THE 4MS IN A PANDEMIC: A SURVEY OF TRAINING NEEDS AMONG HEALTHCARE PROFESSIONALS, OLDER ADULTS, AND COMMUNITY MEMBERS

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The University of New England, in collaboration with the University of Maine, received a five-year grant from the Health Resources and Services Administration (HRSA) to improve the health and well-being of Maine's older adults through enhanced training under HRSA's Geriatrics Workforce Enhancement Program (GWEP). As part of these efforts, stakeholder training needs assessment data were collected via a statewide electronic survey that was distributed to community members and providers throughout Maine. The survey, which focused on the 4M's of Age-Friendly Healthcare, received 68 responses from older adults/community members (N = 26), program administrators (N = 12), along with community leaders, and those working in the public and non-profit sector (N = 13). A significant emphasis on social isolation, mental health, and grief and loss issues was noted and dominating themes centering on two dimensions of the 4M framework: "What Matters" and "Mentation." Findings reflect an overriding priority by providers and consumers to keep older adults socially connected (28%, N = 34) and maintaining mental health and well-being during the pandemic (21%, N = 14). Qualitative response analysis identified additional COVID-19-related training topics such as: what to do if you or a loved one contracts coronavirus, how to handle grief and loss related to COVID-19, strategies for supporting loved ones during COVID-19, and socially distanced bereavement support. Results indicate a need to focus on meeting the emotional and mental health needs of older adults, as well as the importance of encouraging connections and mitigating the effects of social isolation during COVID-19.

USING THE 4 M OF THE AGE FRIENDLY HEALTH SYSTEM TO IMPROVE MIPS DOCUMENTATION IN PRIMARY CARE: A FEASIBILITY STUDY

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Age Friendly Health Systems (AFHS) commit to evidence-based, low-risk, coordinated care that is centered on what matters most to older adults, their families and caregivers. Nova Southeastern University South Florida Geriatric Workforce Enhancement Program (NSU SFGWEP) has partnered with multiple primary care clinics to provide dedicated AFHS training and support to increase AFHS transformation in Broward and Miami-Dade Counties. As part of the initiative, SFGWEP provide didactic training, clinic on-site brief demonstration, and infographic guidance for EHR documentation. NSU SFGWEP activities are conducted through training surveys, provider feedback, and e-clinical measures that align with CMS MIPS measures. Three participating health systems report annually on seven e-clinical measures that, collectively, provide indicators of the 4Ms of AFHS (what matters, medication management, mentation and mobility.) From baseline to Year 1, NSU SFGWEP saw improvement in controlled hypertension (54% to 94%), opioid screening (<1% to 11%), advance care planning (21% to 35%) and falls risk assessment (45% to 59%). Results demonstrate the need to continue and expand AFHS interventions for sustainability. In Year 2, SFGWEP will continue to expand awareness of best practices and benefits of the AFHS through education and training at NSU and at the various primary care sites. As mutual collaboration and implementation methods are shared among participating members, the expectation is that quality healthcare of our elder community adults will measurably improve.

Session 9305 (Poster)

Geroscience

AGE, SEX, AND CEREBRAL MICROBLEEDS AFFECT WHITE MATTER INTEGRITY ACROSS ADULTHOOD AFTER MILD TRAUMATIC BRAIN INJURY

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The contributions of age, sex, and cerebral microbleeds (CMBs) to WM changes after mild traumatic brain injury (mTBI) have not been studied. We used diffusion tensor imaging (DTI) to map WM fractional anisotropy (FA) changes across the first ~6 months post-mTBI in 109 subjects aged 18-77 (46 females; age μ: 40 y, σ: 17 y) imaged within ~1 week post-injury and ~6 months later. After partialing out age, sex, and CMB counts, significant mean FA decreases were found in the anterior body, posterior body, and splenium of the corpus callosum (CC; $p = 0.003$, 0.009 and 0.015, respectively), left superficial frontal fasciculus ($p = 0.008$), and left branch of the corticospinal tract (CST; $p = 0.007$). Age contributed to mean FAs measured acutely in the CC body ($p = 0.04$), and chronically in the CC genu ($p < 0.001$), CC body ($p = 0.01$), and middle longitudinal fasciculi ($p = 0.04$), older adults exhibiting larger decreases. CMB counts were positively associated with mean FA decreases in the CC body ($p = 0.04$) and middle longitudinal fasciculi ($p = 0.04$). Significant age-by-sex and CMB count-by-age interactions mediated FA decreases in the CC genu ($p = 0.02$ and $p = 0.03$, respectively), older males exhibiting larger decreases. Thus, the CC, longitudinal fasciculi, superficial frontal WM and CST are particularly vulnerable to post-traumatic neurodegeneration moderated by age, sex and CMB count, men and older adults being at highest risk for adverse effects. Future research should investigate our findings relative to cognitive function.

AGE-RELATED AORTIC STIFFNESS CAN BE TRANSFERRED AND AMELIORATED VIA FECAL MICROBIOTA TRANSPLANT IN MICE.

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Age-related increases in aortic stiffness contribute to the development of cardiovascular diseases (CVD). To determine whether the gut microbiome (GM) modulates age-related aortic stiffening, we performed fecal microbiota transplants (FMT) between young (Y; 3 month) and older (O; 25 month) male C57BL/6N mice. Following antibiotic treatment (to suppress endogenous microbiota), mice received weekly FMT (fecal samples collected at baseline) via oral gavage for 8-16 weeks from their own (i.e., sham condition: Y-y, O-o [RECIPIENT-donor]) or opposite age group (Y-o, O-y) (N=8-12/group). In vivo aortic stiffness (pulse wave velocity [PWV]) was higher in older vs. young mice at baseline (382±8 vs. 328±7cm/sec, mean±SE, P<0.001). Arterial phenotypes were transferred such that old microbiota transplanted into young mice increased, while young into old decreased, PWV (Y-y: 325±10 vs. Y-o: 362±10cm/sec, P=0.022; O-o: 409±10 vs. O-y: 335±6cm/sec, P<0.001). Intrinsic mechanical stiffness of excised aortic rings (elastic modulus) increased after transplant of old into young (Y-y: 2141±223 vs. Y-o: 3218±394kPA, P=0.022), and decreased with young into old (O-O: 3263±217 vs. O-y: 2602±136kPA, P=0.016), indicating the GM mediates aortic stiffening by modulating structural changes in the arterial wall. Age-related increases in aortic abundance of advanced glycation end products (AGEs), which cross-link arterial structural proteins, tended to be transferred by the GM (Y-y: 0.022±0.001 vs. Y-o: 0.038±0.006 A.U., P=0.11; O-o: 0.120±0.029 vs. O-y: 0.038±0.009 A.U., P=0.06). The aging GM can induce aortic stiffening via promoting AGEs accumulation and crosslinking of arterial structural proteins, and thus might be a promising target for preventing/treating age-related aortic stiffening and CVD.

GEROSCIENCE APPROACHES TO OBESITY

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Besides aging, obesity is the greatest risk factor for numerous chronic pathologies, including metabolic syndrome, type 2 diabetes, cardiovascular disease, hypertension, and cancer. Preventing and treating obesity would greatly reduce healthcare costs and the impact of the aging process, with estimated savings up to $145,000,000,000. Pharmacological interventions identified by geroscience may prove effective against diet-induced obesity. To test this hypothesis, we fed a 66% kcal/fat diet to nine-month-old C57Bl6/N mice for 6 weeks and treated them with either rapamycin, acarbose, or a combination thereof. Rapamycin, and to a lesser extent acarbose, prevented weight gain and fat accumulation in these mice. We detected increased expression of the Liver Activating Protein (LAP) isoform of the transcription factor CCAT/Enhancer Binding Protein β (C/EBPβ) in the liver of mice treated with rapamycin. C/EBPβ-LAP mediates some of the effects of caloric restriction on nutrient metabolism and increases lifespan in a mouse transgenic model. We tested whether independent activation of C/EBPβ-LAP would recapitulate the effects of rapamycin by treating mice on a high-fat diet with adefovir dipivoxil, a reverse transcriptase inhibitor that can activate LAP in vitro independently of mTOR inhibition. Adefovir dipivoxil reduced weight and fat mass accumulation in mice over the course of 6 weeks. Mice treated with adefovir dipivoxil showed increased expression of genes involved in β-oxidation and lipids mobilization, and reduced activation of fatty acid biosynthesis and lipid storage pathways. Our results identify C/EBPβ-LAP as a potential new target to improve lipid homeostasis in both aging and obesity.

PRE-OPERATIVE PHYSICAL FUNCTION PREDICTS POST-OPERATIVE SKELETAL MUSCLE GENE EXPRESSION IN OLD MICE

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In older adults, pre-operative physical function predicts post-operative outcomes. The biological mechanisms underlying vulnerability to physical decline remain poorly understood. Using a mouse model of laparotomy, we sought to identify biological correlates of post-operative function. 24-month-old male C57BL/6N mice were categorized as high functioning (HF) or low functioning (LF) based on pre-operative performance on the accelerating rotarod. On post-operative days (POD) 2 and 4, LF mice had lower rotarod latency to fall times than HF mice did. Forelimb grip strength was reduced after laparotomy in both HF and LF groups on POD 1 and 3 and did not differ significantly between these groups. Whole transcriptome sequencing analysis (RNAseq) of soleus muscles collected on POD 5 showed 224 and 228 differentially expressed genes (DEGs) for HF and LF, respectively, compared to their respective controls. Only 21 DEGs were observed in both groups, including Pparα, Fst and Pla2g15. Such changes may be hallmarks of the post-surgical response in aging. Pathway analysis of DEGs using Ingenuity Pathway Analysis software (Qiagen) revealed one pathway common to HF and LF (osteoarthritis) whereas activation of GP6 signaling and apoptosis signaling was observed in HF and inhibition of PPARα/RXR activation and PPARα signaling was noted in LF. We conclude that pre-operative performance on the accelerating rotarod correlates with differences in skeletal muscle gene expression, which may contribute to the differences in functional outcomes post-operatively in HF and LF mice. Further studies are needed to delineate the roles of these signaling pathways in physical resilience to surgery.

SEX AND AGE DIFFERENCES IN DEFAULT MODE NETWORK FUNCTIONAL CORRELATION AFTER TRAUMATIC BRAIN INJURY

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