

**Interdisciplinary
Research Fuels
Scientific Innovation**

**Proceedings from
the Capra
Interdisciplinary
Healthcare
Symposium 2020**

**School of Health Professions
UT Southwestern Medical Center
6011 Harry Hines Blvd.
Dallas, TX 75235**

Introduction to the Proceedings from the Capra Symposium

The Southwestern School of Health Professions (SSHP) is committed to fostering interdisciplinary research collaborations among its faculty. Accordingly, the Capra Symposium provides a venue for yearly scientific exchanges. It is hoped that through this forum, new collaborations will develop and established collaborations will continue to thrive. It is also hoped that students will be encouraged to join the faculty in on-going research projects.

- The theme of the Capra Symposium is ***“Interdisciplinary Research Collaboration”***. This means that experts in health professions are encouraged to form research teams. Their goal is to find novel approaches to disease treatment through translational research.
- The Capra Symposium is sponsored by an endowment from the Patricia H. and J. Donald Capra family. The continued support of the Capra family has been seminal to the scientific exchanges of the SSHP faculty. The sponsorship is immensely appreciated and gratefully acknowledged.
- The SSHP provides support to the research program through grants awarded to early career faculty engaged in interdisciplinary research projects. The abstracts in this publication provide an overview of the new projects being developed by the faculty.
- The symposium is organized by the SSHP Research Advisory Committee. This committee also provides peer review of grant proposals submitted by early career faculty. A list of the members of the committee is provided on page 2. Their efforts are greatly appreciated.

2020 - Research Advisory Committee Members

Dr. Scott Smith, Associate Dean for Research, Director of Applied Clinical Research PhD Program, Committee Chair

Dr. Karen Brewer-Mixon, Rehabilitation Counseling

Mrs. Tiffany Graham, Prosthetics & Orthotics

Dr. Mu Huang, Applied Clinical Research

Dr. Masaki Mizuno, Applied Clinical Research

Dr. Gilbert Moralez, Applied Clinical Research

Dr. Staci Shearin, Physical Therapy

Dr. Yi-Ting Tzen, Applied Clinical Research

Dr. Gloria Lena Vega, Clinical Nutrition and Center for Human Nutrition

Dr. Jijia Wang, Applied Clinical Research

Dr. Metin Yavuz, Prosthetics & Orthotics and Applied Clinical Research

Dr. Hoda Yeganehjoo, Clinical Nutrition

Dr. Jason Zafereo, Physical Therapy

Ex Officio Members:

Dr. Jon Williamson, Dean

Dr. Kim Hoggatt Krumwiede, Associate Dean for Academic Affairs

Staff:

Mrs. Deborah Sanford (Administrator)

The Patricia H. and J. Donald Capra Endowed Fund in Allied Health Sciences

Dr. Patricia Capra and her late husband, Dr. J. Donald Capra, have had a long-term affiliation with UT Southwestern Medical Center. Dr. Patricia Capra was a faculty member in the Department of Rehabilitation Counseling and Dr. Donald Capra was a Professor of Immunology in Internal Medicine for 23 years. The couple started sponsorship of the Capra Symposium in 1998 and they established the Capra Endowment in 2001.

Dr. J. Donald Capra was recruited to UT Southwestern in 1974 by the late Dr. Donald Seldin and the former Chair of Microbiology, Dr. Johnathan Ur. At UT Southwestern, Dr. Capra conducted his very important work in the field of monoclonal antibody therapy of a number of diseases. He became an international leader in immunology research. He had ample support for research from the National Institutes of Health and he published over 350 research publications and scholarly chapters. He also was the holder of the Edwin L. Cox Distinguished Chair in Immunology and Genetics at UT Southwestern and directed the Molecular Immunology Center from 1990 to 1997. Subsequently, he became President of The Oklahoma Medical Research Foundation where he assembled a formidable research team that was very productive. Dr. Capra became Professor Emeritus in 2006.

It is Dr. Patricia Capra's vision of recognizing and honoring the team approach to healthcare and research that serves as the impetus for this symposium. Clearly, the diagnosis and treatment of any individual is enhanced through inter-professional teamwork; from physicians to physician assistants, to rehabilitation counselors and physical therapists, to prosthetists and orthotists, to clinical nutritionists and radiation therapists. By working together in the endeavors of patient care and scientific research, the field of medicine moves forward and the lives of the people served benefitted. The annual Capra Symposium embodies and celebrates this spirit.

The Capra family has attended the annual Capra Symposia since 1998. Dr. Patricia Capra continues her attendance to the events and is a passionate advocate of interdisciplinary collaborations in research. Her welcomed presence at the meetings is a constant reminder of the goals of the symposia.

Capra Symposia in the Past Decade

The target audience of the Capra Symposia is faculty and students of the Southwestern School of Health Professions, members of the UT Southwestern community and other research centers in the Dallas-Fort Worth area.

The support for the symposium has been contingent on development of interdisciplinary research. This objective coincides with SSHP's long-term mission of scholarly activities centered around interdisciplinary healthcare training. In the SSHP, research is viewed as an integral component of inter-professional training.

There is ample evidence that major advances are made in clinical care through the coordinated efforts of researchers from many disciplines. Moreover, most of the current guidelines for clinical practice are based on evidence derived from clinical trials and other research endeavors. These guidelines require inter-professional collaborations of experts in various fields from clinicians, researchers, biostatisticians, health professionals and ethics boards. An aim of the SSHP is to train leaders in health professions that will collaborate extramurally with others and improve inter-disciplinary healthcare delivery.

An overview of the current Capra Symposia and those held in the past decade is presented on the following pages. It provides the scope of research interests of SSHP faculty as well as presentation abstracts for all speakers. The symposia have usually consisted of keynote speakers, presentation of work in progress from research awardees and round table discussions on interdisciplinary topics. Student participation in the latter also has been encouraged to the extent possible. As an exciting new endeavor, the SSHP opened a novel PhD Program in Applied Clinical Research in the fall of 2019. Brief information about this new program is also included.

CAPRA INTERDISCIPLINARY HEALTHCARE SYMPOSIUM
“Collaborate: New Frontiers in Neurological Research”
Southwestern School of Health Professions
Wednesday, February 12, 2020
Gooch Auditorium

8:00 – 8:55 a.m. Registration and Continental Breakfast

9:00 - 9:05 a.m. Greetings & Recognitions

New frontiers in neurodegenerative disease research

9:05 – 9:30 a.m. **“The impact of exercise intensity on brain derived neurotrophic factor in Parkinson’s disease: a pilot study, from the bench to the clinic”**
Staci Shearin, P.T., Ph.D., N.C.S., G.C.S., Assistant Professor
Masaki Mizuno, Ph.D., Assistant Professor

9:35 – 10:00 a.m. **“Neuroprotective and metabolic effects of geranylgeraniol and α -tocotrienol in streptozotocin-induced Alzheimer’s rat models”**
Hoda Yeganehjoo, Ph.D., R.D., Assistant Professor
Masaki Mizuno, Ph.D., Assistant Professor

10:00 – 10:15 a.m. BREAK

NEW FACULTY FORUM

New frontiers in autonomic dysfunction research

10:20 – 10:40 a.m. **“Autonomic Regulation of Cardiovascular Function during exercise, hypoxia and environmental stressors in at-risk populations”**
Gilbert Moralez, Ph.D., Assistant Professor

New frontiers in wound prevention and healing

10:45 – 11:05 a.m. **“Rehabilitation Technology for Pressure Injury Prevention”**
Yi-Ting Tzen, Ph.D., Assistant Professor

11:10-11:30 a.m. **“Pathomechanics of Diabetic Foot Ulcers: Challenging the Status Quo”**
Metin Yavuz, D. Eng., Associate Professor

**A new frontier in interprofessional research:
The Applied Clinical Research PhD Program**

11:35 – 12:00 p.m. **Expert Round Table Discussion**

Applied Clinical Research PhD Program Faculty:

Scott Smith, Ph.D.; Karen Brewer-Mixon, Ph.D., R.C.R.;

Mu Huang, Ph.D., D.P.T.; Masaki Mizuno, Ph.D.;

Gilbert Moralez, Ph.D.; Yi-Ting Tzen, Ph.D.;

Jijia Wang, Ph.D.; Metin Yavuz, D. Eng.

Current Students: Victor Blais, Novell Kew, Andrew Nabasny,
Brittany Wright

Doctorate Degree in Applied Clinical Research

The School of Health Professions offers a New Ph.D. Degree in Applied Research.

- **The program is accredited by Southern Association of Colleges and Schools-Commissions on Colleges**
- **Patient-oriented research training for graduate level health care professionals**
- **The program is Multi-disciplinary**
- **Program details listed in the following link:**
 - **[Doctor of Applied Clinical Research](#)**
 - **Research Scope of Faculty is listed below**



Karen Brewer-Mixon, Ph.D., CRC
Associate Professor, Department of Rehabilitation Counseling

Title: Neuropsychological Assessment & Intervention in Medical and/or Psychiatric Disorders

Research Scope: My main research has focused on neuropsychological assessment and intervention in persons with medical and/or psychiatric disorders. My research to date has been quite varied and does not represent a specific line of research; however, all of my projects have focused on the improvement of functional outcomes and reduction of emotional suffering for persons with medical and/or psychiatric disabilities such as traumatic brain injury, neurodegenerative disorders, and anxiety. All of my research to date has been collaborative and most projects have been interdisciplinary as well, working with physical therapists, chaplains, neurologists, psychiatrists, and rehabilitation researchers.

Specific Aims: My current research includes projects in development and testing of the effectiveness of a brief intervention program to reduce anxiety in health professions graduate students. The second study objective carried out in collaboration with UTSW Chaplain Services, is to investigate the importance of religious faith on the functioning of caregivers of stroke survivors after hospitalization. Our third specific aim is to study the efficacy of treating anxiety to reduce gait disturbances and falls in Parkinson's patients. Finally, I am a co-investigator on a study to investigate the efficacy of treating depression to improve clinical functioning in post-acute brain injury survivors.

Methods: The methods used in my research primarily include the provision of cognitive-behavioral psychotherapy services to subjects to address anxiety or depression. Other methods include oral interviews and testing for cognitive or emotional difficulties.

Bibliography:

Faculty page URL: <https://profiles.utsouthwestern.edu/profile/10818/karen-brewer-mixon.html>

ResearchGate URL: https://www.researchgate.net/profile/Karen_Brewer-Mixon

ORCID: <https://orcid.org/0000-0002-9806-5472>



Jeffrey D. Browning, M.D.

Associate Professor in Internal Medicine

Chair – Department of Clinical Nutrition

Margo A. Denke, M.D. Professorship in Clinical Nutrition Research

Title: Hepatic Metabolism and its Relation to Health and Disease

Research Scope:

The focus of my research is the comprehensive study of non-alcoholic fatty liver disease (NAFLD) in humans. The overarching goal is to understand the metabolic derangements that lead to this disease through the application of advanced imaging and metabolic techniques. Translating these basic science techniques to the clinical realm allows for a more complete understanding of the pathophysiology of NAFLD and extension of this understanding through complimentary studies utilizing traditional clinical research tools (epidemiology, retrospective and prospective studies, and clinical trials). In addition to the knowledge gained, this approach allows for the development of novel therapeutic and diagnostic modalities in a logical, disease- and patient-oriented manner.

Current Specific Aims:

The primary goal of my research is to create an integrated approach to the study of hepatic glucose and lipid metabolism that allows for multiple simultaneous metabolic flux measurements to be made. We have already applied these techniques in rodents as well as humans (with and without NAFLD) under a variety of conditions.

Methods Employed in the Research:

Stable isotope tracers utilizing carbon-13 and deuterium.

High-field nuclear magnetic resonance spectroscopy.

Clinical magnetic resonance imaging and spectroscopy.

Gas and liquid chromatography, mass spectrometry.

Metabolic modeling.

Standard biochemical techniques including Western blotting, polymerase chain reactions, etc.

Collaborations:

Center for Human Nutrition – Shawn C. Burgess, Ph.D., Stanislaw Deja, Ph.D.

Department of Internal Medicine, Division of Mineral Metabolism – Orson Moe, M.D., Khashayar Sakhaee, M.D.

Bibliography:

<https://www.scopus.com/authid/detail.uri?authorId=7101866470>



**Tiffany Graham, MSPO, CPO, LPO, FAAOP,
Assistant Professor, Prosthetics-Orthotics Program**

Title: Effectiveness of Deformational Head Shape Correction: Cranial Remolding Orthoses versus Repositioning Therapy

Research Scope: Deformational head shapes affect up to 47% of infants. Approximately 1:60 infants may be recommended for Cranial Remolding Orthosis (CRO) Treatment, others are typically recommended for repositioning therapy. A CRO is a custom device (made and fit by an orthotist) designed to reshape an infant's head as they grow over the course of a few weeks or months. Repositioning therapy is the process by which caregivers position the infant's head in order to encourage a more natural head shape. Possible effects of untreated skull deformation are increased otitis media, TMJ dysfunction, craniofacial asymmetries, and strabismus.

Current Specific Aims:

- 1) Evaluate long-term outcomes of repositioning therapy versus CRO treatment.
- 2) Examine compliance with repositioning therapy versus CRO treatment.

Methods Employed in the Research: In an ongoing prospective study, 100 infants will be enrolled and treated with either repositioning therapy or a CRO. The patient's craniums are measured and scanned to determine the amount of correction achieved with each method of treatment over the course of a 10 month span (2 months to 12 months of age). Caregivers fill out surveys and developmental milestones are assessed clinically to see if patient compliance is related to the treatment arm.

Collaborations:

Susan Simpkins, PT, EdD, Associate Professor, Department of Physical Therapy

Rami Hallac, PhD, Assistant Professor, Department of Plastic Surgery & Children's AIM Imaging Center

Jijia Wang, PhD, Assistant Professor, School of Health Professions

P&O Students

Potential Collaborations (Seeking faculty/student volunteers):

Examine the Health Literacy of caregivers and their understanding of the study instructions.

A physical therapy student may work under Dr. Simpkin's direction.

Bibliography:

<https://scholar.google.com/citations?hl=en&authuser=1&user=9x0SJAoAAAAJ>



Mu Huang, D.P.T., Ph.D.

Assistant Professor, Department of Applied Clinical Research

Title: Alterations in autonomic physiology in clinical populations and during stress.

Research Scope: The focus of my research is to examine autonomic alterations in clinical populations (e.g. chronic pain and traumatic brain injury) as well as during stress (e.g. opioid consumption and extreme environment exposure). The mission of this research is to gain a better understanding of underlying physiology during these functional disturbances in order to help improve clinical care and treatment by health care providers.

Current Specific Aims:

- To determine the ability of quantitative sensory testing and autonomic physiological markers to predict clinical outcomes and profiles in patients with chronic pain.
- To investigate the effects of ketamine, fentanyl, and morphine administered in the pre-hospital setting on a conscious human's ability to tolerate a hemorrhagic insult.

ClinicalTrials.gov:

<https://clinicaltrials.gov/ct2/show/NCT03621085?term=ketamine+hemorrhagic+tolerance&draw=2&rank=1>

Methods Employed in Research:

- Lower Body Negative Pressure – simulation of a hemorrhagic insult by using pressure changes to cause fluid in the body to shift from the chest and upper body to the lower body.
- Finger plethysmography and electrocardiogram – continuously monitoring of blood pressure and heart rate/rhythm during experimentation.
- Microneurography – measurement of nerve signals by placing microelectrodes into the nerves of the arm.

Collaborations:

- [Jason Zafereo](#), PT, PhD, OCS, FAAOMPT – UTSW, Department of Physical Therapy
- [Craig Crandall](#), PhD and [Max Hendrix](#), MD – UTSW, Institute for Exercise and Environmental Medicine
- [Shannon Juengst](#), PhD; [Kan Ding](#), MD; and [Kathleen Bell](#), MD – UTSW, Department of Physical Medicine & Rehabilitation

Bibliography



Masaki Mizuno, PhD (2020 Presenter)

Assistant Professor, Department of Applied Clinical Research

Title: Autonomic control of the cardiovascular system in health and disease

Research Scope: I have been studying cardiovascular autonomic regulation at rest and during exercise in both humans and animals for over 15 years. Individuals exhibiting an exaggerated blood pressure response to exercise are more likely to develop future hypertension and are at a greater risk for cardiovascular death. Early detection of this abnormal cardiovascular response to physical activity could lead to the early treatment and prevention of cardiovascular disease. Therefore, dissection of the mechanisms underlying the abnormal cardiovascular response to exercise in disease state may prove beneficial to the development of novel therapeutic strategies targeted at reducing the risks associated with physical activity. This could lead to the prescription of exercise of greater frequency, intensity and duration allowing the benefits of exercise training to be fully realized in disease state.

Current Specific Aims: To examine the mechanisms underlying alterations in circulatory control in Type 1 or Type 2 diabetes mellitus. More specifically, the lab is actively investigating the central and peripheral mechanisms underpinning the abnormal elevations in sympathetic nerve activity that accompany the pathogenesis of diabetes.

Methods Employed in the Research: We have extensive experience in cranial, spinal, muscular and vascular surgery in rodents and are proficient in the instrumentation of these animals for the measurement of hemodynamics (blood pressure, heart rate, blood flow) and sympathetic nerve activity. Neural function has been assessed by single fiber recording in rat muscle-nerve preparations or whole cell patch-clamp recording from dorsal root ganglia. We also have investigated alterations in sensory neurons using standard immunohistochemistry and western blot analyses.

Collaborations:

- Hypertension project with [Dr. Wanpen Vongpatanasin](#), Department of Internal Medicine; [Dr. Scott Smith](#), Department of Applied Clinical Research
- Parkinson disease project with [Dr. Staci Shearin](#), Department of Physical Therapy;
- Alzheimer disease project with [Dr. Hoda Yeganehjoo](#), Department of Clinical Nutrition

Bibliography:

[PubMed publication](#)

[Research Gate](#)



Gilberto Moralez, Ph.D. (2020 Presenter)

Assistant Professor, Department of Applied Clinical Research

Title: Autonomic Regulation of Cardiovascular Function during exercise, hypoxia and environmental stressors in at-risk populations.

Dr. Moralez has a broad interest in the autonomic cardiovascular responses that accompany exercise, hypoxia and environmental stressors in special populations. Specifically, he investigates physiological mechanisms underlying impaired autonomic control of sympathetic activity to stressors in at-risk groups. This research is clinically important given that impaired autonomic control of sympathetic activity leads to poor prognosis in a host of cardiovascular morbidities such as hypertension, left ventricular hypertrophy, chronic heart failure, obstructive sleep apnea, diabetes, obesity and normal aging.

Current Specific Aims:

- The effects of Angiotensin II and peripheral blood mononuclear cells production on the exaggerated increase in sympathetic nerve activity during a sympatho-excitatory stressor in normotensive African Americans.
- The assessment of autonomic dysregulation during mild traumatic brain injury (mTBI) recovery.
- Effect of hypobaric hypoxia on the control of muscle sympathetic nerve activity during dynamic exercise in humans.

Experimental Measurements: Electrocardiogram, Arterial Blood Pressure and Blood Sampling, Metabolic rate by indirect calorimetry, Blood vessel assessment by ultrasound, Peak oxygen uptake, Changes in Central Blood Volume, Middle Cerebral Blood Velocity (Transcranial Doppler Monitoring), measurement of Muscle Sympathetic nerve activity (Radial Nerve Microneurography), Measurement of Free Radical Concentrations, Measurements of Catecholamine, Angiotensin II concentrations.

Collaborations:

Department of Physical Medicine and Rehabilitation, University of Texas Southwestern Medical Center

Department of Applied Physiology & Health Management, Southern Methodist University, Dallas, TX

Institute for Exercise and Environmental Medicine, Texas Health Presbyterian Dallas, Dallas, TX

Centre for Heart, Lung, and Vascular Health, School of Health and Exercise Science, University of British Columbia, Kelowna, Canada

Department of Sport Science, University of Innsbruck, Innsbruck, Austria.

Bibliography: Complete List of Published Work in MyBibliography:



Staci Shearin, M.P.T., Ph.D. (2020 Presenter)
Assistant Professor, Department of Physical Therapy

Title: Functional Mobility In Parkinson's Disease

The research projects include: (a) Impact of carbon fiber AFOs on gait and resulting changes in quality of life across time in persons with Parkinson's disease; (b) Community Boxing Program for Individuals with Parkinson's disease; (c) The impact of exercise intensity on brain derived neurotrophic factor in Parkinson's disease: A Pilot study, from the bench to the clinic

Research Scope:

Overall the focus of each of the current projects is on strengthening, gait improvements, and maximizing functional mobility in individuals with Parkinson's disease (PD). However, I also have an interest in student stress/anxiety as well as the impact of service learning. Although at this time, our projects are focused on PD, I am interested in applying many of these areas of study to other neurologic populations.

Current Specific Aims:

Amongst the different studies the specific aims are assessing the impact of interventions on gait, balance, functional mobility, strength, quality of life and depression

Methods:

Gait parameters (Zeno Walkway Gait Analysis System and measures of gait speed/endurance), functional measures typical of PT related studies, Measurement of Brain Derived Neurotrophic Factor

Collaborations: Dr. Masaki Mizuno, Departments of Health Care Sciences and Internal Medicine; Brittany Mason, Center for Depression Research and Clinical Care Department of Psychiatry; Dr. Mike Braitsch, Tribe Wellness



Scott Smith, Ph.D.

**Professor, Associate Dean for Research
Acting Chair Department of Applied Clinical Research
Program Director, Applied Clinical Research Ph.D. Program
UT Southwestern Medical Center**

The Smith Lab has been studying autonomic regulation of the cardiovascular system at rest and during exercise in both humans and animals for over 20 years. Currently, the lab's research focuses on determining the mechanisms underlying autonomic cardiovascular dysfunction after the development of hypertension. More specifically, the lab is actively investigating the central and peripheral mechanisms mediating the abnormal alterations in sympathetic nerve activity, blood pressure and skeletal muscle blood flow with the pathogenesis of this disease. Interestingly, in collaboration with Drs. Wanpen Vongpatanasin (Cardiology), Jere Mitchell (Cardiology), Masaki Mizuno (Applied Clinical Research), Gary Iwamoto (Cell Biology), Lona Sandon (Clinical Nutrition), Naim Maalouf (Mineral Metabolism) and Orson Mo (Nephrology), the lab has recently determined that excess consumption of phosphates, like those found in processed foods typical of an American diet, promotes hypertension at rest and sympathetic overactivity during exercise. Moreover, the lab has also demonstrated that eating a diet high in phosphate likewise induces exercise intolerance and impairments in fatty acid metabolism. In conjunction with this line of research, the lab has begun to focus on determining the mechanisms by which exercise training improves cardiovascular function during physical activity in hypertension with the goals of identifying: i) novel treatments for the abnormal response to exercise in the disease and ii) new treatment therapies for the disease. A myriad of methods are used in the laboratory including techniques for invasive and non-invasive measurement of blood pressure, running-wheel and treadmill exercise training, electrocardiography, microneurography, Western blotting and immunohistochemistry to name a few. A complete list of Dr. Smith's publications can be found at the following link:

<https://www.ncbi.nlm.nih.gov/myncbi/scott.smith.4/bibliography/public/>



Yi-Ting Tzen, Ph.D. (2020 Presenter)

Assistant Professor, Departments of Applied Clinical Research, Orthopedic Surgery, Physical Medicine and Rehabilitation

Title: Pressure Injury (ulcer) prevention with Rehabilitation Technology

Abstract: My research theme is pressure injury prevention and early detection. People with spinal cord injury (SCI) are at high risk of ulceration, and approximately 50-80% of people with SCI will develop at least one ulcer throughout their lives. Treating an ulcer costs additional \$43K per hospital stay, and providing preventative strategies for the high-risk population is more cost effective. My research studies aim at implementing assistive technology devices for pressure injury prevention in the SCI population. One study examined the effectiveness of cool cushion on increasing tissue tolerance toward pressure at the ischium during seating on a powered wheelchair. The other study tested the benefits of alternating pressure overlay on increasing sacral and heel tissue survival during a simulated surgical procedure. Repeated measures designs were used for both studies on people with chronic SCI, and non-invasive laser Doppler flowmetry system was used to measure skin blood flow. For the cool cushion study, results showed that the reactive hyperemic response, a measurement indicating severity of tissue ischemia, was reduced with the use of cool cushion as compared to regular air-bladder cushion. This suggested that with the same amount of pressure on the skin, cool cushion helped preserve tissue viability by possibly reducing tissue metabolic rate during seating. For the alternating pressure overlay study, results showed that the skin blood flow increased during the deflation cycle of the alternating pressure as compared to lying on operating room (OR) pad alone. In addition, the sacral skin blood flow remained elevated 30 minutes after removal of the overlay as compared to that without prior use of alternating pressure overlay. This suggested that alternating pressure overlay could protect the tissue during weight-bearing condition, and this effect could last for short term at the skin site where there was relatively more soft tissue in contact with the overlay. Proposals are in queue to test the protective effect of cooling on people at risk of developing diabetic foot ulcers, and further investigate the benefits of implementing alternating pressure overlay in the OR and its underlying mechanisms.

Collaborations: Dr. Wei-Han Tan, VA North Texas, Dr. Dane Wukich, Orthopedic Surgery, and Dr. Javier La Fontaine, Plastic Surgery UT Southwestern Medical Center.

Bibliography:

<https://profiles.utsouthwestern.edu/profile/186080/yi-ting-tzen.html>

https://www.ncbi.nlm.nih.gov/pubmed/?term=Tzen%20YT%5BAuthor%5D&cauthor=true&cauthor_uid=31587923



Gloria Lena Vega, Ph.D.

Professor – Department of Clinical Nutrition
and Center for Human Nutrition
**Dr. Scott M. Grundy Distinguished Professorship
In Human Nutrition**

Title of Research: Obesity Phenotypes and Chronic Diseases

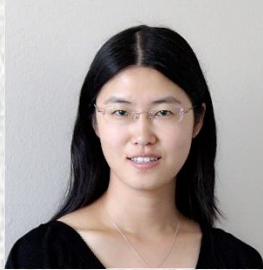
Research Scope: *Our overall goal is to phenotype obesity in relation to metabolic risk and eating behaviors.* Obesity is defined by the fraction of fat mass that imparts risk for chronic diseases. However, susceptibility for disease risk varies according to gender, ethnicity, central regulation of energy balance and genetic variation. New definitions of obesity are not only sex-specific but also ethnic-specific. Importantly, exposure to excess fat weight in young populations seemingly contributes to early onset of chronic diseases and to the current epidemic of early morbidity and mortality observed in middle age populations worldwide.

Specific Aims: Our current research focuses on the relation of obesity to hypertriglyceridemia, impaired cardiorespiratory fitness and eating disorders in subjects with and without type 2 diabetes mellitus. Our specific aims are to phenotype obesity based on: (1) patterns of dysregulation of fatty acid oxidation in the post-absorptive and post-prandial state, (2) patterns of subcutaneous abdominal and gluteo-femoral adipose tissue cellularity and transcriptomics and (3) trends in eating behaviors and functional MRI phenotypes in hyperphagia, orthorexia and body dysmorphia.

Methods employed in the research: (1) Body composition analysis by MRI and dual x-ray absorptiometry, (2) measurement of liver fat content by MRS, (3) transcriptomics by RT-PCR, (4) lipidomics of triglyceride and fatty acids by gas-liquid chromatography and mass spectroscopy, (4) brain functional MRI at the Rogers Imaging Center, UT Southwestern Medical Center, (5) simulation analysis of metabolic data using [SAAM II](#).

Collaborations: Our intramural collaborators are : (1) [Scott M. Grundy, M.D., Ph.D., Center for Human Nutrition](#); (2) [Daniel Bowers, M.D. ; After the Cancer Experience](#) program for childhood cancer survivors; (3) [Dallas Heart Study Investigators](#); (4) [Carrie McAdams, M.D., Ph.D.](#) eating disorders; (5) [Jijia Wang, Ph.D.](#), Department of Applied Clinical Research, statistical modeling. Our extramural collaborators are: (1) Joseph Millburn, M.D. Dallas Veterans Administration, Diabetes and Lipid Clinic (2) [Laura Defina, M.D., Cooper Institute](#), Cardiorespiratory Fitness, Dallas, Texas; (3) [Nancy Puzziferri, M.D. Metabolic Surgery in Severe Obesity.](#)

[Bibliography](#)



Jijia Wang, Ph.D.

Assistant Professor, Department of Applied Clinical Research

Title: Statistical methodology development for the design and analysis of clinical trials

Research Scope: I have been studying statistical methodologies in the design and analysis of clinical trials for several years. Improper design or analysis will lead to underpowered study and biased estimation. The longitudinal studies, such as stepped wedge cluster randomized trials, longitudinal cluster randomized trials, and cluster randomized crossover trials, which are increasingly being used in the evaluation of biomedical and clinical interventions because of their own advantages. However, employing them in practice is challengeable, for example, correlated longitudinal and clustered observations, diverse missing data patterns, different types of clinical outcomes, unbalanced randomization, and heterogeneous correlation structures. Addressing these challenges in the design and data analysis stages is very important for appropriate statistical inferences.

Current Specific Aims: To address various pragmatic issues in the longitudinal studies, we are exploring different innovative clinical design and statistical analysis methods, which go beyond the traditional approaches to increase the flexibility of the design and achieve better performances over a wide spectrum of design configurations compared to traditional methods.

Methods Employed in the Research: We have developed several theoretical methods and made contributions to the clinical trial studies. The methods include power analysis, sample size determination, and experimental design of clinical trials, with applications to missing data. We also proposed the Bayesian adaptive design approach into longitudinal studies to avoid the disadvantages of the Frequentist methods. Furthermore, we have conducted extensive simulation studies to evaluate the performance of the proposed methods.

Collaborations:

Stepped wedge cluster randomized trial project with [Dr. Song Zhang](#), Department of Population and Data Sciences

Cranial remolding project with [Tiffany Graham](#), Department of Health Care Sciences

Cholesterol project with [Dr. Gloria Vega](#), Department of Clinical Nutrition

Alzheimer disease project with [Dr. Hoda Yeganehjoo](#), Department of Clinical Nutrition

Bibliography:

PubMed publication: <https://www.ncbi.nlm.nih.gov/myncbi/browse/collections/59107084>



Metin Yavus, D. Eng. (2020 Presenter)

Associate Professor

Prosthetics-Orthotics Program, Department of Applied Clinical Research, and Department of Orthopedic Surgery

Title: Pathomechanics of Diabetic Foot Ulcers: Challenging the Status Quo

Diabetic foot ulcers continue to burden the US Healthcare System with an annual cost of approximately \$60 billion. Approximately 100,000 amputations need to be performed in diabetic patients every year in the US, due to necrotic tissue and gangrene caused by foot ulcers. The pathology of diabetic foot ulceration has unresolved issues. Plantar pressure has long been considered as the most important pathological factor in the etiology of diabetic foot ulcers (DFU). However, it is known that only a small percentage of DFU develop at peak pressure locations. Moreover, sensitivity and specificity of foot pressure in predicting diabetic ulceration is rather low. In order to better treat and/or prevent DFU, a better understanding of the pathology is crucial. In this regard, our group has been investigating plantar shear stress as well as shoes microclimate as causative factors. Our groundbreaking results indicated that:

1. Shear stress may be twice as damaging on the tissue, compared to pressure
2. Most ulcers develop at peak shear sites
3. Chronic and acute factors lead to higher temperatures in diabetic foot
4. High temperatures facilitate tissue breakdown

We believe that shear and temperature, along with other variables, need to be further studied in order to have a better understanding of the ulceration process. Developing a site-specific predictive model will be crucial in preventing ulceration. A multifactorial approach to the problem will lead to the design of more effective healing and preventive devices.

Collaborations: Larry Lavery, DPM, Dane Wukich, MD, Latifur Khan, PhD

Bibliography: https://www.researchgate.net/profile/Metin_Yavuz



Hoda Yeganehjoo, Ph.D., R.D.N. (2020 Presenter)
Assistant Professor, Department of Clinical Nutrition

Title of Research Interest: Application of dietary isoprenoids against Alzheimer's disease (AD) and its concomitant metabolic abnormalities

Research Scope: Strong correlation and interdependence exists between the apparently distinct pathological conditions of AD and metabolic disorders such as diabetes, insulin resistance, fatty liver, and hyperlipidemia. Our aim is to determine whether dietary isoprenoids can improve AD-related conditions in the central nervous system and peripheral metabolism. Such studies lay the foundation for efficient and safe clinical application of isoprenoids that possess pleiotropic benefits against AD.

Current Specific Aims: The research objective is to elucidate potential impact of geranylgeraniol and δ -tocotrienol on $A\beta$ - and metabolic-related disturbances that may emerge and co-exist in AD. We hypothesize that induction of AD will adversely alter the metabolic profile, including glucose tolerance, insulin sensitivity, and hepatic and brain lipogenesis, in Alzheimer's rat models. We further hypothesize that geranylgeraniol and δ -tocotrienol are effective in deteriorating $A\beta$ aggregates that harm the brain while improving cognition and homeostasis of glucose, insulin, and lipids including triglycerides and cholesterol in the same animal model of AD. We perform neuro-metabolic studies in the streptozotocin (STZ)-induced Alzheimer's rats to determine impact of geranylgeraniol and δ -tocotrienol on 1) cognition, 2) $A\beta$ concentration and brain deposition, and 3) the co-existing metabolic irregularities, such as glucose intolerance, insulin resistance, and abnormal lipogenesis in brain and liver that appear in the same AD model.

Methods Employed in the Research:

- Intracerebroventricular (ICV) injection of streptozotocin to develop AD rat models
- Dietary manipulation with isoprenoid feedings
- Cognitive function testing (Morris Water Maze task)
- Insulin resistance methods
- Whole brain microscopy using serial two-photon tomography technology
- Histochemical staining and assessment of $A\beta$ in brain tissue
- Lipogenesis isotope studies and magnetic resonance (MR) imaging of brain and liver
- Protein analyses using enzyme-linked immunosorbent assay (ELISA) and/or western blotting techniques

Collaborations:

[Masaki Mizuno, PhD](#), Assistant Professor, Department of Applied Clinical Research
[Jijia Wang, PhD](#), Assistant Professor, Department of Applied Clinical Research

Bibliography



Jason Zafereo, PT, PhD

Associate Professor, Department of Physical Therapy

Title: Clinical assessments of central pain processing disorders in patients with chronic pain

Research Scope: Laboratory studies support a link between central pain processing disorders and chronic musculoskeletal conditions, including (but not limited to) osteoarthritis, temporomandibular disorder, myofascial pain syndrome, tendinopathy, chronic spine pain, and headache. An abbreviated, reliable, standardized battery of Quantitative Sensory Testing (QST) could provide the needed objectivity and detail for improved identification of central pain processing disorders in a clinical setting. Such information could improve the clinician's ability to form a more patient-specific diagnosis, prognosis, and treatment plan. Personalized, mechanism-based pain management could enhance outcomes for patients living with chronic pain.

Current Specific Aims: 1. Identify cut-off scores using QST results to help classify individuals into pain subtypes. 2. Assess for responsiveness of QST in patients completing a 4-week prescriptive Interdisciplinary Pain Program (IPP) consisting of physical therapy and cognitive behavioral therapy. 3. Use QST to predict clinical outcomes and profiles within an IPP. 4. Use QST to predict the course of chronic pain development or perpetuation over time.

Methods Employed in the Research: QST provides a psychophysical picture of the entire somatosensory system, from the receptor to the cortex. QST is viewed as an ideal assessment tool for distinguishing among the subtypes of pain (nociceptive, neuropathic, nociplastic), for monitoring change over time in response to treatment, and as a valid and reliable tool for clinical assessment of musculoskeletal pain disorders. Our QST profile consists of warm/cold sensation thresholds, heat/cold-induced pain thresholds, vibration detection thresholds, light touch detection thresholds, dynamic allodynia testing, temporal summation, and conditioned pain modulation. Our QST equipment by Medoc includes the Algomed Algometer, TSA-II NeuroSensory Analyzer, and Q-Sense CPM. Additional equipment includes Semmes Weinstein monofilaments, a Rydel Seiffer Tuning Fork, and the Neurothesiometer.

Collaborations: Eugene McDermott Center for Pain Management (<https://www.utswanesthesia.org/pain-management/>); Dallas Hearts and Minds Study (<https://www.utsouthwestern.edu/research/translational-medicine/doing-research/dallas-heart/>)

Bibliography: <https://profiles.utsouthwestern.edu/profile/49710/jason-zafereo.html>;
<https://orcid.org/0000-0003-2190-9216>

List of Symposia in the Past Decade

Year

- 2019 “Collaborate: Using Team Approaches to Advance Research on Chronic Conditions”
- 2018 “Collaborate: Interdisciplinary Bench Science and Clinical Research”
- 2017 “Collaborate: Transforming Medical Education and Patient Care Through Inter-Professional Research”
- 2016 “21st Century Strategies for Managing Obesity”
- 2015 “Converging on Parkinson’s Disease: Interdisciplinary Approaches to Diagnosis and Management”
- 2014 “Lending a Helping Hand: Community Based Medicine and Research”
- 2013 “Multiple Sclerosis: Diagnosis, Treatment & Management”
- 2012 “Stroke: Risks, Recovery and Relationships”
- 2011 “Interrelationships Between Mind, Body & Physical Functioning”
- 2010 “Perspectives on the Diagnosis and Treatment of Cancer”

CAPRA INTERDISCIPLINARY HEALTHCARE SYMPOSIUM
“Collaborate: Using Team Approaches to Advance Research
on Chronic Conditions”
Southwestern School of Health Professions
Wednesday, February 13, 2019
NB2.EEF Auditorium

- 8:00 – 8:55 a.m. Registration and Continental Breakfast
- 9:00 - 9:05 a.m. Greetings
Description of Interdisciplinary Research Grant Program
Recognition of 2018 Grant Recipients
- 9:05 – 9:35 a.m. **“Clinical Assessments of Central Pain Processing Disorders in Patients with Chronic Pain”**
Jason Zafereo, Ph.D., P.T., F.A.A.O.M.P.T., O.C.S. Associate Professor
Mu Huang, Ph.D., P.T., D.P.T., O.C.S., Instructor
- 9:40 – 10:10 a.m. **“Targeting Insulin Resistance to Improve Abnormal Cardiovascular Control in Diabetes”**
Masaki Mizuno, Ph.D., Assistant Professor
Hoda Yeganehjoo, Ph.D., R.D., Assistant Professor
- 10:10 – 10:30 a.m. BREAK
- 10:35 – 11:10 a.m. **“Keys to the Mindset and Development of Collaborative Clinical Research”**
Ross Querry, Ph.D., P.T., Professor and Chair
- 11:15 – 12:00 p.m. **Expert Round Table Discussion**
“Research Quick Hits”
Speakers
Clinical Nutrition – Dr. Lona Sandon
Health Care Education – Dr. Yulia Piller
Physician Assistant Studies – Dr. Tiffany Kindratt
Physical Therapy – Dr. Ed Mulligan & Dr. Julie DeVahl
Prosthetics-Orthotics – Mrs. Tiffany Graham
Radiation Therapy – Ms. Sandra Hayden
Rehabilitation Counseling – Dr. Shannon Juengst
Grant Writing Workshop Report – Dr. Staci Shearin

**CAPRA INTERDISCIPLINARY
HEALTHCARE SYMPOSIUM**

**ABSTRACTS
2019**

**Collaborate: Using Team Approaches to Advance Research on Chronic
Conditions**



SSHP INTERDISCIPLINARY RESEARCH GRANT PROGRAM RECIPIENTS

PHYSICAL THERAPY/HEALTH CARE SCIENCES

Title: Clinical assessments of central pain processing disorders in patients with chronic pain

Authors: Jason Zafereo, Ph.D., P.T., F.A.A.O.M.P.T., O.C.S. and
Mu Huang, Ph.D., P.T., D.P.T., O.C.S., Instructor

Background: Quantitative sensory testing (QST) has been shown to be very useful for detecting the presence of central pain processing disorders in the laboratory. However, no large-scaled prospective trials have investigated the responsiveness or discriminative validity of QST for patients with musculoskeletal pain receiving interdisciplinary pain program (IPP) treatment.

Objectives: To assess for responsiveness of QST in patients completing a 4-week IPP, and to determine the ability of QST to predict clinical outcomes and profiles within an IPP.

Methods: Sixty participants will be recruited from among patients receiving IPP treatment at UT Southwestern Medical Center. Patients with chronic pain of a musculoskeletal origin over any anatomical site will be eligible to participate. Comprehensive assessments of pain, function, and sensory processing will be performed at baseline, midpoint, and at the completion of the four-week treatment program.

Results: ICCs for same-day inter-rater reliability were good to excellent (0.80-0.98) for the QST battery. To date, eleven participants have completed the 4-week IPP and testing protocol. Although a small sample size limits any robust statistical analysis, trends in the data suggest that certain self-report and QST measures are sensitive to change in response to treatment across time.

Conclusion: The results from this study may suggest that clinical tests for central pain processing dysfunction are sensitive to change in participants completing an IPP.

SSHP INTERDISCIPLINARY RESEARCH GRANT PROGRAM RECIPIENTS

HEALTH CARE SCIENCES/CLINICAL NUTRITION

Title: Targeting insulin resistance to improve abnormal cardiovascular control in diabetes

Authors: *Masaki Mizuno, PhD and Hoda Yeganehjoo, PhD, RD*

In patients with type 2 diabetes mellitus (T2DM), exercise elicits an excessive increase in blood pressure. Since such an exaggerated pressor response to exercise increases the risk for the development of an unfavorable cardiovascular event, elucidating the mechanisms responsible is clinically important. The exercise pressor reflex (EPR, a reflex originating in skeletal muscle) plays an important role in regulating the cardiovascular system during exercise. It is possible that adverse alterations in EPR activity significantly contribute to the evolution of abnormal circulatory control in T2DM. Insulin resistance is one of the pathophysiological characteristics of T2DM. Peripherally, increased insulin concentration may sensitize afferent neurons associated with EPR. Centrally, impaired insulin transport to the brain may potentiate signal transduction associated with the EPR. The global objective of this proposal is to determine the mechanisms underlying the heightened blood pressure response to exercise in T2DM. We will perform neurophysiological studies in T2DM rats to determine 1) whether increased peripheral insulin generates EPR overactivity which can be ameliorated by antagonizing skeletal muscle afferent neurons, and 2) whether central insulin resistance generates an exaggerated EPR which can be ameliorated by increasing central delivery of insulin. We anticipate that peripheral and central changes in insulin handling contribute to the generation of abnormal EPR function in T2DM. The proposed studies are innovative in that they maintain the potential to shift current clinical practice paradigms by identifying insulin as a key target for the prevention and treatment of abnormal cardiovascular control during exercise in diabetes.

KEYNOTE SPEAKER

Title: Keys to the Mindset and Development of Collaborative Clinical Research

Author: Ross Query, Ph.D., P.T.

Collaborative clinical research is the concept of two or more disciplines, entities, or partners working together with a common question or focal point, but with different perspectives, aims, methods, or outcomes of interest. Contributors may seek outcomes that span from basic clinical science to seeking innovative standards of clinical care that directly impact patient outcomes. A “mindset” is defined as an established set of attitudes by an individual or group. Often, professions or departments seek to stay within a mindset that is “fixed” around their own discipline or scope of skills and interactions. While not easy, an open or “growth” mindset is essential in the development and success of collaborative clinical and research opportunities. A variety of collaborative constructs of people, programs, purpose, and potential create opportunities where the sum of the parts and the depth of research discovery and potential funding far exceed the individual parts.

Over the past several years, the faculty and clinicians of the Department of Physical Therapy have strategically sought to expand their clinical research program. Partnerships span UTSW basic and clinical entities, the community, and national and commercial relationships. Projects and goals developed around a variety of clinical questions or conditions. The purpose of this presentation is to highlight some of these efforts and present characteristics of the different models and breadth of collaborations. The goal is not only recognizing the current efforts and successes, but encouraging future possibilities and directions within the School of Health Professions and the UTSW community.

ROUND TABLE DISCUSSANTS

CLINICAL NUTRITION

Title: Preventing Hypertension and Sympathetic Over-activation by Targeting Phosphate PHOSTOP trial

Author: Lona Sandon, PhD, MEd, RDN, LD

Introduction: The average dietary phosphorous intake among U.S. adults is 1200mg/d, nearly twice the recommended daily allowance, 700mg/d. High dietary phosphorous is associated with cardiovascular morbidity, including hypertension. Dietary phosphorous exists in organic and inorganic forms.

Purpose: The purpose of this study is to determine if high levels of inorganic phosphorous intake result in a sustained increase of sympathetic nerve activity and increased blood pressure (BP) in adults with pre-hypertension (120-129/80-84mmHg) compared to low intake.

Methods: This is a randomized, double-blind crossover, metabolic diet study including a 4-week high Pi (1200 mg/d) phase and 4-week low Pi (700 mg/d) phase separated by a 2-week washout period. Participants consume a metabolic diet (2000 kcal (adjusted as needed), 1930mg Na⁺, 2200mg K⁺, 700mg PO₄, 700m Ca⁺⁺, and 200mg Mg⁺⁺) during each phase. Participants consume a daily supplement containing 500mg Pi (NaPO₄, 372 mg Na⁺) or placebo (NaCl, 372mg Na⁺) on the high Pi and low Pi phase, respectively. The primary end-point is BP and secondary end-points (24-hour dietary recalls, 24-hour urinary phosphorous, Na⁺, K⁺, Cr, microneurography) are obtained at baseline, week-2, and week-4 of each phase.

Results: To date 25 participants started, 4 withdrew, and 17 are complete or in-progress. Mean 24-hour urinary phosphorous ($n=16$) at week-4 on both the high and low Pi phases is within goal, $M=1027\pm315$ W4-P1, goal >800 mg/d, and $M=441\pm141$ W4-P1, goal <500 mg/d, respectively. BP data is not available.

Conclusion: To date, urinary phosphorous suggests the metabolic diet meets the dietary phosphorous requirements and participants are compliant with the diet instructions.

ROUND TABLE DISCUSSANTS

HEALTH CARE EDUCATION

Title: Gamification in Patient Centered Care: from assessing the needs to developing solutions (gPACC)

Authors:

University of Texas Southwestern Medical Center, USA: Kim Hoggatt Krumwiede, PhD, Yulia Piller, PhD

Heriot-Watt University, UK: Theodore Lim, PhD. Hans Wolfgang Loidl, PhD., Thusha Rajendran, PhD.

Introduction: Each person who has a stroke is affected differently. Present interventions not only restrict/limit the active roles patients and their families take in the rehabilitation and decision-making processes (NHSI, 2011; Eady, 2017), but also lack implementation of appropriate digital tools (Cogollor et al, 2018). This results in sub-optimal rehabilitation interventions, which ultimately become barriers to adherence and/or are financially unrealistic.

A paradigm shift in healthcare to the Patient Centered Care (PCC) model will encourage the active collaboration and shared decision making between multiple stakeholders (patients, caregivers and clinicians) in the development of successful rehabilitation systems.

Research Questions:

- What are the implications of applying gamification to needs assessment within PCC for cognitive (post-stroke) disabilities?
- What data analysis methodology could be implemented to process the data collected by the gamification framework?
- What is the approach to study user acceptance and related issues?
- Could gamification trigger socio-cultural awareness leading to culturally competent care and lasting behavior change?

Methods: The gPACC project innovates through gamification principles to capture the perception of needs and affordances of post-stroke patients with cognitive impairment. The methods would offer an alternative to bias-susceptible surveys/questionnaires.

Anticipated Outcomes:

- A gamified needs assessment approach for clinical interventions
- Identification of new technological interventions for rehabilitating patients with post-stroke cognitive impairment
- Novel culturally sensitive approach to Patient-Tailored therapy that takes advantage of emerging technologies in digital social innovation for cognitive rehabilitation.
- Insights on the reactions to a set of gamification stimuli or rules across different sociocultural backgrounds.

ROUND TABLE DISCUSSANTS

PHYSICIAN ASSISTANT STUDIES

Title: Examining the Influence of Patient-Provider Communication on Health Outcomes among US- and Foreign-born Racial and Ethnic Groups using Nationally Representative Samples

Author: Tiffany B. Kindratt, PhD, MPH

Introduction: Limited research has evaluated how patient-provider communication (PPC) contributes to health outcomes using nationally representative samples.

Objectives: My research objectives are to: 1) explore how different qualities and modes of PPC are associated with health outcomes across the lifespan and 2) determine differences by race and ethnicity among US- and foreign-born individuals. Current projects aim to: 1) estimate and compare qualities of PPC among non-Hispanic white, non-Hispanic black, Hispanic, Asian and Arab Americans with diabetes, hypertension and disabilities and 2) determine whether adults' perceptions of qualities of PPC are associated with diabetes, hypertension, and rehabilitation outcomes.

Methods: Secondary, cross-sectional data will be gathered from multiple years of linked Medical Expenditure Panel Survey (MEPS) and National Health Interview (NHIS) data. Adults reported how often providers spent enough time with them; explained so they understood; listened to them; showed respect; gave them a chance to ask questions; addressed feelings; involved them in decisions; confirmed understanding; and helped with uncertainty. These qualities of PPC will be evaluated to determine associations with diabetes, hypertension, and disability prevalence and assess whether or not PPC is associated with diabetes (e.g. foot exams, eye exams, lifestyle education), hypertension (e.g. exercise, diet, medications) and rehabilitation (e.g. activity, quality of life) care and health outcomes. Bivariate and logistic regression analyses will be conducted using SAS and STATA statistical packages.

Results: In progress.

Discussion: I seek to collaborate with and mentor interprofessional learners interested in evaluating how qualities of PPC are associated with health outcomes using large national databases.

ROUND TABLE DISCUSSANTS

PHYSICAL THERAPY

Title: Does Proximal Core Stability Impact the Incidence of Functional Ankle Instability?

Authors: Ed Mulligan, PT, DPT, OCS, SCS, ATC and Julie DeVahl, PT, DPT, OCS

Introduction:

The concept of regional interdependence suggests that a geographically remote impairment may influence the risk of injury or recovery at an anatomically distant site. Previous literature has established a link between proximal hip weakness and instability distally at the ankle. What is less clear is which specific muscle groups may be weak and/or inhibited and if this finding is different in subjects who recurrently sprain their ankle as opposed to those that only sprain their ankle once and fully recover.

Purpose:

The aim of this study is to examine whether subjects with chronic ankle instability (CAI) demonstrate proximal hip weakness tested in weight-bearing and non-weight bearing positions compared to subjects without CAI. Additionally, to investigate the relationship between hip strength and dynamic functional reach tests in subjects identified as chronically unstable at the ankle joint.

Methods:

This study will be a single-time assessment of hip strength (muscle force production/body weight) and lower extremity balance (STAR excursion on level and incline) in subjects that have not had ankle pain nor episodes of instability in the past three months. Based on the subjects' ankle injury history, analysis will be based on three groups: controls (no ankle injury history), "copers" (one injury and fully recovered), and CAI (sprained the same ankle two times or more in the past two years). Between group comparisons will be employed to see if the dependent variables (hip strength/balance) differs between the three groups. Data collection is scheduled for March 2019.

Results/Conclusions: To be determined.

ROUND TABLE DISCUSSANTS

PROSTHETICS - ORTHOTICS

Title: Effectiveness of Repositioning, Cranial Remolding, and Physical Therapy in Infants with Cranial Deformation

Author: Tiffany Graham, MSPO, CPO, LPO

Introduction: Deformational head shapes can be treated through repositioning therapy and/or Cranial Remolding Orthotic (CRO) treatment. Torticollis is a common comorbidity for these patients which need to be treated concurrently for optimal outcomes. However, there is conflicting clinical evidence about the effectiveness of each treatment method, exacerbated by a lack of randomized control trials and age-restricted studies.

Objectives: This study will compare the overall 3-dimensional percentage of cranial correction achieved through repositioning therapy versus CRO treatment as well as the rate of non-compliance for each method in order to examine the effectiveness of each treatment method. Compliance with each treatment method as well as physical therapy treatment will be analyzed. The results of this study are expected to lead to future studies comparing the treatment methods in terms of patient compliance, long-term outcomes, larger sample sizes, and statistically similar populations.

Methods: In this study, infants with cranial deformation will be followed from 2 to 12 months of age. Initially, all infants will be assigned to Repositioning Therapy (the current standard of care for 2 month olds) and evaluated by a physical therapist. Some participants will crossover to the CRO treatment group and/or undergo torticollis treatment. At 12 months of age, all infants will be scanned and the residual deformation compared to their initial presentation. Throughout treatment, caregiver surveys will be administered to evaluate compliance. This study will compare if repositioning therapy or CRO treatment is more effective.

Results: In progress.

Discussion: This study is open for enrollment as of January 3, 2018. This study seeks to collaborate with an interdisciplinary team interested in evaluating the effectiveness of different methods in treating deformational head shapes. Opportunities for collaboration in this study involve work in parental education, caregiver surveys, torticollis physical therapy treatment, and orthotic treatment.

ROUND TABLE DISCUSSANTS

RADIATION THERAPY

Title: Isocenter localization correlation between Radiation Therapists and Master's Education Program Radiation Therapy Students. A comparison and agreement study.

Authors:

University of Texas Southwestern Medical Center, USA: Kameka Rideaux, MBA, RT(R) (T), Sandra Hayden, MA., RT(T), FASRT, DeAnn Klein, M.Ed, RT(T)(R),CMD

Introduction:

The rapid technology changing in health care demands accuracy and a high level expertise from professionals.¹ In the highly technical Radiation Oncology Department, daily imaging is necessary to accurately localize the isocenter to provide quality radiation therapy patient treatment. Radiation therapists are extending the regular boundaries of our profession. Image Guidance Radiation Therapy (IGRT) with the advances in linear accelerator capabilities, higher patient volumes and the increased demand for cancer services require the comprehensive additional assistance of highly skilled radiation therapists who deliver care and critical thinking of these dedicated professionals on the front lines. These circumstances require the involvement of select experts in radiation oncology who can be trusted to localize the patient's isocenter on daily basis to treat patients precisely and later a physician to review these images post treatment. This shift in greater responsibility to the radiation therapists is an accepted change in our industry^{2,3} There are radiation therapists seeking professional advancement opportunities in Canada as well as the US.^{2,4}

Research Questions:

- How often will the IGRT imaging shifts correlate between the radiation therapists and the master's level radiation therapy student?
- What data analysis methodology could be implemented to process the data collected by the daily IGRT shifts?
- What is the radiation therapist acceptance to this project? Are there any issues around the radiation therapist adoption or user barriers?
- What are the ramifications of clinical education teaching and will we have enough volunteers to work with us on this study?
- What will be the ideal method of communication to the radiation therapists? What will be the acceptability and compliance by the radiation therapists?
- Could a high correlation percentage of the shifts be made to allow future adoption of the Advanced Practice Radiation Therapist? Could this prospective study lead to other correlation review of the radiation therapists and the radiation oncologists' agreement with daily IGRT image shifts?

Methods: The Isocenter percentage of correlation of daily IGRT shifts study could help to validate the master's level radiation therapy program by providing critical thinking, precision in localization and accurate higher skilled radiation therapy students. This project innovates through the radiation therapy student using principles of anatomical accuracy to enhance their comfort and competency. The daily shifts are recorded with the EMR verify and record system in Mosaiq and the comparisons/correlation in IGRT matching will be made independently between the clinical educators and the radiation therapy students. The data will be collected per orthogonal pair images to ascertain congruence or lack thereof. The methods would offer actual data of shifts.

Anticipated Outcomes:

- Once implemented the clinical coordinators along with the program director can review and provide a needs assessment approach for clinical education interventions to help improve the student's imaging skills.
- Identification of what areas the clinical coordinators can focus on utilizing the VERT simulation center in a lab environment to enhance student learning of imaging and accuracy of isocenter localization via anatomical structures.
- Improved radiation therapist's confidence in the master's level radiation therapy student's abilities.
- Insights on the reactions of the radiation therapists/ clinical education coordinators for increased education program and clinical relationships.
- Long term this data and acceptance could result in less burden of the radiation oncologists allowing them more time for patient centered care as the radiation therapists take on lower level tasks.

References:

1. O'Neil EH and the Pew Health Professions Commission. *Recreating the Health Professional Practice for a New Century*. 1998. Available at: http://www.futurehealth.ucsf.edu/pdf_files/recreate.pdf. Accessed Dec. 20, 2006.
2. Bolderston A. Advanced practice perspectives in radiation therapy. *J Radiotherapy Pract*. 2004;4:57-65.
3. 5. *Environmental Scan of the Radiation Therapists Workplace, 2005*. Available at: <http://www.asrt.org/Media/Pdf/RTTScanFinal.pdf>. Accessed February 20, 2007
4. *Implementing Radiography Career Progression: Guidance for Managers*. London, England: The Society of Radiographers; 2005.

ROUND TABLE DISCUSSANTS REHABILITATION COUNSELING

Title: Problem Solving Training (PST) for Care Partners of adults with Traumatic Brain Injuries (TBI).

Author: Shannon B. Juengst, PhD, CRC.

Introduction: The chronic consequences of traumatic brain injury (TBI) are established, but ongoing support for adults with TBI is limited. This puts undue burden on their care partners, particularly during the transition from hospital to home, leading to emotional distress and increased substance abuse. There are no evidence-based interventions for care partners of adults with TBI to prepare them for this new caregiving role. Problem Solving Training (PST) is an evidence-based, self-management approach with demonstrated efficacy for care partners of individuals with disabilities, but it has not been delivered during inpatient rehabilitation.

Purpose: Aim 1): To assess the feasibility of providing PST to care partners of adults with TBI during the inpatient rehabilitation stay; Aim 2) To assess the efficacy of PST + education vs education alone for improving caregiver burden, depressive symptoms, and coping skills among care partners.

Methods: We are conducting a multisite, randomized control trial of PST vs Education for Care Partners during the inpatient rehabilitation stay of individuals with TBI. We will enroll 172 care partners and conduct baseline assessment, with follow-up assessment at 1 month and 6 months post-discharge.

Anticipated Results and Conclusion: We anticipate that care partners will be able to complete a minimum of 3 sessions during the inpatient rehabilitation stay and that PST will be more effective than Education alone for reducing caregiver burden and depressive symptoms and improving positive coping among care partners. This project provides evidence for effective ways to support care partners during the transition from hospital to home.

Date: Wednesday, February 7, 2018

Title: “Collaborate: Interdisciplinary Bench Science and Clinical Research”

- **Keynote Lecture:**

Jeffrey Browning, M.D., Associate Professor and Chair

“Non-Alcoholic Fatty Liver Disease: From observation to intervention and beyond”

- **2017 Grant Recipients**

Karen Brewer-Mixon, Ph.D., C.R.C., Associate Professor

Staci Shearin, M.P.T., P.T., N.C.S, Assistant Professor

“Effectiveness of a Short Education Series to Reduce Anxiety for Health Professions Graduate Students”

Hoda Yeganehjoo, Ph.D., R.D., Assistant Professor

Masaki Mizuno, Ph.D., Assistant Professor

“Investigating the Potential Impacts of Natural Dietary Components on Improving Cognitive Function and Protein Biomarkers of Alzheimer’s Disease in Rat Models”

- **Expert Round Table Discussion**

“Benefits of Student Involvement in Scholarly Activity and Health Research”

Tiffany Graham, M.S.P.O., C.P.O., L.P.O, Instructor

Tiffany Kindratt, M.P.H., M.A., Assistant Professor

Kameka Rideaux, M.B.A., R.T., (R)(T), Assistant Professor & Program Director

Alexandra Yost (Physician Assistant Student)

Anna Marie Nguyen (Rehabilitation Counseling Student)

Kathryn Welch (Clinical Nutrition Student)

Date: Wednesday, February 15, 2017

Title: “Collaborate: Transforming Medical Education and Patient Care Through Inter-Professional Research”

- **Keynote Speaker**

Craig Rubin, M.D., FACP, AGSF, Professor

Jason Zafereo, Ph.D., P.T., F.A.A.O.M.P.T., O.C.S., Associate Professor

“Investigating Bone and Skeletal Muscle Interaction in Men with Prostate Cancer Treated with Androgen Deprivation Therapy”

- **Small Grants Program**

Venetia Orcutt, Ph.D., MBA, PA-C, Associate Professor
Palma Longo, Ph.D., Assistant Professor

“A New Collaboration Model to Study Clinical Reasoning”

Staci Shearin, M.P.T., P.T., N.C.S, Assistant Professor
Masaki Mizuno, Ph.D., Assistant Professor

“Impact of Exercise Intensity on Brain Derived Neurotrophic Factor in Parkinson’s Disease: From the Bench to the Clinic”

Lona Sandon, Ph.D., RD, LD, Assistant Professor
Scott A. Smith, Ph.D., Professor

“Preventing High Blood Pressure by Targeting Dietary Phosphate: A Collaborative Team Approach”

Expert Round Table Discussion

Symposium Speakers

Karen Brewer-Mixon, Ph.D., Associate Professor

Fan Gao, Ph.D., Associate Professor

Sandra Hayden, MA, R.T. (T), FASRT, Assistant Professor

Date: Wednesday, February 17, 2016

Title: “21st Century Strategies for Managing Obesity”

- **Speakers**

Gloria Lena Vega, PhD, Professor
Department of Clinical Nutrition and
Center for Human Nutrition

“Obesity Epidemic and Health Disparity”

Steve Farrell, PhD, FACSM, Scientific Content Specialist
Division of Adult Education, The Cooper Institute, Dallas

“Joint Associations between Cardiorespiratory Fitness, Obesity, and Mortality: The Cooper Center Longitudinal Study”

Jaime Almandoz, MD, Assistant Professor
Department of Internal Medicine

“Multidisciplinary Weight Loss to Weight Wellness”

Lona Sandon, MEd, RD, LD, Assistant Professor
Department of Clinical Nutrition

“Weight Management & Lifestyle Intervention in the Workplace”

Martin Deschner, PhD, Associate Professor
Department of Psychiatry
“Patient Individuality and Interdisciplinary Treatment in Bariatric Surgery”

Expert Round Table Discussion

Date: Wednesday, February 18, 2015

Title: “Converging on Parkinson’s Disease: Interdisciplinary Approaches to Diagnosis and Management”

Richard Dewey, MD, Professor
Department of Neurology & Neurotherapeutics
UT Southwestern Medical Center
“Parkinson’s Disease Biomarker Program: What Is It and Why Is It Important”

Shilpa Chitnis, MD, Ph.D., Associate Professor
Department of Neurology & Neurotherapeutics
UT Southwestern Medical Center
“Current and Emerging Therapies in Parkinson’s Disease”

Faye Elahi, MS
Special Needs Nutritionist
Founder, Nutrition Balance for Life! LLC
“Latest Dietary and Nutrition Interventions for Management of Parkinson’s Disease”

David Wilson, MPO & Staci Shearin, MPT
Prosthetics-Orthotics Program and
Department of Physical Therapy
UT Southwestern Medical Center
“A Road Map to Improving Gait Dysfunction in Individuals with Parkinson’s Disease”

Expert Round Table Discussion

Date: Wednesday, February 26, 2014

Title: “Lending a Helping Hand: Community Based Medicine and Research”

Heather Kitzman-Ulrich, Ph.D.
Assistant Professor
Texas Prevention Institute-School of Public Health
University of North Texas Health Science Center
“Community-Based Programs to Improve Obesity and Related Chronic Health Conditions”

Carolyn Bradley-Guidry, MPAS, PA-C
Assistant Professor
Department of Physician Assistant Studies
UT Southwestern Medical Center
**“Screening Our Sisters: Addressing Breast Health
Disparities Through Community Education and Client
Navigation”**

Olga Gupta, M.D.
Assistant Professor
Department of Pediatrics, Internal Medicine
UT Southwestern Medical Center
Community Based Medicine and Research
**“Beta Cells and Betta Fish: A Novel Pediatric Based
Medical Approach to Improving Health Outcomes in
Diabetes”**

Expert Round Table Discussion

Date: Wednesday, March 6, 2013

Title: “Multiple Sclerosis: Diagnosis, Treatment & Management”

Elliot Frohman, MD, PhD
Director, Multiple Sclerosis Program
Department of Neurology and Neurotherapeutics
UT Southwestern Medical Center
**Pathobiological Underpinnings of Multiple Sclerosis and
Its Translation into Disease Modifying Therapy**

Teresa Frohman, PA-C
Multiple Sclerosis Clinic
Department of Neurology and Neurotherapeutics
UT Southwestern Medical Center
Managing the Symptoms of Multiple Sclerosis

Scott Davis, PhD
Director, Applied Physiology Laboratory
Department of Applied Physiology & Wellness
Southern Methodist University
Understanding Autonomic Dysfunction in Multiple Sclerosis

Elliot Frohman, MD, PhD, Teresa Frohman, PA-C, Scott Davis,
PhD, Diana Logan, NP, Chung-Yi Chiu, PhD, Kelli Doern, DPT,
Kelly Tarricone, RD, Nathan Sutti, CPO

Round Table Discussion: The Future of Multiple Sclerosis at UT Southwestern

Date: Wednesday, February 25, 2012

Title: “Stroke: Risks, Recovery and Relationships”

Mark Goldberg, M.D.
Professor & Chair
Department of Neurology and Neurotherapeutics
UT Southwestern Medical Center
Stroke Connections—From Axons to People

Mark Barisa, Ph.D., ABPP
Director of Neuropsychology Services
Baylor Institute for Rehabilitation
Dallas, TX
**Management of Depression Following Stroke:
A Stress and Coping Model**

Karen McCain, PT, DPT, NCS
Assistant Professor
Department of Physical Therapy
UT Southwestern Medical Center
Raising Expectations for Gait Recovery after Stroke

Date: March 2, 2011

Title: “Interrelationships Between Mind, Body & Physical Functioning”

Deborah Clegg, Ph.D., R.D.
Department of Clinical Nutrition
Touchstone Diabetes Center
UT Southwestern Medical Center
Body Weight Regulation: Is It All In Your Head?

Chrystyna Senkel, PA-C
Provost Bariatrics
Denton, TX
Intermediate and LongTerm Characteristics of Bariatric Surgery Patients

Deborah Josbeno, Ph.D., MS, PT
Department of Physical Therapy
University of Pittsburgh
Physical Activity and Physical Function After Bariatric Surgery
Title: “Perspectives on the Diagnosis and Treatment of Cancer”

Date: Wednesday, March 3, 2010

Robert Timmerman, MD

Professor

Department of Radiation Oncology

“Radiation Therapy Using Image-Guided and Stereotactic Techniques”

David Euhus, MD

Professor

Department of Surgery

“Energy Balance and Cancer”

Claus Roehrborn, MD

Professor & Chair

Department of Urology

“To Screen or Not to Screen: The Controversy Over Prostate Specific Antigen (PSA) Testing”

Gerald Casenave, PhD

Associate Professor & Acting Chair

Department of Rehabilitation Counseling

“Psychosocial Aspects of Cancer”