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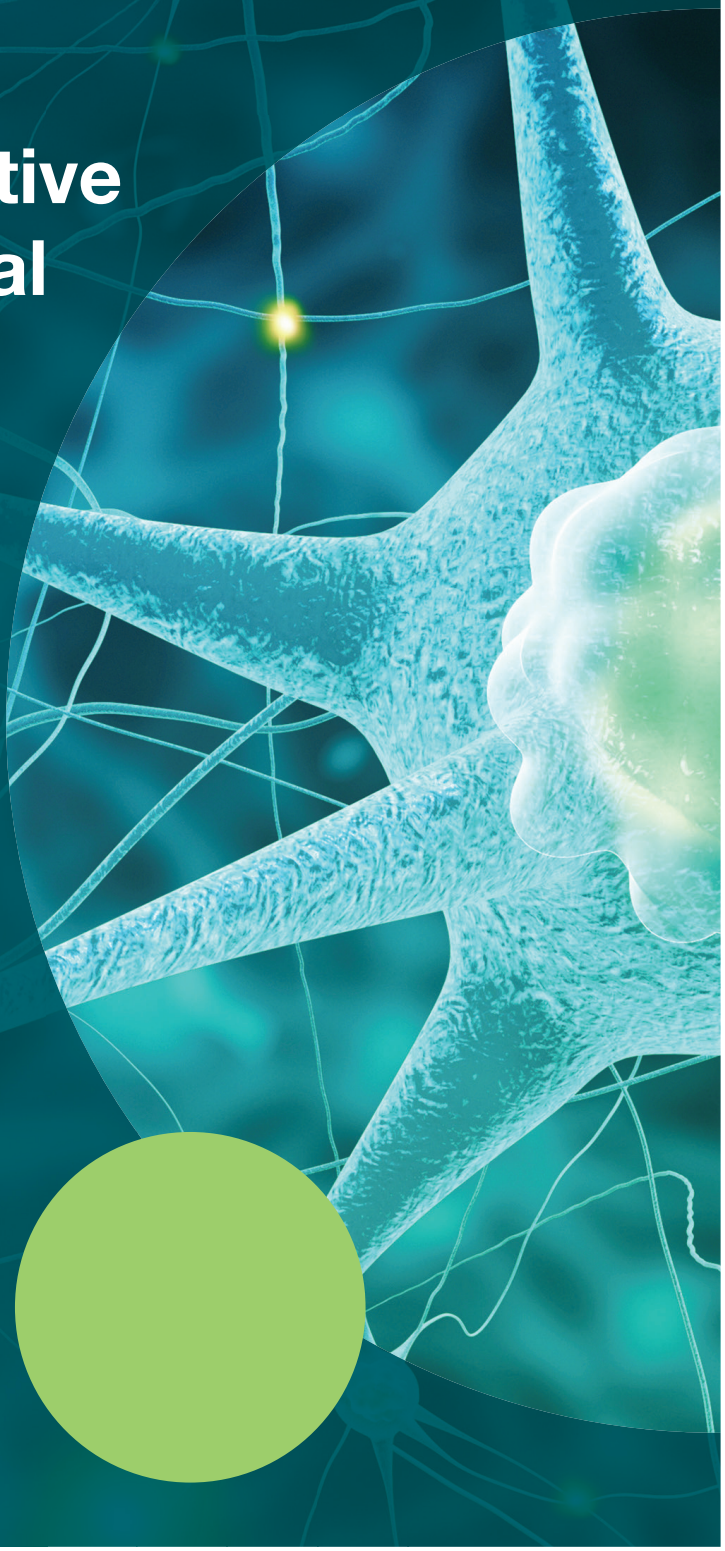
Supplement

ABSTRACTS

Expertise in Neurodegenerative Diseases Clinical Trials



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Symposia

S1- PRELIMINARY RESULTS OF THE SPRINTT PROJECT. Francesco Landi *(Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome Italy)*

Communication 1: *What we have learnt from the SPRINTT Project,* Emanuele Marzetti (Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy)

Communication 2: *SPRINTT Randomized Clinical Trial: preliminary results,* Riccardo Calvani (Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy)

S2- IMPROVING CARE FOR OLDER ADULTS LIVING WITH FRAILTY: RESULTS FROM THE CANADIAN FRAILTY NETWORK'S TRANSFORMATIVE GRANT STUDIES. John Muscedere *(Scientific Director and CEO, Canadian Frailty Network; Department of Critical Care Medicine, Queen's University, Canada)*

Communication 1: *Results from the BABEL (Better tArgeting, Better outcomes for frail ELderly patients) Advance Care Planning Program and Trial,* George Heckman (Schlegel Research Chair in Geriatric Medicine, Research Institute for Aging; School of PublicHealth and Health Systems, University of Waterloo, Canada)

Background: A growing number of older people reside in long-term care (LTC) homes. As they near the end-of-life, it is vital that LTC residents express their healthcare wishes though Advance Care Planning (ACP). Yet, ACP remains suboptimal and LTC residents often experience unmet needs and unnecessary hospital transfers. **Objectives:** We applied the Knowledge-To-Action framework to 1) identify shared barriers and solutions to improve the process of ACP and end-of-life care for LTC residents; 2) develop a standardized, scalable, and person-centered approach to ACP, and 3) evaluate this approach in a multicentre cluster randomized trial. **Methods:** We began in September 2017 with a 1-day workshop for 44 LTC stakeholders, including residents and families, from Manitoba, Alberta, and Ontario. Sessions were recorded and thematic analysis performed. An environmental scan was conducted to assess ACP practices in 38 LTC homes in participating provinces. Over the following 11 months, we developed the intervention to address weak links in ACP. From August 2018 to August 2020, we conducted an unblinded, cluster-randomized, mixed-methods trial in 29 LTC homes (15 intervention, 14 control) in these provinces to assess the impact of the intervention on ACP comprehensiveness and care and interventions at the end-of-life (ClinicalTrials.gov NCT03649191). **Results:** ACP challenges include: 1) differing provincial ACP frameworks; 2) lacking clarity on substitute decision maker (SDM) identity and role; 3) failing to share sufficient information when residents formulate care wishes; and 4) failing to communicate during a health crisis. The environmental scan identified that most conduct ACP upon resident admission, with 90% repeating these when resident clinical status changes. Residents are often excluded from ACP. Physician involvement is often very limited, even in emergencies, leading to decisions counter to resident wishes. Recognizing the variability in physician involvement in ACP, we designed BABEL to be delivered by nurses. Requiring approximately 60 minutes, BABEL: 1) confirms the identity and role of the SDM; 2) prepares the SDM for medical emergencies; 3) explains the resident's clinical situation and prognosis; 4) ascertains the resident's decision-making philosophy; and 5) identifies preferred treatment options for medical emergencies most likely to be faced by that resident. Intervention materials include: a workbook, training tools for LTC staff, and knowledge tools for all stakeholders. The workbook contains carefully worded scripts to guide staff on helping residents and families navigate sensitive ACP. A preliminary discussion is intended to take place very soon after LTC admission, followed 2-8 weeks later by the Full BABEL Discussion, which is the core of the intervention. The trial recruited 713 LTC residents aged >= 65 years with an elevated risk of dying within the next year. The intervention significantly increased the comprehensiveness of ACP. Comfort in dying did not differ between groups. Antimicrobial use was significantly lower in intervention homes. **Conclusions:** The superior comprehensiveness of a person-centered BABEL ACP, codesigned with LTC stakeholders, underscores the importance of allowing adequate time for these discussions, to address all the important aspects of ACP, and may reduce unwanted interventions at the end of life.

Communication 2: *The CFN Transformative Project on Primary Care for Older Canadians Living with Frailty: Analyses of the Intersection between Frailty and Socio-Economic Status,* Kenneth Rockwood (Division of Geriatric Medicine, Dalhousie University, Canada)

Older persons look to their primary care practitioners to assess their needs and coordinate their care. Unfortunately, the health concerns of older persons are often missed. They may need care from a variety of providers and services, but this care is often not well coordinated. Older persons and their caregivers are the experts in their own needs and preferences, but often do not have a chance to participate fully in treatment decisions or care planning. As a result, they may have health problems that are not properly assessed, managed or treated resulting in poorer health and preventable and expensive emergency department visits and hospital stays. Over the past several years, we have explored opportunities to enhance primary care practices related to screening, care coordination, and shared decision-making. As a part of this project, we have sought to deepen our understanding of the intersections between frailty and social position - operationalized in relation to social

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vulnerability, socioeconomic status, wealth and education – for community-dwelling older adults. This presentation will provide an overview of results of these analyses, drawing on the longitudinal National Population Health Survey and other data sources.

S3- RESILIENCE AND MULTIFACTORIAL STRESSORS AMONG OLDER ADULTS DURING THE COVID-19 PANDEMIC. Karen Bandeen-Roche *(Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA)*

Communication 1: *The multifaceted COVID-19 stressor: Results from a quantitative survey of older adults,* Alden L. Gross (Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA)

Participants were recruited by phone from the SPRING study of resilience as well as the Frailty Registry of participants in and around Baltimore, MD. Following oral informed consent, we conducted a 45 minute telephone survey of participants to measure direct (e.g., COVID-19 exposure, infection, hospitalization) and indirect stressors associated with the COVID-19 pandemic (e.g., changes and disruptions to daily life and health care, psychosocial effects and coping, social networks, food/medication access). We also measured important outcomes including physical function, pain, fatigue, depression and anxiety symptoms, loneliness, health behavior changes, worsening chronic medical conditions, and non-COVID-19-related hospitalizations. This presentation will report on tests of associations of these key stressors with outcomes, including potential effect modification by pre-pandemic measures of frailty and resilience.

Communication 2: *The multifaceted COVID-19 stressor: Results from a qualitative survey of older adults,* Melissa deCardi Hladek (Johns Hopkins School of Nursing, Baltimore, MD, USA)

While variable-centered approaches, afforded by quantitative surveys, can be leveraged to learn a great deal about known phenomena, a novel stressor as novel as the COVID-19 pandemic requires more in-depth analysis including open-ended questions about people's opinions, motivations, and drivers of behaviors. A subset of 30-40 participants from the main study of N=200 participants were invited to a ~45 minute semi-structured qualitative interview to explore perceptions and experiences of older adults as to how the COVID-19 pandemic may have been a stressor impacting their health, social interactions, finances and care of existing chronic medical conditions. We used purposive, maximum sampling to maximize the diversity of the sample with respect to age, sex, and race/ethnicity. This presentation will report findings from the qualitative interviews regarding the perceptions and experiences of older adults as to how the COVID-19 pandemic may have been a stressor impacting their health, social interactions, finances and care of existing chronic medical conditions; and strategies they use to cope with these stressors.

Communication 3: *The multifaceted COVID-19 stressor: Results from objective measures salivary cortisol taken in a sample of frail and nonfrail older adults,* Jenna Mammen (Division of Geriatric Medicine and Gerontology, Johns Hopkins University School of Medicine, Baltimore, MD, USA)

This talk will leverage data on direct and indirect COVID-19 pandemic stressors from the quantitative survey of N=200 older adults to test associations of measured direct and indirect stressors with stress levels measured objectively using measurements from salivary cortisol. We will also explore how resilience and frailty affect these relationships. A novel study design feature of this study is that most participants have pre-pandemic measures of salivary cortisol collected under the same protocol, which enables us to characterize changes in chronic stress before vs during the pandemic overall, and stratified by measures of phenotypic frailty and resilience.

S4- WHO ICOPE IMPLEMENTATION PILOT PROGRAMME. Yuka Sumi[1], Bruno Vellas[2] *(1. World Health Organization, Geneva, Switzerland; 2. WHO Toulouse Collaborative Center, Toulouse, France)*

Communication 1: *What is the 'WHO ICOPE implementation pilot programme"?* Yuka Sumi (World Health Organization, Geneva, Switzerland)

Communication 2: *Preliminary results of the ICOPE Implementation Program Ready Phase,* Michael Valenzuela, Project Manager & Core Research Team ICOPE Implementation Pilot Program WHO, Geneva, Switzerland)

Communication 3: *Implementing the ICOPE pilot programme: Experience from the field*

S5- FRAILTY IN RHEUMATIC DISEASES: EVIDENCE TO DATE AND LESSONS LEARNED. Devyani Misra *(Beth Israel Deaconess Medical Center, Boston, MA, USA; Harvard Medical School, Boston, MA, USA)*

Communication 1: *Frailty and Rheumatoid Arthritis,* Katherine Wysham (VA Puget Sound Health Care System, Seattle, WA, USA; University of Washington, Seattle, WA, USA)

Frailty is present in patients with rheumatoid arthritis (RA) across the lifespan, including young and mid-aged patients, and may be amplified in this population due to chronic systemic inflammation, disease-related tissue damage, and glucocorticoid use. Multiple approaches, including phenotypic and cumulative deficits based, have been used to measure frailty in RA. Frailty assessment in a clinical setting may identify RA patients with physiologic vulnerability who might not otherwise be identified by existing metrics of disease activity. This presentation will address evidence to date on frailty prevalence in RA, as well as association with clinical features.

Communication 2: *Frailty and Systemic Lupus Erythematosus,* Sarah Lieber (Hospital for Special Surgery, New York, NY, USA; Weill Cornell Medicine, New York, NY, USA)

Frailty prevalence in systemic lupus erythematosus (SLE), a condition that affects primarily women of childbearing age, exceeds that in older adults, suggesting an accelerated aging phenotype in these patients. Frailty has been defined using the disease-agnostic Fried phenotype and a recently developed SLE-specific frailty index based on a cumulative deficits model. Using these definitions, frailty is associated with multiple adverse health outcomes in SLE, including disability, hospitalizations, and mortality, and may be an important target for intervention in this population. This presentation will address evidence to date on frailty prevalence in SLE and association with clinical outcomes and body composition.

Communication 3: *Frailty and Other Rheumatic Diseases,* Sebastian Sattui (Hospital for Special Surgery, New York, USA; University of Pittsburgh Medical Center, Pittsburgh, PA, USA)

Frailty is associated with multiple systemic rheumatic conditions, such as vasculitis, polymyalgia rheumatica, scleroderma, and inflammatory myositis. Several mechanisms have been proposed to underlie frailty in systemic rheumatic diseases, including "inflammaging." Application of frailty measures across a spectrum of systemic rheumatic conditions reflects increasing recognition of this paradigm within the rheumatology community. This presentation will address evidence to date on frailty prevalence in other systemic rheumatic conditions and potential mechanistic underpinnings.

S6- FRAILTY AND SARCOPENIA IN LONG COVID-19. Riccardo Calvani, Emanuele Marzetti *(Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy)*

Communication 1: *Long COVID-19: facts and figures,* Francesco Landi (Fondazione Policlinico Universitario Agostino Gemelli IRCCS Università Cattolica del Sacro Cuore, Rome, Italy)

Communication 2: *Malnutrition and sarcopenia in long COVID-19,* Matteo Tosato (Fondazione Policlinico Universitario Agostino Gemelli IRCCS Università Cattolica del Sacro Cuore, Rome, Italy)

Communication 3: *Rationale and implementation of nutritional interventions for long COVID-19,* Anna Picca (Fondazione Policlinico Universitario Agostino Gemelli IRCCS Università Cattolica del Sacro Cuore, Rome, Italy)

S7- TOWARD MICROWAVE-BASED ASSESSMENT FOR DIAGNOSIS AND MANAGEMENT OF SARCOPENIA. Taco J. Blokhuis *(Maastricht University Medical Center, Traumatology Department, Maastricht, The Netherlands)*

Communication 1: *A non-invasive microwave-based in-vivo tissue-analysis tool for early diagnosis and management in sarcopenia:preliminary investigations in The Netherlands,* Mauricio D. Perez[1], Viktor Mattsson[1], Leanne L.G.C. Ackermans[2], Maud A.M. Vesseur[2], B. Mandal[1], Jan A. Ten Bosch[2], Taco J. Blokhuis[2], Robin Augustine[1] (1. Uppsala University, Department of Electrical Engineering, Uppsala, Sweden; 2. Maastricht University, The Netherlands)

As a pervasive, prevalent and underdiagnosed muscle disease, sarcopenia affects millions of people and is a major contributor to health care costs. The underdiagnosis is mainly due to poor consensus on variables to measure, assessment tools to use and cut-off points to consider for different target patients' groups. Recently, the use of microwave dielectric spectroscopy to analyze local normal and pathological variations in biological tissues is considered in this context and studied for its potential to determine quantity and quality of muscle tissue in a more accessible manner, with possible application in early diagnosis of sarcopenia. The concept has been preliminary proved in simulation and in-vitro studies based on a hypothetical model that links the electromagnetic response of fat-infiltrated muscle tissue at microwave frequencies. A sensor with proper sensitivity and a more realistic empirical model of a fat-infiltrated muscle are the most important issues to solve. Here we report results of a preliminary pilot clinical trial on a sensor considering their sensitivity and evaluating possible correlation to conventional assessment tools. Skeletal muscle index (SMI, abdominal computational tomography on the third lumbar spine vertebra) and conventional bioimpedance analysis are performed in 50 men and women, aged ≥60 years in the Maastricht University Medical Center, The Netherlands. Participants are also subjected to measurements done with the sensor in the thigh. Collected data are analyzed looking for correlation and laboratory experiments made from synthetic materials emulating human tissues and from ex-vivo porcine tissues are used for optimization and interpretation of the clinical measurements. Up-to-now, 20 patients (out of 50) and 25 volunteers were measured with one proposed sensor. Although a significant difference between both groups was found, there was no significant difference between identified SMI categories. This is in contrast to BIA, which showed a significant difference between these categories. New sensor variants are currently being studied to improve sensitivity and selectivity in both simulations, in-vitro and pilot clinical trials.

Communication 2: *Transmission-based microwave sensor for sarcopenia diagnosis: preliminary phantom results*. Paul Meaney[1], Timothy Raynolds[1], Shireen D. Geimer[1], Robin Augustine[2], Roberta DiFlorio-Alexander[3] (1. The Thayer School of Engineering, Dartmouth College, Hanover, NH, USA; 2. Department of Electrical Engineering, Solid State Electronics, Uppsala University, Uppsala, Sweden; 3. Department of Radiology, Dartmouth-Hitchcock Medical Center, Lebanon, NH, USA)

Sarcopenia is an infiltration of muscle by fat and has wide implications regarding strength, fitness and general outcomes from a range of treatments. The World Health Organization (WHO) only recently granted designation as a substantial and real ailment whose impact requires broader study. As part of its recent identification, there is considerable debate within medical circles about the best ways of diagnosis. Simple methods such as hand grip tests provide some indication. X-ray CT scan is currently considered a gold standard but involves considerable ionizing radiation exposure and is not approved for screening. Most identifications of sarcopenia via CT occur when a patient receives an exam for an unrelated disease such as cancer. Ultrasound and electrical impedance devices have been suggested as alternatives, but their value is uncertain. In this context, there is a real need for an effective, safe, and modestly priced alternative. We have developed a handheld, open-ended, transmission-based coaxial sensor for the detection and diagnosis of sarcopenia. Muscle is generally high in water content while fat has little – at microwave frequencies, water content is the major determinant for the dielectric properties. If water is systematically replaced by fat, the interrogating signals will be visibly altered by the associated perturbations and can subsequently be used for analysis. While a class of reflection-based coaxial sensors are commercially available and used widely for a range of lab experiments, they are patently unsuited for most in vivo applications primarily because of their poor signal penetration depth. The most commonly used probes have an effective sensing depth of roughly 0.3mm which is not sufficient to interrogate more than just the skin layer. Our new probe routinely samples tissue as deep as 2-3cm. This feature makes it useful for interrogating both the subcutaneous fat and initial muscle layers. We present early wideband phantom data that demonstrates the transducer's ability to assess differences in subcutaneous fat layer thicknesses and detect fat objects embedded in the muscle phantom. While the detected features are subtle, they form the basis of more advanced analysis and even integration with conventional techniques such as ultrasound.

Communication 3: *New techniques to assess muscle composition dynamically and the importance of pre-rehabilitation programs for improved outcomes in breast reconstructions and lymphoedema surgeries,* Maria Mani[1], Robin Augustine[2], Afsaneh Koochek[3] (1. Department of Surgical Sciences, Section of Plastic Surgery, Uppsala University Hospital, Uppsala, Sweden; 2. Department of Electrical Engineering, Solid State Electronics, Uppsala University, Uppsala, Sweden; 3. Department of Food studies, Nutrition and Dietetics, Uppsala University, Uppsala, Sweden)

Every year a large number of breast reconstructions and lymphoedema surgeries are performed to improve rehabilitation, back to life, quality of life, reduce pain and suffering of breast cancer patients. Despite current precautions to select patients wisely, sarcopenia is still one known factor which increases the risks of postoperative complications in reconstructive surgery. However, pre-operative rehabilitation and assessment of skeletal muscle mass and quality is not part of the current clinical protocol in reconstructive surgery. The MuSPRO study is a randomized controlled trial conducted in Sweden. In this study all enrolled patients planned for breast reconstruction will be randomized to intervention or control, stratifying by enrolment method. The intervention group will attend 12 weeks of pre-rehabilitation program including structured resistance training and nutritional optimization. The control group will be advised to continue their normal daily exercise and dietary habits. Assessment of muscle mass and tissue quality will be performed by dynamic microwave imaging and to evaluate whether, in cases of sarcopenia, directed pre-rehabilitation can reduce postoperative complications and thus reduce the burden on healthcare. For validation of this new device, the findings will be compared to current clinical assessment methods such as CT, DXA, MRI and/or ultrasound. The results of this intervention study will describe the impact of a pre-rehabilitating intervention program by analyzing the correlation between preoperative sarcopenia and postoperative complications and hospital stay. Clinically relevant cut-off levels to define sarcopenia as measured by the new device will be defined from the study. The results of the validation study as well as the impact of sarcopenia, assessed with the device, on complication rates and recovery after surgery will be analyzed. The results of this study will further define our understanding of the role of a pre-rehabilitation program on muscle mass and quality and risks of postoperative complications among patients undergoing reconstructions and lymphoedema surgeries. Moreover, these results will explain the accuracy of a simple and user friendly new clinical device which can be used for monitoring of muscle mass and quality among breast cancer patients.

S9- COVID-19 & DECONDITIONING IN OLDER ADULTS: EXERCISE AS SOLUTION FROM CLINIC TO COMMUNITY SETTING. Mylene Aubertin-Leheudre *(Université du Québec à Montréal/ Université de Liège, Montréal, Québec, Canada)*

Communication 1: *Implementing physical activity programs in hospitalized positive covid-19 older adults: a feasibility study,* Yves Rolland (Gerontopole of Toulouse, University Hospital of Toulouse (CHU-Toulouse), Toulouse, France; UMR INSERM 1027, University of Toulouse III, Toulouse, France)

Background: Nineteen percent of COVID-19 patients have been hospitalized and most of them were older adults. During

covid-19, specific measures such as decreasing usual care have been implemented during hospitalization to protect the patient. However, these measures could accelerated risk factors of functional decline. **Objective:** Evaluate the feasibility to implement an unsupervised validated physical activity (PA) program (MATCH) in a short-stay Covid-19 geriatric unit. **Methods:** Our pilot study was realized during the covid-19 European 1st wave. Hospitalized Anxiety and Depression (HAD) scale, Activities of Daily Living (ADL) score and functional capacities were assessed at hospital admission and discharge. Before discharge, self-satisfaction of the program was also recorded. A decisional tree (3 validated tests: 30-second chair test, balance with joint-feet and semi-tandem stance, 4 meters walking test) was performed during the first days in order to prescribe one of unsupervised, specific and adapted MATCH programs. MATCH is carried out by the patients themselves and done every day. **Results:** Forty-eight COVID-19 patients were hospitalized. Among this number, 11 patients (women:7; 86.6±6.3yrs) were included in the MATCH intervention. MATCH intervention was feasible and implementable as: 1) it took only 15-20 minutes to complete the decisional tree; 2) staff found it easy to learn and to teach and 3) did not require specific materials. The intervention length was 9.3 days on average. We observed that MATCH was done 53% of the time (adherence: 26-80%) even if 36% of the participants presented some medical limitations. Moreover, 82% of patient were satisfied. ADL improved clinically (mean change: +0.4points; p=0.05). **Conclusion:** Implementing MATCH seems feasible and acceptable in geriatric covid-19 unit and beneficial to improve or preserve ADL. MATCH seems a good choice as it limits healthcare professionals work overload and respect covid-19 public health restrictions. Further research with larger sample size and control group are needed to confirm these results.

Communication 2: *Prevention of Isolation-Related Mobility Loss in Independent Older Adults using a Remote Physical Activity: a solution during the COVID-19 pandemicn,* Mylène Aubertin-Leheudre (Centre de recherche, Institut universitaire de gériatrie de Montréal (IUGM), CIUSSS du Centre-Sud-de-l'île-de-Montréal, Montreal, Canada)

Background: Physical inactivity lead to health declines but COVID-19 lockdown exacerbated this vicious circle. Gerontechnology could help older adults to become/remain physically active as up to 50% of seniors have access to technologies and used Internet daily. Thus, implementing remote physical activity could be a solution to maintain their health and respect covid-19 restrictions. **Objective:** To assess the effects of remote physical activity interventions on physical performance among community-dwelling older adults. **Methods:** Fifty-five older adults aged 60 years and over, living at home and previously sedentary completed a 12-weeks intervention (3-times/weeks) during the covid-19 1st wave. Participants were randomized into 2 groups: interactive (IG; n=29) or video (VG; n=26). The IG was trained in group by a kinesiologist, via Zoom© whereas the VG did the same sessions but individually with pre-recorded videos through a dedicated website. A decisional tree was used to determine the physical activity capacity to ensure safety and adequacy. Anthropometric characteristics, functional capacities (balances, 3-meter TUG & 4-meter walking tests), muscle power (10-rep chair test), muscle endurance (30sec chair test), quality of life and perceived health (EQ-5D), and level of physical activity (RAPA) were assessed pre- and post-intervention via Zoom or lime-survey software. **Results:** The drop-out rate was higher in VG (40%) compared to IG (10%). The adherence to the intervention was similar in both group (>80%). Quality of life, functional capacities, muscle power and endurance improved in both groups ($p < 0.05$). Physical activity level and perceived health improved only in IG group. The changes in muscle power and endurance were significantly greater for the IG group than the VG group. **Conclusion:** Remote physical activity interventions appear to be effective to counteract physical decline among older adults. Nevertheless, the interactive modality seems to be more effective in increasing muscle parameters and generates greater retention. Before to address specific exercise recommendation, further studies examining the virtual/interactive sessions ratio are needed to evaluate the most effective.

Communication 3: *Physical Exercises at Home a solution to counteract the impacts of COVID-19 restrictions on functional status and mobility among community-dwelling pre-disabled seniors ?* Fanny Buckinx (Centre de recherche, Institut universitaire de gériatrie de Montréal (IUGM), CIUSSS du Centre-Sud-de-l'île-de-Montréal, Montreal, Canada)

Background: The COVID-19-related lockdowns lead to sedentariness and limited seniors' mobility and engagement in physical activity. Unfortunately, this could precipitate or accelerate frailty or functional loss. **Objective:** To assess if distance-training in physical exercises helps counteract the lockdown deleterious effects (sedentary and inactivity) in pre-disabled seniors. **Methods:** This is a 12-month intervention study, which started in May 2020 among 84 pre-disabled seniors. Intervention: 12-week Physical Exercises (PE) (1 hour/3-times/week) through Zoom group session supervised by kinesiologist (Web-Ex group, n=11) or phone-supervised individual booklet-based home-program (CEDECOMS group, n=33) vs Control (CONTR, n=40). Measures: Adherence, self-reported satisfaction and acceptability of interventions; Functional status in ADL (OARS Functional scale); Level of physical activities (RAPA); Mobility (SPPB), Frailty (SOF index); Quality of Life (SF-12); and COVID-19 symptoms were assessed every 3 months. Preliminary results (pre- (T0) vs. post- (T3) intervention) are presented. **Results:** The 3 groups were similar in age (yrs; Web-Ex:77±7, CEDECOMS:80±6, CONTR:70±7) and sex (women(%); web-ex:68%, CEDECOMS:67%, CONTR:79%). Adherence/satisfaction: During the 12-week intervention, 7 participants dropped out: CEDECOMS: n=5 (covid-19 positive: n=1; 16%); Web-Ex: n=2 (18%). Post-intervention, 56% and 60% of CEDECOMS and WEB-Ex participants were very satisfied

with intervention. Mobility: RAPA scores increased by 2.7, 1.3 and 0.4 in Web-Ex, CEDECOMS, and CONTR, respectively. All groups improved their SPPB scores (x/12; Web-Ex:+1.7; CEDECOMS:+0.53; CONTR:+0.93). The 3-meter walking speed also improved (sec; Web-Ex:-1.7; CEDECOMS:-0.5; CONTR:-0,9). Based on SOF-scores, the percentage of robust seniors in Web-Ex doubled to 80%; increased from 34% to 57% in CEDECOMS, while remaining stable around 50% in CONTR. Functional ADL scores were similar across groups at baseline (x/14; average:13.8±0.6) and remained stable over time. The SF-12 physical-function scores changes over time in Web-Ex (+13.1/100), CEDECOMS (-5.7/100) and CONTR (+6.0/100) groups. **Conclusion:** Distance training and monitoring of PE programs at Home during the lockdown seemed feasible and acceptable among pre-disabled seniors and seemed to improve their mobility and function, while allowing to maintain some social interactions.

ORAL COMMUNICATIONS

OC1- CLINICAL TRIAL OF METFORMIN FOR FRAILTY PREVENTION IN COMMUNITY-DWELLING OLDER ADULTS WITH PRE-DIABETES. Sara Espinoza, Nicolas Musi, Chen-pin Wang, Joel Michalek, Beverly Orsak, Alicia Conde, Amir Tavabi, Daniel MacCarthy, Qianqian Liu, Tiffany Cortes *(Departments of Medicine and Population Health Sciences, Sam & Ann Barshop Institute for Longevity & Aging Studies, University of Texas Health Science Center, San Antonio, Texas, Geriatrics Research, Education & Clinical Center, South Texas Veterans Health Care System, San Antonio, Texas)*

Backgrounds: Previous studies demonstrate a strong association between frailty and insulin resistance and inflammation. Metformin improves insulin sensitivity and displays anti-inflammatory properties. Pre-clinical studies show that metformin extends lifespan and improves healthspan. **Objectives:** To provide the study design of an ongoing randomized clinical trial of metformin for frailty prevention in older adults with oral glucose intolerance. **Methods:** Older adults aged 65+ years are studied in this randomized, double-blind, placebo-controlled clinical trial of metformin. Pre-diabetes, required for inclusion, is assessed by 2-hour oral glucose tolerance test (OGTT). Individuals with glomerular filtration rate <45 mL/min and frail individuals (Fried criteria) are excluded. Metformin is initiated at 500mg daily and titrated to maximum tolerated dose no greater than 2,000 mg/day. The primary outcome is frailty assessed by Fried criteria and frailty index. Secondary outcomes are physical function (short physical performance battery), lower extremity strength (Biodex), 6-minute walk, inflammation (systemic and skeletal muscle tissue), muscle insulin signaling, insulin sensitivity (insulin clamp), glucose tolerance (OGTT), and body composition (dual-energy x-ray absorptiometry). Subjects are followed for 2 years with safety assessments every 3 months and frailty assessment and OGTT every 6 months. **Results:** Currently, 109 participants (51% male, 37.6% Hispanic/Latino) have been randomized. At baseline, mean age is 72.1±5.5 years (range: 65-88), body mass index is 30.7±5.8 kg/m2 (range: 18.6-47.0 kg/m2) and Hemoglobin A1c is 5.7±0.4%. Using Fried criteria, 57% have frailty score of 0, 36% a score of 1, and 7% a score of 2. **Conclusion:** Metformin is being examined as a potential therapeutic agent to prevent frailty in older adults with pre-diabetes. Findings from this trial may have future implications for screening and treatment of pre-diabetes in older adults for the prevention of frailty.

OC2- IMPACT OF L-CITRULLINE SUPPLEMENTATION COMBINED WITH LOW-INTENSITY RESISTANCE TRAINING ON BODY COMPOSITION AND STRENGTH IN POSTMENOPAUSAL WOMEN. Arturo Figueroa, Arun Maharaj, Stephen M. Fischer *(Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA)*

Backgrounds: Sarcopenia, the age-related loss of muscle mass and strength, is associated with anabolic resistance. L-citrulline supplementation (CIT) alone improved lean and fat mass in malnourished older women. CIT combined with whole-body vibration or high-intensity interval training have shown additive effects on muscle mass and strength in older adults. Although resistance training is the most effective strategy to improve muscle mass and strength, the combination of CIT and resistance training has not been examined in middle-aged and older adults. **Objectives:** The aim of this study was to examine the effects of CIT alone and combined with resistance training on body composition and muscle strength in postmenopausal women. **Methods:** Fourteen postmenopausal women (age: 52-74 years; body mass index: 23.8-34.5 kg/m2) were randomized to receive either 10g/day of CIT (n= 8) or placebo (PL, n= 6) alone for 4 weeks and combined with low-intensity resistance training (CIT+LIRT or PL+LIRT) for another 4 weeks. Body composition (total body [TBLMI] and leg lean mass indexed [LLMI] to height2 and body fat percentage [BF%]) was measured via dual-energy x-ray absorptiometry. Body strength was measured by handgrip maximal voluntary contraction + leg curl 10 RM normalized to body weight. LIRT consisted of 3 sets of four leg exercises at 40-50% of 1RM, 3 days/week. Measurements were performed at 0, 4, and 8 weeks **Results:** Body composition and strength were not improved by CIT alone after 4 weeks. CIT+LIRT induced greater (group-by-time $p<0.05$) improvements in TBLMI (3.4±1.9%, P=0.001 vs 1.7±1.3%, P=0.02) and BF% (-3.6±3.4%, P=0.02 vs. -1.3±1.2%, P=0.04) from 4 to 8 weeks than PL+LIRT. The increases in LLMI (4.1±2.3%, P=0.001 vs. 0.5±2.8%, P=0.6) and body strength (12.7±8.3%, P=0.004 vs. 6.7±8.7%, P=0.13) were observed with CIT+LIRT but not with PL+LIRT. **Conclusion:** CIT alone for 4 weeks did not improve body composition and strength. Although both CIT+LIRT and PL+LIRT increased total body lean mass and reduced body fat, only CIT+LIRT increased leg lean mass and body strength after 8 weeks in postmenopausal women. Our findings highlight the potential of CIT+LIRT as a strategy to prevent or treat sarcopenia in postmenopausal women.

OC3- DOES KRILL OIL SUPPLEMENTATION RESULT IN AN INCREASE IN MUSCLE FUNCTION? A RANDOMISED CONTROLLED TRIAL. Saleh AA Alkhedhairi, AM Hunter, E Combet, TJ Quinn, SR Gray *(Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK; Department of Medical Laboratories, College of Applied Medical Sciences, Qassim University, Saudi Arabia; School of Human Sciences, University of Western Australia, Perth, Australia; Faculty of Health Sciences and Sport, University of Stirling, Stirling, Scotland)*

Backgrounds: Previous data indicates that fish oil supplementation can increase muscle function and mass. There has, to our knowledge, been no investigation of whether krill oil, which also contains choline and astaxanthin, increases muscle function and mass in older adults. **Objectives:** The aim of the current study was to determine the effects of krill oil supplementation, on muscle function and size function in healthy older adults. **Methods:** A total of 102 men and women were enrolled in the study (NCT04048096) between March 2018 and March 2020 and 94 completed the study. Participants were randomised to either control or krill oil supplements (4g/day) for 6 months in this double blind randomised controlled trial. At baseline, 6 weeks and 6 months knee extensor maximal torque was measured as the primary outcome of the study. Secondary outcomes measured were grip strength, vastus lateralis muscle thickness, short performance physical battery test, body fat, muscle mass, blood lipids, glucose insulin and C-Reactive Protein, and erythrocyte fatty acid composition. **Results:** Six months supplementation with krill oil resulted in, relative to control, an increase ($p<0.05$) in knee extensor maximal torque, grip strength and vastus lateralis muscle thickness. The 6-month treatment effects were 9.3% (95%CI: 2.8,15.8%), 10.9 % (95%CI: 8.3,13.6%) and 3.5 % (95%CI: 2.1,4.9%) respectively. Increases ($p<0.05$) in EPA 214% (95%CI: 166, 262%), DHA 36% (95%CI: 24, 48%) and the omega-3 index 61% (95%CI: 49, 73%) were also seen. No effects of on other secondary outcomes were seen. Our data indicated that those with lowest baseline physical function showed the largest increases in muscle function and mass. **Conclusion:** Krill oil supplementation for 6 months results in statistically and clinically significant increase in muscle function and size in healthy older adults. Krill oil may be an effective intervention to reduce the burden of sarcopenia and frailty, with further studies required in this area.

OC4- THE HOLISTIC ASSESSMENT AND CARE PLANNING IN PARTNERSHIP STUDY (HAPPI): RESULTS OF A FEASIBILITY RANDOMIZED CONTROLLED TRIAL OF A NURSE-LED INTERVENTION FOR COMMUNITY-DWELLING OLDER PEOPLE WHO LIVE WITH FRAILTY. Helen Lyndon, Jos M. Latour, Jonathan Marsden, Bridie Kent *(University of Plymouth, United Kingdom)*

Backgrounds: Frailty is a serious but not inevitable consequence of ageing. Frail older people are more at risk to adverse health outcomes than the non-frail, yet many do not receive evidence based management including a comprehensive geriatric assessment (CGA); a holistic assessment and care planning approach. The majority of older people access health services in primary care, yet it is not clear if this approach can be successfully delivered in this setting with nurses as the lead clinician. **Objectives:** The content of a nurse-led assessment and care planning intervention was determined in a previous Delphi survey in the first phase of this research. This study then aimed to evaluate the feasibility of conducting a randomized controlled trial of the intervention for community-dwelling older people who live with frailty. **Methods:** A multi-site, feasibility, cluster randomized controlled trial (fRCT) with 56 participants. Primary analysis was undertaken based on intention to treat descriptive analysis, as a feasibility trial, the study was not powered to detect clinically meaningful between-group differences in a primary outcome. To comprehensively evaluate the intervention and study methods, an embedded qualitative study was conducted with interviews with participants, carers and clinicians. Thematic analysis was used to analyse interview data. **Results:** The fRCT demonstrated that it was possible to conduct a randomized controlled trial of the intervention in primary care. All feasibility criteria relating to recruitment and retention were achieved, outcome measures evaluated, and recommendations made for a definitive trial. The qualitative study determined that the intervention was acceptable to participants and judged as feasible to deliver by the nurses. Trial processes and procedures were feasible with some changes. **Conclusion:** The study has demonstrated that the intervention is feasible and provided information to inform the conduct of a future definitive randomized controlled trial to evaluate clinical and cost-effectiveness of the intervention.

OC5- PREOPERATIVE REHABILITATION IS FEASIBLE IN THE WEEKS PRIOR TO SURGERY AND SIGNIFICANTLY IMPROVES FUNCTIONAL PERFORMANCE. Daniel E. Hall[1,2,3,4], Ada Youk[1,5], Kelly Allsup[1], Kayla Kennedy[1], Thomas D Byard[1], Rajeev Dhupar[1,6], Danny Chu[1,6,7], Mark Wilson[1,3], Lawrence P Cahalin[8], Jonathan Afilalo[9], Daniel Forman[1,2,10] *(1. Center for Health Equity Research and Promotion, VA Pittsburgh Healthcare System, Pittsburgh, PA, USA; 2. Geriatric Research Education and Clinical Center, VA Pittsburgh, Healthcare System, Pittsburgh, PA, USA; 3. Department of Surgery, University of Pittsburgh, Pittsburgh, PA, USA; 4. Wolff Center at UPMC, Pittsburgh, PA, USA; 5. Department of Biostatistics, Graduate School of Public Health, University of Pittsburgh, Pittsburgh, PA, USA; 6. Department of Cardiothoracic Surgery, University of Pittsburgh, Pittsburgh, PA, USA; 7. UPMC Heart & Vascular Institute, Pittsburgh, PA, USA; 8. Department of Physical Therapy, Miller School of Medicine, University of Miami, Miami, FL, USA; 9. Department of Medicine, McGill University, Montreal, Canada; 10. Department of General Internal Medicine, University of Pittsburgh, Pittsburgh, PA, USA)*

Backgrounds: Frail patients are at increased risk for poor surgical outcomes. Prior research demonstrates that rehabilitation strategies deployed after surgery improve outcomes by building strength and optimizing home supports. Frail patients may benefit if similar interventions are also initiated before surgery to augment their capacity to endure the stresses of surgery and recovery. **Objectives:** To examine the feasibility and impact of a novel, multi-faceted prehabilitation intervention aimed at frail Veterans preparing for major abdominal, urological, thoracic or cardiac surgery. **Methods:** We enrolled patients scheduled for surgery with Risk Analysis Index (RAI) scores >=16. Prehabilitation started in a supervised setting to establish safety and then transitioning to home-based exercise with periodic in-person or telephone coaching by exercise physiologists. Prehabilitation included aerobic exercise training with a cycle ergometer, strength training with resistance bands, coordination training aimed a transitional movements needed in the postoperative period, and Threshold Respiratory Muscle Training (RMT). Optimal nutrition was also facilitated. Prehabilitation was initiated 3-6 weeks prior to surgery. Functional performance measures and patient surveys were assessed at baseline, every other week during prehabilitation, and then 30 and 90 days after surgery. Within-person changes over time were estimated using linear mixed models with a fixed effect for time and a random effect for participant identity. **Results:** 43 patients were enrolled with 36 completing a median 5 (range 3-10) weeks of prehabilitation before surgery; 32 were retained through 90 day follow up. Exercise logs show participants completed 94% of supervised exercise, 78% of prescribed Threshold RMT and 74% of prescribed strength and coordination exercise. Between baseline and day of surgery, timed up and go (TUG) decreased 2.3 seconds, gait speed increased 0.1 meters/second, six minute walk test increased 41.7 meters, and the time to complete 5 chair rises decreased 1.6 seconds (all $P \leq 0.002$). Maximum and mean inspiratory and expiratory pressures increased 4.5, 7.3, 14.1 and 13.5 centimeters of water, respectively (all $P \leq 0.03$). **Conclusion:** Prehabilitation is feasible before major surgery and achieves clinically meaningful improvements in functional performance that may improve postoperative outcomes and recovery. These data support rationale for a larger trial powered to detect differences in postoperative outcomes.

OC6- SARCOPENIA AND ADHERENCE AFFECT RESPONSE TO AN EXERCISE/NUTRITION INTERVENTION IN NURSING HOME RESIDENTS. Emelie Karlsson[1], Helena Grönstedt[2], Gerd Faxén-Irving[3], Erika Franzén[4], Yvette Luiking[5], Ake Seiger[3], Sofia Vikström[6], Anders Wimo[7], Tommy Cederholm[8], Anne-Marie Boström[9] *(1. Dept. of Clinical Science and Education, Karolinska Institutet (KI), Stockholm, Sweden; 2. Allied Health Professionals, Function Area Occupational Therapy and Physiotherapy, Karolinska University Hospital, Stockholm, Sweden; 3. Dept. of Neurobiology, Care Science and Society, Division of Clinical Geriatrics, KI, Stockholm, Sweden; 4. Dept. of Neurobiology, Care Science and Society, Division of Physiotherapy, KI, Stockholm, Sweden; 5. Danone Nutricia Research, Utrecht, the Netherlands; 6. Dept. of Neurobiology, Care Science and Society, Division of Occupational Therapy, KI, Stockholm, Sweden; 7. Dept. of Neurobiology, Care Science and Society, Division of Neurogeriatrics, KI, Stockholm, Sweden; 8. Dept. of Public Health and Caring Sciences, Clinical Nutrition and Metabolism, Uppsala University, Uppsala, Sweden; 9. Dept. of Neurobiology, Care Science and Society, Division of Nursing, KI, Stockholm, Sweden)*

Backgrounds: Sufficient physical function and nutritional status are essential to healthy aging. However, there is a great variability in response to nutrition and exercise interventions in older adults. Therefore there is an indication to explore and identify factors associated with intervention response after exercise/nutritional interventions. **Objectives:** To identify factors associated with intervention response measured by change in physical function and body composition in a group of nursing home (NH) residents who participated in an exercise/nutrition intervention. **Methods:** Post-hoc analyses of data from a 2-arm randomized trial (the Older Person's Exercise and Nutrition study), which included residents from dementia and somatic units in eight NHs in Sweden. A 12-week intervention of sit-to-stand exercises and nutritional supplements did not improve the primary outcome chair-stand capacity (30s Chair Stand Test (30s CST)), versus controls on intention-to-treat basis. For the post-hoc analyses the primary outcomes were 30s CST and composite scores combining physical function and fat-free mass. A secondary outcome was intervention adherence. Logistic regressions were performed to explore factors associated with response (defined as maintenance/improvement) or non-response (defined as deterioration) in 30s CST, and linear regressions were performed to explore factors associated with response in composite scores. **Results:** One hundred one NH residents were included in analyses (52

from the intervention group and 49 controls). Mean age of participants was 85.8 years, and sarcopenia was occurring in 74%. Having any grade of sarcopenia at baseline (p=0.005) and high adherence to nutritional supplements (p=0.002) increased the odds of intervention response. Higher independence in daily activities increased the odds of adherence to sit-to-stand exercises (p=0.027) and the combined intervention (p=0.020). Allocation to the intervention group and higher self-perceived health were associated with higher composite scores. **Conclusion:** NH residents with baseline sarcopenia, better self-perceived health and high adherence to nutritional supplements benefitted most from a exercise/nutrition intervention regarding chair-stand capacity and composite scores of function and fat-free mass. Intervention adherence was related to higher grade of independence. Understanding factors associated with response and adherence to an intervention will help target susceptible residents in most need of support and to optimize the outcome.

OC7- UROLITHIN A SUPPLEMENTATION IMPROVES MUSCLE STRENGTH IN HUMANS AND POSITIVELY IMPACTS BIOMARKERS OF CELLULAR HEALTH.

Anurag Singh[1], Davide D'Amico[1], Pénélope A. Andreux[1], Andéané M. Fouassier[1], William Blanco-Bose[1], Johan Auwerx[2], Chris Rinsch[1] *(1. Amazentis SA, EPFL Innovation Park, Bâtiment C, Lausanne, Switzerland; 2. Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland)*

Backgrounds: Urolithin A (UA) is a metabolite produced by gut microflora upon ingestion of ellagitannins that are abundant in pomegranates and berries. We have previously shown that UA improves muscle function in preclinical models (Ryu. et al. Nature Medicine, 2016; Luan et al., Sci. Transl. Medicine, 2021) and is safe and bioavailable in humans (Andreux et al., Nature Metabolism, 2019). **Objectives:** We report the results of a proof-of-concept, long-term randomized, double-blind, placebo-controlled clinical trial with UA (ATLAS; NCT03464500) in a population of overweight, middle-aged subjects (n=88). The impact of UA administered at 500 mg and 1000 mg doses for four-months was investigated on muscle strength, physical performance and mitochondrial biomarkers. Prevalence of UA-producers was also determined in another trial that compared UA-levels achieved from diet versus direct UA supplementation (NCT04160312; NOURISH). **Methods:** ATLAS trial: subjects were randomized to placebo, 500 mg and 1000 mg UA doses. No exercise regimen was provided. n=79 subjects successfully completed the trial and n=9 were drop-outs. In the NOURISH trial, subjects were randomized (1:1) to either PJ or Mitopure product containing UA (500mg). Prevalence of UA-producers and non-producers were determined following PJ intake. Fecal samples were collected for microbiome analysis between UA-producer's and non-producers. **Results:** ATLAS trial: both UA doses significantly improved leg muscle strength (~10%). The highest UA dose increased peak VO2 (~10%), and 6-minute walk distance (+33.4 meters from baseline). Peak power output improved by ~4% from baseline at both doses, although not significantly. UA reduced plasma acylcarnitines and CRP levels, indicating higher mitochondrial efficiency and reduced inflammation. In the muscle, UA induced the expression of genes and proteins linked to improved mitochondrial health. NOURISH trial: only 12% of subjects had detectable levels of UA at baseline. Following PJ intake ~40% of the subjects converted the precursor compounds into UA at variable levels. UA-producers were distinguished by a significantly higher gut microbiome diversity. Direct supplementation with UA provided a >6-fold exposure to UA versus PJ (p<0.0001). **Conclusion:** These data demonstrate the translation of the physiological benefits of UA to humans via both increased muscle strength and improvement in cellular health. Combined with the observed lack of sufficient exposure to UA via diet alone, direct nutritional supplementation with UA is a very relevant approach to improve muscle function and health in humans.

OC8- THE COMBINED EFFECTS OF PHYSICAL FRAILTY AND COGNITIVE IMPAIRMENT ON ALL-CAUSE AND EMERGENCY DEPARTMENT-RELATED HOSPITALIZATIONS: RESULTS FROM LINKED COHORT AND CLAIMS DATA.

Brian Buta[1], Shang-En Chung[1], Orla C. Sheehan[1,2], Marcela D. Blinka[1], Susan Gearhart[1], Qian-Li Xue[1] *(1. Johns Hopkins University, Baltimore, MD, USA; 2. Connolly Hospital Blanchardstown, Dublin, Ireland)*

Backgrounds: Cognitive impairment (CI) and physical frailty are common geriatric syndromes that are associated with increased healthcare utilization. Evidence for this observation is largely based on studies of CI and frailty separately. Less is known about the relative magnitude of the association among older adults with frailty alone vs. CI alone, or both frailty and CI; and difference between Emergency Department (ED)- versus non-ED-related hospitalizations. **Objectives:** We hypothesized that physical frailty and cognitive impairment increase the risk of recurrent hospitalizations in older adults, independent of socio-demographic factors, comorbidity, and disability. **Methods:** The analytic sample consisted of 2,549 older adults from the National Health and Aging Trends Study with continuous Medicare coverage, no history of stroke or depression at baseline and no hospitalization one year before baseline. We used the recurrent events model to investigate the association of baseline CI (MCI or dementia) and physical frailty, separately and jointly, with the number of all-cause vs. ED- vs. non-ED hospitalizations over 2 years based on linked Medicare claims data. **Results:** During follow-up, 17.8% of participants had at least one ED-related hospitalization, and 12.7% had at least one non-ED hospitalization. When frailty and CI were modeled separately, both were significantly associated with risk of repeated all-cause (Risk Ratio (RR)=1.44 for frailty, 1.22 for CI; p<.05) and ED-related (RR=1.78 for frailty, 1.43 for CI; p<.05) hospitalizations but not non-ED hospitalizations. When CI and frailty were examined together, 64.3% had neither CI nor frailty; 28.1% CI only (of those, 18.3% with probable dementia); 4.1% CI+frailty (of those, 53.4% with probable dementia); and

3.5% frailty only. In comparison to those without CI or frailty, CI+frailty was predictive of all-cause (RR1.73, p<.05) and ED-related (RR=2.56, p<.05) hospitalizations, but not non-ED hospitalizations in our adjusted model. Findings were similar when additionally adjusting for comorbidity and disability. **Conclusion:** Older adults with both CI and frailty were most at risk for ED-related hospitalizations. The high prevalence of dementia in this subgroup highlights the need for timely recognition and management of older adults with CI to mitigate preventable causes of ED admissions.

OC9- THE EFFECTS OF VITAMIN D SUPPLEMENTATION ON FRAILTY IN COMMUNITY-DWELLING OLDER ADULTS AT RISK FOR FALLS. Yurun Cai[1], Amal A. Wanigatunga[1,2], Christine M. Mitchell[1,3], Jacek K. Urbanek[2,4], Edgar R. Miller III[3,5], Stephen P. Juraschek[6], Erin D. Michos[3,7], David L. Roth[2,4], Lawrence J. Appel[1,3,5], Jennifer A. Schrack[1,2] *(1. Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA; 2. Center on Aging and Health, Johns Hopkins University, Baltimore, Maryland, USA; 3. Welch Center for Prevention, Epidemiology, and Clinical Research, Johns Hopkins University and Medical Institutions, Baltimore, Maryland, USA; 4. Division of Geriatric Medicine and Gerontology, Johns Hopkins School of Medicine, Baltimore, Maryland, USA; 5. Division of General Internal Medicine, Johns Hopkins School of Medicine, Baltimore, Maryland, USA; 6. Division of General Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School Teaching Hospital, Boston, Massachusetts, USA; 7. Division of Cardiology, Johns Hopkins School of Medicine, Baltimore, Maryland, USA)*

Backgrounds: Low serum 25(OH)D is associated with a greater risk of frailty, but the effects of daily vitamin D supplementation on frailty are uncertain. **Objectives:** To examine the effects of vitamin D supplementation on frailty in community-dwelling older adults with low serum 25(OH) D (10-29 ng/ml) enrolled in the Study To Understand Fall Reduction and Vitamin D in You (STURDY) trial. **Methods:** Participants (N=688, age=77.2±5.4 years, 44% women) were randomized to receive 200IU/d (n=339; control dose) or a higher dose (n=349) of 1000IU/d, 2000IU/d, or 4000IU/d of vitamin D3. The frailty phenotype was based on unintentional weight loss, exhaustion, slowness, low activity, and weakness, with having >=3 conditions considered frail, 1 or 2 conditions considered pre-frail, and no conditions considered robust. Data were collected at baseline, 3, 12, and 24 months. Generalized estimation equations (GEE) models estimated changes in odds of frailty over time by treatment group. Cox proportional hazard models estimated the risk of developing frailty and improving or worsening frailty status at follow-up. All models were adjusted for demographics, health conditions, and further stratified by baseline serum 25(OH)D level (insufficiency (20-29 ng/ml) vs deficiency (10-19 ng/ml)). **Results:** Among 687 participants with frailty assessment at baseline, 198 (29%) were robust, 408 (59%) were pre-frail, and 81 (12%) were frail. Overall, GEE models showed no significant treatment effect for pooled higher doses vs 200IU/d on frailty over time. Analysis stratified by baseline serum 25(OH)D showed a reduced risk of frailty in the pooled higher dose group (p-value for time*treatment=0.04) among those with vitamin D insufficiency but not in those with vitamin D deficiency. When comparing each higher dose vs 200IU/d, the 2000IU/d group had nearly double the risk of worsening frailty status (HR=1.98, 95% CI: 1.19-3.31), while the 1000IU/d group had a lower risk of worsening frailty status (HR=0.41, 95% CI: 0.17-0.94) only among those with vitamin D insufficiency at baseline. **Conclusion:** Overall, high dose vitamin D supplementation did not prevent frailty. While some analyses suggest that 1000IU/d dose might have benefit among those with vitamin D insufficiency, replication is warranted, given the possibility of type 1 error.

OC10- PRO-AUTOPHAGIC AND ANABOLIC AMINO ACIDS IMPROVE MUSCLE FORCE DURING AGING. Claire Boutry-Regard, Gabriele Civiletto, Philipp Gut, Jérôme N. Feige *(Nestlé Institute of Health Sciences, Nestlé Research, Société des Produits Nestlé S.A., 1015 Lausanne, Switzerland)*

Backgrounds: Certain amino acids such as leucine are well known activators of the mTOR muscle protein synthesis pathway and regulate muscle anabolism to prevent loss of muscle mass in sarcopenia. In contrast, autophagy is a catabolic process but is important to maintain muscle strength and performance during aging as it promotes the repair and recycling of damaged cellular materials. **Objectives:** The objective of this study was to evaluate the cross-talk between mTOR/protein anabolism and autophagy during aging of skeletal muscle. In particular, we asked whether a high protein diet represses autophagy and screened individual amino acids for their effect on autophagy. An optimal combination of amino acids activating both mTOR and autophagy was identified and tested preclinically for its efficacy on muscle mass and strength during aging. **Methods:** The effect of essential amino acids on skeletal muscle autophagy has been determined using a zebrafish LC3 reporter. The cross-talk between protein intake and autophagy was then studied using dietary interventions in mice. Finally, the nutritional effect of the specific amino acids mix on age-related muscle decline has been studied in old versus young mice. **Results:** Although the mTOR-activator leucine inhibits autophagy, a high protein diet did not repress autophagy. Proline, glycine, lysine and cysteine were identified as potent activators of autophagy and over-ride the effects of leucine in a high protein diet. Muscle force was significantly preserved with BCAA and pro-autophagic blend of amino acids supplementation during aging. **Conclusion:** mTOR anabolic signaling is not dominant over autophagy and a specific combination of pro-autophagic and anabolic amino acids prevent the functional decline of muscle force during aging. These observations provide the molecular rationale to balance anabolism and autophagy with optimal amino acid ratios for the dietary management of sarcopenia in pets and humans.

OC11- MYOGENIC AND STRESS FACTORS ARE DIFFERENTIALLY EXPRESSED IN SKELETAL MUSCLE OF OLDER ADULTS WITH LOW MUSCLE STRENGTH. Sebastiaan Dalle[1], Jolan Dupont[2], Lenore Dedeyne[3], Evelien Gielen[3], Katrien Koppo[1] *(1. Exercise Physiology Research Group, Dept. of Movement Sciences, KU Leuven, Belgium; 2. Geriatrics and Gerontology, Department of Public Health and Primary Care, KU Leuven & Department of Geriatric Medicine, UZ Leuven, Belgium; 3. Geriatrics and Gerontology, Department of Public Health and Primary Care, KU Leuven, Belgium)*

Backgrounds: The age-related loss of muscle strength and mass, also referred to as sarcopenia, is a growing concern in the ageing population. The condition not only limits mobility and independence, but also induces metabolic dysregulations such as insulin resistance. Until now, it is not fully understood which molecular mechanisms underlie the age-related loss of muscle mass and muscle strength. A better understanding of the mechanisms that drive the progression of sarcopenia might facilitate the development of novel therapies to counteract the condition. **Objectives:** Therefore, the present study compares the protein expression profile relevant in the context of muscle aging, such as myogenic, catabolic and stress-related pathways between older adults with low compared to preserved muscle strength. **Methods:** The muscle protein expression profile from 11 older adults that exhibited low muscle strength (6 female and 5 male) was compared with the profile of 13 older adults with preserved muscle strength (8 female and 5 male) through the western blotting technique. Low muscle strength was defined according to EWGSOP2 sarcopenia diagnostic criteria, i.e. a chair stand test >15s, or grip strength < 27kg (male) or < 16kg (females). The low strength group was older (average ±SD; 78.0±5.0 vs. 71.5±2.6 years; p<0.001), but weight (75.6±4.6 vs. 72.8±2.9 kg; p=0.617) and BMI (26.7±2.5 vs. 27.2±6.0 kg/m2; p=0.782) were not different from the preserved strength group. **Results:** There was a significant difference in performance between the low vs. preserved strength group for the chair stand test (17.5±4.9 vs. 9.1±1.5 s; p<0.01), gait speed over 4 m (1.0±0.2 vs. 1.4±0.1 m/s; p<0.001) and SPPB test (median 9 [5-12] vs. 12 [10-12]; p<0.01) but handgrip strength was not different (26.7±3.4 vs. 29.7±2.7 kg; p=0.559). Major catabolic pathways, i.e. the ubiquitin-proteasome system (i.e. FOXO1/3a, MuRF1, MAFbx) and autophagy (i.e. LC3b, Atg5, p62) were not differentially expressed between both groups, whereas myogenic factors (i.e. Pax7, MyoD, desmin) were systemically upregulated (~2-fold), in older adults with low muscle strength. Also, stress markers CHOP and p-ERK1/2 were higher expressed (~1.5-fold) in the muscle of older adults with low muscle strength. Surprisingly, expression of the inflammatory marker p-65NF-κB was higher (~7-fold) in muscle of normal-strength older adults. **Conclusion:** Older adults with low muscle strength exhibit a different muscle expression profile, that is characterized by a higher expression of myogenic and stress factors. Whereas the stress factors might reflect the age-related deterioration of tissue homeostasis, e.g. due to misfolded proteins (CHOP), the chronic upregulation of myogenic markers might be an attempt to compensate for the gradual loss in muscle quantity and quality. These data might provide valuable insights in the processes that underlie the final stages of sarcopenia (at higher age), which can be different from gradual muscle wasting (e.g. characterized by upregulated catabolic processes).

OC12- THE EFFECT OF YOUNG AND OLD EX VIVO HUMAN SERUM ON CELLULAR PROTEIN SYNTHESIS AND GROWTH IN AN IN VITRO MODEL OF AGEING. Sophie L. Allen[1,2], Ryan N. Marshall[1,3], Sophie J. Edwards[1], Janet M. Lord[2,3,4], Gareth G. Lavery[2,3,5,6], Leigh Breen[1,2,3] *(1. School of Sport, Exercise and Rehabilitation Sciences, University of Birmingham, UK; 2. National Institute for Health Research, Birmingham Biomedical Research Centre at University Hospitals Birmingham NHS Foundation Trust and University of Birmingham, Birmingham, UK; 3. MRC-Versus Arthritis Centre for Musculoskeletal Ageing Research, University of Birmingham, UK; 4. Institute of Inflammation and Ageing, University of Birmingham, UK; 5. Institute of Metabolism and Systems Research, University of Birmingham, UK; 6. Centre for Endocrinology, Diabetes and Metabolism, Birmingham Health Partner, Birmingham, UK)*

Background: The use of in vitro models of ageing are beneficial to study age and disease related anabolic resistance to aid the development of targeted therapies. Existing models include the use of pharmaceutical compounds to induce atrophy, but there is a need for a more physiological experimental model. **Objectives:** We aimed to investigate the mechanisms of age-related muscle loss in vitro, utilizing human serum from young and old adults to create a more physiologically relevant model. Methods: Fasted blood samples were obtained from 4 young (26+3 years) and 4 old (72+1 years) men. Participants underwent basic anthropometric and functional assessment. C2C12 myotubes underwent a serum and amino acid starvation for 1-hour and were subsequently conditioned with human serum (10%) for 4 or 24-hours. After 4-hours C2C12 cells were treated with 5mM leucine for 30-minutes. Muscle protein synthesis (MPS) was determined through the surface sensing of translation (SUnSET) technique and markers of anabolic and catabolic signalling was measured via Western Blot. Myotube diameter was assessed after 24-hours of treatment and imaged using fluorescent microscopy. **Results:** Older individuals showed elevated levels of plasma CRP, IL-6, HOMA-IR, and lower concentric peak torque and work-per-repetition compared with young participants ($p < 0.05$). Myotube diameter decreased by 20% in myotubes treated with old serum and increased by 48% in myotubes treated with young serum in comparison to control myotubes ($p < 0.001$). MPS decreased by 32% in myotubes treated with old donor serum, compared to young donors prior to leucine treatment ($p < 0.01$). In response to leucine treatment, MPS and the phosphorylation of Akt, p70S6K and eEF2 were increased in myotubes treated with young donor serum, with a blunted response identified in cells treated with old donor serum ($p < 0.05$). Markers of muscle protein breakdown remained

unaltered between groups. **Conclusion:** Here, we show an ageing effect in myotubes conditioned with ex vivo serum from older compared with younger individuals, where myotube diameter and MPS were decreased and the anabolic response to leucine was impaired. This work provides an experimental platform for the investigation of age-related muscle anabolic resistance and development of targeted therapies.

OC13- EPIGENETIC AGE ACCELERATION AND CHANGE IN FRAILTY IN MOBILIZE BOSTON.

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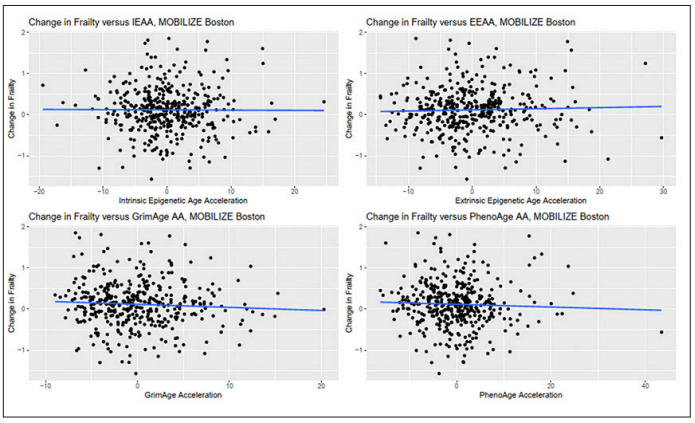
Background: Age associated changes in DNA methylation have been implicated as one mechanism of biological aging yet results from previous cross-sectional studies of associations between epigenetic age acceleration (eAA) and frailty have been inconsistent. Few longitudinal studies have been done to determine if eAA is associated with incident frailty. **Objective:** Determine the association between eAA and change in frailty in the MOBILIZE Boston cohort. **Methods:** The MOBILIZE Boston cohort recruited older adults in and around Boston, MA to study fall risk. Participants were assessed at two visits separated by 12-18 months, with blood drawn at the first assessment. A continuous version of the frailty index at baseline was calculated using a confirmatory factor analysis with one latent variable. The coefficients were used to calculate frailty values at baseline and at follow-up. DNA methylation of whole blood leukocytes was measured using the Infinium HumanMethylation450 BeadChip and used to estimate intrinsic, extrinsic, Grim, and PhenoAge epigenetic ages. Data were assessed by univariate correlation and multiple linear regression with adjustment for age, sex, current and former smoking, and BMI. All data management and analysis were conducted in R. IRB approval was obtained from Hebrew SeniorLife. **Results:** Baseline and epigenetic data were available on 446 MOBILIZE Boston participants and 400 had follow-up data. Mean (SD) age was 78.0 (5.5) yrs, 440 (98.7%) were white, and 366 (59.6%) were female. Results are summarized in Table 1 and Figure 1. Cross-sectionally, eAA was not correlated with intrinsic (Horvath) and extrinsic (Hannum) eAA, but greater GrimAge and PhenoAge were associated with greater frailty scores even with adjustment for covariates. In longitudinal analyses, baseline eAA was not associated with change in frailty. **Discussion:** Our results confirmed that one of the four eAA measures was associated with greater frailty at baseline but none were associated with changes in frailty over 18 months. This may be the result of relatively short follow-up or the measure of frailty used, or might support reverse causation, where contributors to frailty result in greater DNA methylation. Further studies should consider change in frailty over longer periods of time and other measures of frailty.

Table 1. Correlations and multiple regression coefficients between epigenetic age acceleration and frailty or change in frailty. Multiple regressions include adjustment for age, sex, current and former smoking, and BMI. eAA = epigenetic age acceleration, IEAA = intrinsic epigenetic age acceleration, EEAA = extrinsic epigenetic age acceleration

	Baseline Frailty			Change in Frailty		
	Coefficient/r^2	95% CI	p-value	Coefficient/r^2	95% CI	p-value
Correlation						
IEAA	0.031	-0.062 - 0.123	0.520	-0.006	-0.104 - 0.092	0.906
EEAA	0.059	-0.033 - 0.151	0.212	0.034	-0.064 - 0.132	0.494
GrimAge	0.162	0.070 - 0.251	0.0006	-0.062	-0.160 - 0.036	0.216
PhenoAge	0.099	0.006 - 0.190	0.037	-0.042	-0.139 - 0.057	0.406
Regression						
IEAA	0.005	-0.008 – 0.018	0.450	-0.001	-0.011 – 0.009	0.892
EEAA	0.009	-0.002 – 0.021	0.106	0.003	-0.005 – 0.012	0.549
GrimAge	0.036	0.018 – 0.054	0.000094	-0.010	-0.023 – 0.004	0.161
PhenoAge	0.010	0 – 0.021	0.0536	-0.004	0.012 – 0.004	0.331

Figure 1. Scatterplots of change in frailty versus epigenetic age acceleration. AA = age acceleration, IEAA = intrinsic epigenetic age acceleration, EEAA = extrinsic epigenetic age acceleration.



OC14- SEX DIFFERENCES IN MUSCLE-AGEING: A CROSS-SECTIONAL STUDY.

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Background: Ageing is accompanied with loss of muscle mass and function, but the associated (patho)physiological events are complex and incompletely understood. **Objective:** To gain insight in the underlying processes and to assess potential sex differences in the etiology of muscle ageing, we

have performed a cross-sectional study with highly matched male and female groups. **Methods:** RNA sequencing analysis was performed on muscle biopsies from the vastus lateralis muscle of young (13 males and 13 females; 23 ± 2 yrs) and old subjects (26 males and 28 females; 80 ± 3.5 yrs). In both groups, males and females did not differ in age, BMI or Fried frailty index score. Ingenuity Pathway Analysis was performed to compare old versus young subjects, for each sex separately. **Results:** 3136 unique differentially expressed genes (DEGs) were found in old vs. young females, whereas only 1368 unique DEGs were found in old vs. young males, indicating large sex specific effects. In females, top differently regulated pathways were mainly involved in cellular growth or apoptosis, protein ubiquitination, extracellular signalling, metabolism and inflammation. In males, however, pathways related to mitochondrial function and oxidative stress were found among the top differently regulated pathways, in addition to pathways related to cellular growth or apoptosis, protein ubiquitination and inflammation. Genes involved in oxidative phosphorylation and mitophagy were highly differentially expressed in old men compared to young men, and discriminated the aged vastus lateralis muscle from that of women. **Conclusion:** These findings demonstrate that ageing induces sex-specific changes in the transcriptome profile of the vastus lateralis muscle. At the age of 80 years, men exhibit more changes in pathways related to mitochondrial function than women, whilst women exhibit more changes in pathways related to cellular growth, inflammation and protein ubiquitination. Possibly, these sex-specific signatures of muscle-ageing play an equally important role in muscle-ageing of the opposite sex, but at an earlier or later phase. In either case, these findings should encourage researchers to take sex differences into account when performing research on muscle-ageing.

OC15- ADVERSE MUSCLE COMPOSITION PREDICTS ALL-CAUSE MORTALITY IN THE UK BIOBANK IMAGING STUDY.

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Background: Adverse muscle composition (MC), measured by magnetic resonance imaging (MRI), has previously been linked to poor function, metabolic comorbidity and increased hospitalization. **Objective:** To investigate if Adverse MC predicts all-cause mortality. **Methods:** 39,804 participants in the UK Biobank imaging study were scanned using a 6-minute MRI protocol and analyzed for thigh fat-tissue free muscle volume (FFMV) and muscle fat infiltration (MFI) using AMRA® Researcher (AMRA Medical, Linköping, Sweden). For each participant, a sex- and BMI invariant FFMV z-score was calculated. Four MC groups were created: Normal MC, Only low FFMV z-score (<25th percentile (population wide)), Only high MFI (>75th percentile (population wide, sex-specific)) and Adverse MC (low FFMV z-score and high MFI). Association of MC groups with all-cause mortality was investigated using Cox proportional-hazard modeling with Normal MC as referent (unadjusted and adjusted for low hand grip strength (HGS), sex, age, BMI, previous diagnosis of disease (cancer, type 2 diabetes, coronary heart disease), lifestyleand socioeconomic factors (smoking, alcohol consumption, physical activity, Townsend deprivation index)). **Results:** Participants were 52% females, mean (SD) age 64.2 (7.6) years, and BMI 26.4 (4.4) kg/m2. During a follow-up period of 2.9 (1.4) years, 328 mortalities were recorded. At imaging, the prevalence of Adverse MC was 10.5%. The risk for all-cause mortality in the Adverse MC group compared to the Normal MC group was 3.71 (95% CI 2.81-4.91, p<0.001). Furthermore, the Only low FFMV z-score and Only high MFI groups were independently associated with all-cause mortality (1.58 (1.13-2.21), p=0.007 and 2.02 (1.51-2.71), p<0.001 respectively). Adjustment of low HGS (1.77 (1.28-2.44), p<0.001) did not attenuate these associations. In the fully adjusted model, Adverse MC and Only high MFI remained significant (p<0.001 and p=0.020) while the association with Only low FFMV z-score was attenuated (p=0.560). The predictive performance of Adverse MC (1.96 (1.42-2.71), p<0.001) was comparable to previous cancer diagnosis (1.93 (1.47-2.53), p<0.001) and smoking (1.71 (1.02-2.84), p=0.040). Low HGS was non-significant (1.34 (0.96-1.88), p=0.090). **Conclusions:** Adverse MC was a strong, and independent, predictor of all-cause mortality. Sarcopenia guidelines can be strengthened by including cut-offs for muscle fat enabling detection of Adverse MC.

OC16- SARCOPENIA AND SARCOPENIC OBESITY AND INCIDENT FALL RISK: DATA FROM THE NATIONAL HEALTH AND AGING TRENDS SURVEY.

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Background: The prevalence of sarcopenia and obesity is increasing in older adults. The co-occurrence of these two diseases, termed sarcopenic obesity (SO), results in synergistic complications and function decline. Furthermore, SO has no consensus clinical definition, hindering both its diagnosis and research advancement. **Objectives:** To examine, in a representative United States population, the incident fall

hazard ratios by using different definitions of sarcopenia and obesity. **Methods:** Our cohort was comprised of National Health and Aging Trends Survey (NHATS) respondents, a nationally representative survey of adults >=65 years of age. We excluded participants if they had missing grip strength or body mass index (BMI) measures or a self-reported fall within the previous year. Sarcopenia was defined using the Sarcopenic Definitions Outcome Consortium grip strength (GS) cutpoints (males <35.5kg; females<20kg), and obesity was defined using standard body mass index (BMI) and waist circumference (WC) categories (males>102cm, females>88cm). Three sarcopenia/SO exposure variables were defined: 1) SO defined by grip-strength sarcopenia and BMI-derived obesity (GS/BMI), 2) SO defined by sarcopenia and WC-derived obesity (GS/WC), and 3) sarcopenia defined using a grip strength to BMI ratio (SDOC) (males<1.05; females<0.79). Crude and adjusted Cox proportional hazard models evaluated incident falls as a function of sarcopenia, SO, and obesity categories using the three definitions of sarcopenia/SO (referent=neither obesity nor sarcopenia). We adjusted for demographics, a physical activity proxy, and comorbidities. **Results:** Of the respondents, 54.5% were female, with the 70-74 age category most prevalent. The mean (± standard deviation) grip strength, BMI, and waist circumference was 26.7±10.6 kg, 27.4±5.4 kg/m2, and 99.5±16.3 cm, respectively. Sarcopenia was associated with a significantly increased hazard of incident self-reported falls in the fully-adjusted models across all three definitions (GS/BMI: HR 1.21 [1.05-1.39]; GS/WC HR 1.36 [1.19-1.56]; SDOC HR 1.21 [1.10-1.33]). SO was significantly associated with adjusted fall hazard only with the GS/WC-defined model (HR 1.36 [1.18-1.57]) but not with the GS/BMI definition (1.09 [0.94-1.26]). Obesity status was significantly associated with fall hazard in both the BMI and WC definitions (1.23 [1.10-1.38]; 1.44 [1.23-1.68]). **Conclusion:** Sarcopenia and sarcopenic obesity are associated with an increased risk of falls consistently across several sarcopenia definitions.

OC17- SELF-MANAGEMENT BEHAVIOUR AND THE FLUCTUATIONS OF FRAILTY AMONG COMMUNITY-DWELLING OLDER ADULTS IN TAIWAN: A NATIONAL LONGITUDINAL POPULATION BASED COHORT STUDY.

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Background: Frailty in older adults is a common geriatric syndrome, and coping strategies are essential in today's aging population. Changing self-management behaviour is the best cost strategies to improve the physical frailty status of community-dwelling older adults. **Objectives:** This study aimed to describe the phenomenon of frailty status and self-management behaviour in community-dwelling older adults in Taiwan and investigate the association of self-management behaviours on change of frailty status from 2007 to 2011. **Methods:** This data was retrieved from the Taiwan Longitudinal Study of Aging (TLSA), which is a prospective cohort study of 1,286 community-dwelling older adults aged 65 years and older at baseline. Frailty was assessed based on Fried's frailty phenotype, include five components: shrinking, weakness, exhaustion, slowness, and low physical activity, in which >=three following criteria as frail, ≤two criteria as non-frail. Multivariate logistic regression analyses were performed to explore the association between self-management behaviours and change in physical frailty status after a 4-year follow-up. **Results:** During four years of follow-up, 197 people had died. At baseline, the prevalence of frailty was 8.7% of participants. After 4-year of follow up, the incident frailty was 23.5%. Older, female, less educated, chronic illness were positively associated with incident frailty. After adjusting for demographic characteristics and chronic disease, physical exercise was statistically significant with improving physical frailty status ((RR, 3.11; 95% CI, 1.95, 4.95). **Conclusion:** The finding suggests that self-management behaviors are beneficial for improving frailty status, especially maintaining regular exercise associated with better physical status from being frail. We should encourage older frail adults to increase adequate physical fitness and participate in more active social life care. Community-based exercise programs should appropriate for their health status and physical limitations.

OC18- A RANDOMIZED CONTROLLED TRIAL IS TO ASSESS WHETHER PHYSICAL ACTIVITY AND/OR NUTRITION INTERVENTION REDUCE FRAILTY IN PRE-FRAIL OLDER PEOPLE: STAYING UPRIGHT AND EATING WELL RESEARCH, SUPER STUDY.

Ruth Teh[1], Daniel Barnett[2], Ngaire Kerse[1], Debra Waters[3], Leigh Hale[4], Anna Rolleston[5], Richard Edlin[6], Eve Leilua[1], Esther Tay[1], Avinesh Pillai[2] *(1. Department of General Practice and Primary Health Care, School of Population Health, University of Auckland, Auckland, New Zealand; 2. Department of Statistics, Faculty of Science, University of Auckland, Auckland, New Zealand; 3. Department of Medicine, School of Physiotherapy, University of Otago, Dunedin, New Zealand; 4. Centre for Health, Activity and Rehabilitation Research, School of Physiotherapy, University of Otago, Dunedin, New Zealand; 5. The Centre of Health, Tauranga, New Zealand; 6. Health Systems Group, School of Population Health, University of Auckland, Auckland, New Zealand)*

Background: Frailty is prevalent in older people and is closely related to physical function and functional status. Studies showed that nutrition, physical activity, and social integration are related to long term health outcomes and that for older people a mix of factors contributes to maintaining and improving function and quality of life (QOL). Pre-frailty may provide a window of opportunity to prevent deterioration of health outcomes and to maintain QOL. **Objective:** The primary objective is to assess whether physical activity and/or nutrition intervention prevent frailty in pre-frail older people.

Method: The SUPER study is a multi-centre, randomised 2x2 factorial single-blind controlled trial. Community-dwelling older adults aged 75+ (60+ Māori and Pasifika) in New Zealand who were pre-frail according to the FRAIL Scale (score of 1-2) were recruited through health providers. After baseline assessments, participants were randomly allocated to one of the four intervention groups: Senior Chef (SC), a nutrition education and cooking class for 10 weeks; SAYGO, a strength and balance exercise class for 12 weeks, SC+SAYGO, and a Social group (Control). Post intervention assessments were completed right after the intervention, 6, 12 and 24 months. **Results:** More than 6600 participants were invited in 2016-17, 72% responded to the invitation. Of this, 468 eligible adults were enrolled and randomised. Twenty-four-month assessments were completed in Sept-2020. The average age was 80 years, 59% of the sample were women and the majority of participants were NZ European/European descendants. Of the five items on the FRAIL scale screening tool, the three most common self-reported phenotypes were difficulty walking up 10 steps independently (53%), difficulty walking several hundred metres (31%) and unintentional weight loss ≥3kg in the last 12 months (22%). Preliminary analysis showed a trend of declining frailty scores in the first 6 months post-intervention in the SC and SAYGO group but not in the SC+SAYGO or the control group. After the 6-month timepoint, frailty scores increase. Further analyses are underway, including per protocol analysis, and will be presented at the conference. **Conclusion:** Preliminary results suggest group-based lifestyle intervention programme prevent frailty in pre-frail older adults. Findings from this study will inform policy development for maintaining function and improving quality of life in community dwelling older adults.

OC19- FRAILTY TRAJECTORIES IN THREE LONGITUDINAL STUDIES OF AGING: IS THE LEVEL OR THE RATE OF CHANGE MORE PREDICTIVE OF MORTALITY? Ge Bai[1], Agnieszka Szwajda[1], Yunzhang Wang[1], Xia Li[1], Hannah Bower[2], Ida Karlsson[1,3], Boo Johansson[4], Anna K. Dahl Aslan[1,5], Nancy L. Pedersen[1], Sara Hägg[1], Juulia Jylhävä[1] *(1. Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden; 2. Clinical Epidemiology Division, Department of Medicine Solna, Karolinska Institutet, Stockholm; 3. Institute of Gerontology and Aging Research Network – Jönköping (ARN-J), School of Health and Welfare, Jönköping University, Jönköping, Sweden; 4. Department of Psychology & Centre for Ageing and Health (AgeCap), University of Gothenburg, Gothenburg, Sweden; 5. School of Health Sciences, University of Skövde, Skövde, Sweden)*

Background: . Frailty shows an upward trajectory with age, and higher levels increase the risk of mortality. However, it is less known whether the shape of frailty trajectories differs by age at death or whether the rate of change in frailty is associated with mortality. **Objectives.** To assess population frailty trajectories by age at death and to analyze whether the current level of the frailty index (FI) i.e., the most recent measurement or the person-specific rate of change is more predictive of mortality. **Methods:** 3,689 individuals from three population-based cohorts with up to 15 repeated measurements of the Rockwood frailty index were analyzed. The FI trajectories were assessed by stratifying the sample into four age-at-death groups: <70, 70-80, 80-90 and >90 years. Generalized survival models were used in the survival analysis. **Results:** The FI trajectories by age at death showed that those who died at <70 years had a steadily increasing trajectory throughout the 40 years before death, whereas those who died at the oldest ages only accrued deficits from age ~75 onwards. Higher level of FI was independently associated with increased risk of mortality (hazard ratio 1.68, 95% confidence interval 1.47-1.91), whereas the rate of change was no longer significant after accounting for the current FI level. The effect of the FI level did not weaken with time elapsed since the last measurement. **Conclusions:** The current level of FI is a stronger marker for risk stratification than the rate of change. Frailty trajectories differ as a function of age-at-death category.

OC20- ACCELEROMETER-DERIVED AGE- AND SEX-SPECIFIC PHYSICAL ACTIVITY INTENSITY METRICS: PREDICTIVE VALIDITY FOR ALL-CAUSE MORTALITY. J.H. Migueles[1], C. Cadenas-Sanchez[2], E.J. Shiroma[3] *(1. Department of Health, Medicine and Caring Sciences, Linköping University, Linköping, Sweden; 2. Institute for Innovation and Sustainable Development in the Food Chain (IS-FOOD), Public University of Navarra, Pamplona, Spain; 3. Laboratory of Epidemiology and Population Science, National Institute on Aging, Baltimore, Maryland, USA)*

Background: Traditional physical activity intensities based on accelerometer data are limited in generalizability to all ages and both sexes because of low-powered and non-representative calibration studies. Population-based data allow for the development of age- and sex-specific metrics for physical activity intensities. **Objective:** To derive age- and sex-specific metrics for physical activity intensities, and to compare these metrics with traditional metrics and the impact on mortality rates in a US population-based sample of adults. **Methods:** Data were from the National Health and Nutrition Examination Survey (NHANES, 2003-2006), a population-based study of US adults (n = 7,601). Accelerometer-determined physical activity in the 2003-2006 NHANES cycles. Light, moderate, For deriving age- and sex-specific intensity metrics, data were modeled separately by sex, adjusting for age as a percentage of the population's target intensity. Traditional metrics were calculated using thresholds from Freedson et al. Next, we examined the association of the physical activity metrics with all-cause mortality, stratified by sex, and adjusted for relevant covariates. Mortality was ascertained through December 2015. **Results:** Participants engaged in, on average, 17.5 min/day of light physical activity and 21.5 min/day of moderate-to-vigorous physical activity, using the new age- and sex-specific thresholds. There were 1,291 deaths over a mean of 10.1 years. We calculated age-adjusted percentiles (from 5th to 97th) for men and women of the target maximum intensity. Comparing

new to traditional thresholds, the percentage of adults who met the physical activity guidelines differed, particularly among older adults (new: ~30%, traditional: ~ 12%). Interestingly, the choice of threshold did not substantially alter the percent reduction in mortality rate, across age or sex. However, as the population proportion meeting the guidelines is higher using the new thresholds, more individuals would be in the group with lower mortality rates. **Conclusions:** The age- and sex-specific physical activity intensities are promising to harmonize accelerometer assessed physical activity data. The use of age- and sex-specific thresholds results in over double the number of individuals who meet the physical activity guidelines compared to the traditional guidelines, even if both thresholds have similar mortality rate reductions.

OC21- CAN JUMP TEST PERFORMANCE BE USED AS A SCREENING TOOL TO PREDICT THE HIP SKELETAL STATUS IN OLDER ADULTS? Harshvardhan Singh[1], Zhaojing Chen[2], Samuel Buchanan[3], Michael G. Bemben[4], Debra A. Bemben[4] *(1. University of Alabama at Birmingham, USA; 2. California State University San Bernardino, USA; 3. University of Texas Rio Grande Valley, USA; 4. University of Oklahoma, USA)*

Background: Limited data exists regarding the relationship of neuromuscular performance with bone parameters in older adults. Jump test performance (JTP) is a reliable and safe technique to assess neuromuscular performance. Currently, it is unknown if JTP is related to bone mineral density (BMD) and skeletal status in older adults. **Objectives:** To examine the relationship of JTP with BMD and skeletal status of the L1-L4 spine, total hip, and femoral neck in older adults, and to investigate if those relationships are independent of age, height, sex, body composition, physical activity, and skeletal status. **Methods:** Older adults (n = 144; age = 67.1 ± 6.4) participated in this study. Jump power (JPow), jump height (JHt), jump velocity (JVel), and air time (AT) were assessed by JTP. We used DXA to measure (i) BMD and T-scores of the total hip, femoral neck, and L1-L4 spine, and (ii) body composition (total fat mass (TFM), bone free lean body mass (BFLBM)). T-scores were used to classify the skeletal status of participants in 2 categories: a) normal, and b) osteopenia/osteoporosis. We used Bone-Specific Physical Activity Questionnaire (BPAQ) to estimate physical activity. We combined participants with osteopenia and osteoporosis for our analyses. **Results:** 62.7% (91/144) of our participants had either osteopenia or osteoporosis. Participants with osteopenia/osteoporosis had lower BFLBM ($p = 0.012$) while there was no difference in age, height, body mass, BMI, TFM, and BPAQ ($p = 0.09$ - 0.842). Sex distribution between participants with osteopenia or osteoporosis (12.1% men; 87.9% women) was significantly different ($p = 0.007$) than normal (30.2% men; 69.8% women). Stepwise sequential regression analyses after controlling for age, height, BFLBM, sex, BPAQ, and skeletal status revealed JPow as the significant predictor of the total hip BMD ($p = 0.022$; $\beta = 0.269$; $r_{partial} = 0.195$) and total hip T- score ($p = 0.024$; $\beta = 0.296$; $r_{partial} = 0.192$). No significant predictors were found for BMD and skeletal status of the femoral neck and L1-L4 spine. **Conclusion:** JPow is an independent robust predictor of DXA-assessed hip bone parameters in older adults. JPow has potential as a screening tool to predict hip skeletal status in older adults.

OC22- INFLAMMATORY MARKERS ARE ASSOCIATED WITH QUALITY OF LIFE, PHYSICAL ACTIVITY & GAIT SPEED BUT NOT SARCOPENIA IN AGED MEN (40-79Y). Jolan Dupont[1,2], Leen Antonio[3], Lenore Dedeyne[1], Terence W. O'Neill[4], Dirk Vanderschueren[3], Jos Tournoy[1,2], Katrien Koppo[5], Evelien Gielen[1,2] *(1. Geriatrics & Gerontology, Department of Public Health and Primary Care, KU Leuven, Belgium; 2. Department of Geriatric medicine, UZ Leuven, Belgium; 3. Clinical and Experimental Endocrinology, Department of Chronic Diseases and Metabolism, KU Leuven, Belgium; 4. Arthritis Research UK Centre for Epidemiology & NIHR Manchester Musculoskeletal Biomedical Research Unit, Manchester, UK; 5. Exercise Physiology Research Group, Department of Movement Sciences, KU Leuven, Belgium)*

Background: One of the presumed driving mechanisms behind sarcopenia is the age-related chronic low-grade inflammation (inflammaging). However, findings regarding inflammaging in sarcopenic older adults are often conflicting. **Objectives:** To determine associations between inflammatory markers, prevalent as well as incident sarcopenia, sarcopenia-defining parameters, quality of life (QoL) and physical activity in middle-aged and older European men. **Methods:** Men aged 40-79 years (mean 59.66 ±11.00y) were recruited from population registers in eight European centres for participation in the European Male Aging study (EMAS). Subjects were assessed at baseline (2003-2005) and again after a median follow-up of 4.29 years. In 2577 participants, associations between baseline inflammatory markers (hs-CRP, white blood cell count (WBC), albumin) and baseline physical activity PASE) and QoL (SF-36) were analysed. In the Leuven and Manchester cohort (n=447), data were available on muscle mass (whole-body DXA) and strength at baseline. In this subgroup, cross-sectional associations between baseline inflammatory markers and sarcopenia-defining parameters (handgrip strength, chair stand test, appendicular lean mass, gait speed) and prevalent sarcopenia were examined. In a further subgroup (n=277), associations with knee extensor strength were explored. Predictive value of baseline inflammation on functional decline, physical activity, QoL and incident sarcopenia was also examined. Linear and logistic regression were used, adjusted for age, BMI, centre and smoking. **Results:** At baseline, hs-CRP and WBC were negatively associated with PASE score (hs-CRP: β=-7.920, $p<0.001$; WBC: β=-4.552, $p<0.001$) and the physical component score of SF-36 (hs-CRP: β=-1.025, $p<0.001$; WBC: β=-0.364, $p<0.001$). Baseline WBC levels were negatively associated with gait speed (β=-0.013, $p=0.025$), quadriceps isometric 90°(β=-5.983; $p=0.035$) and isokinetic 60°/s peak torque/body weight (β=-5.532, $p=0.027$). Prevalence of sarcopenia at baseline was 18.1% (n=81). Of those without sarcopenia at baseline, 64(18.6%) satisfied criteria for sarcopenia at follow-up. There were no

significant associations between baseline inflammatory markers and either prevalent or incident sarcopenia, or change in sarcopenia-defining parameters. **Conclusion:** In middle-aged and older men, inflammatory markers (hs-CRP and WBC) were associated with measures of QoL, physical activity and gait speed, but not with other sarcopenia-defining parameters. None of the inflammatory markers in this study could predict functional decline, decline in physical activity, decline in QoL or incident sarcopenia.

OC23- SKIN AUTOFLUORESENCE, A NON-INVASIVE BIOMARKER OF ADVANCED GLYCATION END-PRODUCTS (AGES), IS ASSOCIATED WITH FRAILTY: THE ROTTERDAM STUDY. Komal Waqas[1], Jinluan Chen[1], Katerina Trajanoska[1,2], M. Arfan Ikram[2], André G. Uitterlinden[1,2], Fernando Rivadeneira[1], T. Voortman[2], M. Carola Zillikens[1] *(1. Department of Internal Medicine, Erasmus University Medical Center, Rotterdam, The Netherlands; 2. Department of Epidemiology, Erasmus University Medical Center, Rotterdam, The Netherlands)*

Background: We recently found skin AGEs to be cross-sectionally associated with sarcopenia, which precedes physical frailty. However, 82% of the subjects in our cohort with sarcopenia were not physically frail. Moreover, a gold standard biomarker to evaluate frailty is lacking in clinical practice. **Objective:** We aimed to investigate the association between skin AGEs and frailty, a hallmark of ageing, measured both as Physical Frailty and through its multidimensional variant also including cognitive and psychosocial aspects, the Frailty Index. **Methods:** Cross-sectional analysis in 2521 Rotterdam study participants aged 45 years and older with assessment of skin AGEs as skin autofluorescence (SAF) using the AGE reader since 2011. Fried's frailty criteria was used to define Physical Frailty (presence of ≥3 components) and pre-frailty (1 or 2 components) including weight loss, muscle weakness, gait speed, exhaustion and decreased physical activity. Rockwood's concept was used to define Frailty Index including 38 deficits originating from six categories i.e. functional status, cognition, diseases, health conditions, nutritional status and mood. Multinomial logistic and multiple linear regressions were used with SAF as exposure and frailty as outcome adjusting for age, sex, Rotterdam study cohorts, renal function, diabetes, socioeconomic and smoking status. **Results:** Mean SAF was 2.39 ± 0.49 arbitrary unit and median age was 74.2 years. Regarding Physical Frailty, 96 persons (4%) were frail and 1221 (48%) pre-frail; SAF was associated with both being pre-frail [odds ratio (95% confidence interval) = 1.29 (1.07 – 1.56)] and frail [1.87 (1.20 – 2.90)] with non-frail subjects being used as reference. Regarding Frailty Index, the median value was 0.14 (range 0-1) and higher SAF was associated with a higher frailty index [β=0.116, p= 1.3x10-8]. **Conclusion:** Higher skin AGEs are associated with both Physical Frailty and Frailty Index in our cohort. Replication of our findings and longitudinal studies are needed to evaluate potential use of SAF as a biomarker of frailty.

OC24- THE HIGH INTENSITY INTERVAL TRAINING AND CITRULLINE SUPPLEMENTATION ALTER THE CIRCULATING AND MUSCLE MICRORNA LEVELS IN OBESE ADULTS OVER 60 YEARS: A VALIDATION STUDY. Marjorie Millet[1], Martine Croset[1], Elisabeth Sornay-Rendu[1], Philippe Noirez[2,3], José Morais[4], Mylène Aubertin-Leheudre[3], Jean-Charles Rousseau[1], Roland Chapurlat[1,5,6] *(1. INSERM 1033, Lyon, France; 2. UFR des Sciences et Techniques des Activités Physiques et Sportives de Paris, Université Paris-Descartes, Paris, France; 3. Département des Sciences de l'Activité Physique, Université du Québec à Montréal, Montréal, Québec, Canada; 4. Faculté de Médecine, Département de Gériatrie, Université McGill, Montréal, Québec, Canada; 5. Hôpital E. Herriot, Hospices Civils de Lyon, Lyon, France; 6. Université de Lyon, Lyon, France)*

Introduction: The small non-coding microRNAs (miRs) are endogenous regulators of gene expression. They bind to complementary sequence on target messenger RNA transcripts resulting in translational repression or target degradation. They are involved in the skeletal muscle response to training in animals and humans (Kirby, 2015). **Objectives:** The aim of our sub-study was to investigate the effects of High Intensity Interval Training (HIIT) associated or not with L-Citrulline (CIT) on the expression of serum and muscle miRs in a group of obese adults. **Patients and Methods:** As part of a larger randomized clinical trial, a subset of 68 obese adults (Montréal area, 36 women, 67±4.6 years) were randomly assigned in 2 groups: HIIT + CIT vs HIIT + placebo (10 g-dose of CIT or Placebo every day). All participants followed a 12-week HIIT and were evaluated Pre and Post-intervention. Blood and/or muscle biopsy samples (n = 28) were analyzed to identify miRs. Based on a RNA-seq screening phase (Qiagen) search we have selected 19 miRs for a validation phase to analyse their expression levels in serum and muscle using pre-designed miRNA-TaqMan arrays (Applied-Biosystems). **Results:** Serum/Post-HIIT-compared-to-Pre. miR-151a-3p expression was higher (p = 0.0009) and miR-483-3p and miR-744-5p expressions were lower (p = 0.044 and 0.004) in the entire population. miR-744-5p and miR-106b-5p expressions were decreased in men (p = 0.019 and p = 0.007) while miR-151a-3p expression was increased in women (p = 0.005). Only placebo group decreased the expressions of miR 106b-5p (p=0.039), miR-744-5p (p=0.006) and miR-484 (p = 0.025). However, both groups increased the miR-151a-3p expression (placebo, p = 0.014 vs CIT, p=0.031). Muscle/Post-HIIT-compared-to-Pre. miR-151a-3p and miR-504-5p expressions were lower in the entire population (p=0.03 and 0.027) and in men (p = 0.039 and 0.004). Only CIT Group decreased miR-151a-3p and miR-504-5p expressions in the entire population (p = 0.009 and 0.017) and in men (p = 0.02 and p = 0.008). Moreover, miR-136-3p expression was also decreased in men by CIT (p = 0.008). **Conclusion:** We identified 7 miRs differentially expressed before and after HIIT. CIT and sex seem to have an impact on its expression.

OC25- FRAILTY IS ASSOCIATED WITH A HIGHER MORTALITY IN OLDER PEOPLE WITH CANCER HISTORY: EVIDENCE FROM THE 1999-2014 NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY. Dongyu Zhang[1], Erin Mobley[2], Todd Manini[3], Christiaan Leeuwenburgh[3], Stephen Anton[3], Caretia Washington[4], Daohong Zhou[5], Alexander Parker[6], Paul Okunieff[7], Marco Pahor[3], Dejana Braithwaite[1,3,8] *(1. Department of Epidemiology, University of Florida College of Public Health and Health Professions, Gainesville, FL, USA; 2. Department of Surgery, University of Florida College of Medicine, Jacksonville, FL, USA; 3. Department of Aging & Geriatric Research, University of Florida College of Medicine, Gainesville, FL, USA; 4. University of Florida College of Medicine, Gainesville, FL, USA; 5. Department of Pharmacodynamics, University of Florida College of Pharmacy, Gainesville, FL, USA; 6. University of Florida College of Medicine, Jacksonville, FL, USA; 7. Department of Radiation Oncology, University of Florida College of Medicine, Gainesville, FL, USA; 8. University of Florida Health Cancer Center, Gainesville, FL, USA)*

Background: Limited studies investigated impact of frailty on mortality in older people with cancer history. **Objectives:** To explore association between frailty and mortality in older people with cancer history. **Methods:** We identified 2,148 older people (>=60 years at interview) with cancer history from the 1999-2014 cohorts of the National Health and Nutrition Examination Survey. A comprehensive 45-item frailty index (FI) was the exposure and categorized based on validated cutoffs (FI≤0.21: not frail, 0.21<FI≤0.45: moderately frail, FI>0.45: severely frail). Outcomes included all-cause, cancer-specific, and cardiovascular disease (CVD)-specific mortality. Multivariable Cox proportional hazards models estimated adjusted hazard ratio (aHR) and 95% confidence interval (CI) of FI, adjusting for age, sex, race, education, marital status, body mass index (BMI), smoking and alcohol use, protein and energy intake, survival time, history of more than 1 cancer, and survey year. To explore if effect measures of FI were heterogeneous between cancer and CVD-specific mortality, a joint Cox model was applied. Subgroup analyses were conducted by relevant sociodemographic and lifestyle factors, and Wald tests were used to examine if effect measures of frailty differed significantly by these factors. Restricted cubic splines were used to depict non-linear dose-response relationship between FI and mortality. **Results:** The mean age of participants was 72.9 years (SD=7.2), 52.6% of them were male, 76.0% were white, and 61.4% were frail (0.21<FI≤0.45: 1,143, FI>0.45: 176). During the follow-up (median: 6.0 years), 758 people died (cancer-specific: 219, CVD-specific: 146). The multivariable model suggested that frailty was associated with a higher all-cause mortality (FI>0.45 vs. ≤0.21: aHR=3.76, 95% CI=2.90-4.89, p-trend<0.01). In subgroup analyses, effect measures of frailty were significantly larger in people younger than 75 years or with BMI>=30 kg/m2. Positive and significant associations were also observed for cancer and CVD-specific mortality, but the joint Cox model suggested aHR of frailty was larger for the latter (cancer: aHR=2.30, 95% CI=1.39, 3.80; CVD: aHR=5.61, 95% CI=3.20-9.84). Positive and monotonic association patterns were observed for FI in dose-response analysis. **Conclusion:** In older people with cancer history, frailty is associated with a higher mortality, and it may have a stronger impact on CVD-specific death compared to cancer-specific death.

OC26- PLASMA PROTEOMIC PROFILE OF FRAILTY INDEX TRAJECTORIES IN THE INCHIANTI STUDY. Toshiko Tanaka[1], Stefania Bandinelli[2], Luigi Ferrucci[1] *(1. Longitudinal study section, National Institute on Aging, Baltimore; 2. Geriatric Unit, Azienda Sanitaria Firenze (ASF), Florence, Italy)*

Background: Identifying biomarkers of healthy aging is of utmost public health importance. The accumulation of health deficits is reflected by the frailty index (FI) and one metrics to assess health trajectories. Biomarkers that predict FI trajectories could be used to identify those at risk for health decline. **Objective:** Identification of plasma proteins that are associated with trajectories of FI over a 6-year period. **Methods:** In a prospective population-based cohort study, circulating levels of 1301 plasma proteins were measured using an aptamer based proteomic assessment. Participant included 621 individuals over 65 with longitudinal assessment of FI. **Results:** There were 144 proteins associated FI throughout the follow up period, these proteins represented inflammatory and chemokine pathways. There were 7 proteins associated with trajectories of FI. Higher abundance of myoglobin, myostatin, brain and muscle creatinine kinase, growth hormone receptor, and fibrinogen activating protein were associated with slower increase in FI while higher abundance of insulin-like growth factor binding protein 2 was associated with more rapid increase FI over time. The proteins associated with trajectory of FI were related to muscle growth, function, and differentiation. **Conclusion:** Plasma proteins are associated with longitudinal trajectories of FI and could be used to stratify individuals at risk for developing health deficits.

OC27- BODY MASS INDEX AND MINI NUTRITIONAL ASSESSMENT-SHORT FORM AS PREDICTORS OF IN-HOSPITAL MORTALITY IN OLDER ADULTS WITH COVID-19. L. Kananen[1,2,3,4], M. Eriksdotter[5,7], A.M. Boström[6,7,8], M. Kivipelto[5,7,8], M. Annetorp[7], C. Metzner[7], S. Hägg[4], V. Bäck Jerlardtz[9], M. Engström[10], P. Johnson[11], L.G. Lundberg[11], E. Åkesson[8], C. Sühl Öberg[13] , D. Religa[5,7], J. Jylhävä[2,3,4], T. Cederholm[5,7,14] *(1. Faculty of Medicine and Health Technology, Tampere University, Tampere, Finland; 2. Faculty of Social Sciences (Health Sciences), Tampere University, Tampere, Finland; 3. Gerontology Research Center, Tampere, Finland; 4. Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden; 5. Div Clinical Geriatrics, Department of Neurobiology, Care sciences and Society, Karolinska Institutet, Stockholm, Sweden; 6. Division of Nursing, Department of Neurobiology, Care Sciences and Society, Karolinska Institutet, Stockholm,*

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Background: Overweight and obesity have been consistently reported to carry an increased risk for poorer outcomes in coronavirus disease 2019 (COVID-19) in adults. Existing reports mainly focus on in-hospital and intensive care unit mortality in patient cohorts usually not representative of the population with the highest mortality, i.e. the very old and frail patients. Accordingly, little is known about the risk patterns related to body mass and nutrition in very old patients. **Objectives:** Our aim was to assess the relationship between body mass index (BMI), nutritional status and in-hospital mortality among geriatric patients treated for COVID-19. As a reference, the analyses were performed also in patients treated for other diagnoses than COVID-19. **Methods:** We analyzed up to 10031 geriatric patients with a median age of 83 years of which 1409 (14%) were hospitalized for COVID-19 and 8622 (86%) for other diagnoses in seven hospitals in the Stockholm region, Sweden during March 2020-January 2021. Data were available in electronic hospital records. The associations between 1) BMI and 2) nutritional status, assessed using the Mini-Nutritional Assessment - Short Form (MNA-SF) scale, and short-term in-hospital mortality were performed using logistic regression. **Results:** After adjusting for age, sex, comorbidity, polypharmacy, frailty and the wave of the pandemic (first vs. second), underweight defined as BMI<18.5 increased the risk of in-hospital mortality in COVID-19 patients (odds ratio [OR]=2.30; confidence interval [CI]=1.17-4.31), but not in patients treated for other diagnoses (OR=0.84; CI=0.31-1.88). Overweight and obesity were not associated with in-hospital mortality. Malnutrition; i.e. MNA-SF 0-7 points, increased the risk of in-hospital mortality in patients treated for COVID-19 (OR=2.03; CI=1.16-3.68) and other causes (OR=6.01; CI=2.73-15.91). **Conclusions:** Our results indicate that obesity is not a risk factor for older patients with COVID-19, but emphasize the role of underweight and malnutrition for in-hospital mortality in geriatric patients with COVID-19. Keywords: COVID-19, mortality, BMI, MNA-SF, obesity, malnutrition

OC28- ONSET OF FRAILTY AND DIABETES IN OLDER U.S. VETERANS. Tiffany M. Cortes[1,2,3], Daniel MacCarthy[4], Chen-Pin Wang[2,3,4], Nicolas Musi[1,2,3], Sara E. Espinoza[1,2,3] *(1. Department of Medicine, UT Health San Antonio, Texas, USA; 2. Barshop Institute for Longevity & Aging Studies, UT Health San Antonio, Texas, USA; 3. Geriatrics Research, Education and Clinical Center, South Texas Veterans Health System, USA; 4. Department of Epidemiology and Biostatistics UT Health San Antonio, Texas, USA)*

Background: Longitudinal prospective studies have shown that older adults with diabetes are more likely to develop frailty or have worsening frailty compared to those without diabetes, and that those who are pre-frail or frail are more likely to develop diabetes. A strong relationship between diabetes and frailty has been demonstrated, but the temporal (i.e. longitudinal) relationship between diabetes and frailty is unknown. **Objectives:** To examine the natural history of older adults without diabetes or frailty and to examine the onset of diabetes or frailty in older U.S. veterans. **Methods:** We examined a longitudinal cohort of adults older than 65 years old without diabetes or frailty in 2015 from the Veterans Administration clinical database and obtained data on a yearly basis until 2015, death, or no outpatient visits for 365 days. Diabetes was defined as the presence of an ICD 9 diagnosis code for diabetes or diabetes complication and/or use of a glucose-lowering agent. Frailty was defined using a deficit accumulation model adapted for VA administrative data. The cut offs for frailty index scores were defined as: non-frail, 0-0.1; pre-frail, 0.11-0.20; and frail, over 0.21. On a yearly basis over the follow-up period, diagnosis of diabetes or frailty was determined. **Results:** At baseline, 1,073,837 older adults met the inclusion criteria and were 98.2% male and 75.1% Caucasian. The proportion of subjects in this population that developed diabetes and/or frailty during the follow-up period was 13.0% diabetes, 19.1% frailty, 14.1% frailty without diabetes, and 8.9% diabetes without frailty. 72.1% of enrolled subjects did not develop diabetes or frailty. Of the subjects who were diagnosed with both frailty and diabetes, 45.5% were diagnosed with frailty before diabetes, 25.2% were diagnosed with diabetes before frailty and 29.3% were diagnosed with diabetes and frailty during the same year. **Conclusion:** Frailty and diabetes develop in a significant portion of older adults. Of those who develop diabetes and frailty, most will develop frailty before or during the same year as they are diagnosed with diabetes. Interventions that target frailty also may be beneficial for the prevention of diabetes in older adults, and vice versa.

OC29- REPLACING UNINTENTIONAL WEIGHT LOSS WITH SARCOPENIA IN PHYSICAL FRAILTY PHENOTYPE CONSTRUCT FOR CLINICAL USE. Xiaomeng Chen[1], Omid Shafaat[1,2], Yi Liu[1], Nadia M. Chu[1,3], Cliff Weiss[2], Dorry L. Segev[1,3], Mara McAdams-DeMarco[1,3] *(1. Department of Surgery, Johns Hopkins School of Medicine, Baltimore, MD, USA; 2. Russell H. Morgan Department of Radiology and Radiological Science, Johns Hopkins School of Medicine, Baltimore, MD, USA; 3. Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA)*

Background: A recent consensus panel of physicians caring for older kidney failure patients did not support the use

unintentional weight loss to measure shrinking in Physical Frailty Phenotype (PFP) because it is subjective. Therefore, we tested whether self-reported unintentional weight loss, could be replaced by sarcopenia, identified by objective CT measures that are obtained as part of routine clinical practice among kidney transplant (KT) recipients. **Objectives:** To compare frailty defined by the original PFP (oPFP) using subjective unintentional weight loss vs. frailty defined by new PFP (nPFP) using objective sarcopenia measures for risk predictions of mortality and graft loss in KT recipients. **Methods:** In a prospective cohort of adult KT recipients measured oPFP at admission (12/2008-2/2020), we calculated skeletal muscle index from available CT scans within 1-year pre-KT and ascertained binary sarcopenia status (male<50cm2/m2; female<39cm2/m2). nPFP score was calculated in the same way as oPFP score, while shrinking was determined by sarcopenia. Frailty by either PFP was defined as a score≥3. Hazard ratios (HRs) of all-cause mortality and all-cause graft loss by frailty were estimated using Cox proportional hazard models for oPFP and nPFP respectively, adjusted for age, sex, race, donor type, and Charlson comorbidity index. The model discriminations of outcomes using oPFP vs. nPFP were quantified using Harrell's C-statistic. **Results:** Among 1,113 KT recipients with both oPFP and nPFP scores, oPFP identified 16.5% while nPFP identified 15.1% of recipients being frail. After adjustment, frail recipients identified using oPFP had 1.39-fold higher risk of mortality (95%CI:1.03-1.87) and 1.42-fold higher risk of graft loss (95%CI:1.11-1.83), compared to their non-frail counterparts; frail recipients identified using nPFP had 1.45-fold higher risk of mortality (95%CI:1.07-1.97) and 1.44-fold higher risk of graft loss (95%CI:1.11-1.87), compared to their non-frail counterparts. The C-statistics of mortality (oPFP=0.710 vs. nPFP=0.713) and graft loss (oPFP=0.630 vs. nPFP=0.635) models for nPFP and oPFP were similar. **Conclusion:** Subjective unintentional weight loss used in the PFP construct could be replaced with objective sarcopenia in KT recipients with similar discriminations for risks of post-KT mortality and graft loss. Transplant centers may consider using sarcopenia identified by CT measures for PFP construct for clinical use.

OC30- FRAILTY IN SYSTEMIC LUPUS ERYTHEMATOSUS: AN ADMINISTRATIVE CLAIMS DATA ANALYSIS. Sarah B. Lieber[1,2], Iris Navarro-Millan[1,2], Musarrat Nahid[2], Mangala Rajan[2], Sebastian E. Sattui[1], Lisa A. Mandl[1,2] *(1. Hospital for Special Surgery, New York, NY, USA; 2. Weill Cornell Medicine, New York, NY, USA)*

Background: Frailty is an important risk factor for adverse health outcomes in systemic lupus erythematosus (SLE) across the lifespan. Evaluation of frailty in SLE using national administrative claims data may allow for identification of frailty at a population level, including in young and middle-aged patients. **Objectives:** We aimed to study frailty prevalence in adults with SLE <65 years old compared to age- and gender-matched comparators without systemic rheumatic disease (SRD) using two validated claims-based frailty indices (CFI) [1-2]. **Methods:** We identified patients with SLE 18-65 years old enrolled in the Centers for Medicare and Medicaid Services Medicaid subset of the Truven Health MarketScan dataset in 2011. SLE was defined by ≥3 ICD-9 CM codes for SLE (710.0) ≥30 days apart. Age- and gendermatched comparators [1:4] without SRD also were identified. Frailty status and frailty component characteristics were determined using two CFIs validated in older adults by Segal et al. and Kim et al. [1-2]. Agreement between CFIs was evaluated using a kappa statistic. **Results:** 2262 patients with SLE and 9048 matched comparators without SRD were identified. Frailty prevalence in patients with SLE was higher than in comparators without SRD according to each CFI (Segal's definition: 38.3% versus 21.6%; Kim's definition: 50.4% versus 18.6%); 28.8% of patients with SLE and 11.6% of comparators without SRD were frail according to both CFIs. There was moderate statistically significant agreement between CFIs (κ=0.47, p<0.0001). Among patients with SLE classified as frail according to both CFIs, depression (56.2%), recent admission (43.9%), and urinary tract infection (43.3%) were the most commonly observed nonmusculoskeletal Segal frailty components whereas hypertensive disease (88.9%) and mental health disorders (74.5%) were the most commonly observed non-musculoskeletal Kim frailty components. **Conclusions:** Frailty prevalence in young and middle-aged patients with SLE exceeded that in comparators without SRD according to two validated CFIs. Further study is needed to evaluate discrepancies between CFIs and to determine the association of frailty status with clinically relevant outcomes in SLE.

OC31- DOES ALTERED LIPID METABOLISM DUE TO LOSS OF SREBF1 DECREASE MUSCLE MASS IN ZEBRAFISH? Rajashekar Donaka, Chen Shochat, David Karasik *(The Azrieli Faculty of Medicine, Bar-IIan University, Safed, Israel)*

Background: Pathophysiology of sarcopenia (muscle wasting) is multifactorial; however, genetic regulation of lipid effects is mostly unexplored in sarcopenia. A study of muscle lipid metabolism and its impact on progressive loss of (slow) muscle fibers is needed for better understanding of disease's manifestation. Therefore, we hypothesized that our srebf1 knockout zebrafish can serve as a model system to identify lipid-based biomarkers for the early diagnosis of sarcopenia. **Purpose:** Functional characterization of muscle phenotypes of srebf1 knockout (KO) zebrafish generated by CRISPR-Cas9 technology. **Methods:** Morphometric measurements: body weight and muscle weight were measured. Adult zebrafish (5 months old) back muscles were extracted for lipid profiling, and gene expression by RT-qPCR. Neutral lipids were quantified on larvae and adult muscle tissue by Oil Red O staining (ORO). Imaging was done using Axio Scan.Z1 microscope and the intensity of the ORO staining was measured using FIJI software. The locomotion of the larvae was determined at light-dark-light conditions with 15 min intervals. **Results:** We found that adult srebf1 KO had significantly reduced body weight (p=0.0017) and muscle tissue weight (p=0.0003) compared to wild type siblings (WT). Further, muscle lipid profiling

revealed increased lipid mediators (polyunsaturated fatty acids; PUFA) in KO, although, histologically, lipid accumulation observed at slow muscle fibers of srebf1 KO (mean±SD, 78.03±35.03 vs. 93.69±23.80) was border-line compared to srebf1 WT. Moreover, lipogenesis enzymes such as acetyl coenzyme A (acc), fatty acid synthase (fasn), and stearoyl-CoA desaturase-1 (scd) gene expression was significantly ($p<0.0001$) upregulated in srebf1 KO adult muscle. At the early age 7 days post fertilization srebf1 KO larvae displayed faster ($p=0.004$) movement in dark conditions, but disorganized slow muscle fibers and a significant ($p=0.001$) increase in neutral lipids. **Conclusion:** Knockout of the srebf1 gene is most possibly responsible for decreased muscle mass by increasing polyunsaturated fatty acids and activating lipogenesis signaling pathway of skeletal muscle. Utilization of easily accessible zebrafish models is essential for exploring muscle diseases. If confirmed, novel fatty acids might serve as biomarkers for an early diagnosis of sarcopenia and as potential drug targets.

OC32- PHYSICAL FRAILTY TRAJECTORIES IN OLDER U.S. NURSING HOME RESIDENTS. Yiyang Yuan[1,2], Kate L. Lapane[2], Jennifer Tjia[2], Jonggyu Baek[2], Shao-Hsien Liu[2], Christine M. Ulbricht[3] *(1. Clinical and Population Health Research PhD Program, Graduate School of Biomedical Sciences, University of Massachusetts Medical School, Worcester, MA, USA; 2. Department of Population and Quantitative Health Sciences, University of Massachusetts Medical School, Worcester, MA, USA; 3. National Institute of Mental Health, National Institutes of Health, Bethesda, MD, USA)*

Background: Physical frailty (PF) is prevalent in older nursing home (NH) residents and often co-occurs with cognitive impairment. The longitudinal trajectories during NH stay and the role of cognitive impairment remain unknown. **Objectives:** In older U.S. NH residents, to identify PF trajectories over the first six months of NH stay and examine the associations between PF trajectories and cognitive impairment. **Methods:** Minimum Data Set (MDS) 3.0 was used to identify older residents newly-admitted to U.S. NHs who stayed for over six months in 2014-16 (n=266,001). Their MDS 3.0 admission, 3-month and 6-month assessments were analyzed. PF was measured by FRAIL-NH, and cognitive impairment by Brief Interview for Mental Status (intact; moderate impairment; severe impairment). To identify the optimal number of PF trajectories, a group-based trajectory model was used, with PF operationalized as FRAIL-NH score (range: 0-13) and time as total number of days since admission. The identified trajectories were described qualitatively using the validated FRAIL-NH cut-offs as guidelines (score 0-5: robust; 6-7: pre-frail; 8-13: frail). Residents were then assigned to the trajectory to which they had the highest posterior probability of belonging. The association between cognitive impairment and trajectories was analyzed using multinomial logistic regression, adjusting for demographic and clinical characteristics at admission. **Results:** Nearly half of residents were 85 years or older, two-thirds were female, fewer than 20% were racial/ethnic minorities. About 30% had moderate cognitive impairment and 37% severe impairment. Five distinct PF trajectories were identified: "Consistently Robust" (prevalence: 4.8%), "Improving" (5.5%), "Worsening" (7.6%), "Consistently Pre-frail" (29.0%), "Consistently Frail" (53.0%). Compared to those with intact cognition, those with moderate cognitive impairment were less likely follow "Consistently Robust" (adjusted odds ratio[95% confidence intervals]: 0.56[0.53-0.58]), "Improving" (0.65[0.62-0.68]), "Worsening" (0.67[0.64-0.70]), and "Consistently Pre-frail" (0.71[0.70-0.73]) than the "Consistently Frail" trajectory; those with severe cognitive impairment had even lower odds. **Conclusion:** Residents with more severe cognitive impairment were more likely to be consistently frail with lower odds of experiencing changes, either improvement or worsening. Results have implications for the underlying mechanism of PF and cognitive impairment and future work building prediction models to identify NH residents at risk for accelerated rate of progression.

OC33- ADVERSE MUSCLE COMPOSITION PREDICTS ALL-CAUSE MORTALITY INDEPENDENT OF FUNCTIONAL PERFORMANCE LEVEL IN THE UK BIOBANK IMAGING STUDY. J. Linge[1,2], M. Petersson[1], M.F. Forsgren[1,2,3], A.J. Sanyal[4], O. Dahlqvist Leinhard[1,2,3] *(1. AMRA Medical, Linköping, Sweden; 2. Department of Health, Medicine and Caring Sciences, Linköping University, Sweden; 3. Center for Medical Image Science and Visualization (CMIV), Linköping University, Sweden; 4. Department of Internal Medicine and Division of Gastroenterology, Hepatology and Nutrition, Virginia Commonwealth University, Richmond, VA, USA)*

Background: Adverse muscle composition (AMC), measured by magnetic resonance imaging (MRI), has previously been linked to poor function, metabolic comorbidity and increased hospitalization. **Objective:** To investigate the association between all-cause mortality and the combination of AMC and measures of functional performance/frailty. **Methods:** 39,804 participants in the UK Biobank imaging study were scanned using a 6-minute MRI protocol and analyzed for thigh fat-tissue free muscle volume (FFMV) and muscle fat infiltration (MFI) using AMRA® Researcher (AMRA Medical, Linköping, Sweden). For each participant, a sex- and BMI invariant FFMV z-score was calculated. AMC was defined as low FFMV z-score (<25th percentile (population wide)) and high MFI (>75th percentile (population wide, sex-specific)) and combined with low vs high hand grip strength (HGS), slow vs average/brisk walking pace and no vs ≥1 fall last year. Associations with all-cause mortality were investigated using Cox proportional-hazard modeling with non-AMC and normal function (high HGS, average/brisk walking pace and no fall last year respectively) as referents. **Results:** Participants were 52% females, with mean (SD) age 64.2 (7.6) years and BMI 26.4 (4.4) kg/m2 and 10.5% had AMC. During a follow-up period of 2.9 (1.4) years, 328 deaths were recorded. Among those with normal function, AMC was significantly associated with all-cause mortality (HRs 2.6-2.9, all $p<0.001$). Among

those with poor function (low HGS, slow walking pace or ≥1 fall last year), AMC was also significantly associated with all-cause mortality ($p<0.001$, $p<0.05$ and $p<0.05$ respectively). The most vulnerable participants were found in the group with poor function and AMC (HRs 5.7 (3.6-9.1), $p<0.001$ for AMC and low HGS vs non-AMC and high HGS; 5.4 (3.3-8.7), $p<0.001$ for AMC and slow walking pace vs non-AMC and average/brisk walking pace; and 4.0 (2.0-8.1), $p<0.001$ for AMC and >1 fall last year vs non-AMC and no falls last year. **Conclusions:** AMC was associated with all-cause mortality independently of functional performance level, indicating the value of assessing a patient's muscle composition even though they do not yet present with poor function. The strongest association with all-cause mortality was found for those with both poor function and AMC.

OC34- A PHASE 2, RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY IN JAPAN TO INVESTIGATE THE SAFETY AND EFFICACY OF LOMECEL-B ADMINISTRATION BY LONGEVERON IN PATIENTS WITH AGING FRAILTY: STUDY DESIGN AND RATIONALE. Kevin N. Ramdas, Keyvan Yousefi, Geoff Green, Lisa Moss, Ben Hitchinson, Liliana Diaz, Jessica Protenic, Joshua M. Hare, Anthony A. Oliva, Jr. *(Longeveron Inc., Miami, USA)*

Background: Aging frailty is associated with a constellation of physical and neurological symptoms which render the afflicted to various adverse health outcomes. There are no approved interventions for prevention or treatment of aging frailty. Therefore, presenting the field with novel therapeutic strategies that can reverse or attenuate the progression of frailty symptoms, represents a significant unmet clinical need. Mechanistically, inflammaging which a low grade chronic inflammatory state, plays a crucial role in the pathophysiology of frailty. Lomecel-B, an allogeneic bone-marrow-derived product featuring medicinal signaling cells (MSCs) has immunomodulatory activities and can modulate inflammaging and potentially ameliorate the pathology of aging frailty. However, there are no controlled studies that evaluate the safety and efficacy of Lomecel-B in in frail subjects. **Objectives:** This phase II study aims to evaluate the efficacy and safety of the intravenous delivery of Lomecel-B in individuals with Aging Frailty. This is a Japan based clinical trial. **Methods:** This is a randomized, double-blind placebo-controlled, multi-arm multicenter study granted approval by the Japanese PMDA. Consenting older adults 70-85 years identified as frail per Japanese version of frailty phenotype model, a mini-mental examination score above 24, and elevated Tumor Necrosis Factor-α (≥2.5 pg/mL) will be enrolled. A total of 45 subjects (15 per group) will be randomized to receive either a single peripheral intravenous infusion of 50 or 100 million Lomecel-B, or placebo. Patients will receive the intervention while hospitalized (1d) and then followed up at 1-week and 30-days post-treatment for safety evaluation and at 90-days and 180-days post-infusion for safety and efficacy assessments. **Results:** The primary efficacy endpoint is change in 6-minute walk distance (6MWD) at 180-days post-infusion in the 100million Lomecel-B group vs placebo. The secondary efficacy endpoints is change in 6-minute walk distance (6MWD) in 50 million and change in TNF-a levels in 100 million Lomecel-B arm vs placebo at 180-days post-infusion. Additional exploratory assessments will measure exercise tolerance, physical endurance, quality of life and safety. **Discussion:** We describe the design and rationale for a phase II clinical trial evaluating the effects of Lomecel-B on older adults with Aging Frailty in Japan.

OC35- LOWER-EXTREMITY FUNCTION PREDICTS FRAILTY THROUGH ACTIVE LEISURE ACTIVITIES: A LONGITUDINAL MEDIATION ANALYSIS. Meng Zhao, Yaqi Wang, Shan Wang, Yuan Yang, Ming Li, Kefang Wang *(School of Nursing and Rehabilitation, Cheeloo College of Medicine, Shandong University, Jinan, Shandong 250012, P.R. China)*

Backgrounds: Despite the strong evidence that lower-extremity function is associated with frailty, the mechanism of how impaired lower-extremity function can increase the risk of frailty has not been well-described. **Objectives:** This study aimed to determine whether different types of leisure activity mediate the effect of lower-extremity function on frailty. **Methods:** The study included 353 Chinese nursing home residents aged >=60 who were assessed at baseline, 6, and 12 months. Lower-extremity function, leisure activities, and frailty were assessed using the Short Physical Performance Battery, activity engagement questionnaire, and FRAIL-NH scale, respectively. The longitudinal mediation analyses comprising regression and bootstrap analyses, were conducted to evaluate the direct and indirect effects of lower-extremity function on frailty and the mediating role of active and passive leisure activities on their association. **Results:** Lower-extremity function had a significant indirect effect on frailty through active leisure activities (indirect effect = -0.048, bias-corrected 95% CI = -0.093, -0.016), but not through passive leisure activities (indirect effect = -0.013, bias-corrected 95% CI =-0.049, 0.006). Lower-extremity function was not significantly related to frailty when adjusting for leisure activities and covariates (β = -0.061; 95% CI = -0.119, 0.032). Active leisure activities accounted for 44.4% of the indirect effect of lower-extremity function on frailty. **Conclusion:** Leisure activities impact the association of lower-extremity function and frailty, and its protective role depends on the type of leisure activity. Interventions on frailty should be designed by focusing on active leisure activities among older adults especially for those with impaired lower-extremity function.

OC36- DIFFERENCES IN INTRINSIC CAPACITY AND BIOLOGICAL PROFILE ACCORDING TO LONGITUDINAL FRAILTY TRAJECTORIES IN COMMUNITY-DWELLING OLDER ADULTS. Emmanuel Gonzalez Bautista[1,2], Wan-Hsuan Lu[1,2], Bruno Vellas[1,2], Philipe de Souto Barreto[1,2] *(1. Gerontopole of Toulouse, Institute of Ageing, Toulouse University Hospital (CHU Toulouse),*

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Backgrounds: Frailty is a dynamic process with heterogeneous progression patterns in older adults (OA) that have not been fully characterized. Little is known about older individuals' functional and biological profiles according to their frailty trajectories over time. **Objectives:** To identify frailty trajectories among community-dwelling OA and compare them according to their baseline intrinsic capacity (IC) and inflammatory profiles. **Methods:** This secondary analysis from the Multidomain Alzheimer Preventive Trial (MAPT) included 614 participants (mean age ± SD: 76.0 ± 4.3 years) with yearly frailty assessments. Trajectories of frailty over four years were obtained using group-based trajectory modeling. All participants had their IC and plasma inflammatory markers measured at 12 months. Six domains of IC were measured using standardized scores (cognition, locomotion, psychological, vision, audition, and nutrition). Plasma biomarkers included tumor necrosis factor receptor type 1 (TNFR-1), interleukin-6 (IL-6), monocyte chemoattractant protein-1 (MCP-1), C-reactive protein (CRP), and growth differentiation factor 15 (GDF-15). **Results:** We identified four distinct trajectories of frailty: reversed (19.4%), worsening (21.7%), stably pre-frail (55.7%), and stably frail (3.2%). OA with a stably frail trajectory had lower IC capacities in cognition, locomotion, psychological, and nutrition than the other three groups (all $p < 0.01$). Participants with stably pre-frailty trajectory showed worse IC in the four domains aforementioned than those with reversed and worsening trajectories (post hoc $p < 0.01$). In contrast, the group of reversed frailty showed higher psychological capacity than those in the worsening trajectory. On the other hand, we observed higher concentrations of GDF-15, TNFR-1, IL-6, and CRP in the stably frail group than in the other three groups (all $p < 0.01$). Lower levels of GDF15 were found in older adults with worsening frailty trajectory compared to those in stably pre-frailty (post hoc $p < 0.01$). **Conclusion:** OA in the four frailty trajectories identified had distinct IC levels and inflammatory markers at baseline. Further studies should explore the predictive ability of IC and inflammatory biomarkers against frailty trajectories. An algorithm based on IC and biomarkers could, for instance, identify robust OA with a high risk of a worsening trajectory in the mid-term.

OC38- LOWER URINARY TRACT SYMPTOMS AND INCIDENT FUNCTIONAL LIMITATIONS IN OLDER COMMUNITY-DWELLING MEN. Scott R. Bauer[1,2,3], Peggy M. Cawthon[4,5], Kristine E. Ensrud[6,7], Anne M. Suskind[2], John C. Newman[8,9], Howard A. Fink[6,7], Kaiwei Lu[3], Rebecca Scherzer[1,3], Kenneth Covinsky[3,9], Lynn M. Marshall[10,11] for the Osteoporotic Fractures in Men (MrOS) Research Group *(1. Division of General Internal Medicine, Department of Medicine, University of California, San Francisco, CA, YSA; 2. Department of Urology, University of California, San Francisco, CA, USA; 3. San Francisco VA Medical Center, San Francisco, CA, USA; 4. Research Institute, California Pacific Medical Center, San Francisco, CA, USA; 5. Department of Epidemiology and Biostatistics, University of California, San Francisco, CA, USA; 6. Department of Medicine and Division of Epidemiology and Community Health, University of Minnesota, Minneapolis, MN, USA; 7. Veterans Affairs Health Care System, Minneapolis, MN, USA; 8. Buck Institute for Research on Aging, Novato, CA, USA; 9. Division of Geriatrics, Department of Medicine, University of California, San Francisco, CA, USA; 10. Oregon Health and Science University-Portland State University School of Public Health, Portland OR, USA; 11. Department of Orthopaedics and Rehabilitation, Oregon Health and Science University, Portland, OR, USA)*

Background: Lower urinary tract symptoms (LUTS) can occur during both urine storage and voiding and are increasingly appreciated as an important geriatric syndrome associated with phenotypic frailty. However, the association between LUTS and new functional impairment remains unknown. **Objectives:** To determine the association between LUTS severity and risk of incident functional impairment among older men. **Methods:** This analysis includes 2716 community-dwelling men age >=72 years from the multicenter Osteoporotic Fractures in Men (MrOS) study. American Urologic Association Symptom Index was used to classify baseline LUTS severity as none/mild (score 0-7), moderate (8-19), and severe (20-35). At baseline and 2-year follow-up interviews, men reported their ability to complete tasks used to define 3 primary outcomes: 1) mobility limitation (difficulty walking 2–3 blocks or climbing 10 steps), 2) activities of daily living (ADL) limitation (difficulty bathing, showering, or transferring), and 3) cognition-dependent task limitation (difficulty managing money or medications). We restricted the analysis to men reporting no limitations at baseline. We used Poisson relative risk (RR) regression with a robust variance estimator to model the association of LUTS with incident limitations in mobility, ADL, and cognition-dependent tasks. Models were adjusted for age, site, and comorbidities; further adjustment for other demographic/lifestyle factors did not materially change estimated coefficients. **Results:** Among men with none/mild LUTS, incidence of limitations was 11% for mobility, 8% for ADLs, and 4% for cognition-dependent tasks. Compared to men with none/mild LUTS, risk of incident mobility limitations was higher among men with moderate (cumulative incidence=17%; RR =1.35, 95%CI: 1.12,1.63; P=0.002) and severe LUTS (cumulative incidence=26%; RR=1.98, 95%CI: 1.48,2.64; P<0.001). Men were also more likely to develop incident ADL limitations if they reported moderate (cumulative incidence=12%; RR=1.32, 95%CI: 1.05,1.67; P=0.02) and severe LUTS (cumulative incidence=15%; RR=1.62, 95%CI: 1.07,2.43; P=0.02) compared to men with none/mild LUTS. LUTS were not associated with incident cognition-dependent task limitations. Results were virtually unchanged after adjustment for informative censoring and attenuated after adjusting for frailty phenotype components. **Conclusion:** LUTS are positively associated with incident mobility and ADL limitations among older men. Causal mechanisms and shared biological pathways of this novel association should be explored.

OC39- ADHERENCE TO A MEDITERRANEAN LIFESTYLE AND FRAILTY OCCURRENCE IN OLDER ADULTS: THE SENIORS-ENRICA-1 COHORT. Javier Maroto-Rodriguez[1], Mario Delgado-Velandia[1], Rosario Ortola[1], Esther Garcia-Esquinas[1], David Martinez-Gomez[1,2], Ellen Struijk[1] Esther Lopez-Garcia[1,2], Fernando Rodriguez-Artalejo[1,2], Mercedes Sotos-Prieto[1] *(1. Universidad Autonoma de Madrid-IdiPaz and CIBERESP, Spain; 2. IMDEA Food Institute, Spain)*

Backgrounds: There is some evidence that a Mediterranean diet is associated with frailty, but only a few studies have evaluated the joint association of other lifestyles beyond diet and the risk of frailty. **Objectives:** Thus, our aim was to study the association between adherence to a Mediterranean lifestyle score (MEDLIFE) and the occurrence of frailty in community-dwelling older adults. **Methods:** We analyzed data from 1880 individuals, aged ≥ 60 years from the Seniors-ENRICA-1 cohort, with an average follow-up of 3.3 years. Adherence to a Mediterranean lifestyle was assessed at baseline with the 27-item MEDLIFE index (with higher score representing better adherence). Frailty was assessed using the Fried criteria, and defined as having at least 3 of the following 5 criteria: a) Exhaustion; b) Weakness; c) Low physical activity; d) Slow walking speed; e) Unintentional weight loss. The main analyses were performed using logistic regression models, adjusting for the main confounders. **Results:** Study participants had a mean (SD) age of 68.7 (6.4) years, and MEDLIFE score of 13.0 (2.5). At the end of follow-up 136 incident frailty cases were ascertained. Compared with participants in the lowest tertile of the MEDLIFE score, the odds ratio (95% confidence interval) for occurrence of frailty was 0.84 (0.55–1.27) for those in the second tertile, and 0.39 (0.21–0.72) for those in the highest tertile (P-trend <0.001). Two of the three blocks of the MEDLIFE score, namely diet and rest, conviviality & physical activity, were significantly associated with lower frailty occurrence. **Conclusion:** Higher adherence to a Mediterranean lifestyle was associated with lower risk of frailty. Promoting maintenance or adoption of a Mediterranean lifestyle may be a useful strategy to prevent frailty in the older population. Funding: FIS grants 19/319 and 20/896, (ISCIII, Secretary of R+D+I, and FEDER/FSE), Plan Nacional sobre Drogas 2020/17.

OC40- THE FIRST ICOPE REMOTE MONITORING PLATFORM IN THE OCCITANIA REGION (FRANCE): ORGANIZATION AND FUNCTIONING. Neda Tavassoli, Caroline Berbon, Justine De Kerimel, Celine Mathieu, Christine Lafont, Catherine Takeda, Magali Poly, Sandrine Augusto, Laure Bouchon, Florence Da Costa, Melanie Comte, Maria Soto, Bruno Vellas *(Gérontopôle, Centre Hospitalo-Universitaire de Toulouse, équipe Régionale Vieillissement et Prévention de la Dépendance (ERVPD), Hôpital La Grave, Place Lange, TSA 60033, Toulouse, France)*

Background: Reducing the number of dependent subjects by 2025 is the economic and human challenge, which has led the World Health Organization (WHO) to develop the ICOPE program «Integrated care for the elderly». The objective of this 5-step program is to allow as many people as possible to age in good health. In order to support primary care in the implementation of this program, the Gérontopôle of Toulouse (WHO Collaborating Center on Frailty, Clinical Research and Training in Geriatrics), created the first ICOPE Remote Monitoring Platform in the Occitania region (France). **Objectives:** To implement the ICOPE program in usual care in Occitania. **Methods:** The WHO STEP1 tool allows the monitoring, every 4 to 6 months, of 6 major functions in order to maintain autonomy in subjects aged 60 years and over. The ICOPE Remote Monitoring Platform, set up within the Toulouse University Hospital Center, has the mission to help primary care professionals in this task. It involves: - Digital tools: the ICOPE MONITOR application and the ICOPEBOT Chatbot, which facilitate the implementation and monitoring of STEP1. Both are connected to a secure database that generates an alert in the event of a decline in one or more functions for rapid intervention by healthcare professionals. - A care team: 5 nurses, a coordinating team, 1 geriatrician; - Telemedicine for the management of complex cases. **Results:** Until April 20, 2021, 1917 professionals have created an account in the database: nurses (40%), physicians (23%) pharmacists (11%). The database includes 9016 subjects, 11368 STEP1 were performed (74.9 ± 12.6 years, 61% female). 94% of people who benefited from the first STEP1 had at least one impaired capacity; the most commonly affected areas were vision (71%), cognition (56%), and hearing (49%). Nurses on the remote monitoring platform manage more than 50 alerts per day. Referral to the attending physician for further assessment is necessary in 20% of cases. **Conclusion:** This first ICOPE Remote Monitoring Platform should promote the emergence of regional platforms to generalize the ICOPE program to all primary care.

OC41- SEX-SPECIFIC ASSOCIATION OF SOCIAL FRAILTY WITH INTRINSIC CAPACITY IN COMMUNITY-DWELLING OLDER ADULTS. Chi Hsien Huang[1,2,3], Kiwako Okada[4], Eiji Matsushita[4], Chiharu Uno[4,9], ShosukeSatake[5,6], Beatriz Arakawa Martins[1,7,8], Masafumi Kuzuya[1,9] *(1. Department of Community Health and Geriatrics, Nagoya University Graduate School of Medicine, Nagoya, Japan; 2. Department of Family Medicine, E-Da Hospital, Kaohsiung City, Taiwan; 3. School of Medicine for International Students, College of Medicine, I-Shou University, Kaohsiung City, Taiwan; 4. Graduate School of Nutritional Sciences, Nagoya University of Arts and Sciences, Aichi Prefecture, Japan; 5. Section of Frailty Prevention, Department of Frailty Research, Center for Gerontology and Social Science, National Center for Geriatrics and Gerontology, Obu, Aichi, Japan; 6. Department of Geriatric Medicine, Hospital, National Center for Geriatrics and Gerontology, Obu, Aichi, Japan; 7. Adelaide Geriatrics Training and Research with Aged Care (G-TRAC Centre), Discipline of Medicine, Adelaide Medical School, University of Adelaide, South Australia, Australia; 8. National Health and Medical Research Council Centre of Research Excellence in Frailty and Healthy Ageing,*

University ofAdelaide, South Australia, Australia; 9. Institutes of Innovation for Future Society, Nagoya University, Aichi Prefecture, Japane)

Background: Social frailty is associated with poor health outcomes; however, its effects on healthy aging indicators have not been adequately investigated. **Objective:** This study assessed the longitudinal association between social frailty and the intrinsic capacity of community-dwelling older adults. **Methods:** A total of 663 participants (57.3% women) aged ≥60 years, followed-up annually from 2014 to 2017 in Nagoya, Japan, were included in the cohort study. Social frailty was determined based on four items: financial difficulty, household status, social activity, and regular contact with others. A deficit score of 0 represented social robustness, 1 represented social prefrailty, and ≥2 represented social frailty. Intrinsic capacity was evaluated by the locomotion, cognition, psychological function, vitality, and sensory function domains. The longitudinal association was analyzed using generalized estimating equations. **Results:** The prevalence of social prefrailty and social frailty at baseline was 31.2% and 6.3%, respectively. The social prefrailty group (β=–0.132, P<0.001) and social frailty group (β=–0.258, P<0.001) were associated with a greater reduction in the composite intrinsic capacity scores than the social robustness group, especially in the cognition, psychological function, and vitality domains. Men with social prefrailty/social frailty demonstrated a greater decrease in the psychological function domain score (–0.512 vs.–0.278) than women. Additionally, the cognition domain score only decreased in men in the social prefrailty/social frailty group (β=–0.122, P=0.016). **Conclusion:** Social frailty was associated with intrinsic capacity and its subdomains longitudinally. Men with social frailty were more vulnerable than women to a decline in their psychological function and cognition domains. Therefore, the advanced management of social frailty is necessary to facilitate healthy aging.

OC42- AGE-SPECIFIC DIFFERENCES IN ANTHROPOMETRIC, MOTOR AND NEUROPSYCHOLOGICAL FACTORS IN GRIP STRENGTH.

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Background: Grip strength is a convenient clinical measure with predictive power regarding age-related health outcomes. Though a common index of sarcopenia, it has more recently been suggested that grip may better reflect age-related declines in neural (e.g., cognitive, sensorimotor) function. **Objectives:** Our primary objective was to determine associations between grip strength and peripheral and central neural indices in young and older adults, with and without adjustment for muscle size. **Methods:** In 85 older adults (OA, 75 ± 6.7 years) with preserved cognition and 24 young adults (YA, 22 ± 1.8 years), we assessed grip strength, sensorimotor dexterity (Purdue Pegboard Test (PPT)), anthropometrics (BMI, distal arm lean tissue mass (LTM)), and cognitive function (Repeatable Battery for the Assessment of Neuropsychological Status (RBANS),Trail Making Test (TMT) A & B). **Results:** OA had lower absolute and relative (grip/LTM) terms and scored significantly ($p < 0.050$) worse than YA on the PPT, RBANS visuo-spatial (VS) and language (LAN) indices and TMT-A & B. In YA, the only significant associations with grip were between relative grip and the RBANS-LAN and LTM. In OA, by contrast, absolute and relative grip were positively and negatively associated with PPT time and BMI, respectively. The RBANS-VS and TMT-A were significantly associated with absolute and relative grip, respectively. Regression modeling of grip was driven by LTM in YA ($r2 = 0.782$) and OA ($r2 = 0.581$). Additional factors improving the fit were RBANS-LAN ($r2 = 0.822$) in YA and PPT ($r2 = 0.630$) in OA. Age, PPT, TMT-A & -B, LTM and the RBANS-VS differed significantly across grip tertiles in OA. Differences in PPT remained significant with LTM and the RBANS-VS, but not TMT-A as a covariate. **Conclusions:** The strongest measured predictor of grip in YA and OA was LTM, but this was less robust in OA. In addition, strength and dexterity were associated in OA, but not YA, and different neuropsychological indices were associated with grip strength in OA and YA, perhaps reflecting changes in peripheral sensorimotor function and/or cognitive domains, even among older adults without cognitive impairment.

OC43- EFFECTS OF PREOPERATIVE FRAILTY ON OUTCOMES FOLLOWING SURGERY AMONG PATIENTS WITH GASTROINTESTINAL TUMORS: A SYSTEMATIC REVIEW AND META-ANALYSIS.

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Backgrounds: Frailty is common in patients who receive gastrointestinal tumor surgery plays an important role in the perioperative period. **Objectives:** This review aimed to explore the effects of preoperative frailty on multiple outcomes following surgery among patients with gastrointestinal tumors. **Methods:** Studies published up to September 2020 were identified by searching the PubMed (Medline), Embase, Web of Science, and other databases. Meta-analysis or qualitative synthesis was performed to examine the relationship between preoperative frailty and adverse postoperative outcomes. **Results:** A total of 26 studies enrolling 121990 patients were included. Through meta-analysis, frailty was associated with an increased risk of total complications (risk ratio [RR] 1.45; 95% confidence interval [CI] 1.40 to 1.50), major complications (RR 1.71; 95% CI 1.50 to 1.95), 30-d mortality (RR 2.38; 95% CI 2.12 to 2.67), 5-year mortality (RR 1.74; 95% CI 1.35 to 2.24). Through qualitative synthesis, compared with non-frail patients, two studies both found that frail patients had worse quality of life, and three studies all reported that frail patients experienced more non-home discharge. However, two

studies got inconsistent conclusions regarding the relationship between frailty and functional status. **Conclusion:** Preoperative frailty was a high-risk factor for multiple adverse postoperative outcomes of patients with gastrointestinal tumors, including objective clinical outcomes and patient-centered outcomes. More original studies focusing on the effects of frailty on patient-centered outcomes like quality of life and functional status are needed.

OC44- ASSOCIATION OF EXECUTIVE FUNCTION AND POSTURAL STABILITY IN COMMUNITY-DWELLING OLDER ADULTS: A LONGITUDINAL APPROACH. Jennifer Blackwood[1], Reza Amini[2], Gerry Conti[3], Quinn Hanses[3], Rebekah Taylor[3], Rachelle Naimi[3], Deena Fayyad[4] *(1. Department of Physical Therapy at the University of Michigan-Flint, USA; 2. Department of Public Health and Health Sciences at the University of Michigan-Flint, USA; 3. Department of Occupational Therapy at the University of Michigan-Flint, USA; 4. Department of Psychology at the University of Michigan)*

Background: Declines in Executive Function (EF) are associated with postural instability in community-dwelling older adults with Mild Cognitive Impairment (MCI). While this has been examined in cross-sectional studies, no longitudinal studies describe the change in EF and balance over time. **Objectives:** The purpose of this study was to examine how performance on the components of the Short Physical Performance Battery (SPPB) are associated with EF in community-dwelling older adults who transition into MCI. **Methods:** The National Health and Aging Trends Study dataset (2011 – 2018) with 1,225 participants in each wave (balanced) was employed. EF levels are defined as normal, mild, mild-to-moderate. EF was measured with the Clock Drawing Test, and SPPB balance tests included side-by-side, semi-tandem, full tandem, and single-leg stance with eyes open or closed. Longitudinal ordered logistic regression was used to examine associations between each balance measure and EF while controlling for comorbidity, function, depression, gender, age, ethnicity, and time (i.e., year). **Results:** EF was significantly associated with tandem, semi-tandem, and single-leg stance after controlling for covariates. One point increase on the SPPB is associated with an 8.2% decreased risk of EF impairment (Odds Ratio (OR)=0.918, $p<0.001$). Among SPPB components, semi-tandem (OR=0.468) and side-by-side (OR=0.472) were the strongest predictors of EF impairment. This finding is uniquely contrasted with previous cross-sectional studies. **Conclusion:** Declines in both EF and balance performance occurred over an eight-year period in community-dwelling older adults. This may reflect common neural processes shared between the cognitive and motor areas of the central nervous system. Best practice suggests screening both postural stability (tandem, semi-tandem, or single-leg stance) and EF in the clinical assessment of community-dwelling older adults.

OC45- SIMPLE CARBOHYDRATE INTAKE AND HIGHER RISK FOR PHYSICAL FRAILTY OVER 15 YEARS IN COMMUNITY-DWELLING OLDER ADULTS. Virginie Chuy[1,2], Mélissa Gentreau[3], Sylvaine Artero[3], Claire Berticat[4], Vincent Rigalleau[1,5], Karine Pérés[1], Catherine Helmer[1,6], Cécilia Samieri[1], Catherine Féart[1] *(1. Univ. Bordeaux, INSERM, BPH, U1219, Bordeaux, France; 2. Univ. Bordeaux, CHU Bordeaux, Department of Dentistry and Oral Health, France; 3. Institute of Functional Genomics, University of Montpellier, CNRS, INSERM, Montpellier, France; 4. ISEM, University of Montpellier, CNRS, EPHE, IRD, Montpellier, France; 5. Univ. Bordeaux, CHU Bordeaux, Department of Endocrinology, France; 6. Clinical and Epidemiological Research Unit, INSERM CIC1401, France.)*

Background: Insulin resistance and the resulting excessive exposure to glucose are believed to be contributors to the mechanisms underlying physical frailty development. Although rich carbohydrate diets may promote insulin resistance, few studies have examined their association with physical frailty risk. **Objectives:** To investigate the spectrum of carbohydrate exposure, including carbohydrate intakes (simple, complex, and total), glycemic load (measure of the diet-related insulin-demand), and adherence to a low-carbohydrate diet (≤45% of energy provided by carbohydrates), and their association with the incident risk of physical frailty in community-dwelling older adults. **Methods:** At baseline, non-frail non-diabetic participants of the Three-City-Bordeaux prospective cohort, aged over 67 years and non-institutionalized, completed a 24H dietary recall used to assess carbohydrate exposures. Physical frailty was defined as the presence of at least 3 out of 5 criteria on the FRAIL scale (i.e. Fatigue, Resistance, Ambulation, Illnesses, and weight Loss) and was assessed at each of the six follow-up visits over 15 years. Associations between carbohydrate exposures and incident physical frailty were estimated using mixed-effects logistic regression models adjusted for sex, age, education, smoking status, alcohol consumption, depressive symptomatology, global cognitive performances, and protein and energy intakes. **Results:** The sample included 1,210 participants (62% females, mean age 76 years). Baseline average carbohydrate intake was 209 ± 74 g/d (100 ± 44 g/d and 109 ± 50 g/d for simple and complex carbohydrates, respectively), average glycemic load was 107 ± 41 U/d, and 45% of the participants reported a low-carbohydrate diet. Over the follow-up, 295 (24%) incident cases of physical frailty were documented (28% in females, 18% in males). In fully adjusted models, higher intake of simple carbohydrates was significantly associated with greater odds of incident physical frailty (per 1 standard deviation increase, OR: 1.29; 95% CI: 1.02, 1.62), specifically among males (OR: 1.52; 95% CI: 1.04, 2.22). No association was observed in females or with complex or total carbohydrate intake, glycemic load, or low-carbohydrate diet. **Conclusion:** Among the whole carbohydrate exposure, only higher consumption of simple carbohydrates in older males was associated with a higher risk of developing physical frailty. Further studies are required to explore underlying mechanisms.

OC46- WEIGHT VARIABILITY, PHYSICAL FUNCTIONING AND INCIDENT DISABILITY

IN OLDER ADULTS. Katie McMenamin, Joshua F. Baker *(Perelman School of Medicine at the University of Pennsylvania, USA)*

Background: While unintentional weight loss and sarcopenia are known to be associated with frailty in older adults, it is unclear how fluctuations in weight over time might be associated with the development of frailty. Previous studies have shown associations between body weight cycling and adverse health effects such as increased risk of cardiovascular events, death, cancer, and various other types of incident disease. **Objective:** The goal of this study was to determine if high levels of body weight variability are associated with declines in physical functioning and incident disability in older adults. **Methods:** We defined weight variability as the average successive variability of semiannual BMI measurements during the first 3 years of the Health, Aging and Body Composition study, and categorized participants into quintiles from lowest to highest variability. Outcomes included change in Health ABC Score (a physical performance battery) and time to incident disability. Linear regression was used to assess the relationship between weight variability and changes in BMI, ALMI, FMI and physical performance during the first three years of the study, while Cox proportional hazards models assessed the relationship between weight variability and subsequent time to incident disability, adjusting for confounding factors. **Results:** Participants in the highest quintile of BMI variability were significantly more likely to lose both body mass (β = -0.085, $p < 0.01$) and fat mass (β = -0.059, $p = 0.044$) and had a greater decline in HABC Score (β = -0.094, $p < 0.01$) compared to participants with the least variability over three years. Participants in the highest quintile also had a higher risk of incident disability (HR = 1.36 [95% CI: 1.07, 1.72]), $p = 0.01$). Our results support the hypothesis that body weight variability in older adults is associated decline in physical performance and incident disability, and may be a useful biomarker for sarcopenia. **Conclusion:** Body weight variability in older adults is associated decline in physical performance and incident disability, and this relationship cannot be explained by weight loss alone. These results support the hypothesis that body weight variability represents a feature of frailty and may be a valuable biomarker.

OC47- EVALUATION OF THE VALUE OF THE SARQOL® QUESTIONNAIRE IN SCREENING FOR SARCOPENIA. Anton Geerinck[1], Bess Dawson-Hughes[2], Charlotte Beaudart[1], Médéa Locquet[1], Jean-Yves Reginster[1,3], Olivier Bruyère[1,4,5] *(1. Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium, World Health Organization Collaborating Center for Public Health aspects of musculo-skeletal health and ageing; 2. Jean Mayer USDA Human Nutrition Research Center on Aging, Tufts University, Boston, MA, USA; 3. Chair for Biomarkers of Chronic Diseases, College of Science, King Saud University, Riyadh, Kingdom of Saudi Arabia; 4. Department of Sport Rehabilitation Sciences, University of Liège, Belgium; 5. Physical, Rehabilitation Medicine and Sports Traumatology, SportS2, University Hospital of Liège, Belgium)*

Background: Because of its low prevalence and the relative complexity of its diagnosis, recruiting sarcopenic people for clinical studies can be resource-intensive. The same applies to clinical practice, where sarcopenia often goes undetected because of a lack of time and resources. Screening instruments can play a role in both situations and provide a cost-effective measure to increase detection of sarcopenia. **Objectives:** To investigate whether a 55-item auto-administered questionnaire, designed to measure quality of life in sarcopenia, could be used to identify older people with a high likelihood of being sarcopenic, and to compare its performance to the SARC-F tool. **Methods:** We performed a secondary analysis of data from older, community-dwelling participants of the SarcoPhAge study. We included all individuals who were evaluated for sarcopenia according to the EWGSOP2 criteria, and who completed the SarQoL and SARC-F questionnaires. We determined the optimal threshold to distinguish between sarcopenic and non-sarcopenic people with the Youden index. Diagnostic performance was evaluated with the area under the ROC curve (AUC) and by calculating sensitivity (Se), specificity (Sp), positive predictive value (PPV) and negative predictive value (NPV). **Results:** A total of 309 participants, with a median age of 74 (70-79) years and mostly women (n=180; 58.3%), were included in the analysis. The prevalence of sarcopenia, according to the EWGSOP2 criteria, was 5.5% (n=17). An optimal threshold value of ≤52.4 points was found for the SarQoL questionnaire, with a sensitivity of 64.7%, a specificity of 80.5% and an AUC of 0.771 (0.652-0.889). This corresponds to a PPV of 16.2% and an NPV of 97.5%. Compared to the SARC-F, the SarQoL has greater sensitivity (64.7% vs 52.39%), but slightly lower specificity (80.5% vs. 86.6%). Correspondingly, the SARC-F has a higher PPV at 18.8% but a lower NPV at 96.9%. The AUC of the SARC-F was 0.802 (0.696-0.909), which was not significantly different from the SarQoL questionnaire (p=0.606). **Conclusion:** This exploratory study found that the SarQoL questionnaire and the SARC-F provided comparable diagnostic accuracy in identifying sarcopenic people. The SarQoL could be useful in a screening strategy, while providing a measurement of quality of life at the same time.

OC48- AN ELECTRONIC FRAILTY INDEX PREDICTS IN-HOSPITAL MORTALITY IN GERIATRIC PATIENTS. Jonathan K. L. Mak[1], Maria Eriksdotter[2,3], Laura Kananen[1,4], Ralf Kuja-Halkola[1], Anne-Marie Boström[3,5], Miia Kivipelto[2,3], Martin Annetorp[2,3], Carina Metzner[2,3], Sara Hägg[1], Viktoria Bäck Jerlardtz[6], Malin Engström[7], Peter Johnson[8], Lars Göran Lundberg[9], Elisabet Åkesson[10], Carina Sühl Öberg[11], Maria Olsson[12,13], Tommy Cederholm[2,3,14], Dorota Religa[2,3], Juulia Jylhävä[1] *(1. Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden; 2. Division of Clinical Geriatrics, Department of Neurobiology, Care sciences and Society, Karolinska Institutet, Stockholm, Sweden; 3. Theme Inflammation and Aging, Karolinska University Hospital, Huddinge, Sweden; 4. Faculty of Social*

Sciences, Tampere University, Tampere, Finland; 5. Division of Nursing, Department of Neurobiology, Care Sciences and Society, Karolinska Institutet, Stockholm, Sweden; 6. Department of Geriatric Medicine, Jakobsbergsgeriatriken, Stockholm, Sweden; 7. Department of Geriatric Medicine, Sabbatsbergsgeriatriken, Stockholm, Sweden; 8. Department of Geriatric Medicine, Capio Geriatrik Nacka AB, Nacka, Sweden; 9. Department of Geriatric Medicine, Dalengeriatriken Aleris Närsjukvård AB, Stockholm, Sweden; 10. Research and Development Unit, Stockholms Sjukhem, Stockholm, Sweden; 11. Department of Geriatric Medicine, Handengeriatriken, Aleris Närsjukvård AB, Stockholm, Sweden; 12. Department of Geriatric Medicine, Capio Geriatrik Löwet, Stockholm, Sweden; 13. Department of Geriatric Medicine, Capio Geriatrik Sollentuna, Stockholm, Sweden; 14. Department of Public Health and Caring Sciences, Uppsala University, Uppsala, Sweden)

Background: Frailty screening at hospital admission can identify patients at risk of adverse outcomes. However, the currently used frailty measure in Sweden, the Clinical Frailty Scale (CFS), requires in-person assessment and is not always feasible. **Objectives:** To develop an electronic frailty index (eFI) using medical records in the TakeCare journal system at geriatric clinics and compare its predictive ability for in-hospital mortality to other validated frailty and comorbidity measures. **Methods:** Patients admitted to 12 geriatric clinics in the Stockholm area between March 1, 2020 and April 16, 2021 were included. The eFI was constructed using 44 items (diagnoses, functioning and laboratory measures) according to the Rockwood FI model. Other frailty and comorbidity measures that were assessed included the CFS and Hospital Frailty Risk Score (HFRS), and the Charlson Comorbidity Index (CCI). Both the HFRS and CCI were calculated based on International Classification of Diseases, Tenth Revision (ICD-10) codes. The primary outcome, in-hospital mortality, was defined as deaths during the hospital stay at geriatric care unit. Analyses were performed separately in patients treated for COVID-19 and other causes using logistic regression models and areas under the receiver operating characteristic curve (AUC). **Results:** Among the 13,961 patients with eFI available (median age 83 years), 19.2% were treated for COVID-19 and 80.8% for other causes; death rates in the two groups were 10.4% and 1.2% respectively. In both patient groups, the eFI (COVID-19 patients: odds ratio [OR] per 10% increase in the eFI=3.41; 95% confidence interval [CI]=2.68–4.35; other patients: OR=5.18, 95% CI=3.85–6.98), as well as the CFS, HFRS and CCI, were all associated with higher odds of in-hospital mortality after adjusting for age and sex. Of all the frailty and comorbidity measures, the eFI had the best predictive accuracy for in-hospital mortality in patients treated for COVID-19 (AUCs for eFI=0.77, CFS=0.76, HFRS=0.72, CCI=0.71) and for other causes (AUCs for eFI=0.82, CFS=0.73, HFRS=0.70, CCI=0.77). **Conclusions:** An eFI based on routinely collected medical records has a good predictive accuracy for in-hospital mortality. When automated, the eFI can be applied for frailty screening and risk stratification in hospitalized geriatric patients.

OC49- DOES SARCOPENIA INCREASE THE RISK OF TRANSITIONS IN FRAILTY STATUS? Alejandro Álvarez-Bustos[1], Jose Antonio Carnicero-Carreño[1,2], Francisco Javier Garcia-Garcia[1,4], Cristina Alonso-Bouzón[1,4], Leocadio Rodríguez-Mañas[1,4] *(1. Biomedical Research Center Network for Frailty and Healthy Ageing (CIBERFES), Institute of Health Carlos III, Madrid, Spain; 2. Biomedical Research Foundation, Getafe University Hospital, Getafe, Spain; 3. Geriatrics Department, Virgen del Valle Hospital, Toledo, Spain; 4. Geriatrics Department, Getafe University Hospital, Getafe Spain)*

Backgrounds: Frailty is a dynamic condition over time and one of the key forerunner elements of disability. A recent study suggests the existence of different frailty phenotypes, being the presence/absence of sarcopenia one risk factor that could modify the outcomes of frailty. **Objectives:** Following this hypothesis, the aim of this work is to assess whether sarcopenia influences frailty transitions. **Methods:** Data from the Toledo Study in Healthy Aging were used. Follow-up time range was from 2.1 to 4 years. Frailty was defined using the the Frailty Trait Scale 5 (FTS5) and the Frailty Phenotype (FP). Both frailty tools were measured at baseline and at follow-up. Basal sarcopenia was diagnosed according to the Foundation for the National Institutes of Health criteria. The association between basal sarcopenia and changes of the frailty status (transitions) were assessed using hierarchical logistic regression model (Frail vs No frail [FP and FTS5]; Prefrail vs Robust [FP]) adjusted by Age, Gender, Charlson Index, sarcopenia and frailty status at baseline. Differences were evaluated using the Mann-Withney and Chi-square tests. Fisher's exact test was used to determine whether the transition between the different frailty states was modified by the presence (or absence) of sarcopenia. **Results:** 1538 subjects (45.51% male, 74.73±5.73 years) were included. Sarcopenics (348) had a statistically significant higher risk of worsen their frailty status in the fully adjusted model independently the tool used [FP: robust-to-prefrail 1.88 (1.33-2.66;p-value<0.001), nonfrail-to-frail 3.73 (1.86-7.46;p-value<0.001); FTS5: 3.52 (2.27-5.46;p-value<0.001)]. Moreover, robust individuals with sarcopenia were less likely to remain robust (FTS5:61.43%; FP:53.46%) when comparing with non-sarcopenic (FTS5:81.37%; FP:71.08%), and more likely to develop frailty (FTS5: 22.42%;FP:5.03%) than non-sarcopenic (FTS5:3.99%; FP:1.00%) (p-value<0.001). Moreover, a lower rate of sarcopenic prefrail improve their frailty status (29.27% vs 45.22%) and a higher rate worsened (10.98% vs 3.68%) when comparing with non-sarcopenic according with the FP (p-value<0.001). **Conclusions:** These results suggest that sarcopenia modulates the evolution of the frailty status, supporting the hypothesis of the existence of different clinical phenotypes. Accordingly, determining both frailty and sarcopenia statuses is recomendable as part of the clinical approach to those patients.

OC50- CORRECTING FOR SUBCUTANEOUS ADIPOSE TISSUE MARGINALLY IMPROVES THE ASSOCIATION BETWEEN ULTRASOUND ECHO INTENSITY AND MAGNETIC RESONANCE PROTON DENSITY FAT FRACTION. Benjamin Rush[1], Sujay Garlapati[1], Jevin Lortie[1], Katie Osterbauer[1], TJ Colgan[2], Ken Lee[2], Brian Anthony[3], Scott B. Reeder[2], Adam Kuchnia[1] *(1. Nutritional Sciences Department, University of Wisconsin-Madison, Madison, WI, USA; 2. Department of Radiology, University of Wisconsin-Madison, Madison, WI, USA; 3. Institute for Medical Engineering and Science, Massachusetts Institute of Technology, Cambridge, MA, USA)*

Background: Myosteatosis is a consequence of aging and is associated with increased frailty and metabolic dysfunction. Ultrasound (US) echo intensity (EI) is used as a convenient bedside measure of myosteatosis; however, EI measures of myosteatosis are limited by US image depth and wave penetration through tissue, including subcutaneous adipose tissue (SAT). EI has been adjusted by a thickness correction factor, which improved the association between EI and a magnetic resonance (MR)-based, T1-weighted intramuscular percent fat reference measure in a small sample. Problematically, T1-weighted measures are non-quantitative, susceptible to magnetic field inhomogeneities, and indirectly estimate fat, and ultrasound transducer compression on tissue, which may affect EI, is often unknown. **Objectives:** Therefore, we propose using MR proton density fat fraction (PDFF) as a reference to determine the benefit of correcting EI for SAT thickness using known compression forces in a larger sample. We hypothesize EI corrected for SAT thickness is more associated with PDFF than uncorrected EI. **Methods:** We measured PDFF in the mid-thigh rectus femoris using chemical-shift encoded MRI, EI, and SAT thickness in 25 participants (ages 19-82). We captured 6 US images of the rectus femoris at 5, 10, and 15 newtons of force (2 images per force) and SAT thickness. We generated an EI correction factor for SAT thickness by fitting a regression line for EI and SAT thickness for each participant, then averaging the regression lines. We conducted spearman correlations between uncorrected EI, corrected EI, SAT thickness, and PDFF. We also conducted a multiple regression with uncorrected EI and SAT thickness predicting PDFF. **Results:** Corrected EI, uncorrected EI, and SAT thickness were similarly associated with PDFF (r=0.59; r=0.54, r=0.50; p<0.05, respectively). The multiple regression using uncorrected EI and SAT thickness to predict PDFF had an r=0.60 (p=0.009). Transducer compression had no evident pattern with PDFF. **Conclusion:** Correcting EI for SAT thickness marginally improves the association between EI and PDFF though EI and SAT thickness, independently or cumulatively, also serve as useful predictors of PDFF. More research is needed to determine the strengths of association of EI and SAT thickness with PDFF by age, health status, and gender.

OC51- NEUROFILAMENT-LIGHT CHAINS (NF-L), A BIOMARKER OF NEURONAL DAMAGE, IS INCREASED IN SARCOPENIC PATIENTS: RESULTS OF THE SARCOPHAGE STUDY. Aurélie Ladang[1], S. Kovacs[1], L. Lengelé[2], M. Locquet[2], J.Y. Reginster[2,3], O. Bruyère[2,4], E. Cavalier[1] *(1. Clinical Chemistry department, CHU Liège; Belgium; 2. WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Aging, Division of Public Health, Epidemiology and Health Economics, University of Liège, Belgium; 3. Chair for Biomarkers of Chronic Diseases, Biochemistry Department, College of Science, King Saud University, Riyadh, KSA; 4. Physical, Rehabilitation Medicine and Sports Traumatology, SportS2, University Hospital of Liège, Belgium)*

Background: Recently, several papers have made the hypothesis that sarcopenia might partially due to a nervous system failure. Indeed, part of the diagnosis is based on volitional tasks that require the integrity of the nervous system to be properly realized. In the recent years, neurofilament light chains (NF-L) have emerged as a new highly specific blood-biomarker of neuronal damage. Its expression has been reported to be modified in both central and peripheral neuropathies as well as traumatic brain injuries. **Objectives:** In this study, we measured NF-L in a large cohort of older individuals to define its expression in presence of sarcopenia. **Methods:** The SarcoPhAge cohort is a Belgien cohort of community-dwelling older adults. A diagnosis of sarcopenia was established according to the European Working Group on Sarcopenia in older People 2 (EWGSOP2) criteria. Muscle strength was evaluated with a hydraulic hand-dynamometer, appendicular lean mass by Dual-Energy X-Ray Absorptiometry and physical performance by the Short Physical Performance Battery test (SPPB). NF-L, was measured on all the available sera collected at time of inclusion (n=409) using the SiMoA technology (Quanterix°). **Results:** NF-L was increased in sarcopenic patients (median NF-L: 43.0 pg/mL) compared to controls (median NF-L: 21.1 pg/mL) (p-value: < 0.0001). We also observed a significant difference between subjects with high SPPB score (score: 10 – 12) (median NF-L: 19.5 pg/mL), intermediate SPPB score (score: 7 – 9) (median NF-L: 24.5 pg/mL) and low SPPB score (score: 0 - 6) (median NF-L: 27.7 pg/mL) (p-value: <0.0001). The rank correlation gave a Spearman's rho of -0.267 (p-value <0.0001). A significant correlation was also observed between appendicular lean mass/height2 (ALM/h2) and NF-L (rho: -0.200; p-value <0.0001) but also between handgrip strength and NF-L (rho: -0.196; p-value =0.0001). In a multiple regression after adjustment for potential confounding variables, NF-L was independently associated with SPPB score (p-value: <0.0001) but not with ALM/h2 or handgrip strength. **Conclusions:** In this study, we showed that NF-L is increased in sarcopenic patients and is more particularly associated with SPPB score. Our results suggest that sarcopenia may share common features with neurodegenerescence.

OC52- IMPROVEMENT IN FUNCTIONAL STATUS AT 2 YEARS IN PRE-FRAIL AND FRAIL OLDER PEOPLE WITH TYPE 2 DIABETES MELLITUS

FOLLOWING A MULTIMODAL INTERVENTION-MIDFRAIL CLINICAL TRIAL. Olga Laosa[1,2], Laura Pedraza[2], Alan Sinclair[3], Eva Topinkova[4], Isabelle Bourdel-Marchasson[5], Bruno Vellas[6], Andrej Zeyfang[7], Giuseppe Paolisso[8], Mikel Izquierdo[9], Leocadio Rodriguez Mañas[1,10] *(1. Centre of Network Biomedical Research on Frailty and Healthy Ageing (CIBERFES), Institute of Health Carlos III, Madrid, Spain; Institute of Biomedical Research, University Hospital of Getafe, Getafe, Madrid, Spain; 2. Institute of Biomedical Research, University Hospital of Getafe, Getafe, Madrid, Spain; 3. fDROP and King's College, London, UK; 4. Department of Geriatrics, First Faculty of Medicine, Charles University, Prague, Czech Republic; 5. UMR 5536, Bordeaux University / CNRS ; CHU Bordeaux, Bordeaux, France; 6. Gérontopôle de Toulouse, Institut du Vieillissement, Centre Hospitalo-Universitaire de Toulouse, Toulouse, France; 7. Department of Internal Medicine, Geriatric Medicine, Palliative Medicine and Diabetology, medius Klinik Ostfildern-Ruit, Germany; 8. Department of Advanced Medical and Surgical Sciences, University of Campania «Luigi Vanvitelli» Piazza Miraglia, Naples, Italy; 9. Navarrabiomed, Complejo Hospitalario de Navarra (CHN), Universidad Pública de Navarra (UPNA), IdiSNA, Pamplona, Spain; 10. Division of Geriatrics, University Hospital of Getafe, Getafe, Spain)*

Backgrounds: Diabetes and frailty are two associated highimpact conditions. Frailty is a risk factor for disability in older people and increases the health burden of diabetes. The multimodal intervention has shown to be useful in the main cohort of the MIDFRAIL study with 1 year of follow-up, in terms of improvement of the functional status measured by the SPPB test. **Objectives:** To assess the effectiveness of the multimodal intervention on functional capacity in the cohort of frail/prefrail 70+ years patients with type 2 diabetes included in MIDFRAIL randomized clinical trial, followed for 2 years. **Methods:** A cohort of 260 participants in the multicenter, cluster-randomized clinical trial MIDFRAIL study from 5 countries was followed-up until 2 years. The multimodal intervention included an educational and nutritional program, glycosylated hemoglobin (HbA1c), and blood pressure targets according to EDWPOP 2011 guidelines and individualized resistance training. The resistance training program lasted 16 weeks and was repeated in the second year under similar conditions. **Results:** 260 participants (160 in usual care groupUCG, and 100 in intervention group-IG) completed 2 years of follow-up. Mean age was 77.8 +5.72 years, 46.5% were female and 32.7% were frail. After 2 years of follow-up, there was an improvement in SPPB of 0.75 points (8.60 in screening visit to 9.35 after 2 years) in IG (p 0.001) while in UCG decreased 0.28 points (from 9.39 in screening to 9.11 after 2 years). In IG, the results after 1 year of follow-up were similar to 2 years (SPPB (1st year) 9.56 and SPPB (2nd year 9.35; p0.31) and the results after the training period (week 16 and week 68) in the 1st and 2nd year were similar as well (9.80 and 9.79 p0.31, respectively). **Conclusion:** A multimodal intervention program used in MIDFRAIL randomized clinical trial in older people frail and prefrail with type 2 diabetes improves the function in a clinically significant way and the benefit remains along the time at least until 2 years even though the physical exercise program had finished 36 weeks before the final assessment.

OC54- SOCIOECONOMIC POSITION AND RISK OF SARCOPENIA IN COMMUNITY-DWELLING OLDER ADULTS: FINDINGS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING. Lauren Swan[1], Austin Warters[2], Maria O'Sullivan[1] *(1. Department of Clinical Medicine, School of Medicine, Trinity College Dublin (TCD), Dublin 8, Ireland; 2. Older Person Services, Dublin North City and County Community Health Organisation, Health ServiceExecutive, Dublin 9, Ireland)*

Backgrounds: Maintaining muscle function throughout the life course is a crucial component of successful aging. Research has highlighted the association between socioeconomic disadvantage and adverse health outcomes however, this has not been extensively studied for the muscle disease sarcopenia. **Objectives:** This study aimed to estimate the prevalence of probable sarcopenia overall, and according to socioeconomic position (SEP), based on the European Working Group on Sarcopenia in Older People (EWGSOP2) criteria. Furthermore, to determine risk factors for probable sarcopenia, including markers of SEP, in a large population of community-dwelling older adults. **Methods:** This cross-sectional study comprised 5031 community dwelling older adults [mean age (SD), 70.0 (7.2)] from Wave 6 of the English Longitudinal Study of Ageing (ELSA). Probable sarcopenia was identified by poor chair-rise test performance and/or low hand grip strength as recommended by EWGSOP2. SEP was determined by years of formal education. Backward stepwise logistic regression was employed for multivariate analysis of sarcopenic risk factors. **Results:** Overall, probable sarcopenia was detected in 23.6% of the study population with mean age 70.0 ± 7.2 years. The prevalence of probable sarcopenia was significantly higher amongst older adults of low vs high SEP (49.1% vs. 16.0%, p<0.001). Based on stepwise logistic regression analysis, disadvantaged SEP [OR, CI 1.48 (1.11, 1.97) p= 0.007], increasing age [OR, CI 1.10 (1.09, 1.12) p<0.001], physical inactivity [OR, CI 3.07 (2.46, 3.83) p<0.001], underweight BMI [OR, CI 2.26 (1.08, 4.73) p=0.030], number of chronic conditions [OR, CI 1.28 (1.21, 1.37) p<0.001] and minority group ethnicity [OR, CI 1.85 (1.17, 2.94) p=0.009] were significantly associated with probable sarcopenia. Additionally, obese BMI appeared to have protective effects [OR, CI 0.79 (0.64, 0.99) p=0.004]. **Conclusion:** Overall, 23.6% of community dwelling older adults had probable sarcopenia, rising to 49% in those living with disadvantaged SEP. Probable sarcopenia was associated with older age, physical inactivity, co-morbidity, underweight BMI, ethnicity and disadvantaged SEP. The study highlights the importance of developing inclusive screening and prevention strategies targeting those most at risk of sarcopenia in older populations.

OC55- EFFECTS OF BODY COMPOSITION ON LONGITUDINAL GRIP STRENGTH IN CARDIOVASCULAR DISEASE PATIENTS FROM THE UK BIOBANK. Fayeza Ahmad, Rosie Fountotos, Aayushi Joshi, Jonathan Afilalo *(Experimental Medicine, McGill University, Quebec, Canada; Clinical Epidemiology and Division of Cardiology, Jewish General Hospital, Quebec, Canada)*

Background: Handgrip strength (HGS) is a marker of physical frailty and sarcopenia that has been shown to predict cardiovascular events and mortality. Most studies have examined HGS at a single point in time, with little data on longitudinal changes in HGS and its determinants. **Objectives:** We sought to determine the factors associated with worsening HGS in cardiovascular patients, specifically factors related to body composition. **Methods:** Post hoc analysis of 10,514 participants (age at baseline 40-69 years) from the the UK Biobank. HGS was measured at baseline between 2006-2010 and then at follow-up in 2014, and classified according to the sex-stratified FNIH criteria as normal, intermediate, or weak. Logistic regression was used to determine the effect of age, sex, whole-body fat free mass and fat mass (using bioimpedance), and cardiovascular comorbidities on transitions to weaker classes of HGS. **Results:** A total of 1,722 (16%) participants transitioned to a weaker HGS class over 4-8 years of follow-up. Factors associated with weakening were: age (OR 1.06 per year; 95% CI 1.05-1.07; P<0.01), male sex (OR 2.04; 95% CI 1.56-2.65; P<0.01), whole-body fat free mass (OR 0.90 per kg; 95% CI 0.86-0.94; P<0.01), whole-body fat mass (OR 1.09 per kg; 95% CI 1,06-1.12; P<0.01), ischemic heart disease (OR 1.25; 95% CI 1.09-1.44; P<0.01) and hypertensive heart disease (OR 1.26; 95% CI 1.08-1.48; P<0.01). **Conclusion:** Older adults with lower fat-free mass and higher fat mass, especially with comorbid ischemic and hypertensive heart disease, are more likely to develop progressive weakness. Clinicians should be cautious with patients with these risk factors and take the necessary precautions to decrease risk of frailty-related adverse events.

OC56- THE IMPACT OF A LIVE ONLINE EXERCISE TRAINING PROGRAM ON OLDER ADULTS' LEVELS OF PHYSICAL ACTIVITY: A PILOT RCT. Giulia Coletta[1], Angelica Mcquarrie[1], Julia Di Bussolo[2], Paula Bochnak[2], Stuart Phillips[1,2] *(1. Department of Kinesiology, McMaster University, Hamilton, ON, Canada; 2. Physical Activity Centre of Excellence, McMaster University, Hamilton, ON, Canada)*

Background: Prolonged inactivity, such as those during the COVID-19 pandemic, may negatively affect older adults, including mental and physical health declines. Exercise effectively mitigates declines in physical and mental health; however, older adults prefer live instruction as it fosters a sense of social connectivity. Implementing new live streaming technologies to deliver home-based workouts to older adults may be a safe and effective way to enhance physical activity, mitigate declines in health, and maintain social connectivity. **Objectives:** We aimed to evaluate the feasibility of an age-appropriate and ability-modified low-risk exercise and activity program via live video streams on accelerometer-determined daily steps, moderate to vigorous intensity physical activity (MVPA), and daily energy expenditure (DEE) in older adults. **Methods:** In this two-arm, pilot RCT, we randomly assigned physically inactive community-dwelling adults (65-80 years) to a waitlist control (CON) group or an active group (ACTIVE). The active group participated in a thrice-weekly, 8-wk online live exercise program delivered via Zoom by trained professionals. The program had a focus on strength, balance, and aerobic training. Pre- and post-intervention individuals' daily steps, metabolic equivalent of task (MET), and daily energy expenditure (DEE) were collected using an arm-worn accelerometer (BodyMediaTM unit) for 7 consecutive days. **Results:** A total of 15 participants (mean age 70±5; 73% women; 80.4±17.0 kg; 28.9±5kg/m^2) were randomized (ACTIVE, n=8; CON, n=7). Attendance to online classes was 100% and all ACTIVE participants reported being satisfied with the exercise sessions. There was no effect of the intervention compared to CON on daily steps (ACTIVE=3852 steps/d; CON=3239 steps/d), MVPA (ACTIVE=1.2 MET; CON=1.2 MET), or DEE (ACTIVE=1804 kcal/d; CON=1434 kcal/d; all p>0.05). Trends for increased daily steps and MVPA were observed (+896 mean daily steps; p=0.09) (+0.07 MET; p=0.07) in the ACTIVE group. **Conclusion:** We demonstrated good feasibility, adherence, and provided insight into the preliminary efficacy of a live online exercise program on older adults' habitual levels of physical activity. A full RCT is needed to extend these findings.

OC57- OSTEOSARCOPENIA PREDICTS MORTALITY IN OLDER ADULTS WITH SEVERE AORTIC STENOSIS UNDERGOING TRANSCATHETER VALVE REPLACEMENT. Pablo Solla[1,2], Julia Rodighiero[1], Neelabh Rastogi[1], Andrew Meng[1], Jonathan Afilalo[1] *(1. Division of Cardiology & Centre for Clinical Epidemiology. Jewish General Hospital, McGill University, Canada; 2. Division of Geriatric Medicine & Health Research Institute of Asturias (ISPA). Hospital Monte Naranco, Asturian, Health Service, Spain)*

Background: Osteosarcopenia, the concomitance of osteopenia and sarcopenia, is the final pathway of the functional decline of muscle and bone tissues. **Objectives:** To determine the impact of osteosarcopenia in older adults with severe aortic stenosis undergoing transcatheter aortic valve replacement (TAVR). **Methods:** Patients ≥70 years of age who underwent TAVR from the FRAILTY-AVR study were included. For osteosarcopenia assessment, we analyzed computerized tomography examinations routinely performed before TAVR. Primary outcome was 1-year all-cause mortality. Secondary outcomes were hospital length of stay, 30-day all-cause mortality, discharge to location other than home and quality of life and functional deconditioning at 1-year post-procedure. Multivariable regression models were used to adjust for confounders. **Results:** 400 patients were evaluated.

The mean age was 83.3±5.9 years, and 296 (74%) patients were > 80. There were 174 (44%) females and prevalence of frailty was 36-51%. Mean bone density by trabecular attenuation was 101.6±36 HU and mean total psoas muscle area at L4 level was 17.9±5.6 cm2. We divided the cohort in 4 groups based on musclebone status: normal (27.5%), osteopenia (22.5%), sarcopenia (22.5%) and osteosarcopenia (27.5%). Osteosarcopenia patients were older (84.8±5.7 years old, p<0.001), had higher procedure associated risk (TAVI2-SCORe 2.5±1.1, p=0.002), higher prevalence of frailty (SPPB 5.3±3.2, 52% frail, p=0.006), more functional limitations in instrumental (67%, p=0.005) and basic (25%, p=0.03) activities, as well as a worse mental (27% scored MMSE <24) and nutritional status (MNA-SF 10.7±2.7, p<0.001). 1-year all-cause mortality was higher in the osteosarcopenia group (27%) than in the sarcopenia (19%), osteopenia (14%), and normal (7%) groups (p=0.001). After adjustment for age, sex, body mass index, procedure related risk, comorbidity, frailty or cognitive impairment the presence of osteosarcopenia conferred a 3-fold risk of 1-year mortality (OR 3.04, 95 % confidence interval 1.23-7.50) after TAVR. **Conclusion:** Osteosarcopenia confers a 3-fold increased risk for 1-year mortality after TAVR. Adding its evaluation to the comprehensive geriatric assessment before this procedure should be considered.

OC58- STUDY DESIGN AND RATIONALE FOR HERA: A PHASE I/II STUDY EVALUATING THE EFFECTS OF INTRAVENOUS DELIVERY OF LOMECEL-B ON VACCINE-SPECIFIC ANTIBODY RESPONSES IN SUBJECTS WITH AGING FRAILTY. Kevin N. Ramdas, Keyvan Yousefi, Geoff Green, Lisa Moss, Ben Hitchinson, Liliana Diaz, Jessica Protenic, Joshua M. Hare, Anthony A. Oliva, Jr. *(Longeveron Inc., Miami, FL, USA)*

Background: Aging Frailty is a major geriatric syndrome predisposing the afflicted to detrimental health outcomes. Frailty is characterized by a chronic low-grade inflammatory status (inflammaging) with detrimental consequences including impaired B-cell function that in turn impairs immunity following vaccination. There is no approved treatment for frailty or the impaired immune capacity in this population; therefore, introducing novel strategies to restore immunity and physiological capacity in frail older adults remains an unmet clinical need. Lomecel-B, an allogeneic product of bone-marrow-derived medicinal signaling cells, with immunomodulatory properties can ameliorate inflammaging and may improve B-cell function. However, there are no controlled studies to evaluate the effects of Lomecel-B to improve immunogenicity in older adults with aging frailty following vaccination. **Objectives:** This study aims to evaluation the safety and efficacy of Lomecel-B in frail older adults following influenza vaccination. Efficacy measures include immunogenicity after vaccination and effects on frailty symptoms. **Methods:** This is a randomized, double-blind placebo-controlled, multicenter study enrolling older adults aged 65-90 with a score of 4 to 7 on the CSHA Clinical Frailty Scale and a 6-minute walk distance of 200-400m. In Phase I, 3 Safety Run-In subjects were given a single peripheral intravenous infusion of 20M Lomecel-B followed by influenza vaccination at 1-week. Next, 19 subjects were randomized to receive an infusion of 100M Lomecel-B, followed by influenza vaccination at 1-week or 4-weeks after infusion to determine the optimal time-point for administering the vaccine after Lomecel-B. Findings from the pilot phase indicated an optimal interval of 1-week. In Phase II, 39 subjects received either Lomecel-B or placebo, followed by influenza vaccine 1-week later. **Results:** The primary safety endpoint was Incidence of any TE-SAE. The primary efficacy endpoint was the immunogenicity of the influenza trivalent vaccine at baseline and after vaccination by hemagglutination inhibition assay. Additional efficacy measures include B-cell function, prevention of disease caused by influenza virus and assessments of physical strength and endurance, quality-of-life (QOL) and activities of daily living (ADL), cognitive function, and blood-based biomarkers. **Conclusion:** We describe the design and rationale for a phase I/II study assessing the safety and efficacy of Lomecel-B following influenza vaccination in older adults with Aging Frailty.

OC59- EXPLORING EARLY DETECTION OF FRAILTY SYNDROME IN OLDER ADULTS: EVALUATION OF BIOMARKERS, CLINICAL PARAMETERS AND MODIFIABLE RISK FACTORS. Armanda Teixeira-Gomes[1,2,3,4], Filipa Esteves[1,2,4], Susana Silva[2], Vanessa Valdiglesias[1,5,6], Blanca Laffon[6,7], Joao Paulo Teixeira[1,2,4] Solange Costa[1,2,4] *(1. EPIUnit, Institute of Public Health, University of Porto, Porto, Portugal; 2. Environmental Health Department, National Institute of Health, Porto, Portugal; 3. ICBAS - Institute of Biomedical Sciences Abel Salazar, University of Porto, Porto, Portugal; 4. Laboratory for Integrative and Translational Research in Population Health (ITR), Porto, Portugal; 5. Centro de Investigaciones Cientificas Avanzadas (CICA), Departamento de Biologia, Facultad de Ciencias, Universidade da Coruna, Grupo DICOMOSA, Campus A Zapateira, A Coruna, Spain; 6. Instituto de Investigacion Biomédica de A Coruna (INIBIC), AE CICA-INIBIC, A Coruna, Spain; 7. Centro de Investigaciones Cientificas Avanzadas (CICA), Departamento de Psicologia, Facultad de Ciencias de la Educacion, Universidade da Coruna, Grupo DICOMOSA, Campus Elvina, A Coruna, Spain)*

Background: Older adults are a well-recognized susceptible population given the decline in multiple body systems, characterized by loss of function and physiologic reserve, as well as increased vulnerability to external stressors. As a susceptible population, the burden of environmentally induced disease and lifestyle risk factors became an increasing concern. Frailty is a multidimensional geriatric syndrome, identified as the most common condition leading to disability, institutionalization and death in older adults. Despite the acknowledged biological basis, no particular biological trait has been consistently associated with frailty syndrome until now. **Objectives:** IIn light of this, our aim was to explore a possible link between frailty syndrome and biomarkers, as well

as understand the association of clinical parameters and lifestyle factors with this geriatric syndrome. **Methods:** Biomarkers of genomic instability were evaluated in a group of Portuguese older adults (≥65years old) classified according to their frailty status. The influence of nutritional status, cognitive function, depression and functional status was evaluated by standardized scales and key exposures were assessed via a lifetime exposure questionnaire. **Results:** The study population was classified according to Fried's frailty model. All clinical parameters were associated with frailty. No differences were observed between frailty groups regarding the participants smoking habits. However, second-hand smokers were more prevalent in the pre-frail group when compared to robust group. A higher number of robust participants was found among those consuming home-produced vegetables and water from well/springs. No significant differences were found between robust and pre-frail groups regarding DNA damage and H2AX phosphorylation. Additionally, significant differences were found between the genotoxicity biomarkers and the exposures/lifestyle collected data. **Conclusion:** These preliminary results emphases the importance of understanding if the way we live(d) and worked impact the way we age. Data acquired stresses the importance of further research to explore biomarkers standardization to be used in clinics, the influence of clinical parameters and the role of key exposures. ATG and SC are supported by Fundação para a Ciência e Tecnologia (FCT-MCTES), and the European Social Fund, through Programa Operacional Capital Humano (POCH), under the grants SFRH/BD/121802/2016 and SFRH/BPD/ 100948/2014, respectively. VV is supported by Beatriz Galindo Research Fellowship, BEAGAL18/00142.

OC60- COGNITIVE IMPAIRMENT PREDICTS SARCOPENIA AFTER NINE YEARS IN OLDER COMMUNITY-DWELLING BRAZILIANS. Gabriela Cabett Cipolli[1], Flavia Silva Arbex Borim[1,2], Deusivania Vieira Falcao[3], Meire Cachioni[1,3], Ruth Caldeira de Melo[3], Samila Sathler Tavares Batistoni[1,3], Ivan Aprahamia[4], Anita Liberalesso Neri[3], Monica Sanches Yassuda[1,3] *(1. State University of Campinas, Campinas, SP, Brazil; 2. University of Brasilia, Brasilia, DF, Brazil; 3. University of Sao Paulo, Sao Paulo, SP, Brazil; 4. Faculty of Medicine of Jundiai, Jundiai, SP, Brazil)*

Background: The association between cognition and sarcopenia among older adults has not been fully elucidated. **Objectives:** To investigate a possible association between cognitive performance at baseline and sarcopenia after nine years among community-dwelling Brazilians,controlling for important covariates. **Methods:** A sample of 1,284 participants aged 65+ was assessed in the baseline of the study Frailty in Older Brazilians (FIBRA) in two locations in the State of Sao Paulo, Brazil. After nine years, part of the sample was located and interviewed again. In the follow up, low handgrip strength and low muscle mass were used to identify sarcopenia. Cognition was assessed by the Mini Mental State Examination. Logistic regression analysis was used to determine whether cognitive impairment at baseline was a significant risk factor for sarcopenia at follow up, including age, sex, education, hypertension, diabetes, level of physical activity, body mass index, and depression symptoms, as covariates in the model. **Results:** The follow up sample included 521 participants with a mean age of 72.2 (±5.2) years, 70.1% being female. The prevalence of sarcopenia was 9.2%. Older individuals (OR 6.31, 95% IC 2.33-17.1, p<0.001), with hipertension (OR 0.32, 95% IC 0.15-9.65, p=0.002), poor nutritional state (overweight- OR 0.16, 95% IC 0.05- 0.46, p=0.001; obese- OR 0.03, 95% IC 0.00-0.16, p<0.001) and with cognitive deficit (OR 2.21, 95%IC 1.13-4.32, p=0.020) had a higher risk to develop sarcopenia. **Conclusion:** Cognitive impairment represents an important risk for sarcopenia among older adults.

OC61- PREDICTORS AND FUNCTIONAL CONSEQUENCES OF LONG-COVID IN HOSPITALIZED PATIENTS: A PROSPECTIVE COHORT STUDY. Marlon Juliano Romero Aliberti, Murilo Bacchini Dias, Victor José Dornelas Melo, Wilson Jacob Filho, Thiago Junqueira Avelino-Silva *(University of Sao Paulo Medical School, Brazil; and Research Institute, Hospital Sirio-Libanes, Sao Paulo, Brazil)*

Background: As the pandemic continues its global assault, there is increasing interest in long-lasting coronavirus disease 2019 (long-COVID). Preliminary studies found that persistent COVID-19 symptoms are common in patients after discharge. However, little is still known about the risk factors of long-COVID and its consequences for the independence of older adults. **Objectives:** We investigated the predictors of long-COVID and its association with subsequent 6-month functional disability. **Methods:** Prospective cohort study comprising patients aged >=50 years who had been hospitalized in a large referral center for COVID-19 that supported 85 cities of the metropolitan area of Sao Paulo, Brazil, between March and July 2020. Patients were followed using structured telephone interviews 30, 90, 180, and 270 days after discharge. Long-COVID was defined as persistent COVID-19 symptoms >28 days after discharge. We used logistic regression to examine whether sociodemographic factors, medical diagnosis, baseline frailty (Clinical Frailty Scale) and other geriatric conditions, COVID-19 symptoms on admission, delirium and other medical complications during hospitalization, laboratory findings, length of stay (LOS), and transfer to post-acute care services were predictors of long-COVID. We also used generalized linear mixed models to estimate whether long-COVID were associated with subsequent 6-month functional disability in mobility, basic and instrumental activities of daily living (ADL and IADL). **Results:** We evaluated 3,577 observations of 1,035 patients with a mean age of 65 years, 55% male. Six out of 10 patients presented long-COVID, and the most common persistent symptoms were fatigue, dyspnea, and myalgia. Female sex (aOR=1.6; 95%CI=1.2-2.1), hypertension (aOR=1.4; 95%CI=1.1-1.9), pulmonary disease (aOR=1.6; 95%CI=1.1-2.4), anosmia (aOR=1.5; 95%CI=1.1-2.1), fever (aOR=1.4; 95%CI=1.1-1.8), intensive care admission (aOR=1.8; 95%CI=1.4-2.4), venous thromboembolism (aOR=2.0; 95%CI=1.1-3.9), and LOS>14 days (aOR=2.6;

95%CI=1.7-4.1) were independent risk factors for long-COVID. Compared to patients without persistent symptoms, those with long-COVID had a higher risk of functional disability in ADL (aOR=1.6; 95%CI=1.2-2.0), mobility (aOR=1.6; 95%CI=1.4-1.9), and IADL (aOR=1.5; 95%CI=1.3-1.8) over the subsequent 6 months. **Conclusion:** Clinicians should be aware that older adults with COVID-19 who survived hospitalization but maintain symptoms of the disease are at high risk of functional disability over the next months. Patients presenting risk factors for long-COVID should be prioritized for post-acute care and rehabilitation services.

OC62- COMPUTED TOMOGRAPHY INTERNAL CALIBRATION FOR MUSCLE DENSITY ANALYSIS OF CRITICAL CARE PATIENTS. Ainsley C.J. Smith[1,2,3], Justin J. Tse[1,2,3], Steven K. Boyd[1,2,3], Sarah L. Manske[1,2,3] *(1. Biomedical Engineering Graduate Program, University of Calgary, Alberta, Canada; 2. Department of Radiology, Cumming School of Medicine, University of Calgary, Alberta, Canada; 3. McCaig Institute for Bone and Joint Health, University of Calgary, Alberta, Canada)*

Background: Intensive care unit (ICU) patients are at risk for severe muscle weakness. As part of routine clinical care, these patients are scanned with computed tomography (CT) several times. These scans can be repurposed to provide information about muscle density, as a surrogate for muscle function, as differences in the grey scale Hounsfield unit (HU) values reflect the relationship between muscle density and fat infiltration. Although muscle density is commonly reported in HU, these values are unreliable across scan protocols, patient positioning, and CT manufacturers. While calibration phantoms can convert HU into a reliable density value, these phantoms must be scanned with the patient, which is not typically done clinically. Research has validated internal calibration methods to assess bone mineral density (Michalski et al., 2020), but its effectiveness to quantify muscle density remains unknown. **Objectives:** To develop and validate a CT internal calibration method that converts HU into muscle density values without the need to scan a calibration phantom. **Methods:** We adapted the internal calibration method developed by Michalski et al (2020) for muscle density analysis. This approach relates the mass attenuations and HU values of regions of interest within the scan to estimate the effective scan energy and derive the relationship between HU and density. We tested this method by scanning muscle samples and a sucrose phantom that we designed as a gold standard at different positions within the scanner bore and field of view. We determined the coefficient of variance (CV) across scan conditions and the correlation between methods. **Results:** Across scan conditions, internal calibration provided muscle densities with more consistency (CV 0.23) when compared to phantom calibration (CV = 0.32) and normal HU value calibration (CV = 4.09). Internal calibration values were highly correlated with phantom values ($r2 > 0.99$) but were systematically lower. **Conclusion:** Density values derived from internal calibration were more reliable across different scan conditions than HU values. Internal calibration values are highly correlated with phantom calibration values and can potentially be used to study muscle density loss in critical care patients using clinically acquired CT scans that do not include calibration phantoms.

OC63- ASSOCIATION OF NEUTROPHIL-TO-LYMPHOCYTE (NLR) RATIO WITH IN-HOSPITAL MORTALITY ACCORDING TOFRAILTY STATUS IN OLDER VETERANS HOSPITALIZED WITH COVID-19 INFECTION. Marlena Fernandez[1], Alma Diaz[1], Dominique Tosi[2], Victor Cevallos[1], Jorge G. Ruiz[1,2,3] *(1. Miami VAHS Geriatric Research, Education and Clinical Center (GRECC), USA; 2. University of Miami/Jackson Health System, USA; 3. University of Miami Miller School of Medicine, USA)*

Background: COVID 19 infection is associated with higher mortality in hospitalized older adults. The neutrophil-to-lymphocyte ratio (NLR) represents a measure of greater systemic inflammatory response and may identify those with higher in-hospital mortality risk. Frailty, a state of vulnerability stressors characterized by chronic, low grade, inflammation is associated with worse clinical outcomes. Previous studies in older adults with a variety of chronic diseases have shown the association of the NLR with frailty. **Objectives:** Determine the association of NLR with in-hospital mortality according to frailty status in older Veterans hospitalized with COVID 19. **Methods:** Retrospective cohort study of Veterans aged >=60 years hospitalized with COVID-19 infection at 7 VA medical centers across Florida. Socio-demographic, clinical information COVID-19 PCR status, neutrophil/lymphocyte levels, and in-hospital mortality were determined through review of electronic medical records (EHR) databases and in-depth chart reviews. The NLR was calculated by dividing the absolute neutrophil count by the absolute lymphocyte count and categorized patients into normal (<6), mild (6-9), moderate (9-18), and severe (>18). Frailty was operationalized with the 31-item VA Frailty Index (VA-FI), generated upon admission, as a proportion of EHR variables (morbidity, function, sensory loss, cognition/mood and other). The VA-FI categorized Veterans into non-frail (FI<.21) and frail (FI>=.21). After adjusting for age, gender, race, ethnicity, and BMI, we performed multivariate Cox regression to determine differences in in-hospital mortality. We repeated the analysis for frail and non-frail subgroups. **Results:** 490 veterans were hospitalized with COVID 19 infection, mean age 73.5 (SD=9.1), 96.4% male, 61.1% Caucasian, 83.8% Non-Hispanic, 39.0% (n=191) non-frail and 61.0% (n=299) frail. Over a median follow up of 7 days (IQR=15) there were 46 in-hospital deaths. As compared with normal NLR, the moderate and high groups had higher in-hospital mortality, adjusted hazard ratio (HR)=2.35(95%CI:1.16-4.78), p=.018 and HR=5.33(95%CI:2.00-14.22), p=.001, respectively. However, this high NLR association only remained in the frail, HR=9.16, 95%CI:2.75-30.57), p=.004, but not in non-frail, adjusted HR=.89(95%CI:.10-8.02), p=.184. **Conclusion:** High NLR was associated with in-hospital mortality in older Veterans with frailty hospitalized with COVID-19. The association of NLR

with in-hospital mortality in hospitalized older adults warrants a more active approach in the diagnosis of frailty.

Late Breaking Communications

LB1- THIGH AND CALF MYOSTEATOSIS ARE STRONGLY ASSOCIATED WITH MUSCLE AND PHYSICAL FUNCTION IN AFRICAN CARIBBEAN MEN. Adam J. Santanasto[1], Joseph M. Zmuda[1], Ryan K. Cvejkus[1], Christopher L. Gordon[2], Sangeeta Nair[3], J. Jeffrey Carr[3], James G. Terry[3], Victor W. Wheeler[4], Iva Miljkovic[1] *(1. Department of Epidemiology, University of Pittsburgh, USA; 2. McMaster University, Hamilton, ON, Canada; 3. Department of Radiology, Vanderbilt University Medical Center, Nashville, TN, USA; 4. Tobago Health Studies Office, Scarborough, Tobago, Trinidad & Tobago)*

Background: Declines in physical function with aging are an enormous public health problem that lead to increased risk of disability and mortality. The burden of physical limitations is higher in African ancestry compared with Caucasian individuals. African Caribbeans have higher levels of muscle fat (myosteatosis) than other populations; however, little is known about the impact of myosteatosis on physical function in African Caribbean. **Objective:** In this study, we examined the cross-sectional association between regional myosteatosis and objectively measured muscle and physical function in 850 African-ancestry men aged 64.2 ± 8.9 (range 50-95) years living on the Caribbean Island of Tobago. **Methods:** Myosteatosis was measured using Computed Tomography (CT) and included intermuscular fat (IMAT) and muscle density of the abdomen (psoas and paraspinous), calf and thigh. Muscle and physical function were defined as grip strength (dynamometry), time to complete 5 chair-rises (seconds) and 4-meter gait-speed (meters/second). Associations were presented per 1 SD of each myosteatosis depot using separate linear models adjusted for age, height, demographics, physical activity, and chronic diseases. Associations were also examined stratified by age <65 vs. 65+. **Results:** Higher thigh IMAT was the only IMAT depot significantly associated with weaker grip strength (β = -1.3 ± 0.43kg, P = 0.003). However, lower muscle density of all four muscle groups was associated with weaker grip strength (all P <0.05). Calf and thigh myosteatosis (both IMAT and muscle density) were significantly associated with chair-rise time; thigh IMAT and muscle density depots had the largest effect sizes (all P <0.05). Calf and thigh IMAT and muscle density were all equally strongly associated with slower gait speed (~0.05m/s slower gait speed per SD higher myosteatosis, p <0.05). Abdominal myosteatosis was not a strong predictor of physical function. Associations between myosteatosis and physical function were stronger in those aged ≥65; however, associations with grip strength were similar in older vs. younger adults. **Conclusion:** Myosteatosis of the calf and thigh were strongly associated with muscle and physical performance in African-Caribbean men. Abdominal myosteatosis, though not a strong determinant of physical function, may have some utility when abdominal images are all that are available.

LB2- EVIDENCE FOR CELLULAR SENESCENCE IN SKELETAL MUSCLE AGING. Xu Zhang[1,2], Leena Habiballa[1,3,8], Zaira Aversa[1,2], Ayumi E. Sakamoto[1], Davis A. Englund[1,2], Vesselina M. Pearsall[1], Thomas A. White[1], Matthew M. Robinson[4], Donato A. Rivas[5], Surendra Dasari[6], Yan Er Ng[1], Anthony B. Lagnado[1,7], Sarah K. Jachim[1], Antoneta Granic[3,8], Avan A. Sayer[3,8], Diana Jurk[1,7], Ian R. Lanza[9], Sundeep Khosla[1,10], Roger A. Fielding[5], K. Sreekumaran Nair[10], Marissa J. Schafer[1,7], João F. Passos[1,7], Nathan K. LeBrasseur[1,2] *(1. Robert and Arlene Kogod Center on Aging, Mayo Clinic, Rochester, MN, USA; 2. Department of Physical Medicine and Rehabilitation, Mayo Clinic, Rochester, MN, USA; 3. NIHR Newcastle Biomedical Research Centre, Newcastle University and Newcastle Upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK; 4. School of Biological and Population Health Sciences, College of Public Health and Human Sciences, Oregon State University, Corvallis, OR, USA; 5. Nutrition, Exercise Physiology and Sarcopenia Laboratory, Jean Mayer USDA Human Nutrition Research Center, Tufts University, Boston, Massachusetts, USA; 6. Department of Health Sciences Research, Mayo Clinic, Rochester, MN, USA; 7. Department of Physiology and Biomedical Engineering, Mayo Clinic, Rochester, MN, USA; 8. AGE Research Group, Translational and Clinical Research Institute, Faculty of Medical Sciences, Newcastle University, Newcastle, UK; 9. Division of Endocrinology, Mayo Clinic, Rochester, MN, USA; 10. Division of Endocrinology, Diabetes, Metabolism and Nutrition, Mayo Clinic, Rochester, Minnesota, USA)*

Background: Skeletal muscle aging is marked by the loss and atrophy of resident fibers, and the accumulation of functionally diverse cell types including fibroblasts, adipocytes, and immune cells. Senescent cells amass in multiple tissues with advancing age where they contribute to aging, chronic disease, and physical decline. The role of senescence in mediating muscle aging has become a popular and sometimes contentious topic. However, to date, the identity and influence of senescent cells in old skeletal muscle are unclear. Objectives: In this study, we characterized the changes in cell abundance and, importantly, cell-specific transcriptional profiles throughout skeletal muscle aging using scRNA-seq and imaging methods. **Methods:** Single cell RNA-sequencing, bulk RNA-sequencing, qPCR, and complementary imaging methods. **Results:** We identified a population of fibro-adipogenic progenitors (FAPs) that express p16 and senescence associated secretory phenotype (SASP) factors but not p21. In contrast, terminally differentiated myofibers exhibit age-dependent increases in p21 expression, activated p53 signaling pathways, and a strong inflammatory phenotype including cytokine-cytokine receptor interaction. Through cell type cross-talk analysis, we found that senescent FAPs and myofibers could contribute to skeletal muscle aging in a paracrine manner. Importantly, these evidence for senescence found in mice were confirmed in human samples, suggesting the strong translational power of these findings. **Conclusion:** Collectively, our data

provide compelling evidence for cellular senescence as a hallmark and potentially tractable mediator of skeletal muscle aging.

LB3- HIGH INTENSITY INTERVAL TRAINING (HIIT) ENHANCES PHYSICAL AND COGNITIVE PERFORMANCE AND OVERALL QUALITY OF LIFE IN OLDER VETERANS. Kenneth L. Seldeen, Yonas Redae, Ayesha Rahman, Nikhil Satchidanand, M. Jeffery Mador, and Bruce R. Troen *(Division of Geriatrics and Palliative Medicine, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo and Research Service, Veterans Affairs Western New York Healthcare System, Buffalo, NY, USA)*

Background: Sarcopenia is a condition marked by accelerated loss of muscle mass and function during aging that increases susceptibility to falls, disability, and loss of independence. Exercise is an established strategy to combat sarcopenia, yet participation is as low as 8% in those 75 and older. We are exploring the use of short session high intensity interval training (HIIT) as an alternative to standard exercise that increases adherence due to lower time commitments. We have previously published that short session HIIT in aged mice enhances physical performance and muscle quality (Seldeen et al, Journal of Gerontology). However, the efficacy of this exercise strategy in older Veterans is not known. **Objectives:** To determine the feasibility of recruitment and administration of the HIIT protocol to older Veterans. Secondarily, to evaluate the benefits of HIIT for physical and cognitive performance and overall quality of life. **Methods:** Participants included Veterans between the ages of 60-85 years of any race and sex with medical clearance to exercise. Recruitment strategies included posted advertisements and poster presentations. Participants were screened for cognition using the VA-SLUMS instrument. At baseline (BL) and endpoint (EP), participants were assessed for 6-minute walk endurance, quadriceps strength, maximal oxygen intake (VO2max), exercise enjoyment (PACES), and overall quality of life (Q-LES-Q-SF). The 11.5-minute HIITprotocol was administered 3 days per week for 12 weeks and included 4 high intensity 1-minute intervals. Intensity was initially determined based upon VO2max scores and adjusted relative to participant perceived exertion. **Results:** A total of 42 participants were enrolled, and 23 participants completed the 12-week HIIT protocol before suspension due the COVID-19 pandemic. A total of 4 individuals dropped out following initiation of HIIT, none due to dislike of the program or injury. Of the 23 participants that completed the study (mean age 71.9$\pm$6.8 years; 82.6% white, 17.4% black, 22 men, 1 woman), the exercise was well tolerated and received strong enjoyment scores (87.1$\pm$11.3 out of 100), which did not decline after twelve weeks (89.0$\pm$11.6). Following HIIT, participants exhibited greater quadriceps strength (p=0.011), increased endurance as measured using the 6 minute walk (p=0.024) and VO2max (p=0.036). Participants also exhibited improved cognition (p=0.045) and quality of life (p=0.012). **Conclusion:** 12-weeks of short session HIIT safely increased physical performance, cognition, and quality of life in older Veterans. Future studies will investigate whether home based strategies can elicit similar improvements, thus demonstrating the benefits of short session exercise to boost healthspan during aging.

LB4- OUT OF HOSPITAL FRONT OF MIND: VIRTUAL HOSPITAL MODEL OF INTEGRATED CARE FOR FRAIL OLDER ADULTS. Michelle N Grinman[1,2,3], Azadeh Motehayerarani[1,2], Jillian Walsh[1,2,3], Lesly Deuchar[1], Lindsay Wodinski[1], Juhina El-Hajj[1], Vanessa Gibbons-Reid[1], Ryan Kozicky[1], Shy Amlani[1], Gregory Hrynchyshyn[1,4] *(1. Alberta Health Services, AB, Canada; 2. Cumming School of Medicine, University of Calgary, Calgary AB, Canada; 3. O'Brien Institute for Public Health, University of Calgary, Calgary AB, Canada; 4. Faculty of Medicine and Dentistry, University of Alberta, Edmonton AB, Canada)*

Background: A large body of evidence spanning several decades has shown that home-based acute care bringing hospital-level care into the homes of older adults, reduces the risk of exposure to infections, and the deconditioning that is often associated with hospitalization in conventional bricks-and-mortar hospitals. Alberta, Canada's Virtual Hospital (VH) programs have provided home-based acute care ranging from Hospital-at-Home services that substitute days in hospital, to post-acute complex case management to reduce the risk of readmission since 2018. During the COVID-19 pandemic, the VH's added digital remote patient monitoring to expand and enhance their ability to provide virtual care for this complex elderly population. **Objectives:** To implement a VH for vulnerable older adults with complex medical conditions. **Methods:** The program was evaluated using the Quadruple Aim framework to study patient outcomes (health-related quality of life), patient and caregiver experience (surveys and semi-structured interviews interviews), provider experience (surveys and semi-structured interviews) and healthcare utilization. **Results:** Since 2018, 930 unique patients have been cared for under the VH program with a total of 1102 admissions to the program. Patients had an average Charlson Comorbidity Index of 2.55. The average and median ages were 70.0 and 72.0 respectively with approximately 65.7% of patients greater than 65 years of age. The most common diagnoses were congestive heart failure and COPD. Preliminary healthcare utilization analyses suggests that the VH reduced in-hospital length of stay, and contributed to lower utilization of acute care in the 90 days post-discharge. More than 80% of patients (n=105) expressed that the program helped them maintain or regain function and independence, and over 80% of patients (n=105) and caregivers (n=52) viewed VH care as the same or better than an in-person hospital stay. Providers agreed that VH improves patient quality of care (99%, n=78), and 92% (n=78) were satisfied with the experience caring for VH patients. **Conclusion:** This Virtual Hospital model offers older adults with complex biopsychosocial conditions an alternative to conventional hospitalization for lower acuity exacerbations of their chronic conditions with early indicators of reduced demand on acute care and excellent patient, caregiver and

provider experience.

LB5- THE DIET QUALITY AND NUTRITION INADEQUACY OF PRE-FRAIL OLDER ADULTS IN NEW ZEALAND: STAYING UPRIGHT AND EATING WELL RESEARCH, SUPER STUDY. Esther Tay, Ruth Teh, Daniel Barnett, Evelingi Leilua, Ngaire Kerse, Maisie Rowland, Anna Rolleston, Debra Waters, Richard Edlin, Martin Connolly, Leigh Hale, Avinesh Pillai *(University of Auckland, Auckland, New Zealand)*

Background: Studies showed dietary intake of energy, protein and micronutrients with antioxidant/anti-inflammatory activity (vitamin D, E, C, folate, PUFA n-3) are associated with frailty. The evolving evidence of nutrition in frailty pathogenesis stresses the importance of assessing the nutritional status of older adults at risk of developing frailty. **Objectives:** To describe the diet quality of pre-frail community-dwelling older adults living in New Zealand. **Methods:** Pre-frail community dwelling adults aged 75+ (60 years for Maori and Pacific people) were invited to the Staying UPright and Eating well Research (SUPER) Study. Trained interviewers conducted a face-to-face food-record interviews using an online 24-hour recall tool (multiple pass method) for two non-consecutive days. The Diet Quality Index-International (DQI-I) assessment was used to determine diet quality. The index incorporates four components: variety, adequacy, moderation, and overall balance, made up to a maximum score of 100 points. Higher scores indicate better diet quality. Socio-demographic, medical history and lifestyle behaviour were collected using a standardised questionnaire. Body weight was measured using a Tanita BC-545N scale and height with a stadiometer. **Results:** Four-hundred-sixty-eight pre-frail older adults were recruited. The median (IQR) age was 80 (77–84), more than half (59%) were female. The sample had a moderately healthful diet, DQI-I score: 60.3 (54.0 – 64.7). Women scored slightly higher than men [60.8 (IQR: 54.3 – 64.6) versu males: 59.3 (53.2 – 67.9 p = 0.042)]. DQI-I components identified better dietary variety in men (p = 0.044), and dietary moderation in women (p = 0.002); both sexes performed equally well in dietary adequacy and poorly in dietary balance scores (73% and 47% of maximum scores respectively). Low energy 20.3 (15.4 – 25.3) kcal/kg body weight (BW) and protein intakes 0.8 (0.6 – 1.0) g/kg BW were coupled with a high prevalence of mineral inadequacies: calcium (86%), magnesium (68%), selenium (79%), and zinc (men 82%). **Conclusion:** The diet quality of pre-frail older adults was moderately high in variety and adequacy but poor in moderation and balance. Our findings support targeted dietary interventions to ameliorate frailty.

LB6- ARNT REGULATES MUSCULAR ADAPTATION TO EXERCISE. Yori Endo, Mehran Karvar, Indranil Sinha *(Harvard Medical School, Brigham and Women's Hospital, USA)*

Background: The hypoxia signaling pathway plays a pivotal role in the regulation of metabolic response during muscular adaptation to exercise. The response to exercise declines with aging with diminished activation of the hypoxia signaling pathway and ARNT level in skeletal muscle. To explore the role of hypoxia signaling in exercise performance, we generated a transgenic mouse model with inducible, skeletal muscle-specific knockout of ARNT (ARNT mKO). **Objectives:** To elucidate the role of ARNT and hypoxia signaling pathway in the regulation of exercise-induced muscular adaptation. **Methods:** ARNT mKO and ARNT WT mice were subjected to an 8-week course of sedentary activity or regimented treadmill running exercise at an increasing speed from 8 to 12 m/min for 40 minutes, three times weekly. **Results:** : 95% reduction in ARNT RNA expression was confirmed in skeletal muscle of ARNT mKO mice. The improvements in the maximum running speed and distance were severely restricted in the ARNT mKO mice versus the similarly trained ANRT WT mice. Cross-sectional area of myofibers increased significantly following exercise in WT mice indicating muscle hypertrophic response, while no change was observed in the ARNT KO group. Hypertrophic response was accompanied by enhanced force per cross-sectional area, and reduced fatigability of contraction, neither of which were observed in the ARNT mKO group. In addition, switching from type I to type II myofibers and an increase in the capillary densities notable in the WT mice were completely absent in the ARNT mKO mice. Evaluation of the key metabolic factors revealed that protein levels of PPARd and PGC-1a did not increase in the exercised muscle of ARNT mKO mice, contrary to the WT mice. Administration of ML228, a potent hypoxia pathway activator, restored the maximum distance of running, muscle hypertrophic response and fiber type adaptation in ARNT mKO mice. **Conclusion:** ARNT is critical for adaptation to exercise, and PPARd might be the downstream target of ARNT-dependent metabolic response.

LB7- RATIO OF APPENDICULAR MUSCLE MASS TO TOTAL BODY FAT PREDICTIS ADVERSE OUTCOMES OF OLDER ADULTS: A POTENTIAL BIOMARKER OF SARCOPENIC OBESITY. Pei-Chin Yu[1,2,4], Wei-Ju Lee[2,3,5], Ming-Hsien Lin[1,3], Li-Ning Peng[1,2,3], Liang-Kung Chen[1,2,3,6] *(1. Center for Geriatrics and Gerontology, Taipei Veterans General Hospital, Taipei, Taiwan; 2. Aging and Health Research Center, National Yang Ming Chiao Tung University, Hsin-Chu, Taiwan; 3. Department of Geriatric Medicine, National Yang Ming Chiao Tung University School of Medicine, Hsin-Chu, Taiwan; 4. Institute of Neuroscience, National Yang Ming Chiao Tung University, Hsin-Chu, Taiwan; 5. Department of Family Medicine, Taipei Veterans General Hospital Yuanshan Branch, Yi-Lan, Taiwan; 6. Taipei Municipal Gan-Dau Hospital, Taipei, Taiwane)*

Background: Aging is featured by the changes of body composition, individually or synergistically, to impact the health of older adults. This study aims to compare the clinical characteristics of appendicular muscle mass (ASM) and its ratio to total body fat, and their ability to predict adverse health outcomes of older people. **Methods:** Data of 1,060 community-

dwelling persons aged 65 and older from the Longitudinal Aging Study of Taipei (LAST) were excerpted for this study. ASM was measured by bioimpedance analysis, and the relative appendicular skeletal muscle mass (RASM) was calculated for analysis. Muscle-to-fat ratio (MFR) defined as ASM (kg) divided by total body fat mass (kg) in this study. Low RASM and low MFR were defined as lower quintile of them, respectively. Adverse health outcomes included fall-related fractures and mortality. **Results:** Overall, 196 (67 males) had low MFR, and those with low MFR were significantly older (72±5.6 vs 70.7±4.6 years, P=0.002), using more medications (2.9±3.3 vs. 2.1±2.5 items, P=0.002), having higher BMI (26.8±2.9 vs. 23±2.8 kg/m2, P<0.001), higher waist-to-hip ratio (0.9±0.07 vs. 0.87±0.11, P<0.001), higher body fat percentage (38±4.8 vs. 28±6.4%, P<0.001, higher RASM (6.7±1 vs. 6.5±1.1 kg/m2, P=0.003), and higher in fasting plasma glucose (105±27.5 vs. 96.8±18.7 mg/dL, P<0.001), HbA1C (6±0.8 vs. 5.8±0.6%, P<0.001) , serum levels of triglyceride (122.5±56.9 vs. 108.6±67.5 mg/dL, P=0.007), and lower HDL-C (56.2±14.6 vs. 59.8±16 mg/dL, P=0.002). Moreover, participants with low MFR were poorer in all functional domains, including cognitive performance (Montreal Cognitive Assessment: 25.7±4.2 vs. 26.4±3, P=0.028), handgrip strength (24.7±6.7 vs. 26.1±7.9 kg, P=0.009), gait speed (1.8±0.6 vs. 1.9±0.6 m/s, P=0.001), 5-time chair-rise test (10.1±3.3 vs. 9.3±3.1 sec, P=0.001), and 6-minute walk distance (477.6±75.7 vs. 511.5±76.9 m, P<0.001). Besides, participants with low MFR were significantly associated with adverse outcomes (35.7% vs 28.6%, P=0.049), but not low appendicular muscle mass (26.5% vs 30.7%, P=0.253). **Conclusion:** Low MFR represented the unique combination of unfavorable body composition, cardiometabolic risk and poor functional performance that predicted adverse health outcomes of older people. Further study is needed to explore the roles of MFR as the biomarker linking cardiometabolic risk and functional performance of older adults, such as sarcopenic obesity.

LB8- OPA1 ORCHESTRATES PRECOCIOUS SENESCENCE, DEGENERATION OF MULTIPLE ORGANS, AND PREMATURE DEATH THROUGH INFLAMMATION AND METABOLIC CHANGES.
Caterina Tezze, Nicola Faedda, Ivan Francesco Amendolagine, Marco Sandri *(University of Padua, Padova, Italy)*

Background: A healthy mitochondrial network is essential for post-mitotic tissues as muscles. Mitochondria-shaping machinery is downregulated in sarcopenia and is maintained by lifelong exercise. OPA1 is a profusion protein that plays an important role in mitochondrial dynamics we have demonstrated. Interesting, OPA1 protein is significantly decreased in sedentary humans and old mice compared to young controls and, exercise is sufficient to restore the protein level. In conditional tissue-specific Opa1 ko is sufficient to induce a sarcopenic-cachectic phenotype in just 3 months of deletion and Fgf21 is a central myokine in this process. **Objectives:** This work aims to find new specific players involved in aging sarcopenia. **Methods:** we are comparing different genetic mouse models to dissect the specific role of the different genes in the sarcopenia scenario. **Results:** Mitochondrial dysfunction in muscle tissue is sufficient to directly drive metabolic changes and systemic inflammatory by increasing the expression and secretion of the myokines FGF21 and IL6. Despite the key role of FGF21, we have new evidence that is connecting mitochondrial dysfunction, autophagy alteration, muscular IL6, and aging. **Conclusion:** Opa1 is a «sensor» for the health of the muscle, the reduction of the protein level recapitulates the acute sarcopenia process. The changes related to mitochondrial dysfunction are specifically correlated to the shape of these organelles. Different alteration induces some common but mainly specific metabolic and stress responses directly correlated to sarcopenia development.

LB9- THE OUTCOMES FROM CARDIOPULMONARY RESUSCITATION IN ADULTS LIVING WITH FRAILTY: A SYSTEMATIC REVIEW AND META-ANALYSIS.
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Background: Older adults suffering a cardiac arrest have a lower chance of survival from cardio-pulmonary resuscitation (CPR) compared to their younger counterparts. Older age alone, however, is not a sufficient predictor of whether CPR is likely to be successful. Frailty is a clinical expression of adverse ageing which could be a more valuable predictor of outcomes from CPR. **Objectives:** The aim of this systematic review and meta-analysis was to evaluate the survival outcomes from CPR in adults living with frailty, versus adults living without frailty. **Methods:** Studies included were prospective and retrospective observational studies. MEDLINE, EMBASE, CINAHL and Web of Science databases were searched with no date or language restrictions applied. Within-study risk-of-bias assessment was performed using a modified Newcastle-Ottawa Scale, and certainty of evidence at the outcome level was assessed using the GRADE framework. All aspects of methodology were performed in duplicate and in accordance with PRISMA guidance. **Results:** Six eligible studies were identified across five countries. Five retrospective observational studies, all of which presented a low risk-of-bias, were included in a meta-analysis comprising 1704 participants. Frailty was strongly associated with an increased likelihood of mortality after CPR, with considerable inter-study heterogeneity (OR = 4.62, 95% CI = 3.22 - 6.60, I2 = 83%). **Conclusion:** This review supports the consideration of frailty status in a holistic approach to CPR. The present findings suggest that frailty status provides valuable prognostic information and could complement other known pre-arrest prognostic factors such as age and comorbidities in the context of DNACPR decision-making. Awareness of the poor outcomes from CPR in those living with frailty may permit a dignified and peaceful dying process in some patients who, otherwise, may have undergone futile and traumatic resuscitation. Review limitations include lack of adjustment for key confounders such as presenting

rhythm, age and comorbidities in meta-analysis, and notable disparities between included studies. A validatory large multicentre observational trial and evaluation of quality-of-life in frail individuals surviving CPR are prerequisites for the future integration of frailty status into CPR clinical decision-making.

LB10- HANDGRIP STRENGTH, BUT NOT SARC-F SCORE, PREDICTS COGNITIVE IMPAIRMENT IN OLDER ADULTS IN PRIMARY CARE SETTINGS.

Paul KM Poon[1], KW Tam[1], Dexing Zhang[1], Benjamin HK Yip[1], Jean Woo[2], Samuel YS Wong[1] *(1. Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong, Hong Kong Special Administrative Region; 2. Department of Medicine and Therapeutics, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong Special Administrative Region; Jockey Club Institute of Ageing, The Chinese University of Hong Kong, Hong Kong Special Administrative Region)*

Background: Assessing motor functions can be a simple way to track cognitive impairment. We analyzed associations between cognitive and motor function and assessed predictive value of two motor function measures on cognitive impairment in older adults with multimorbidity in primary care settings. **Objectives:** To delineate associations of handgrip strength or SARC-F score with cognitive impairment and inform clinical practice regarding motor function assessment in primary care settings. **Methods:** This is a prospective cohort study with 1-year follow-up on primary care patients aged >= 60 with >=2 morbidities. We assessed motor functions by handgrip strength and a sarcopenia screening scale (SARC-F). We measured cognitive function by Hong Kong Montreal Cognitive Assessment (HK-MoCA). We defined cognitive impairment as HK-MoCA score <22. Associations between cognitive and motor function were examined from a bidirectional perspective. **Results:** We included 477 participants (mean age 69.4, 68.6% female) with mean (SD) HK-MoCA, SARC-F score and handgrip strength of 25.5 (3.55), 1.1 (1.33) and 22.5 (7.30) kg respectively at baseline. Multivariable regression models showed cross-sectional associations of HK-MoCA score with SARC-F score and handgrip strength at baseline (p=0.012, p<0.001) and at 1-year (p<0.001, p=0.011). Cox regression found longitudinal association between baseline handgrip strength and cognitive impairment at 1-year (hazard ratio: 0.53, 95% CI 0.36-0.79), but no longitudinal association between SARC-F and cognitive impairment. Variation in SARC-F score increased with decreasing HK-MoCA score while variability of handgrip strength remained small. **Conclusion:** Primary healthcare providers may use handgrip strength to track cognitive functioning decline for older adults with multimorbidity. SARC-F scale may not have the same predictive value on cognitive impairment. More research is needed to further evaluate performance and variability of SARC-F score in persons with poor cognitive functions.

LB11- EFFECT OF VITAMIN D LEVELS ON 30-DAY MORTALITY IN OLDER ADULTS HOSPITALIZED WITH COVID-19 ACCORDING TO FRAILTY STATUS.

Sanaa Badour[1], Marlena Fernandez[2], Victor Cevallos[2], Jorge G. Ruiz[1,2,3] *(1. University of Miami/Jackson Health System, USA; 2. Miami VAHS Geriatric Research, Education and Clinical Center (GRECC), USA; 3. University of Miami Miller School of Medicine, USA)*

Background: COVID-19 infection is associated with higher mortality in older adults. Vitamin D (VitD) may decrease viral respiratory infections and has been recommended as an approach for the prevention or treatment of COVID-19 infections. Research has shown the association between VitD deficiency and frailty, a state of vulnerability stressors due to multisystemic dysfunction. VitD supplementation may improve the status of frailty in older adults with COVID-19 infection. **Objectives:** Determine whether VitD deficiency is associated with 30-day all-cause-mortality in older adults hospitalized with COVID-19 according to frailty status. **Methods:** Retrospective cohort study consisting of Veterans hospitalized with COVID-19 infection at seven VA centers across Florida admitted March-August 2020. VitD levels were obtained within one year of admission. Frailty was operationalized with the 31-item VA Frailty Index (VA-FI), generated upon admission, as a proportion of electronic health record variables (morbidity, function, sensory loss, cognition/mood and other) and categorized as non-frail<0.21 and frail>0.21. All-cause 30-day mortality was compared for patients with normal (>30ng/ml) versus deficient (<30ng/ml) VitD using multivariate Cox-proportional hazard models with hazard ratios (HR) and 95% confidence intervals (CI). Covariates included age, body mass index, race and ethnicity. Analysis was conducted for the entire group, then categorized based on frailty status. **Results:** VitD levels were available for 350 veterans and obtained within a median of 222 days (SD=6.7) of admission. Patients were male (93%, n=325), Caucasian (49%, n=194), mean age 68(SD=14), non-frail(36%, n=127), frail(64%, n=223) and mean VitD level was 33(SD=14) ng/ml. Over a mean follow-up of 28 days (range=1.3-30), there were 41 deaths (VitD deficient 13%, n=20, normal 11%, n=21). There were no overall group differences in 30-day mortality although there was a trend for the VitD deficient group to have higher 30-day mortality adjusted HR=1.82(0.92-3.62), p=0.086. In terms of frailty status, there was again a trend for higher 30-day mortality for the VitD deficient subgroups but without reaching significance: non-frail adjusted HR=1.10(0.21-5.88), p=0.911 and frail adults adjusted HR=1.92(0.89-4.14), p=0.099. **Conclusion:** Irrespective of frailty status, pre-admission VitD deficiency was not associated with all-cause 30-day mortality in hospitalized older adults with COVID-19. Future studies are needed to investigate the association between frailty and vitamin D upon hospital admission.

LB12- DIFFERENTIAL MODERATION OF APOE AND 5-HTTLPR GENOTYPES OVER SOCIAL VULNERABILITY IN PREDICTING MORTALITY

AMONG COMMUNITY-DWELLING MIDDLE-AGED AND OLDER ADULTS: A NATIONWIDE POPULATION-BASED STUDY. Hsin-Yu Liu[1,2,3], Li-Ning Peng[1,3], Wei-Ju Lee[1,4], Ming-Yueh Chou[5], Chih-Kuang Liang[5], Ming-Hsien Lin[1,3], Liang-Kung Chen[1,3,6] *(1. Aging and Health Research Center, National Yang Ming Chiao Tung University Yangming Campus, Taipei, Taiwan; 2. Institute of Public Health, National Yang Ming Chiao Tung University Yangming Campus, Taipei, Taiwan; 3. Center for Geriatrics and Gerontology, Taipei Veterans General Hospital, Taipei, Taiwan 4. Department of Family Medicine, Taipei Veterans General Hospital Yuanshan Branch, Yi-Lan, Taiwan; 5. Center for Geriatrics and Gerontology, Kaohsiung Veterans General Hospital, Kaohsiung, Taiwan; 6. Taipei Municipal Gan-Dau Hospital, Taipei, Taiwan)*

Background: Social determinants play important roles in elderly's health. Social vulnerability index (SVI) which incorporated several aspects of social factors, can predict mortality and adverse health outcomes. However, little evidence is about the interaction between SVI and genotypes. **Objectives:** This study aims to explore the clinical outcomes of the gene-environment interaction between social vulnerability, ApoE, and 5-HTTLPR genotyping among middle-aged and older adults. **Methods:** Data from second wave of the Social Environment and Biomarkers of Aging Study (SEBAS) in 2006 were excerpted for study. Social vulnerability index (SVI) with 32 self-reported items were constructed. The association between SVI and all-cause mortality was discovered and further interactions with two genotypes of Serotonin Transporter Polymorphism (5-HTTLPR) and Apolipoprotein E gene (ApoE) were tested. **Results:** The median of Social Vulnerability Index was 0.35 with near normal distribution. Higher SVI was found in women, poor cognitive function, lower education, lower CES-D and poor function status. Adjusting for age and gender, each increase of 1 deficit item in SV was associated with 12% increased mortality risk (Hazard ratio[HR]: 1.12, 95% CI: 1.04-1.20, p=0.002). Interaction was found between ApoE and SVI but not 5-HTTLPR. Strata-specific hazard ratio by ApoE genotype was done and significant association of SVI and mortality was only found in non-ε4 carriage group (HR: 1.15, 95% CI: 1.01-1.24, p<0.001). **Conclusion:** Mortality is associated with greater social vulnerability in middle-aged and older adults. ApoE genotype interacts with social vulnerability in the associations with mortality, but not 5-HTTLPR. Further research should focus on strategies to reduce social vulnerability and maximize the intervention effects for healthy longevity.

LB13- SARCOPENIA IN COMMUNITY-DWELLING OLDER ADULTS AT RISK OF MALNUTRITION: PREVALENCE AND ASSOCIATED FACTORS. Samuel Teong Huang Chew[1], Siew Ling Tey[2], Menaka Yalawar[3], Zhongyuan Liu[2], Geraldine Baggs[4], Choon How How[5,6], Magdalin Cheong[7], Wai Leng Chow[8], Yen Ling Low[2], Dieu Thi Thu Huynh[2], Ngiap Chuan Tan[6,9] *(1. Department of Geriatric Medicine, Changi General Hospital, Singapore; 2. Abbott Nutrition Research and Development, Asia-Pacific Center, Singapore; 3. Statistical Services, Cognizant Technologies Solution Pvt. Ltd. Bangalore, India; 4. Abbott Nutrition Research and Development, Columbus, Ohio, United States of America; 5. Care and Health Integration, Changi General Hospital, Singapore; 6. SingHealth-Duke NUS Family Medicine Academic Clinical Program, Singapore; 7. Department of Dietetic & Food Services, Changi General Hospital, Singapore*

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Background: Rapidly aging population worldwide presents many challenges including loss of function and dependency due to sarcopenia. Increasingly a link is emerging in the literature between sarcopenia and malnutrition. However, this relationship and associated factors have not been extensively examined in community-dwelling older adults at risk of malnutrition. **Objectives:** The objectives were (i) to determine the prevalence of sarcopenia and its components, and (ii) to examine factors associated with sarcopenia in community-dwelling older adults (>= 65 years) in Singapore, who were at risk of malnutrition as determined using Malnutrition Universal Screening Tool. **Methods:** A total of 811 community-dwelling older adults at risk of malnutrition took part in this cross-sectional study. Appendicular skeletal muscle mass index (ASMI) was measured using bioelectrical impedance analysis, handgrip strength using a handheld dynamometer, and physical performance determined by using 5-time chair stand test as a surrogate marker. Participants were then classified as sarcopenia and severe sarcopenia based on the Asian Working Group for Sarcopenia consensus 2019 (Chen et al., 2020). Socio-demographic information, anthropometry, body composition, functional assessments, and dietary intake were also collected. After excluding participants with missing data, 694 participants were included in the analysis. **Results:** Examination of the individual components showed that 81% of the participants had low ASMI, 83% had low handgrip strength, and 78% had low physical performance. Of the 694 participants, the overall prevalence of sarcopenia was 76% (n = 530) and 57% (n = 393) had severe sarcopenia. Participants with sarcopenia were significantly older, and with lower physical activity scale for the elderly (PASE) score, leg strength, handgrip endurance, mid-upper arm circumference, calf circumference, bone mass, energy-adjusted protein intake, and poorer nutritional status (MUST), compared to those without sarcopenia (all $p \leq 0.0469$). After adjusting for confounders, sarcopenia was associated with increasing age, male gender, higher risk of malnutrition, lower calf circumference, and lower bone mass (all $p \leq 0.0435$). **Conclusion:** The prevalence of sarcopenia is high in community-dwelling older adults at risk of malnutrition. Therefore, the potentially modifiable risk factors identified in this study including malnutrition represent important targets for early screening and intervention to preserve and sustain independent and strong living in old age.

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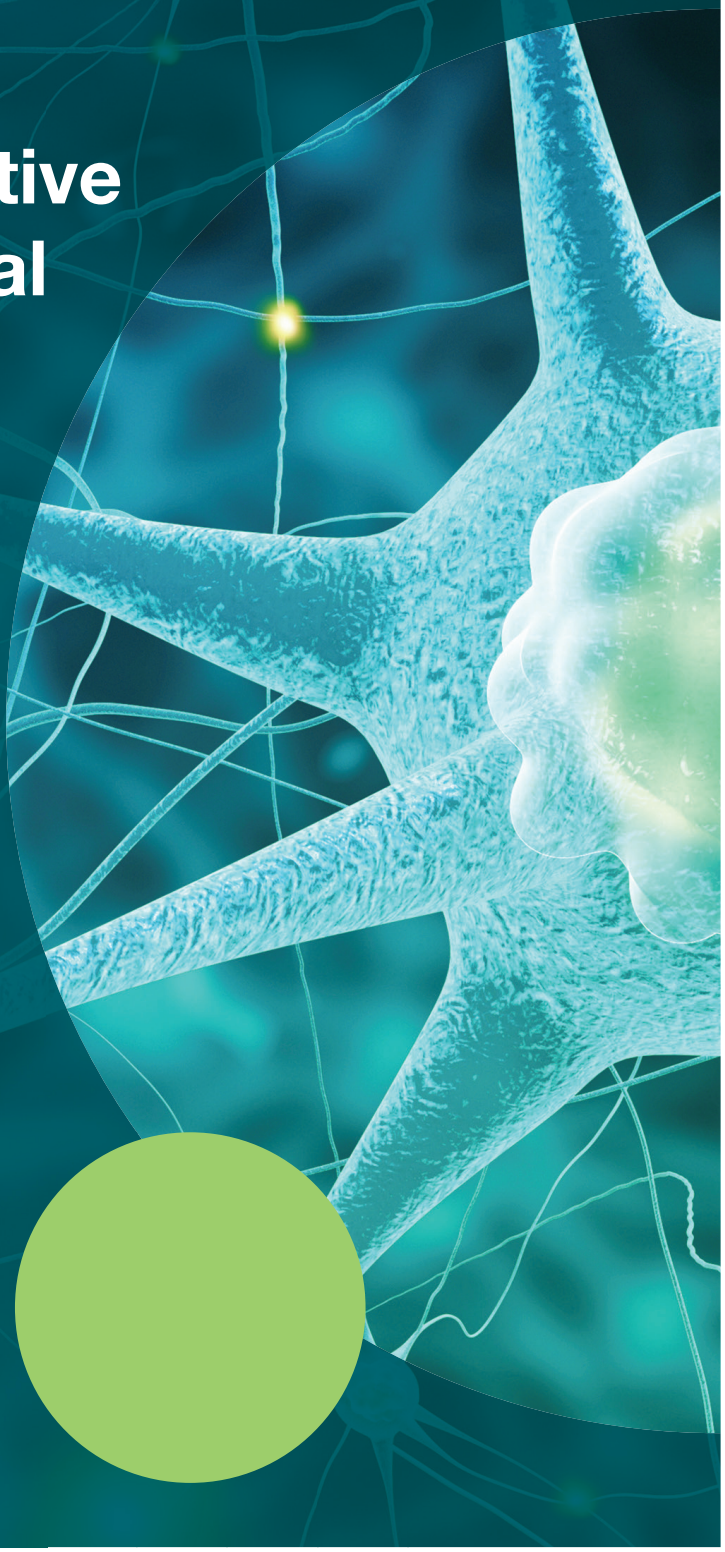

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