limitations.

Results: More than half (52%) of participants reported pain and the most common locations were shoulder (20%) and hand (16%). Nearly one-third of participants reported at least one limitation. Participants with pain were two times more likely to report limitation in any upper extremity activity after controlling for all covariates. Other factors associated with upper extremity limitations were older age, being female, race/ethnicity (Black and Hispanic), comorbidities (arthritis, diabetes, stroke, dementia, heart attack) and depression. Education was protective of limitations in upper extremity activities.

Conclusions: Prevalence of pain among older Americans was high and associated with upper extremity activity limitation. Earlier assessment and better management of pain may prevent upper extremity disability in older adults.
THE EPIDEMIOLOGY OF FALLS AND AGING

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The purpose of this poster presentation is to explore the epidemiology of falls and aging. A literature review was used to explore the current epidemiology factors that relate to falls and fall injury. This poster presentation will focus specifically on the “descriptive epidemiology” concepts in relation to the condition fall injury. The case definition of fall injury will be described in relation to terms used in surveillance systems in the United States such as the National Center for Health Statistics (NCHS) and the International Statistical Classification of Diseases and Related Health Problems (ICD) coding system. The statement of the public health problem of fall injury will be described in relation to person, place and time through morbidity and mortality data, trends over time, risk factors, and population at risk. Three figures will be presented on the poster to further describe the epidemiology of falls. The first figure will be a line graph representing the death rates ages 65 and older due to unintentional falls, for the years of 2005-2014. The second figure will describe falls related to percentage of population by age, cognition and number of falls. The third figure will be a bar graph that describes percent of fall occurrence related to number of risk factors. Finally, examples of current prevention and control measures used in the United States will be provided that attempt to reduce the occurrence of falls and injury related to falls.
SLEEP HYGIENE PRESENTATION FOR SENIORS

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The purpose of this poster is to determine if a one-time presentation addressing sleep facts and interventions would be effective at improving sleep hygiene knowledge and sleep for seniors. Prior to the sleep presentation, the Pittsburgh Sleep Quality Index (PSQI) was administered to 9 seniors at a low-income housing facility to identify problem areas with sleep. The presentation was developed to address the problems identified by the participants. Pre and post assessments were conducted to test their knowledge of sleep facts. After three weeks, 7 participants identified changes they made and how helpful they were utilizing a 5-point Likert scale survey. Descriptive statistics, means, and a Wilcoxon Signed Rank test were used to analyze the data. The Wilcoxon Signed Rank test was statistically significant for the pre and post assessments. The Likert scale assessment had a greater than 4 mean for the sleep presentation improving sleep and teaching sleep facts. The sleep education topics with a mean above 4.5 included washing sheets once a week, creating a darker space, and eating lightly or not at all before bed. The lowest mean for the sleep interventions was yoga and the highest means were for the 4-7-8 breathing exercise and deep breathing exercise. Pre and post assessments showed significant improvement in knowledge of healthy sleep habits and sleep facts. The Likert scale assessment showed that the participants found the presentation useful for improving sleep and teaching sleep facts. Findings from this small study suggest that a one-time sleep presentation format about healthy sleep habits is useful for seniors, indicating that this type of presentation can be a rapid and effective method to address these sleep hygiene problems.
INFLUENCE OF COGNITIVE IMPAIRMENT ON PROGRESSION AND RECOVERY FROM PHYSICAL PRE-FRAILTY FOR OLDER MEXICAN AMERICANS

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Many older adults recover from pre-frailty, but a significant number experience continued functional declines and may become physically frail or deceased. Older Mexican Americans are vulnerable to becoming frail. This may be partly due to the high prevalence of cognitive impairment in this population. However, research into the role of cognition in the progression and recovery from pre-frailty, especially in older Hispanic populations, is limited. Data for this analysis came from Wave 6 (2006-07) and Wave 7 (2010-11) of the Hispanic Established Population Epidemiological Study of the Elderly. The final sample included 772 participants (age >77 years). Non-frail, pre-frail, and frail were defined as presence of 0, 1, and >2 frailty measures (weight loss, exhaustion, slow walking speed, and low grip strength). Cognitive impairment was defined as < 21 points on the Mini Mental Status Examination. Multinomial logistic regression models were used to assess the relationship between cognition and frailty status at Wave 6 (2006-07) and frailty status and mortality at Wave 7 (2010-11). The estimated probability of becoming non-frail for cognitively impaired pre-frail participants was 0.15 (95% CI=0.08-0.26) compared to 0.39 (95% CI=0.32-0.46) for cognitively intact pre-frail participants. The estimated probability of being deceased at follow-up (0.34, 95% CI=0.24-0.48) than cognitively intact pre-frail participants (0.16, 95% CI=0.12-0.22). These findings provide evidence that cognitive impairment is an important characteristic that is related to the likelihood for progression and recovery from physical pre-frailty.
NEUROPSYCHIATRIC DISTURBANCE AMONG OLDER MEXICAN AMERICAN AND INCREASED DEPRESSION AMONG THEIR CAREGIVERS

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According to the U.S. Census, those 65 and older are projected to grow by 56% doubling to 88.5 million by 2030 and those 85 and older will triple from 5.4 million to 19 million by 2050. A lack of geriatric specific facilities and services leaves an increasingly disproportionate amount of older individuals reliant on informal caregivers. Over the next 40 years older Hispanics will increase from 8% to 20% of the population 65 and older. Older Mexican Americans are also reported to have higher incidence and prevalence of dementia, mild cognitive impairment, and Alzheimer’s disease. Increasingly older Hispanics, are choosing to “age in place” due to cultural and/or limited structural factors, thus placing responsibility of caregiving on loved ones. Unfortunately, neuropsychiatric dysfunction has been found to be highly associated with depression, caregiver burden, and institutionalization. This study utilized secondary data from Wave 7 of the HEPSE to assess “direct personal care” burden (ADLs) among caregivers. For the present analysis, 200 informants who were a child of the interviewed subject and provided direct personal care tasks (e.g., bathing, toileting, dressing, etc.) were considered. A multivariable linear regression analysis was conducted to predict caregiver depression. We found that “unmarried” caregivers (b = 2.24, p < 0.05), those with increased “caregiver-stress” (b = 0.86, p < 0.001), and those who reported increased psychiatric disturbances/behavioral dysfunction (b = 0.46, p < 0.05) were positively associated with caregiver’s depressive symptoms. A lack of resources and social support systems in and of itself is not sufficient to prompt Mexican American families to institutionalize older family members but increases in neuropsychiatric disturbances increase caregiver depression and the ultimate likely-hood of institutionalization.
DISPARITIES IN SELF-REPORTED ADVERSE CHILDHOOD EXPERIENCES (ACES) ACROSS SOCIO-DEMOGRAPHIC STRATA IN A COMMUNITY-BASED RANDOM SAMPLE OF GALVESTON COUNTY RESIDENTS

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Background: Exposure to adverse childhood experiences (ACEs) has been tied to a number of negative health outcomes across the lifespan. Understanding the exposure to ACEs across age, racial/ethnic, and income strata in UTMB’s primary service area may increase our understanding of the burden ACEs exposure may have in our population health efforts.

Methods: The first wave of the REACH Galveston County Health Needs Assessment (conducted in 2016) is a demonstration of the potential a population-based population health survey can have in identifying health priorities for public health planning efforts. This survey included 247 residents ages 18 and older living in Galveston County, and responses were weighted post-hoc to account for response bias. Among the questions asked was a standard battery of 10 adverse childhood experiences. Poisson regression models estimated disparities in cumulative number of ACEs experienced during childhood across income, racial/ethnic and age groups.

Results: Overall, 44.1% of respondents reported experiencing no ACEs during childhood, compared to the national average of 40.7%; however, 19.8% of respondents reported experiencing 4 or more ACEs, compared to the national average of 14.3%. Respondents 65 and older (p<0.001) and Black/African-American respondents (p=0.02) were less likely to report a higher frequency of ACEs experienced than those aged 18-64 years and White, non-Hispanics, respectively. Further, those with reported household incomes over $60,000 were also less likely to report a higher frequency of ACEs (p=0.01).

Discussion: While the sample size and potential for response bias is strong for this dataset, it nonetheless suggests that examining ACES across the entire population in Galveston County more robustly may be a worthwhile endeavor, with a particular focus on the differences between older and younger cohorts.
INCIDENCE OF FALLS AND PREDICTOR FACTORS IN MEXICAN OLDER ADULTS - FINDINGS FROM THE MEXICAN HEALTH AND AGING STUDY

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Objectives: To examine the incidence of falls and recurrent falls, and the factors associated with falls among Mexican older adults aged 50 years and older.

Design, Setting, Participants, and Measurements: The sample for this study was drawn from the Mexican Health and Aging Study (2001-2012). We analyzed the incidence of one or more falls and two or more falls of participants and their spouse aged 50 years and older over 11-years of follow-up. Our predictor variables included: sociodemographic variables, physical activity, comorbid conditions, pain, vertigo, vision and hearing problems, urinary incontinence, lower extremity functional limitation and Activities of Daily Living (ADL) disability, cognitive function, and depressive symptoms.

Results: At baseline around 35% reported having fell in the last 2 years. Approximately 44% experienced one or more falls during the follow-up period. Being female, lower years of education, suffering of pain and vertigo were significant predictors of incidence of one or more falls. Obesity, arthritis, fractures, and having fell previously were additional predictors of recurrent falls. Participants living in a high population residency had a decreased incidence of one or more falls and recurrent falls.

Conclusion: Incidence of falls among Mexican older adults is high. Early detection and treatment of modifiable risk factors for the incidence of falls such as pain, arthritis, and obesity, would be helpful in improving quality of life and reducing health care costs and medical complications resulting from falls.
ASSOCIATION OF ARTHRITIS AND VITAMIN D INSUFFICIENCY WITH PHYSICAL DISABILITY IN MEXICAN OLDER ADULTS – FINDINGS FROM THE MEXICAN HEALTH AND AGING STUDY

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Objective. This study examined the association of arthritis and vitamin D insufficiency with upper-lower extremity functional limitations and Activities of Daily Living (ADL) disability among Mexican older adults.

Methods. We examined 1,830 participants aged 50 years or older from a subsample of the Mexican Health and Aging Study (MHAS). Measures included sociodemographic characteristics, body mass index, comorbid conditions, functional limitations, ADLs, C-reactive protein and vitamin D. Logistic regression analysis was performed to test the association of arthritis and vitamin D insufficiency with any upper-lower extremity functional limitations and ADL disability.

Results. Fourteen percent of the participants had self-reported arthritis and 32.7% had vitamin D insufficiency. Participants with arthritis and vitamin D insufficiency were more likely to report ADL disabilities (OR= 2.98, 95%CI= 1.70–5.23) when compared to those with neither arthritis nor vitamin D insufficiency. Those participants with arthritis and without vitamin D insufficiency were more likely to report upper and lower extremity functional limitations (OR= 3.16, 95%CI= 2.12–4.69, and OR= 3.08, 95%CI= 1.90–4.99, respectively) when compared to those with neither arthritis nor vitamin D insufficiency.

Conclusion. Self-reported arthritis and vitamin D insufficiency are prevalent among older Mexican adults. Both conditions are associated with increased functional limitations in upper-lower extremities and ADL disabilities. Early detection and treatment of arthritis and vitamin D insufficiency would reduce health care costs and future medical complications.
HEALTHCARE EXPENDITURES AND UTILIZATION AMONG MEXICAN OLDER ADULTS

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Objectives: Examine and compare healthcare utilization and expenditures among older adults in Mexico before and after the implementation of a new public health insurance in Mexico, Seguro Popular.

Methodology: Data from the 2001 and 2012 cross-sections of the Mexican Health and Aging Study were utilized. Analysis was conducted on 12,701 and 13,654 direct interviews of individuals aged ≥50 years in 2001 and 2012, respectively. Healthcare services included nights spent in the hospital, and medical/outpatient visits in the previous year. Out-of-pocket expenditures included the payments incurred from these services. We also examined demographic characteristics, insurance coverage, and comorbidities. Differences in service use, expenditure and covariates between the years were compared using chi-square tests. Two-part regression models were used to identify covariates associated with healthcare expenditures and use.

Results: The mean age was 62 years in 2001 and 65 years in 2012 (p<0.001). There was a dramatic decrease in uninsured population from 2001 to 2012 (46% to 15%, p<0.001). Hospitalizations accounted for the highest expenditures in both years. Yet, expenditures related to hospitalizations did not differ between the two years. Outpatient and medical visits expenditures increased from MEX$2,438 in 2001 to MEX$4,047 in 2012 (p=0.02). The proportion of individuals who did not pay any out-of-pocket expenditure increased among all services from 2001 to 2012. Adults with three or more comorbid conditions had the highest proportion of healthcare utilization in both years, spending an extra of MEX$2,344 compared to people without chronic diseases in 2012.

Conclusion: While the number of uninsured adults and individuals with out-of-pocket expenditures decreased from 2001-2012, those with three or more chronic conditions still incurred the highest out-of-pocket expenditures among older adults in Mexico.
LONELINESS: A LONGITUDINAL LOOK AT INCIDENCE AND PREDICTIVE FACTORS REGARDING SOCIAL SUPPORT AND HISPANIC AMERICAN CULTURE

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Loneliness in older adults has been shown in prior research to be predictive of increased morbidity and mortality and is a major public health problem among older adults in the US. Research has shown there to be a difference between subjective loneliness and objective loneliness (social isolation), in that older adults living alone are not necessarily lonely if they remain socially engaged. In addition, recent research shows that there is a difference in loneliness between cultures that are more family oriented and ones that are more individualistic, driving the theory that loneliness overall as a construct needs to be examined in culture-specific framework.

We propose that loneliness in older Hispanics, despite their historically familial framework, will be more affected by friends rather than family. This hypothesis supports prior cross-sectional research on an older Hispanic American population in which we wish to build upon with longitudinal analysis. Using four waves of the H-EPESE data (n=1682), we estimated discrete time hazard models to predict the onset of loneliness over a 10-year period.

Our findings have important informal care implications with friends potentially having a greater role in the mental health of older Hispanics than previously thought. In regards to reporting general loneliness, our findings support the traditional familial model in that having family close reduces loneliness. However, for more severe and constant states of loneliness reported by subjects, the impact on objective and subjective friendship as well as increasing depressive symptoms are shown to outweigh the familial influence.
ORTHOTOPIC LIVER TRANSPLANTATION: RACIAL AND SOCIOECONOMIC DISPARITIES IN DISEASE PREVALENCE, LIVER TRANSPLANTATION AND LIVER DISEASE OUTCOMES

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Extensive research shows that social determinants impact the development and progression of disease. Two key aspects that are health influential are ethnicity and socioeconomic status (SES). This pattern is consistent in orthotopic liver transplant (OLT) waitlist access and long term graft and patient outcomes. Little is known regarding the mechanisms behind the effect of social determinants in OLTs. Research efforts are needed regarding increasing restrictions of insurance, cultural factors, access to healthcare, disparities within donor specific areas (DSA), and post-transplant adherence.

Though there is not extensive research regarding the association between SES, ethnicity, and outcomes after liver transplantation, the studies that do exist show that lower SES and minority status are linked to higher re-hospitalization rates and increased mortality. The overall objective proposed in this investigation is to better understand the relationship between ethnicity, SES and OLT outcomes in OLT recipients. The central hypothesis is that the risk of worse outcomes for adult recipients of an OLT in the U.S. increases with lower SES, and that there will be ethnic differences in OLT outcomes. Finally, a more exploratory hypothesis is that there will be fewer disparities in the post-MELD (Model for End Stage Liver Disease) era than in the pre-MELD era.

To address these specific aims, I propose to use survey data from 1988 – 2016 from an established sample of OLT recipients, ages 40 and older, living in the United States. The sample will be taken from the Scientific Registry of Transplant Recipients, who maintains the database containing all organ transplant data within the U.S. The expected results will add new knowledge on the mechanisms through which social determinants influence OLT outcomes.
COGNITIVE AGING AND LEAD EXPOSURE THROUGH THE USE OF GLAZED CERAMICS IN MEXICO

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The detrimental effects of lead exposure on childhood development are well established, but childhood lead exposures can have long-term consequences for cognitive function. Lead has been shown to cause changes in the aging brain, and has been implicated in neurodegenerative diseases, particularly Alzheimer’s disease, and Parkinson’s disease. Epidemiological studies of older adults have also identified an association between lead exposure and cognitive decline. The objective of this study is to examine the cross-sectional relationship between lead exposure and cognition in older Mexican adults. Data was used from the 2012 Mexican Cognitive Ancillary Study (MCAS), which is a subset of the 2012 Wave of the Mexican Health and Aging Study (MHAS). The MCAS is an on-going project, Phase 1 of data collection was completed in May 2016 and Phase 2 is currently being collected (October to November). Cognition was measured using the Mini-Mental State Examination (MMSE). Lead exposure was assessed through three survey questions; “In your lifetime, have you eaten foods that were prepared, stored, or served using lead glazed ceramics?”, “Approximately, how many years has it been since you last ate food that was prepared, stored, or served using lead glazed ceramics?”, and “In the last three months, how often have you used lead glazed ceramics?”. The MCAS was matched with the 2012 MHAS data set to provide socioeconomic and demographic characteristics for participants. This project is in the beginning stages of analysis. We hope to find an association between increased lead exposure and lower MMSE scores. This study hopes to provide insight into lead exposure, specifically lifelong cumulative lead exposure, in older adults and how this exposure influences cognitive functioning in older Mexican adults.
JOB INSECURITY AND SELF-REPORTED HEALTH AMONG MIDDLE TO OLD AGE WORKING ADULTS IN THE US: A CROSS-SECTIONAL EXPLORATION

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Background: Psychosocial occupational characteristics are important determinants of workers’ physical and mental health. Job insecurity has been associated with adverse self-reported health (SRH), however nationally representative studies of mid-old age working adults in the US are scarce. The current study examined the cross-sectional association between job insecurity and SRH in middle to old age working adults in the US.

Methods: This study used cross-sectional data from the 2010 National Health Interview Survey (NHIS) for adults aged 45-85 years (n=5,330). Logistic regression models were used to examine the association between job insecurity and SRH. Secondary analyses were conducted to test the hypothesized relationship by work schedule and occupational category.

Results: In the model fully adjusted for relevant sociodemographic, health, and occupational covariates, reporting job insecurity was associated with increased odds of poor SRH (OR=1.72, 95% CI=1.39-2.14), relative to reporting no job insecurity. Association between job insecurity and poor SRH was strongest among white collar workers (OR=2.25, 95% CI=1.66-3.04) and participants with rotating work schedules (OR=1.84, 95% CI=1.1-3.1). Obesity, presence of chronic medical conditions, lack of health insurance, working less than 35 hours per week, and income poverty ratio below 400% were associated with higher odds of poor SRH, whereas higher educational attainment was associated with lower odds of poor SRH.

Conclusions: Job insecurity is associated with poor SRH and might act as an important determinant of overall health and well-being of middle to old age working adults. Future studies should investigate the longitudinal association between job insecurity and SRH, taking into account the competing priorities between home and work among older working adults.
EXPLORING THE NEED FOR SKILLED OT INTERVENTION AT ST. VINCENT’S CLINIC, GALVESTON TO ADDRESS BEHAVIORAL RISK MODIFICATIONS FOR CHRONIC DISEASES

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Karen Aranha, PhD, OTR, Department of Occupational Therapy

The purpose of this study was to examine literature to understand the benefits of addressing behavioral management with chronic diseases, and to scope the need of offering skilled Occupational Therapy (OT) services at St. Vincent’s OT clinic using a biopsychosocial model of care for behavioral risk modifications. Globally the epidemiological transition with the advent of chronic diseases has posed a new set of challenges for health care (Cockerham, 2005). Lifestyle choices is the underlying cause impacting multiple systems resulting in disability, a decreased quality of life and even mortality. Five of the six leading causes of death are chronic diseases and heart conditions is the leading cause of mortality in Texas and in particular Galveston (DSHS, 2011). St. Vincent’s clinic, Galveston, sees a proportional share of people with chronic diseases. OT skill set based on the biopsychosocial model of care can be a potential link in community health care systems that seek to address self-management of chronic diseases (Baum & Law, 2016). Methods: included a literature search conducted of Cochrane, Google Scholar, and PubMed. Findings suggest: OT intervention focusing on coaching on occupational performance may be key in behavioral risk modifications (Baum & Law, 1997). Improvement secondary to intervention is seen in activity level, cognitive symptom management, improved communication with physicians, disability and social/role activities and self-reported health (Lorig et al., 1999). Coaching clients by OTs could bridge clients' real life practices with goals of the multi-disciplinary medical team addressing chronic diseases (Hand, Law & McColl, 2011). Recommendations based on this literature search support the idea of OTs expanding their services to address chronic disorders at St. Vincent’s student clinic.
GROUNDWORK TO ESTABLISH AN OCCUPATIONAL THERAPY TELEHEALTH PROGRAM IN UKRAINE AND GUATEMALA

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This project seeks to establish a framework for global health OT students to use technology to collaborate with partners (NGOs, faith-based organizations, and private allied health entities) in Guatemala and the Ukraine in their work to rehabilitate and habilitate people who are disabled or are at risk for disabilities. Occupational therapy as a profession seeks to promote active engagement of all people across the globe irrespective of functional abilities (AOTA, 2014). The underlying premise of our discipline is that engagement in occupations facilitates health and overall quality of life. Barriers to accessing occupational therapy services globally include lack of trained and practicing therapists, socioeconomic status and poverty, and infrastructure (WHO, 2011). Working to overcome these barriers, this project will use a semi-structured qualitative questionnaire completed by identified partners in the Ukraine and Guatemala to develop a telehealth framework. Themes and categories will be generated from responses to the questionnaire from which a framework will be developed to establish an OT telehealth project here at UTMB. The main focus of this project will be to educate, train, and guide collaborators in these two countries to help people engage in healthful living.
AGE OF MIGRATION AND DEMENTIA FREE LIFE EXPECTANCY: 20 YEAR FINDINGS FROM THE HISPANIC-EPESE

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Brian Downer, PhD, Division of Rehabilitation Sciences
Joseph Saenz, PhD, University of Southern California
Chi-Tsun Chiu, PhD, Institute of European & American Studies
Sunshine Rote, PhD, University of Louisville
Rebeca Wong, PhD, Sealy Center on Aging

This study employs 20 years of data from the Hispanic Established Populations for the Epidemiologic Study of the Elderly to examine nativity and age of migration differences in dementia-free life expectancy among older Mexican adults residing in the southwestern United States. Results show foreign-born Mexican-Americans, regardless of sex, spend a greater number of years after age 65 with dementia compared to U.S.-born Mexican-Americans. Furthermore, we document an advantage in dementia life expectancy and proportion of years after age 65 cognitively intact among mid-life immigrant men and women relative to early- and late-life migrants. The robust relationship between nativity, age of migration and dementia life expectancy means that the foreign-born may place particularly serious burdens on families and the government. This issue merits special attention in the development of community-based long-term care programs to appropriately target the specific needs of different sub-groups of older Mexican-origin individuals who are entering into their last decades of life.
RACIAL AND ETHNIC DIFFERENCES IN COGNITIVE IMPAIRMENT-FREE AND DEMENTIA-FREE LIFE EXPECTANCY IN THE UNITED STATES

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Background: Cognitive impairment and dementia are major health issues confronting older adults, particularly Blacks and Hispanics. Prior research indicates racial/ethnic minority older adults are at greater risk for cognitive impairment and dementia compared to Whites, but less scholarship has focused on potential racial and ethnic differences in the number of years lived with cognitive impairment or dementia.

Methods: This study employs data from 8 waves of the Health and Retirement Survey (1998-2012) to estimate racial/ethnic differences in the transitional probabilities among four states: cognitively normal, cognitively impaired/no dementia (CIND), dementia, and death among 32,271 White, Black, U.S.-born Hispanic, and Foreign-born Hispanic adults 50 years and older. Sullivan-based life tables are used to estimate life expectancies with and without cognitive impairment and dementia in later life.

Results: Older Blacks and Hispanics spend a larger fraction of their remaining years with cognitive impairment and dementia relative to older Whites, regardless of sex. Foreign-born Hispanic women and Black males are particularly disadvantaged in the proportion of years spent after age 50 with cognitive impairment and/or dementia.

Conclusions: Dementia and Alzheimer’s disease are more prevalent among racial/ethnic minorities and more years spent with dementia may result in burden on family members and/or high dependency on public resources. Programs are needed that reduce the risk for dementia in mid-life and target the specific needs of minority and immigrant elders who are entering into their last decades of life.
INTERNATIONAL DISABILITY COMPARISONS BETWEEN OLD ADULTS IN THE UNITED STATES AND KOREA USING THE RASCH MODEL

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Background: Currently, countries are ranked in ascending order based on the percentage of people with limitations in activities of daily living (ADLs) for international disability comparisons. However, this estimation method does not reflect differences in disability across various ADLs, resulting in biased disability estimations. Therefore, the purpose of this study is to create the same measurement scale to challenge the current international disability estimation method.

Design: A secondary data analysis from two population-based surveys of the US National Health and Nutrition Examination Survey (NHANES) and the Korea NHANES (KNHANES). Participants: We extracted 1,021 and 2,389 adults from the 2005 NHANES and KNHANES databases who answered “yes” to a single question about having disability. Participants had a mean age of 63.4 years old (SD=15.8) and multiple chronic conditions. The majority of the participants in this study were female (58.6%), unemployed (73.9%).

Methods: We equated 13 ADL items from the NHANES and 14 ADL items from the KNHANES using the Rasch common-item equation method and then estimated disability levels between the United States and Korea.

Results: While the percentage of Americans who had a disability (20.5%) was higher than the percentage of Koreans who had a disability (9.6%), the Rasch model estimated that the American sample had a lower disability level than the Korean sample (delta = -0.35 logits, t = -3.64, p < 0.01).

Conclusion: While the current disability estimation method demonstrated that the American sample had more disability than the Korean sample, the Rasch model revealed that the Korean sample had more disability than the American sample. This finding indicates that the percentage of people having disability does not account for the different ADL task difficulties.
HOMOCYSTEINE EFFECT ON INCREASED PAIN INTERFERENCE IN ELDERLY ADULTS

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John Janowski, MD, School of Medicine
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Richard Lipton, MD, School of Medicine

Objective: To determine the longitudinal association of homocysteine levels with the risk of developing incident moderate-severe pain interference (PIf).

Methods: Eligible, community-based participants from the Einstein Aging Study (EAS) without moderate-severe PI at baseline were enrolled. Pain intensity (PIn) and PI were measured using the bodily pain subscale from the Short Form-36. Nested cox regression models examined the relationship between continuous log plasma total homocysteine at baseline and PI incidence adjusting for demographics, PIn, cardiovascular comorbidity index, metabolic syndrome, and fasting glucose level.

Results: The sample included 442 adults aged 70+ followed for a median of 3.85 years. Higher homocysteine levels (HR=3.88, 95%CI: 1.65-9.63) and moderate-severe PIn (HR=3.84, 95%CI: 1.75-8.44) were independently associated with moderate-severe PI. When cardiovascular comorbidity index was added to the model, the homocysteine HR attenuated by 33%. When metabolic syndrome was added to the model, the homocysteine HR decreased by 39.69%. In the final model, after glucose was added to the model (HR=3.66, 95%CI: 1.52-7.43), homocysteine HR attenuated by 21.90% (HR=3.03, 95%CI: 1.08-8.53).

Conclusions: Our findings support the notion that homocysteine renders elderly adults vulnerable to PI at a given amount of PIn. This is likely to occur through shared vascular pathways.
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CALORIC INTAKE IN POST HOSPITALIZED GERIATRIC PATIENTS

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Rachel Deer, PhD, Sealy Center on Aging

Prevalence of malnutrition in the older adult population can range from 28%-42%. Multiple factors may contribute to malnutrition in post hospitalized older adults (65 years of age and older) such as: chronic medical conditions coupled with decreased appetite, chewing/swallowing difficulties, limited access to foods either by financial circumstances of mobility/ functionality, presence of depression, and or lack of social support. Malnutrition has been associated with: increased risk of mortality within 12 months of hospitalization, longer hospital admissions, increased likelihood of being readmitted within 30 days of discharge, and decrease of independence and quality of life. Thus, the research question and the primary outcome for this study is: “Are patients over the age of 65 consuming enough calories after being discharged from the hospital?” The DRI energy intake recommendations for this population are 1600 kcal/day for sedentary women and 2000 kcals/day for sedentary men. UTMB ACE unit was screened daily for eligible participants. Participants were enrolled during their hospital stay. Food recalls administer at week 1 and at week4. 62% of participants were not meeting the DRI recommendations for intake. However, neither females (p=.170) nor males (p=.164) are consuming significantly different amounts than the DRI recommendation. Intake did not significantly increase from week 1 to week 4; females (p=.178), males (p=.826). As a whole, the group is meeting the Acceptable Macronutrient Distribution Ranges (AMDR) for protein and carbohydrate and are slightly over the AMDR for fat. The majority (62%) of geriatric patients discharged from UTMB were not meeting the DRI recommendations for caloric intake. However, as a whole their intake was not statistically different from the DRI recommendations. Intake did not significantly increase from week 1 to week 4. While older adults’ diet follow the Acceptable Macronutrient Distribution Range (AMDR), their caloric intakes were below the recommendations.
PREDICTING POSTOPERATIVE ATRIAL FIBRILLATION IN CORONARY ARTERY BYPASS GRAFTING SURGERY: A SYSTEMATIC REVIEW

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Introduction: About 30% of patients undergoing coronary artery bypass grafting (CABG) surgery develop postoperative atrial fibrillation (POAF). Several risk prediction models have been developed to predict the risk of POAF among these patients. The study aim was to systematically review and summarize currently available risk prediction models for POAF in patients undergoing CABG surgery.

Methods: A literature search of MEDLINE, PSYCHINFO, CINAHL, Web of Science and Cochrane Library was conducted through July 2016. Studies pertaining to atrial fibrillation as a complication after CABG were considered, and those that developed and validated risk prediction models were included. We extracted year, population/setting, cohort size, POAF definition, the rate of atrial fibrillation incidence, and model discrimination and calibration. The models were further evaluated to identify common patient characteristics that best predicted POAF.

Results: Of 562 articles, 13 papers met selection criteria and 14 distinct risk models were included. The studies used both single- and multi-institutional populations from eight countries. The cohort size ranged from 556 to 19,083, and incidence of POAF ranged from 13% to 33%. The definitions of POAF were comparable. The c-statistic of prediction models ranged from 0.62 to 0.87. The most commonly used variable was age. Other common patient characteristics used included gender, height, weight, co-morbidities, smoking history, concurrent valve surgery, preoperative withdrawal of medications, and CHA2DS2-VASc Score.

Conclusions: Several risk prediction models were developed to predict the risk of POAF after CABG in different patient populations. Four of these models achieved a c-statistic of greater than 0.75, indicating a need for further external validation of most models by utilizing different populations in order to prove applicability.
EXAMINING PHYSICIAN NETWORK DIFFERENCES AND MINIMALLY INVASIVE BREAST BIOPSY USE IN TEXAS USING SOCIAL NETWORK ANALYSIS

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Objective: To describe physician networks derived from Texas Medicare data in terms of network measures and to relate these network measures to minimally invasive breast biopsy rates (MIBB).

Data Sources: Physician networks were created using the 100% Texas Medicare Data for seven metropolitan regions in Texas from 2009 to 2012.

Methods: We created networks of physicians involved in breast cancer care using the shared patient model. In this model, physicians are the nodes of the network and edges are defined by shared patient claims for two physicians. An edge is present if two physicians share claims for more than eight patients. For each year, network measures such as density and centralization were calculated and compared between regions.

Principal Findings: Accounting for network size, Lubbock was the densest network compared with the other metropolitan regions. This network was among the highest in utilization of MIBB. Degree Centralization for Austin was increasing from 2009 to 2012.

Conclusion: Performing a regional description of healthcare service in a network analysis framework can lead to a better understanding of regional healthcare patterns and geographic variation. Specifically, this was done in Texas for breast cancer diagnostics within the Medicare population.
RELATIONSHIP OF DIET QUALITY AND SOCIOECONOMIC STATUS IN HOSPITALIZED OLDER ADULTS

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Shawn Goodlett, Sealy Center on Aging  
Elena Volpi, MD, PhD, Sealy Center on Aging  
Rachel Deer, PhD, Sealy Center on Aging  

It is well established that poor nutritional status or malnutrition in older adults leads to increased length of hospital stay as well as rates of comorbidities and mortality. Therefore, it is imperative to ensure adequate dietary intake in older adults. While a number of factors may be associated with dietary intake, the question of how socioeconomic status (SES) correlates to diet quality in hospitalized older adults remains equivocal. Prior research points to the possibility that overall diet quality is positively associated with SES, especially in older adults. Analysis of diet quality and SES in hospitalized older adults revealed that as the level of SES increased so did the quality of diet (Spearman’s correlation $P = -0.0265$) ($p = 0.01$). This finding illustrates the impact of SES on diet quality in this population and serves to assist health professionals in identifying those with an elevated risk of poor nutritional status and malnutrition.
EFFECT OF HOSPITALISTS’ YEARS OF EXPERIENCE ON HOSPITAL AND 30-DAY MORTALITY AMONG MEDICARE POPULATION

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James Goodwin, MD, Sealy Center on Aging
Jie Zhou, PhD, Sealy Center on Aging

Background: The total percentage of Medicare beneficiaries being cared for by hospitalists is increasing. The effect of hospitalists’ years of experience on the outcomes of hospitalized patients is not clearly studied.

Methods: We aim to describe the effect of hospitalists’ experience on their outcomes (hospital mortality, and 30-day mortality). We utilized 5% National Medicare Data over two-year period using multilevel, and multivariable models using patient characteristics (age, gender, race, Medicaid eligibility education, length of stay, admission source, number of admissions in the past 12 months prior to the index admission, DRG weight, DRG type, hospitalists’ experience and comorbidities) and hospital characteristics (bed size, urban/rural indicator, provider type, overall patient rating and medical school affiliation). Acute hospital admissions were divided in 3 groups based on hospitalist experience (0-1, 2-3 and > 3years). We used multilevel logistic regression modeling to evaluate the association of patient and hospital characteristics with these two outcomes. SAS version 9.4 (SAS Institute, Cary, NC) was used for all statistical analyses.

Results: We identified a sample of 152,545 acute hospital admissions. The three groups differed in patient’s race, DRG weight, DRG type, length of hospitalization and number of hospitalization in the 12 months prior to the index admission and all hospital characteristics. The multilevel and multivariable analysis showed that hospitalists’ experience was protective against 30-day mortality 0.976 (0.955-0.998) and had a protective trend against hospital mortality 0.989 (0.953-1.027).

Conclusion: Hospitalists’ experience had a protective effect against 30 day mortality but showed a protective trend for the hospital mortality. The effect size suggests that hospitalists mortality outcomes may improve in the first few years of practice. Further studies are needed for longer term outcomes.
Patient-Centered Outcomes Research - Student

ASSESSING THE IMPORTANCE OF SPIRITUALITY IN DIABETES SELF-MANAGEMENT AND LIFE-IMPACT: A COMPARATIVE ETHNIC STUDY OF TYPE 2 DIABETES PATIENTS

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Patient-centered Type II diabetes care may be important for modifying treatments and improving patient satisfaction. This study identifies how spiritual approaches are integrated into self-management and are associated with glycemic control, self-management behaviors, and quality of life. A first phase is qualitative, exploring patients’ beliefs and behaviors concerning self-management and spirituality, and a second phase integrates patients’ responses to develop a structured patient survey to test for associations between patient practices and blood glucose concentration (hemoglobin A1C), adherence to recommended diabetes self-care activities (Diabetes Self-Management Questionnaire), and quality of life (Patient-Reported Outcomes Measurement Information System (PROMIS)). Psychological wellbeing (Depression Anxiety Stress Scales (DASS-21)) will be used to test for associational mediation between patient practices and the outcomes. Type II diabetic patients at least 50 years of age with a diagnosis of five or more years will be recruited as they appear for routine appointments at the Geriatrics and Family Medicine clinics at UTMB. Sampling will seek equal representation by ethnicity (Hispanics, non-Hispanic blacks, and non-Hispanic whites) and gender (N~60). Open-ended interviews will explore treatments, management, goals, quality of life, and spirituality, defined as the meanings, purposes, and hopes in the context of the illness. Themes will be compared across ethnic and gender subgroups. The completed first phase interview content will be used to create the structured survey that will be used for the associational tests in the second phase of the study. The poster describes the study background, objectives, and protocol.
METFORMIN AND HEALTH CARE UTILIZATION IN PATIENTS WITH COEXISTING CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND DIABETES

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BACKGROUND: COPD and Diabetes are common coexisting condition. Skeletal muscle dysfunction is well known in patients with chronic obstructive pulmonary disease (COPD). We aim to investigate the role of metformin in patient with coexisting chronic obstructive pulmonary disease and diabetes on health care utilization in terms of all cause and COPD related hospitalization.

METHODS: We study Medicare beneficiaries with COPD and diabetes who initiated their antidiabetic medications (metformin, sulfonylurea, insulin and others) between 2008 and 2010. Patients were followed for two years after the initial antidiabetic prescription for all-cause and COPD-related hospitalization. The association between antidiabetic medication use and the outcomes was examined by multivariable logistic regression model. All analyses were performed with SAS version 9.4 (SAS Inc., Cary, NC).

RESULTS: Among 5,614 patient with coexisting chronic obstructive pulmonary disease and diabetes were initiated on an antidiabetic medicine. Metformin, sulfonylurea, insulin and others were used in 3,110; 1,110; 936; and 435 patients with COPD, respectively. In comparison to oral hypoglycemic, patient on insulin group were sicker, more likely to be on oxygen, had more hospitalization in prior year, had more cardiovascular co-morbidities, sarcopenia, osteoporosis and were receiving hemodialysis. In a multivariate logistic regression model, after adjusting for baseline characteristics, patients with COPD on metformin had a lower odds of all cause hospitalization (0.50; 95 %CI 0.42-0.60) and COPD related hospitalization (0.74; 95 % CI 0.56-0.98) compared to those on insulin.

CONCLUSION: Our study showed that patient with coexisting chronic obstructive pulmonary disease and diabetes mellitus who received metformin were less likely to be admitted to the hospital for all cause and COPD related hospitalization as compared to those on insulin.
LONG-ACTING BRONCHODILATORS WITH OR WITHOUT INHALED CORTICOSTEROIDS AND 30-DAY READMISSION IN PATIENT HOSPITALIZED FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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BACKGROUND: The ability of a long acting muscarinic antagonist and long acting beta 2 agonists (long acting bronchodilators, LABD) with or without inhaled corticosteroid (ICS) to reduce early readmission in hospitalized patients with Chronic Obstructive Pulmonary Disease (COPD) is unknown.

METHODS AND FINDINGS: We studied a 5% sample of Medicare beneficiaries enrolled in Medicare parts A, B and D and hospitalized for COPD in 2011. We examined prescriptions filled for LABD and/or ICS (LABD+/-ICS) within 90 days prior to and 30 days after hospitalization. Primary outcome was 30-day readmission rate between “users” and “non-users” of LABD+/-ICS. Propensity score matching and sensitivity analysis was performed by limiting analysis to patient hospitalized for acute exacerbations of COPD (AECOPD).

Among 6,066 patients hospitalized for COPD, 3,747 (61.8%) used LABD+/-ICS during the specified period. The “user” and “non-user” groups had similar rates of all-cause ER visits and readmissions within 30 days of discharge date (22.4% vs 20.7%, p-value 0.11; 18.0% vs 17.8%, p-value 0.85, respectively). However, the “users” had higher rates of COPD-related emergency room (ER) visits ([5.3% vs 3.4%, p-value 0.0006] and higher adjusted odd ratio (aOR) 1.47 [95% confidence interval (CI) 1.11-1.93] and readmission [7.8% vs 5.0%, p-value <0.0009 and aOR 1.48 (95% CI 1.18-1.86)] than “non-users”. After propensity score matching, the aOR of COPD-related ER visits was 1.47 (95% CI, 1.11-1.93) and readmission was 1.48 (95% CI, 1.18-1.86). The results were similar when restricted to patient hospitalized for AECOPD.

CONCLUSIONS: Use of LABD+/-ICS did not reduce 30-day readmissions in patients hospitalized for COPD.
ADJUNCT TESTOSTERONE THERAPY IMPROVES CARDIAC FUNCTION IN CANCER PATIENTS UNDERGOING CONCURRENT CHEMORADIATION

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Testosterone therapy has been reported to be cardioprotective in hypogonadal older men and to be effective at counteracting age-related sarcopenia. Testosterone has also been shown to be a vasodilator of both coronary and systemic arteries including resistance arteries. Extending these findings, we conducted a clinical trial (R01 CA127971) to assess the efficacy of adjunct testosterone therapy at counteracting the loss of skeletal muscle mass and function in cancer patients. As a secondary outcome, we assessed the influence of testosterone therapy on cardiac function and its potential to be part of a cardio-protective regimen in late stage cancer patients. Men and women recently diagnosed with late stage (≥IIIIB) or recurrent head and neck or cervical cancer who were scheduled to receive standard of care chemotherapy or concurrent chemoradiation were administered an adjunct 7 weeks treatment of either weekly intramuscular injections of 100mg testosterone (T, n=1M/5F) or placebo (P, n=6M/4F) in a double-blinded and randomized fashion. Systolic and diastolic cardiac functions were measured by a board certified peri-operative cardiographer in a blinded fashion via transthoracic echocardiogram (TTE) at the beginning and at the end of each patient’s study period. Adjunct testosterone therapy significantly improved stroke volume (-1.9mL vs +11.5mL, p=0.01), ejection fraction (-1.8% vs +6.2%, p=0.02), and cardiac index (0.09L/min/m2 vs 0.92L/min/m2, p=0.02) for placebo vs testosterone, respectively. However, systemic vascular resistance was reduced with testosterone therapy (+45.7dyn*s/cm5 vs -359.3dyn*s/cm5, p=0.001). Adjunct testosterone therapy in late stage cancer patients undergoing standard of care cancer treatment appears to improve systolic function by reducing afterload. These results suggest that testosterone may have the potential to mitigate or prevent cardiac remodeling during chemotherapy or concurrent chemoradiation by reducing cardiac workload.
FACTORS AFFECTING LIKELIHOOD OF OBTAINING THORACOSCOPIC VERSUS OPEN LOBECTOMY: A NSQIP ANALYSIS

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Introduction: Nationwide, video assisted thoracoscopic surgery (VATS) is being utilized with increasing frequency for pulmonary resection. VATS lobectomy is associated with less morbidity than open lobectomy. There appears to be a disparate rate of utilization of VATS across different patient populations, however. Our goal was to determine which factors affect a patient’s likelihood of undergoing VATS versus open lobectomy.

Methods: The National Surgical Quality Improvement Program (NSQIP) was queried from 2005 through 2014 to identify all patients undergoing pulmonary lobectomy. Multivariable logistic regression was conducted to identify factors associated with an increased likelihood of receiving an open lobectomy versus a VATS approach.

Results: From 2005 through 2014, 11,977 patients in the NSQIP database underwent lobectomy (open, 6,391; VATS, 5,586). The mean age was 64.4 years and females comprised 53.4% of cases. The use of VATS lobectomy increased significantly over time. On multivariable analysis, male gender (odds ratio [OR], 1.20; 95% confidence interval [CI], 1.12-1.30), African-American race (OR, 1.22; 95% CI, 1.04-1.43), age under 75 years (OR, 1.21; 95% CI, 1.11-1.32), worse frailty index (OR, 1.56; 95% CI, 1.06-2.28) and performance of the lobectomy by someone other than a non-cardiac thoracic surgeon (OR, 1.37; 95% CI, 1.25-1.51) were associated with an increased likelihood of receiving an open lobectomy.

Conclusions: The frequency of VATS lobectomy has increased substantially over the last 10 years. Demographics including gender, race/ethnicity, and age; clinical characteristics; and specialty of surgeon influences a patient’s likelihood of receiving VATS versus open lobectomy. Identifying such disparities in surgical approach may help to direct the focus of interventions at the individual, hospital or organizational level to increase the use of VATS lobectomy.
LESSONS LEARNED: ASSESSING GRIP STRENGTH AND MOBILITY FUNCTIONS IN A BREAST CANCER SUPPORT GROUP SETTING

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Background: Functional impairments are associated with reduced quality of life in aging breast cancer survivors. Self-reported functional measures are frequently used, and community-based measurement is rare. However, objective functional measures may better capture deficits, and community-based assessment would allow earlier discovery in a broader population. Thus, the aim of this study was to evaluate the feasibility of using objective functional measures within a community-based breast cancer support group.

Methods: Baseline information from an ongoing 12-week support group intervention was used to evaluate participants’ function. We used Jamal dynamometer to evaluate grip strength and Short Physical Performance Battery (SPPB) to assess mobility function. Feasibility was evaluated based on number of participants completing both assessments and time required for assessments. Descriptive statistics were conducted.

Results: Nineteen survivors completed the grip strength and SPPB assessments. Majority were White (68%) with a mean age of 55±12 years. All completed three grip strength evaluations for both hands despite 32% reporting peripheral neuropathy. Seven participants had grip strength below norms. All attempted the SPPB assessments with a mean score of 10±1.3 out of 12, indicating high functioning. However, 9 of 19 participants completed the 10 seconds tandem balance test with some difficulty. Approximately 25 minutes was required to complete assessments using standardized protocols.

Discussion: We found that it is feasible to conduct grip strength and SPPB assessments in a support group setting. Despite 47% of participants experiencing difficulty during the 10 seconds tandem balance test, the mean SPPB score was high. This indicated a ceiling effect. A protocol modification to increase hold time from 10 seconds to 30 seconds may eliminate the ceiling effect and to help capture possible balance issues.
QUALITY EVALUATION OF THE OPTICAL COHERENCE TOMOGRAPHY DIAGNOSTIC ACCURACY STUDIES FOR GLAUCOMA CLINICAL MANAGEMENT: STUDY DESIGN AND BASELINE CHARACTERISTICS

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Glaucoma is the leading cause of irreversible blindness worldwide. The disease prevalence increases with age, being 3.5% in the 40-80 year-old age group. As the world population ages, it is estimated that 111.8 million people will be affected by glaucoma in 2040.

Early detection and close monitoring of disease progression are essential components of the glaucoma clinical practice. For this purpose, clinicians largely rely on the results of ophthalmic imaging tests. Among the available imaging technologies, Optical Coherence Tomography (OCT) plays a dominant role. Studies indicate that available OCTs are able to discriminate between healthy and glaucomatous eyes; however, at present no OCT has received regulatory approval/clearance for glaucoma diagnosis or screening in the United States. As OCT continues to evolve, new diagnostic test accuracy (DTA) studies are conducted to elucidate the role of OCT in the glaucoma decision-making process.

Sound methodology and reporting of DTA studies are necessary to determine the clinical value of a given test. Despite the efforts of the scientific community at large to promote the highest research standards, as of 2006, the glaucoma OCT DTA studies were shown to have suboptimal reporting quality. Since then, the widespread diffusion of OCT determined an unprecedented proliferation of OCT publications. However, it is unclear whether the quality of the OCT DTA studies in glaucoma has improved over time.

The purpose of our study is to systematically evaluate the reporting and methodological quality of the OCT DTA studies for glaucoma clinical management, published in the medical literature over the decade 2006-2016. The study design and the baseline characteristics of the included OCT DTA studies will be presented.
RODENT IN VIVO ASSESSMENT (RIVA) CORE

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The UTMB Rodent In Vivo Assessment (RIVA) Core Facility was established to provide UTMB researchers access to top-quality behavior equipment and professional expertise in the design and execution of rodent behavior experiments. Our RIVA Core Facility ensures that Users are rigorously trained in the consistent performance of rodent behavior paradigms. The Core is fully equipped to perform a thorough evaluation of the animals’ general health, sensory, motor, and cognitive function as part of its characterization or validation.
PALMITOYL-CARNITINE PRODUCTION BY BLOOD CELLS IS ASSOCIATED WITH PHOSPHORYLATION OF PROTEIN KINASE A

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Circulating acyl-carnitines (Acyl-CNTs) are associated with insulin resistance and type 2 diabetes in both rodents and humans. We have previously shown that in humans, blood cells produce palmitoyl-CNT, the process that strongly associated with the concentration of circulating acyl-CNTs and the plasma palmitate oxidation. In vitro studies on endothelial cells showed that protein kinase A (PKA) upregulates carnitine palmitoyltransferase-1 (CPT-1), the enzyme that catalyzes the synthesis of palmitoyl-CNT. Here we aimed to test our hypothesis that in humans the synthesis of palmitoyl-CNT by blood cells associates with the activity of PKA in these cells.

We measured the fractional and absolute synthesis rates of palmitoyl-CNT by blood cells using stable isotope tracer approach. Measurements were made under fasting and hyperinsulinemic-euglycemic conditions in eight non-diabetic healthy women (Age: 47±19 y; BMI: 26±1 kg•m⁻²). Peripheral blood mononuclear cell proteins were extracted and the ratio of phosphorylated to total PKA (p/tPKA) was measured by Western Blot. Linear regression analyses were performed to determine the relationship between p/tPKA and the synthesis rate of palmitoyl-CNT.

The ASR of palmitoyl-CNT significantly correlated with p/tPKA (r=0.883, p=0.019) under the hyperinsulinemic, but not fasting state (r=0.354, p=0.492).

Our data demonstrate that in healthy non-diabetic women, the synthesis of palmitoyl-CNT by blood cells associates with activation of PKA; however, this was true under pseudo fed (i.e., hyperinsulinemic) but not fasting state. Future studies investigating the role of blood cells in lipid metabolism and thus in the development of metabolic complications leading to the development of insulin resistance are warranted.
PRELIMINARY FINDINGS OF THE EFFECTS OF LEUCINE SUPPLEMENTATION IN BEDRIDDEN OLDER ADULTS

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Older adults are at increased risk of being bedridden and experiencing negative health outcomes including loss of muscle mass and function and impaired insulin action. We hypothesize that supplementing daily meals with leucine will partially preserve muscle mass and function during bed rest in older adults. Up to this point in recruitment, men and women (11 male, 3 female) with an average age of 66.5±1.5 years old have been randomized to be supplemented with leucine (LEU, 0.06 g/kg/meal; n=4) or an isonitrogenous control (CON; 0.06 g/kg/meal; n=9), and admitted to the Institute for Translational Sciences’ Clinical Research Center for 7 days of bed rest followed by 7 days of inpatient rehabilitation. We are assessing body composition using iDEXA, measuring muscle strength using isokinetic dynamometry, aerobic capacity via VO2 max testing and indicators of metabolic health including OGTT and blood lipids. Preliminary findings indicate that leucine may slow the loss of lean leg mass, reduce the accumulation of fat mass and preserve aerobic capacity during physical inactivity. This research is supported by: RO1 NR012973 (DPJ), The Claude D. Pepper Older Americans Independence Center, Sealy Center on Aging and Institute for Translational Sciences-Clinical Research Center.
A HEALTH INFORMATION WEBSITE DEDICATED TO SUPPORT THE FAMILIES / FRIEND OF INDIVIDUALS WITH SELF-NEGLECT

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Self-neglect is one of the most common problems investigated by Adult Protective Services. It is often a treatable condition and may lead to negative health consequences if ignored (Pavlou & Lachs, 2008; Torke & Sachs, 2008). There are currently no websites dedicated exclusively to self-neglect. Development of a comprehensive self-neglect website is proposed to address such need. The Selfneglect.org website (SNW) is designed with the following premises: 1) a person with self-neglect is unlikely to seek help; 2) the SNW is tailored to address the concerns of the families and friends of individuals with self-neglect (IWSN); and 3) if provided with accurate information and guidance, families and friends of IWSN are likely to be the catalyst for successful intervention. Ten experts from the fields of self-neglect, geriatric nursing, and/or health care informatics will then assess the SNW utilizing a questionnaire. The questionnaire will cover the following topics: navigation, literacy, authority, contact, sponsorship, currency, credibility, objectivity, coverage, disclaimer, purpose, privacy / confidentiality, and audience. Results of the survey will serve as a basis for a Plan-Do-Study-Act process to improve the quality of the SNW. After content expert feedback has been incorporated, the modified version of the SNW will be made public on the Internet. The final phase of the SPP will be to determine which webpages on the SNW receive the most traffic in order to guide further website development, including establishing user forums, and applications of the site.
ESTIMATION OF APPENDICULAR SKELETAL MUSCLE MASS WITH BIOELECTRICAL IMPEDANCE ANALYSIS IN ACUTELY ILL OLDER ADULTS

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Over 20% of acutely ill geriatric patients have age-associated loss of skeletal muscle mass and function. With the growing awareness of the prevalence of sarcopenia, there is an increasing need for a portable, inexpensive and user-friendly approach to measuring appendicular skeletal muscle mass (ASMM).

The objective of this study was to create a validated prediction model for ASMM from bioelectrical impedance analysis (BIA) using dual energy X-ray absorptiometry (DXA, GE lunar) as the reference measurement. To increase the usability of this equation in the geriatric population we used a basic “foot-to-foot” BIA scale (Tanita BF-350) that determined percent fat mass (FM-BIA).

The sample consisted of 171 subjects. Testing included measurement of demographics (age, gender, race), body composition (DXA, BIA, anthropometric measures), physical function tests (gait speed and grip strength), independence questionnaires (ADL, IADL), and chart review (BMP and admission history).

FM-BIA was positively correlated with fat mass measured by the DXA (FM-DXA): r= 0.792, p<0.01. The Bland-Altman plot showed BIA underestimated FM with the mean difference of 3.44 ± 5.49%. Scatterplots for linearity were run on all testing measures. The following statistically correlated variables were included into the prediction model: gender, BMI, max grip strength, and FM-BIA. R2 and SEE for the equation was 0.67 and 2.450, respectively. Gender was the main contributor in our model: explained 32.7% of the variance seen in ASMM measured by DXA.

After validation of this equation with a separate sample, physicians would be able to estimate ASMM through the use of easily obtained and cost-effective measurements. This equation would enable physicians to prevent, diagnose and treat sarcopenia in the acutely ill geriatric population.
A QUALITY IMPROVEMENT PROJECT TO REDUCE 30 DAY RE-HOSPITALIZATION RATES FOR NURSING HOME PATIENTS

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Background: High hospitalization rates in skilled nursing facility patients have resulted in high health care costs and poor health outcomes. Use of risk prediction models to identify patients at high risk for hospital readmission has the potential to reduce hospital readmissions and increase cost effectiveness if risk reduction interventions are focused on patients at the highest risk for readmission. A gap in the literature exists for readmission risk prediction models validated for use in older adults receiving care in nursing homes and for implemented intervention stratification models.

Objective: To reduce facility 30 day re-hospitalization rates post intervention in comparison to the current 30 day re-hospitalization rate of 18.75%.

Setting: A 113-bed privately owned suburban skilled nursing facility that provides care to short stay and long term care nursing home patients.

Subjects: All admissions to the nursing facility during the study period will be assessed using the HOSPITAL risk prediction tool. Patients with a HOSPITAL score of ≥7 out of 13 possible points will receive the intervention.

Methods: For patients identified as high risk (HOSPITAL score ≥ 7), the intervention will include an admission visit by the primary care provider within 24 hours, increase of primary care visits to 2-3 visits per week and daily registered nurse assessment with medical provider notification of any changes. Daily RN assessments will include increased diagnosis specific monitoring in patients with a diagnosis of congestive heart failure, pneumonia or acute myocardial infarction.

Measurements: To evaluate the project goal, facility reported 30-day re-hospitalization rates prior to and after the intervention will be collected and analyzed over a period of 3 months pre- and post- intervention.

Results; Conclusions: Intervention in progress.
EXERCISE TRAINING FOR THE TREATMENT OF ACCELERATED SARCOPENIA IN ELDERLY DIABETICS

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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 upcoming 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 OLDER ADULTS

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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 two groups for a six-month intervention: 1h of supervised treadmill walking with 15g of essential amino acid supplementation (EAA, n=13; age=71.17 ± 1.15y) or 1h of supervised treadmill walking with placebo (PLA, n=11; age=73.64 ± 1.38y). All 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 oral disposition index.

RESULTS: After six months, both groups increased (p<0.05) VO2peak (EAA=15.3 ± 4.1%, PLA= 16.3 ± 4.2%) and fast walking speed (EAA=5.4 ± 1.1%, PLA=4.6 ± 1.7%). In contrast, only EAA increased (p<0.05) leg strength (EAA= 17.9 ± 6.4%, PLA= 11.6 ± 7.1%). Although preliminary (n=5 for each group), there was a larger improvement in insulin resistance for EAA (77.7%) versus PLA (30.2%) subjects.

CONCLUSION: Aerobic exercise with EAA supplementation increases muscle function, while decreasing insulin resistance. This treatment is a possible option for reducing the risk of developing sarcopenia and improving metabolic health.

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IMPROVEMENT OF INTERPROFESSIONALISM AND PROFESSIONALISM USING CLINICAL AND EDUCATIONAL EXPERIENCES THROUGH PATIENT CARE

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No matter the setting, all healthcare professionals come together to combine skill and expertise to provide quality patient-centered care. Interaction and communication among all healthcare professionals are vitally important for a streamlined, efficient process. According to the World Health Organization (2010), “interprofessional education occurs when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes.” When taking care of the patient population, the interprofessional team is concerned with aging because of the prevalence of diseases, conditions, and injuries that may disrupt healing and recovery. The team’s role is to communicate to the patient, caregivers, health professionals, and social workers in order to build a bridge of interprofessional communication. This communication can include education about the disease process and/or condition affecting the geriatric population, appropriate patient care in a hospice, and discharge planning. The purpose of this study was for an interprofessional team including two physical therapy students, one nursing student, one respiratory therapy student, and one medical student to seek an improvement in how interprofessionalism and professionalism applies to patient care throughout the lifespan by using clinical and educational experiences.
IMPLEMENTING POST-HOSPITAL INTERVENTIONS IN COMMUNITY DWELLING OLDER ADULTS: FEASIBILITY & ADHERENCE

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Acute hospitalization contributes to morbidity in geriatric patients. Evidence-based strategies to improve functional recovery after discharge are lacking. The goal of this pilot study was to test the feasibility of post-hospitalization interventions [isocaloric placebo, whey protein supplement, in-home rehabilitation + placebo, rehabilitation + whey, or testosterone] to improve physical function in older adults.

From Jan 2013- July 2016, of the 4533 patients screened 594 met our eligible criteria. We contacted 384 and enrolled 113 subjects. 100 subjects were randomized and began the 30-day intervention. We were able to meet our recruitment goals within the allotted time frame.

Adherence to testosterone was 100%, to rehabilitation was 77%, and to supplements was 75%. At the start of the rehabilitation program, 46% were unable to do the prescribed program, 49% started at low-level, 2% at mid-level, and 2% at high-level intensity. All those that were re-hospitalized were unable to increase intensity throughout the program; yet in those that completed the program 88% increased intensity. Mean supplement adherence score did not vary according to group, type, or single versus dual intervention. However, participants who completed the study had a higher mean supplement adherence score (p<0.01).

Data from this pilot study are important for power analysis for designing larger clinical trials. We found that implementation of post-hospitalization interventions in acutely ill older adults was feasible and adherence in all groups was adequate.
DECREASING 30-DAY READMISSIONS WITH POST-HOSPITAL INTERVENTIONS IN COMMUNITY DWELLING OLDER ADULTS

Rachel Deer, PhD, Sealy Center on Aging
Elena Volpi, MD, PhD, Sealy Center on Aging

Hospital readmission is a common occurrence among elderly and high risk patients. Evidence-based strategies to decrease readmissions and improve the quality of care are a national priority. The goal of this pilot study was to determine if post-hospitalization interventions [isocaloric placebo (p), whey protein supplement (w), in-home rehabilitation + placebo (r+p), rehabilitation + whey (r+w), or testosterone (t)] decreased 30-day readmission in older adults.

From Jan 2013- July 2016, 100 subjects were randomized and began the 30-day intervention. 8 subjects withdrew from the study prior to the intervention being completed. 13 subjects were re-hospitalized between 1-26 days post discharge with 46% occurring within the first two weeks. The majority of readmissions (61%) were due to a similar diagnosis. Re-hospitalization rates varied greatly between groups with the highest rates in the placebo group (25%) and lowest in the testosterone group (5%) (p=0.06).

Data from this pilot clinical trial indicate that post-hospitalization interventions in acutely ill older adults may decrease 30-day hospital readmission. Further analysis to adjust for covariates (age, comorbidity index, length of stay) is ongoing.
PRESERVING MUSCLE MASS AND FUNCTION IN BEDRIDDEN OLDER ADULTS: EFFECTS OF LOW-INTENSITY EXERCISE

Elfego Galvan, PhD, Division of Rehabilitation Sciences
Emily Arentson-Lantz, PhD, Department of Nutrition & Metabolism
Sneha Nagamma, MD, Department of Nutrition & Metabolism
Douglas Paddon-Jones, PhD, Department of Nutrition & Metabolism

After the age of 40 years muscle mass and strength begin to decline by approximately 0.8%/year. The rate increases to 1.5%/year by the age of 65 years. Short-term periods of disuse accelerates the loss of muscle mass and function. In healthy older adults, leg lean mass decreased by approximately 4% and 7% after 5- and 14-days of bed rest, respectively. This decrease in leg lean mass was accompanied by a 15% loss in leg strength.

Our goal is to determine the effects of daily low-intensity exercise (2,000 steps/d) on the regulation of muscle mass and function. We utilized our 7-day bed rest protocol to model skeletal muscle unloading utilizing two experimental groups: Bed Rest alone (CON); Bed Rest + countermeasure (Ex). Mean and percent changes in isometric strength, total lean mass (TLM), and leg lean mass (LLM) were determined and compared between baseline and after 7-day of bed rest. We observed post-bed rest changes in isometric strength (CON: 3±9 Nm vs Ex: -5±22 Nm), TLM (CON: -1260±872 g vs Ex: -1887±1141 g) and LLM (CON: -932±575 g vs Ex: -858±731 g). In terms of percent change, isometric strength (CON: 1.9±5.7% vs Ex: -3.5±14.5%) and TLM (CON: -2.7±1.9% vs Ex: -4.0±2.2%) decreased slightly more in the Ex group, while LLM (CON: -5.9±3.7 vs Ex: -5.5±4.6%) was slightly more preserved with low-intensity exercise.

Our preliminary data currently suggests that 2,000 steps/day may not be sufficient activity to mitigate the loss of muscle mass and function associated with disuse in healthy older adults. Preserving muscle and functional capacity during bed rest is clinically desirable as the aging population continues to grow.
EFFECT OF INCREASING HABITUAL PHYSICAL ACTIVITY ON NUTRIENT SENSING AND ANABOLIC RESISTANCE IN OLDER ADULTS

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Aim: Anabolic Resistance is the reduced capacity of skeletal muscle to increase protein synthesis rates in response to appropriate anabolic stimuli such as exercise and nutrient intake. This condition could explain the physiological decline of structural and functional characteristics in skeletal muscle that occurs with aging. However, the molecular mechanisms underlying anabolic resistance are unknown. Acute bouts of physical activity can improve the ability of amino acids to stimulate mTORC1 signaling, which is the primary contributor to muscle protein synthesis. Therefore, the aim of this study was to determine if an increase in habitual physical activity in older adults improves mTORC1 signaling and its ability to restore amino acid sensing.

Methods: To test our hypothesis 20 healthy older adults (65-80 years old) were trained for 12 weeks with a progressive RT program. Pre and post-training measurements of muscle mass, strength, and metabolic health were obtained. Pre and post study days also included a stable isotope infusion trial wherein subjects ingested an essential amino acids (EAA) drink and skeletal muscle biopsies were taken at rest, 1 hr and 3 hr after EAA ingestion to measure markers of amino acid sensing (e.g., mTORC1 activation) rate of protein synthesis.

Results: RT increased muscle mass and strength and improved metabolic parameters. RT enhanced mTORC1 activation as indicated by a post-training increase in the phosphorylation status of Akt, 4E-BP1, p70S6K, and rpS6 and the rate of protein synthesis in response to EAA drink.

Conclusion: Our preliminary data suggest that an increase in habitual physical activity can improve amino sensing in skeletal muscle and may be an effective strategy to overcome anabolic resistance in older adults.
SKELETAL MUSCLE MITOCHONDRIAL IN PATIENTS WITH PERIPHERAL ARTERY DISEASE/Critical Limb Ischemia

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Craig Porter, 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 versus age-matched healthy controls.

Methods: To date, we have recruited and studied 7 patients with CLI undergoing revascularization procedures or amputation (60.8±10.6 y; PAD) and 7 age-matched healthy adults (62.1±6.5 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: Maximal mitochondrial respiration coupled to ATP production was lower in muscle from PAD patients compared to control (18.4±4.6 vs. 41.3±4.7 pmol/s/mg; P<0.01), Maximal respiration in the uncoupled state was also lower in PAD patients compared to control (28.3±6.9 vs 51.8±16.6 pmol/s/mg; P<0.05). Capacity for ATP production was highly correlate to maximal respiratory capacity in both PAD patients (r=0.94, P<0.01) and controls (r=0.91, P<0.001). The respiratory control ratio for ADP was not significantly different between groups. However, the flux control ratio was lower in PAD patients vs controls (0.66±0.05 vs 0.80±02 P<0.05).

Conclusion: Our preliminary results show that skeletal muscle oxidative capacity is substantially lower in PAD. Moreover, these data suggest that mitochondrial quality is lower in muscle from patients with PAD. Collectively, reduced skeletal muscle respiratory capacity and mitochondrial quality likely contribute to impaired functional capacity in patients with PAD.
TESTOSTERONE SUPPLEMENTATION PRESERVES LEAN BODY MASS IN PATIENTS WITH CERVICAL AND HEAD AND NECK CANCERS

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Bill Durham, PhD, Department of Internal Medicine
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Albert Chamberlain, MD, Department of Internal Medicine
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Christopher Danesi, MS, Department of Internal Medicine
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Daniel Jupiter, PhD, Preventive Medicine and Community Health
Randall Urban, MD, Department of Internal Medicine

Cancer is the second leading cause of death for individuals over 45 years old (second only to heart disease), and the risk of developing cancer increases dramatically with age. A cancer induced increase in inflammatory cytokines can result from the tumor itself or indirectly due to invasive cancer treatments such as surgery, chemotherapy, and chemoradiation. This inflammation can result in a loss of both muscle and fat (cachexia) which is estimated to be directly responsible for approximately 20% of cancer related deaths and negatively impacts patient quality of life. The loss of lean body mass in older individuals with cancer may be exacerbated by age-related loss of skeletal muscle which often coincides with a reduction in testosterone. We undertook a 7-week, randomized, placebo-controlled, double-blind study in patients with squamous cell carcinoma (SCC) of the head/neck or cervix to test the efficacy of testosterone enanthate as an adjunct therapy to preserve lean body mass. We compared body composition, physical performance (SPPB), quality of life (FACT-G) and activity (accelerometry) before and after 7 weeks of testosterone or placebo. Lean body mass decreased in the placebo group 3.3% (-2.0 kg, p = 0.085) whereas lean mass increased 3.2% (1.3 kg, p 0.062) in the testosterone group (between group p = 0.015). Time spent in light and lifestyle activities increased in the testosterone group compared to placebo, and showed meaningful improvements in SPPB total score (+1.4). Testosterone also resulted in clinically meaningful improvements in total FACT-G QOL score (+4.5) while placebo declined (-3.1). Testosterone therapy appears to be an effective adjunct therapy for cancer patients with SCC in the early phase of cancer treatment.
OPTIMIZATION OF THE ELECTRONIC MEDICAL RECORD: NURSING ASSESSMENT OF GERIATRIC SYNDROMES

Erin Hommel, MD, Department of Geriatrics
Colleen James, RN, School of Nursing

Use of electronic medical records (EMR) has been fraught with challenges including technology limitations, lack of clinical decision support, and workflow inefficiencies\(^1\). However, meaningful use of an advanced EMR can serve to standardize care, enhance care coordination, and drive care quality\(^2\). To spur higher quality care for our hospitalized older adults, we report our journey to meaningfully enhance the EMR with tools for nursing assessment and documentation of geriatric syndromes.

Working with health IT, we built a geriatric flowsheet to include functional assessment, cognitive screen and delirium assessment. Time from concept to IT go live was 8 months. Prior to go live, paper assessments were employed. Completion rates of paper assessments was <10% despite nursing education and auditing. IT go live was accompanied by synchronous nursing education. Post-implementation feedback drove further flowsheet improvement. Auditing and re-education are ongoing. Completion rates of electronic assessments increased to 69%. Barriers to uptake include workflow variation, acceptance of change, and failure to see downstream effects on patient care.

Meaningful adaptation of an advanced EMR to drive high quality nursing geriatric care requires IT development, education, auditing, feedback, and revision. Assessments must be matched with high quality care plans and clinical decision at point of care to drive adoption. Geriatric flowsheets are now utilized at point of care and in IDT rounds. They also feed into a comprehensive geriatric snapshot report. Next steps include revision of nursing care plans for high quality geriatric principles.

References
Quality Improvement Project - Faculty Member

INCREASING PREVNAR 13 VACCINATION AT UTMB GERIATRIC FELLOWS CLINIC

Olusola Onoviran, MD, Department of Geriatrics
Kassem Khreis, MD, Department of Geriatrics

BACKGROUND: From January to June 2012, 29% of cases of invasive pneumococcal disease in adults in the US were caused by PCV13 serotypes. Late 2014 was recommended by ACIP for all adults 65 years old and older.

AIM: Increasing the percentage of Prevnar 13 administration by 20% from baseline within 3 months at the LEA VTC Geriatric Fellow’s Clinic.

PROJECT DESCRIPTION: Patients were called by nurses about Prevnar 13 status and informed them to bring to clinic related documents. Once arrived, Medical Assistants noted status Prevnar 13 on chart with Prevnar 13. MDs actively educated the patients and offered the Prevnar 13. Chart review was performed to identify rates of success with vaccine completion for the 3 months period and compared with 3 months before intervention.

OUTCOMES: Between September and November 2015, 68 patients were seen. 36 (53%) received Prevnar 13. 32 (47%) did not receive Prevnar 13. Between February 1st 2016 and April 30th 2016 (time of project implementation), 52 patients were seen. 46 (88%) received Prevnar 13. 6 (12%) patients did not get Prevnar 13. Of those 6, 2 patients refused, 1 patient had allergy, 2 patients were sick (contraindication), 1 patient had another PPV23 less than a year ago. We had a 35% increase in vaccination completion rate.

DISCUSSION: The improvement noticed was attributed to the following factors:
- Active education by physicians- main intervention.
- Actively offering immunization to the patients by physician.
- Nurses calling patients about Prevnar 13.
- Medical assistants identifying patients Prevnar 13 status before MD arrival.

The reasons for failure in some patients were: (1) Myths, (2) Allergy to eggs, and (3) Bad experience with immunization.

CONCLUSION: The aim was 20% but were able to achieve 35% over what the percentage of Prevnar 13 vaccination was before the intervention.
RETROPERITONEAL LIPOSARCOMA: RARE TUMOR IN A GERIATRIC PATIENT

Olusola Onoviran, MD, Department of Geriatrics
Elizabeth Jaramillo, MD, Department of Geriatrics

History: Mr. C was an 85-year-old Caucasian male with past medical history significant for coronary artery disease and 4-vessel coronary artery bypass graft with occasional angina who was in his usual state of health until 3 months ago. When he presented with 3 months of increased abdominal girth and worsening lower extremity edema. He had been intentionally losing weight until a few months ago when he started gaining weight despite strict adherence to a plant-based diet. Despite initial improvement in constipation with this diet, his constipation started to worsen 3 months ago until he only had a BM every few days with medication. ROS was positive for shortness of breath and fatigue and negative for melena and hematochezia. He had a family history positive for peritoneal cancer in his sister.

Physical Findings: Exam showed a healthy looking elderly man with enlarged, non tender abdomen with no palpable organomegaly or masses with pitting edema up to his knees.

Laboratory Data: Complete blood count and Comprehensive metabolic panel were significant for a drop in hemoglobin (from 12.6 to 10.8 in a 3-month period). CT abdomen/pelvis showed a large left sided 35 cm encapsulated soft tissue/fatty mass with internal calcification causing severe mass effect over the adjacent solid organs without invasion. Radiology reported it was consistent with a retroperitoneal liposarcoma.

Management Description: Open resection was done, was complicated by intraoperative diaphragm tear as the tumor had adhered to the anterior diaphragm. The patient did have some positive tumor margins. However, due to age and comorbidity, he was not a candidate for radiotherapy or chemotherapy. Histopathological result of the tumor showed de-differentiated liposarcoma but no evidence of distant metastases.
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). 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 12 Week Plan for Verbal Reasoning Success, Introduction to Research for Healthcare Professionals, the MMHI Grant Writing Workbook and 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 vilhudson@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

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 Taglialatela, PhD, Michele Comerota

2015 MSTAR Students, topics & mentors:

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

5) 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
6) **Jacob Moran** (UTMB)
Quality Improvement Project: Improving the Number of Times Geriatric Patients Bring Their Medication Bottles into Clinic
Mentor: Elizabeth Jaramillo, MD

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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 new Research Resources website [http://research.utmb.edu/](http://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
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SciVal Funding
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Proposal Central
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<td>Hazra, Tapas K.</td>
<td>Preferential Single-Strand Break Repair in the Active Genes of Mammalian Cells</td>
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**TOTAL AMOUNTS**  
* Indicates primary appointment in Geriatrics  

|$84,645,211 | $20,471,223|
Aging Funding at UTMB, 2016

- **NIA**, $4,964,723 (24%)
- **Non-NIH funding**, $5,114,686 (25%)
- **Other NIH Institutes**, $10,391,814 (51%)
# Forum on Aging Postdoctoral Student Awards

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<td>Basic Science &amp; Neuroscience</td>
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<tr>
<td>Brian Downer</td>
<td>Evaluation</td>
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<td>Addie Middleton</td>
<td>Clinical Research</td>
<td>2014-2015</td>
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<td>Miroslav Nenov</td>
<td>Basic Science &amp; Neuroscience</td>
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<td>Amitesh Agarwal</td>
<td>Clinical Epidemiology</td>
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<td>Faranak Behnia</td>
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<td>Rachel Deer</td>
<td>Patient-Centered Outcomes Research</td>
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<td>Carlos Diaz-Venegas</td>
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<td>Carrie Simmons</td>
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<td>Soujanya Challa</td>
<td>Clinical Research</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Carlos Diaz-Venegas</td>
<td>Health Disparities Research</td>
<td>2012-2013</td>
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<tr>
<td>Bernard Fongang</td>
<td>Basic Science Research</td>
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<tr>
<td>Marcos Guerrero-Munoz</td>
<td>Neuroscience Research</td>
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<tr>
<td>Kyaw Lwin</td>
<td>Clinical Research</td>
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<tr>
<td>Melissa Markofski</td>
<td>Clinical Physiology Research</td>
<td>2012-2013</td>
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<tr>
<td>Ragai Meena</td>
<td>Clinical Epidemiology</td>
<td>2012-2013</td>
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<tr>
<td>Abhishek Parmar</td>
<td>Comparative Effectiveness Research</td>
<td>2012-2013</td>
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<tr>
<td>Gurinder Singh</td>
<td>Clinical Epidemiology</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Gabriella Vargas</td>
<td>Comparative Effectiveness Research</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>
## Forum on Aging Student Awards

<table>
<thead>
<tr>
<th>Name</th>
<th>Department/Program</th>
<th>Academic Year</th>
</tr>
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<tbody>
<tr>
<td>Michele Comerota</td>
<td>Neuroscience</td>
<td>2014-2015</td>
</tr>
<tr>
<td>Amit Kumar</td>
<td>Rehabilitation &amp; Disability</td>
<td>2014-2015</td>
</tr>
<tr>
<td>Zakkoyya Lewis</td>
<td>Minority Health/Health Disparities</td>
<td>2014-2015</td>
</tr>
<tr>
<td>Figaro Loresto</td>
<td>Clinical Epidemiology/Physiology</td>
<td>2014-2015</td>
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<tr>
<td>Jacob Moran</td>
<td>CER/PCOR</td>
<td>2014-2015</td>
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<tr>
<td>Ashley Nilson</td>
<td>Neuroscience</td>
<td>2014-2015</td>
</tr>
<tr>
<td>Joseph Saenz</td>
<td>Minority Health/Health Disparities</td>
<td>2014-2015</td>
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<tr>
<td>Samantha Sheller</td>
<td>Basic Sciences</td>
<td>2014-2015</td>
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<tr>
<td>Michael Borack</td>
<td>Clinical Physiology</td>
<td>2013-2014</td>
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<tr>
<td>Kelsey English</td>
<td>Neuroscience</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Amit Kumar</td>
<td>Clinical Epidemiology</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Figaro Loresto</td>
<td>Comparative Effectiveness Research</td>
<td>2013-2014</td>
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<tr>
<td>Claudia Marino</td>
<td>Neuroscience</td>
<td>2013-2014</td>
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<tr>
<td>Amanda Randolph</td>
<td>MSTAR Research</td>
<td>2013-2014</td>
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<tr>
<td>Joseph Saenz</td>
<td>Clinical and Health Disparities</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Charles Umbaugh</td>
<td>Basic Science</td>
<td>2013-2014</td>
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<tr>
<td>Vanessa Danquah</td>
<td>School of Medicine (MSTAR)</td>
<td>2012-2013</td>
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<tr>
<td>Kshitija Kulkarni</td>
<td>Rehabilitation Sciences</td>
<td>2012-2013</td>
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<tr>
<td>Joseph Saenz</td>
<td>Preventive Medicine and Community Health</td>
<td>2012-2013</td>
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<tr>
<td>Xiao Fang</td>
<td>Neurology</td>
<td>2012-2013</td>
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<tr>
<td>Paul Reidy</td>
<td>Rehabilitation Sciences</td>
<td>2012-2013</td>
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<tr>
<td>Kevin Barnes</td>
<td>Neuroscience &amp; Cell Biology</td>
<td>2012-2013</td>
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<tr>
<td>A. Varma</td>
<td>Clear Lake High School, CCISD</td>
<td>2012-2013</td>
</tr>
<tr>
<td>David Briley</td>
<td>Neuroscience &amp; Cell Biology</td>
<td>2012-2013</td>
</tr>
</tbody>
</table>
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, 2017**

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

### Lefeber Scholar Awardees

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Academic Year</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>Gloria Li</td>
<td>School of Medicine</td>
<td>2010-2011</td>
</tr>
<tr>
<td>Donald B. Warren</td>
<td>School of Medicine</td>
<td>2011-2012</td>
</tr>
<tr>
<td>Diana Torres</td>
<td>School of Medicine</td>
<td>2012-2013</td>
</tr>
<tr>
<td>Cody Gomez</td>
<td>School of Medicine</td>
<td>2013-2014</td>
</tr>
<tr>
<td>Nathaniel DeLaCruz</td>
<td>School of Medicine</td>
<td>2014-2015</td>
</tr>
<tr>
<td>Leyla Akhverdiyeva</td>
<td>School of Medicine</td>
<td>2015-2016</td>
</tr>
</tbody>
</table>