education intervention, based on the KAER Model, using a live video format. Four evidence-based, 45-minute training modules presented core knowledge skills, including how to have difficult conversations, which are essential to diagnosing cognitive impairment. To overcome the obstacles to doing so in primary care, our team relied on a deep understanding of busy primary care practice. With a combined 35 years of direct experience in primary care, our collaborative interdisciplinary team was able to use the KAER Model to develop a highly acceptable intervention for primary care.

IMPLEMENTATION OF THE GSA KAER TOOLKIT IN A LARGE CLINIC SYSTEM: WORKFLOW MODIFICATIONS AND EMR TOOLS

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We implemented the KAER toolkit in the University of Washington primary care clinics. In this session we share the workflows implemented to promote the KAER model and share the tools we developed within EPIC, the system’s electronic medical record (EMR). We collaborated with clinic staff to develop interdisciplinary workflows including: training patient service representatives, social workers, nurses, and medical assistants (MAs) about ‘red flags,’ training medical assistants to complete the Patient Health Questionnaire (PHQ-9) and Montreal Cognitive Assessment (MoCA); and assuring they are appropriately entered into flowsheets in EPIC. We created a checklist (EPIC ‘SmartPhrase’) and educated the clinics’ interdisciplinary teams to utilize it within their scope of practice. Additionally, we created an order set (EPIC ‘SmartSet’) of commonly ordered tests and referrals to expedite evaluation of patients with suspected cognitive impairment. Lastly, we created a direct link from our EMR to our website containing community resources.

COGNITION IN PRIMARY CARE COMMUNITY RESOURCE DIRECTORY FOR INDIVIDUALS, CAREGIVERS, AND PROVIDERS

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A KAER Model recommendation is to refer individuals diagnosed with dementia to resources that help them prepare for the future and services that provide ongoing support. The purpose of this project was to locate local quality services and develop a resource directory for persons with cognitive impairment for use by providers, staff, individuals, families, and caregivers. We worked with a Community Advisory Board and interviewed individuals and caregivers to understand what resources are useful and important to include in the resource directory. We built a web-based resource directory that allows users to query resources based on specific needs. We integrated the resource directory within the electronic health record for providers to include after visit summaries. A resource directory was deployed for community use, with goals of sustainability and longevity after this project is completed.

Session 3335 (Symposium)

APPROACHING MULTIMORBIDITY FROM A TRANSLATIONAL GEROSCIENCE PERSPECTIVE

Chair: Anne Newman

Multimorbidity describes the accumulated burden of chronic disease. Multimorbidity erodes physiologic reserve, increasing the risk of frailty, disability and death. Most older adults have at least one chronic health condition by age 65. Once established, many age-related conditions progress and accumulate with age. Geroscience holds that there are key biologic pathways that explain the increase with age in multimorbidity, frailty and disability. Translation of geroscience principles to human studies requires careful assessment of biomarkers of these pathways and multisystem outcomes. In this symposium, translational researchers in geriatric medicine and gerontology will present current work to elucidate biologic underpinnings of aging and potential intervention targets. We will address whether blood biomarkers of aging processes are prognostic using combinatorial techniques and explore the potential for proteomics to identify novel pathways for health aging. New insights into the role of inflammation will be discussed with an emphasis on its relationship to multimorbidity. Brain aging will be considered with respect to the interactions between external stressors and resilience evaluating the role of ketone bodies which have immunomodulatory effects particularly on innate immune cells. Finally, the role of multimorbidity as an intervention target and potential intermediate outcomes including biomarkers will be presented with discussion of next steps needed to realize the potential for translational geroscience clinical trials to improve health span.

OPERATIONALIZING HEALTHSPAN AS AN OUTCOME FOR CLINICAL TRIALS IN GEROSCIENCE

Jamie Justice, Wake Forest School of Medicine, Wake Forest School of Medicine, North Carolina, United States

Efforts targeting biological aging pathways are advancing interventions which could extend healthy lifespan. Design of clinical trials to test such interventions necessitates an operational definition of healthspan, such as slowed accumulation or progression of multiple chronic diseases, functional decline, and disability. In this talk we explore these composite measures of healthspan proposed as outcomes for clinical trials in aging. This will be examined in example cases including multimorbidity and deficit accumulation frailty indices in an 8-Year intensive lifestyle intervention trial, and
an update on multimorbidity, functional, and biomarker endpoints in the trial Targeting Aging with MEtformin (TAME). Through these examples we will explore issues related to effect sizes and statistical challenges related to composite endpoints. Finally, we will discuss the role existing and emerging biomarkers of aging in clinical trials in geroscience and summarize evidence linking biomarkers to clinically meaningful outcomes.

UNBIASED PROTEOMICS AND TARGETED BIOMARKERS ASSOCIATED WITH EXCEPTIONAL LONGEVITY AND MULTIMORBIDITY IN HUMANS

Jason Sanders, Brigham and Women’s Hospital, Boston, Massachusetts, United States

Biomarkers ideal for geroscience trials could be those simultaneously identified using targeted and discovery assays and which strongly associate with complementary disease (multimorbidity) and longevity (exceptional survival) outcomes. To identify a tractable set of biomarkers for use in geroscience trials, we used the Cardiovascular Health Study (CHS), whose participant makeup closely aligns with the Targeting Aging with MEtformin (TAME) trial. In ~4800 CHS participants, quantitative assays of nine a priori-identified biomarkers were used to construct a biomarker index which strongly associated with the TAME primary outcome of mortality and multimorbidity over 6 and 10 years of follow-up. In ~3000 CHS participants, 1300 proteins were measured with unbiased aptamer proteomics and associated with survival to age 90 over 25 years of follow-up. Proteins in the biomarker index were identified as some of the strongest associated with survival to 90. This convergent evidence suggests these biomarkers may be well-suited for geroscience trials.

CHRONIC INFLAMMATION AND THE ACCELERATION OF CHRONIC DISEASE STATES

Jeremy D. Walston, Johns Hopkins University School of Medicine, Baltimore, Maryland, United States

The chronic activation of the immune system is commonly observed in older adults, and is highly associated with multiple chronic disease states and Geriatric syndromes including physical frailty, sarcopenia and mild cognitive impairment. Chronic inflammation is multifactorial, and the individual inflammatory mediators that drive the development and propagation of disease states impact normal tissue homeostasis as well as stem cell vitality. This session will discuss age-related etiologies of chronic inflammation and specific inflammatory mediators and their measurement, including Tumor Necrosis Factor (TNF) alpha and its receptors. Inflammation-driven molecular pathways that most impact relevant chronic disease states such as the tryptophan degradation pathway, and its relationship to pathophysiological changes, will also be considered. Finally, discussion of potential treatment modalities, including several emerging from Geroscience research, will be described as will their impact on chronic disease states.

IMMUNOMETABOLIC STRESS AND KETONE BODIES IN DISORDERS OF THE AGING BRAIN

John Newman, Buck Institute for Research on Aging, Novato, California, United States

Delirium is an acute confusional state that is a common complication of acute illness in older adults, and is associated with increased risk of death, disability, and dementia. Delirium in older adults is an example of a geriatric syndrome, with multifactorial, multi-system causes that include existing aging-related physiological changes as well as external acute stressors. Its pathophysiology delirium is not well understood but may include glycolytic energy deficits associated with acute inflammation in the brain. The endogenous ketogenic system provides ketone bodies as a lipid-derived alternative to glucose for cellular energy, and ketone bodies are increasingly understood to have immunomodulatory effects particularly on innate immune cells. We used a mouse model of acute inflammation-associated behavioral change to investigate how age-related differences in energy utilization in the brain affect delirium-like phenotypes, focusing on energy metabolism and innate immune activation in the brain as an example of immunometabolic approaches to geriatric syndromes.

Session 3340 (Symposium)

BEHAVIORAL HEALTH, SOCIAL ENGAGEMENT, AND LONG-TERM CARE SERVICES USE AMONG COMMUNITY OLDER ADULTS: USA VS. TAIWAN

Chair: Su-I Hou Co-Chair: Chien-Ching Li
Discussant: Darren Liu

As healthcare advances, older adults are living longer. While 90% of older adults prefer aging in their own homes and communities, it is important to examine key factors influencing healthy aging-in-community and community-based long-term care (LTC) services available in different countries. This symposium examines behavioral health, social engagement, and LTC services utilization among community-dwelling older adults in the USA and Taiwan. Lessons learned from older adults across countries will provide insights for tailored community-based LTC services and program development. Dr. Hou from The University of Central Florida (UCF) will highlight similarities and differences in behavioral health profiles and the topics that most interest community-dwelling older Americans participating in three aging-in-community programs in Central Florida. Dr. Wang from Case Western Reserve University will examine the impact of neighborhood social cohesion on mobility among community-dwelling older Americans aged 65 and older from the national Health and Retirement Study. Dr. Liu from National Cheng-Kung University in Taiwan will share results of healthy lifestyle on quality of life among community-dwelling older adults in southern Taiwan. Dr. Young from State University of New York at Albany will compare long-term care use among community-dwelling older adults with and without dementia in Central Taiwan. Finally, Drs. Cao and Hou from UCF will analyze home and community-based services in the USA versus Taiwan. This symposium will further discuss similarities and differences of key factors related to healthy aging-in-community, along with practical recommendations and lessons learned across countries and cultural environments to improve community-based long-term care services and programs.