

## 13<sup>th</sup> Annual College of Allied Health Research Day

April 14, 2023 (noon-4pm)

Call for Abstracts

Submission due February 17, 2023 by 11:59 PM

**\*Late Submissions will not be accepted**

### GENERAL ANNOUNCEMENT

The College of Allied Health Research Day provides a platform for exchanging research/scholarship among faculty and students and creates an opportunity for collaborations across disciplines. Faculty and students in the College of Allied Health, or who are collaborating with College of Allied Health faculty and/or students, are invited to submit abstracts for a **10-minute presentation** (8-minute presentation and 2-min Q&A). Research that has been or will be presented in other venues is still eligible.

Abstracts will be evaluated by an ad hoc committee comprised by members of the College of Allied Health Research Committee and other members of the College. Once decisions are made you will be provided additional instructions regarding your presentation.

In order to present at Research Day, each submission will include a **cover letter** (only for student submissions), an **abstract** of the research project (formatted as per below specifications), a short **bio** for the presenter, and one **learning objective**.

There are three potential categories for submission: Original Research, Literature Review, and Case Report/Case Study.

### SUBMISSION CATEGORIES

	<b>Description</b>	<b>Examples</b>
Original Research	May include observational or experimental studies in any stage of completion: completed research with outcomes, research that is in progress with some outcomes, or research proposals.  When you select this option on the submission form, you will specify which stage your research will be in <i>at the time of presentation</i> .	Completed quantitative or qualitative research  Preliminary work which can demonstrate some but not all results  Emerging faculty or student project, including student thesis or dissertation in the proposal stage
Literature review	Research that demonstrates a systematic and replicable review of the literature to answer a clinical question deemed appropriate for advancement of science and/or education.	Systematic reviews, meta-analyses, critically-appraised topics
Case report/case study	Descriptive project that highlights novelty in choice of participant, assessment, or intervention.	Case report; case study completed to provide preliminary feasibility or data.

## REQUIRED SUBMISSION INFORMATION

1. **Cover page** (only for student submissions): The cover page must include the (a) title of the presentation, (b) the student's name and the name of the research mentor and that of any other faculty involved in the project, and (c) the signature of the research mentor approving the proposal. By signing, the mentor confirms that they have read the abstract in full, contributed guidance as needed, and that the application is worthy of acceptance at the CAH Research Day. The mentor further agrees to provide sufficient oversight and support.
2. **Abstract:** All abstracts must follow the abstract guidelines listed below, or *the abstract will not be scored and will not be invited for presentation at Research Day.*
3. **Speaker bio:** Submit a short biography of the presenter as a Word document or PDF labeled as follows '*Last name-First initial\_bio#.docx*' (Example: '*Jones-E\_bio1.docx*'). Students, please submit a short paragraph description of your training and professional expertise as it relates to your ability to speak on this topic.
4. **One learning objective:** This objective states what the audience will be able to do with the knowledge gained from your presentation. Submit one objective for your session using the stem: "*Following this presentation, attendees in this interprofessional audience will be able to...*"

## ABSTRACT GUIDELINES

Individuals (students and faculty) may submit no more than 2 abstracts as the primary author, but are allowed unlimited submissions as secondary author. The primary author is defined as the leading author of the abstract and the one whose name appears first in the abstract. This is also the submitting author. It is the responsibility of the primary author to ensure that names, credentials, and affiliations of all co-authors are included and that authors are listed in the order they will appear on the abstract and citation.

Length and format: Abstracts must be no longer than 1 page, single spaced, with 1-inch margins and left justified text in Times New Roman (11 point) font. Each abstract must be submitted as a Word document or PDF labeled as follows '*Last name-First initial\_abstract#.docx*' (Example: '*Jones-E\_abstract1.docx*').

Each abstract must include each of the following items, or it will not be scored. Example abstracts are included for reference.

Required elements:

1. Project Title
  - Project Title: all capital letters, no more than 15 words, centered
  - Name of author/presenter, collaborators, and credentials: first initials and last name with a superscript number identifying departmental affiliation
  - Departmental Affiliations
2. Body of Abstract (all sections are required)
  - Headings for the abstract will be dependent on type of work submitted. Please follow sections in the categorical examples provided in the pages following this call.
  - All submissions must have a Relevance to Allied Health section. Submissions without this section will not be reviewed! The author should *provide compelling rationale for why the research should be of interest to other disciplines.*

**SUBMISSION DEADLINE: 11:59 pm on February 17, 2023.** Late submissions will not be accepted.

Presenters will be notified of the status of their submission by **March 20, 2023** by e-mail regarding acceptance. Further instructions will be included with notification.

If you have questions, please contact your department's representative on the research committee or Katerina Ntourou, by e-mail at [katerina-ntourou@ouhsc.edu](mailto:katerina-ntourou@ouhsc.edu).

Research Committee Members:

Jonathan Baldwin- Medical Imaging and Radiation Sciences

Brian dela Cruz- Nutritional Sciences

Denise Finneran – Communication Sciences and Disorders

Amanda Hanstein: Medical Imaging and Radiation Sciences

Frank Hays – Nutritional Sciences

Tara Klinedinst- Rehabilitation Sciences

Katerina Ntourou– Communication Sciences and Disorders

Yo Shih- Rehabilitation Sciences

**EXAMPLE: ORIGINAL RESEARCH (COMPLETED RESEARCH WITH OUTCOMES)**

**FAT-FREE MASS INDEX IN A RACIALLY/ETHNICALLY DIVERSE ADULT POPULATION**

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D Gallagher, EdD<sup>2</sup>

Developmental Origins of Human Disease Laboratory, OUHSC, Oklahoma City, OK<sup>1</sup>, Body  
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St. Luke's-Roosevelt Hosp, New York, NY<sup>2</sup>

**Background:** Nutritional status is often assessed using BMI or percent body fat. BMI can however, misclassify a person that carries more weight as lean tissue mass. Similarly, assessing percent body fat can be misleading in cases of malnutrition or in disease states characterized by wasting or reduced lean tissue mass. Past research suggests that the use of the fat-free mass index (FFMI) may alleviate some of these issues. Where BMI is a useful tool to interpret body weights from individuals of differing height, FFMI can be useful to interpret body composition from individuals of differing body weight and height. This would allow identification of individuals with similar body fat, but differing in height and therefore lean tissue mass.

**Purpose:** The purpose of this study was to determine whether the FFMI differs in a group of racially/ethnically diverse adults.

**Methods:** Subjects were a multi-ethnic sample (Caucasian – CA, African American – AA, Hispanic – HIS and Asian – AS) of 1339 healthy males (n=480) and females (n=859) ranging in age from 18 – 110 years. Total body fat, lean, and bone mineral content (BMC) were measured using dual energy x-ray absorptiometry (GE Lunar DPXL, Madison, WI) and analyses were performed using software version 4.7e. Multiple regression analysis was used to examine the relationship between FFMI and race. Gender, age, age\*gender interaction, and age\*race interaction were the significant covariates and interactions retained in the final model.

**Results:** The FFMI value for the mean age of the group (46.4 yrs) for males and females, respectively are as follows: CA = 20.3 kg/m<sup>2</sup> and 16.6 kg/m<sup>2</sup>, AA = 21.2 kg/m<sup>2</sup> and 17.5 kg/m<sup>2</sup>, HIS = 20.7 kg/m<sup>2</sup> and 17.0 kg/m<sup>2</sup> and AS = 18.7 kg/m<sup>2</sup> and 15.0 kg/m<sup>2</sup>. All groups differed from CA ( $p \leq 0.004$ ). Main effects for gender and age were found ( $p \leq 0.001$ ) such that males had a greater FFMI than females, and as age increased FFMI decreased in males (non-AA:  $\beta = -0.028$ ;  $p \leq 0.001$ , AA:  $\beta = -0.044$ ;  $p \leq 0.001$ ) however only AA females decreased in FFMI with increasing age ( $\beta = -0.018$ ;  $p \leq 0.002$ ).

**Discussions/Conclusions:** Differences in FFMI between race/ethnic groups and gender were found and a decline in FFMI with age was indicated across all groups in males and in AA females.

**Relevance to Allied Health:** These findings have clinical implications for all allied health disciplines in identifying individuals that may not be recognized as being in an abnormal nutritional state based on their BMI or percent body fat values, but have a relatively low amount of lean tissue mass.

**EXAMPLE: ORIGINAL RESEARCH (RESEARCH PROPOSAL)**

**SYRINGE SHIELD IMPACT IN TECHNOLOGISTS' RADIATION EXPOSURE**

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Oklahoma City, OK

**Background:** As low as reasonably achievable (ALARA), is a guideline for radiation safety that is foundational in radiation safety practices. Currently no regulation governs the use of syringe shields for nuclear medicine technologists' in the workplace. However, it is the decision of the technologist to use this shielding tool to reduce their exposure. Radiation exposure has been linked to primary DNA damage, and genotoxic implications from chronic low dose exposure caused by occupational exposure levels. Given this information and the ALARA principal, it is interesting that syringe shields are not included in federal regulations for nuclear medicine technologists. What is even more interesting is the lack of research available on the efficacy of syringe shields and how these tools can reduce occupational exposure.

**Purpose:** With this research we aim to determine the efficacy of two different types of syringe shields compared to not using a syringe in shielding radiation exposure to nuclear medicine technologists. The research will show how syringe shields effect exposure from a source of radiation used commonly in the nuclear medicine field. With these answers we hope to provide occupational nuclear medicine technologists with accurate data to aid in the decision to use or not use syringe shields in the work place.

**Methods:** We plan to use an UNFORS Nuclear Education Device to measure exposure rates in mR and mR/min. The UNFORS is a dosimeter that measures dose exposure in real time. We will use the UNFORS on a syringe with a common dose of Tc-99m, shielded with a TommyBoy syringe shield, a ProTec Tungsten syringe shield, and the syringe unshielded. The same dose of Tc-99m will be used for all measurements and radioactive decay will be taken into account in calculations. Each measurement will take place for a total time period of ten seconds, and the syringe will be placed next to the dosimeter in the same area for each measurement. All investigators have been extensively trained in the handling and transportation of radioactive sources through the OUHSC Radiation Safety Office. UNFORS readings from both the shielded and unshielded syringes will be recorded and compared using t-tests. Previous research indicates that syringes shields decrease exposure by 90%. Assuming this difference then a sample size of 20 measurements for the two shielded syringes and the unshielded syringe will be required to achieve at least 80% power, with a 5% chance of a type one error.

**Results:** We hypothesize that the unshielded syringe will have the highest exposure rates out of the three groups. In previous research a 90% reduction of dose was recorded, we expect to see similar results from both syringe shields. Further we hypothesize that the tungsten syringe shield will have the highest efficacy of the three groups tested. Due to the lack of published research on this topic we encourage any feedback on our study design and methods.

**Conclusion:** This study is important to our field because of the ALARA principle and the effects of chronic low dose radiation exposure might have to occupation nuclear medicine technologists. Nuclear medicine workers have dose limits in place to protect them but have no regulation on syringe shields that embody the principle ALARA. Even though syringe shields are not required they will aid in helping technologists receive the lowest possible exposure in the field.

**Relevance to Allied Health:** This topic is relevant to many allied health professions due to the fact that radiation exposure is heavily regulated across our modalities for both patients and health care workers. Many times in nuclear medicine we are called to a patient's room to inject our radiopharmaceutical. It is probable that other Allied Health modalities like physical therapy or dieticians may be in the patients' room. Properly shielding our doses protects these professionals from exposure, as well as nuclear medicine technologists.

## EXAMPLE: LITERATURE REVIEW (SYSTEMATIC REVIEW)

### THE HEAR AND KNOW OF ADMINISTERING COGNITIVE ASSESSMENTS TO PATIENTS WITH HEARING LOSS

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<sup>2</sup>Department of Rehabilitation Sciences, College of Allied Health, University of Oklahoma Health Sciences Center, Oklahoma City, OK

**Background:** The growing population over the age of 65 years presents challenges and burdens for health care service delivery, especially in the management of chronic health problems. Declines and cognitive function are common among older people and have been associated with perceptual declines, including hearing sensitivity. Older people with hearing loss are at an increased risk for cognitive decline, suggesting a possible interplay between hearing and cognition. Health care professionals should be aware of these perceptual and cognitive changes and their impact on assessment.

**Purpose:** The aims of this literature review are: 1) to review the impact of aging on cognitive and sensory (specifically, hearing) impairments and assessments, 2) to provide evidence of the interaction of hearing loss and cognitive impairment, and 3) to provide recommendations for administration of cognitive assessments to patients with hearing loss.

**Methods:** Through a focused search on the association of hearing and cognition, we reviewed over 100 peer-reviewed articles, websites, and online resources from January 1974 to April 2016 using the PubMed, CINAHL, ScienceDirect, and Google Scholar databases for search terms “hearing loss,” “cognition,” “aging,” and “assessment.” In addition, online resources from the Alzheimer’s Association, the Better Hearing Institute, the American Speech-Language-Hearing Association, the American Academy of Audiology, and the American Academy of Family Physicians were reviewed. Sources were grouped into the following areas: 1) epidemiology of hearing loss and cognitive impairment, 2) impact of aging on cognitive and hearing impairment, 3) commonly used assessments to assess cognitive function, 4) evidence of the interaction of hearing loss and cognitive impairment and its impact on cognitive assessments, and 5) best practice recommendations for administering cognitive assessments to patients with hearing loss and unknown cognitive status.

**Results:** The evidence presented in this review suggests an interaction between declines in audibility and cognition that may impact how health care professionals deliver intervention and evaluations to older people who have both conditions. Reduced audibility can yield artificially low cognitive assessment scores, even in people who are not cognitively impaired, and impaired cognition can impact the delivery of reliable responses during an audiometric evaluation.

**Discussions/Conclusions:** Hearing loss and cognitive decline interact, having negative effects on cognitive assessment scores. It is important to confirm audibility before administering cognitive assessments to patients with hearing loss. We will provide recommendations for clinicians administering these assessments along with other verbally administered tests (e.g. pain scales, medication dosing instructions, etc.), including managing amplification and optimizing the environment, to older people.

**Relevance to Allied Health:** Allied health professionals should be aware of the impact of hearing loss on cognitive assessments, as well as the comorbidity of hearing loss and cognitive impairment in older adults. Audibility should be ensured so that cognitive assessment scores are not affected by hearing loss. Recommendations for administering cognitive screenings to older people with hearing loss may be applicable to other bedside or verbally administered assessments.

## EXAMPLE: CASE REPORT

### Treadmill Training Improves Pain and Mobility in a Case of Persistent CIPN

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**Background:** Recent evidence suggests that chemotherapy-induced peripheral neuropathy (CIPN) is bothersome and interferes with activity and participation, even when graded as ‘mild’ by the oncologists. For some survivors, CIPN is painful, yet pain medications may interfere with postural control; a concern for balance already challenged by CIPN and age-related decline. Given that CIPN can persist long after chemotherapy has ended, better management of related pain and imbalance are critical to survivorship.

**Purpose:** This case report describes the apparent impact of treadmill gait training (TMT) on functional mobility and pain outcomes in an older adult breast cancer survivor with severe, persistent CIPN.

**Case Description:** A 73 year old female, previously an unlimited community ambulator, underwent left lumpectomy for breast cancer and stopped chemotherapy after developing severe sensorimotor CIPN requiring bilateral ankle-foot orthoses (AFOs) for ambulation, and a wheelchair for community mobility. At cancer PT evaluation 2 years later, she had progressed to walking with standard cane without AFOs. Gait Speed (GS) with cane was 0.86 m/s and Timed Up and Go (TUG) was 15.2 s, both with losses of balance, and she reported recent injurious falls. Finger and toe pain was 10/10 and ‘stabbing,’ even on 15 mg oxycodone (Oxy) and 3000 mg gabapentin (Gab) daily. Cancer PT added TMT to her existing PT program of overground balance and gait training.

**Outcomes:** After 4 minutes of TM walking provided transient pain relief (0/10), she added TM to her home program and began to wean Oxy. By 6 weeks, she discharged cane use for indoor mobility, and GS improved to 1.0 m/sec. At 6 months (on 6 mg of Oxy), she transferred care to Cancer PT for TMT with intermittent speed challenge and emphasis on consistent foot clearance and step width, length and time. After 5 months of weekly PT she improved in: Balance Confidence (66.3% from 51.3/100%), Dizziness Handicap Inventory (18 from 50/100), GS (1.06 m/s without cane), TUG (10.3 s and steady), and Functional Gait Assessment (16 from 12/30). Through continued use of home TM for pain relief, she weaned to 2400 mg Gab and no Oxy. She had no falls in 4 months and resumed gardening on a slope and carrying plates of food and a full laundry basket with no cane.

**Discussion:** TMT appeared to provide a non-pharmacologic pain management strategy for this older adult with persistent painful CIPN, a phenomenon supported by animal research. Further, with no corresponding improvement in nerve function, she achieved significant improvement in functional mobility over 5 months of TMT, even after plateauing with 2 yrs of standard rehab. This suggests that TMT may have provided this patient with advantages over standard rehab, however randomized controlled trials are needed to quantify any advantage of TMT over standard PT and natural history of neural repair.

**Relevance to Allied Health:** Rehab clinicians should consider a trial of TMT for clients with painful neuropathy, or those with residual mobility deficits after a course of overground gait training. All allied health professionals should consider new strategies when a patient plateaus with standard care, and monitor for unanticipated secondary benefits of interventions.