

## SYMPOSIA

**S1- THE ENABLING REDUCTION OF LOW-GRADE INFLAMMATION IN SENIORS (ENRGISE) PILOT TRIAL TO AVERT INFLAMMATION, MOBILITY LOSS, AND FRAILITY: EARLY RESULTS.** Stephen B. Kritchevsky (*Division of Gerontology and Geriatric Medicine, Wake Forest School of Medicine, Winston-Salem, NC, USA*)

**Communication 1:** *The Design and Rationale of the ENRGISE Study*, Marco Pahor<sup>1</sup>, Walter Ambrosius<sup>2</sup>, Anne Newman<sup>3</sup> ((1) Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA; (2) Department of Biostatistical Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA; (3) Department of Epidemiology, University of Pittsburgh, Pittsburgh, PA, USA)

Low-grade chronic inflammation, characterized by elevations in Interleukin-6 (IL-6), is an independent risk factor of disability, frailty, and lower walking speed. It is unknown whether interventions that reduce the levels of inflammatory markers per se improve mobility, or avert decline in mobility in older persons. ENRGISE, a placebo-controlled randomized clinical trial, will test the ability of anti-inflammatory interventions for preventing major mobility disability by preserving walking ability. The ENRGISE Pilot study is testing whether 12 months of assignment to either losartan or omega-3 polyunsaturated fatty acids, or their combination reduces IL-6 levels in persons with elevated levels compared to a placebo, and whether the treatments can affect walking speed over 400 m. Both active treatments are safe, tolerable, acceptable, and affordable for vulnerable older persons. ENRGISE targeted the recruitment of 300 men and women > 69 years of age, with slow walking speed over 4 m (>.44 m/s, <1 m/s) but who are able to complete a 400 m test within 15 minutes. Entry IL-6 levels are >2.5 pg/ml and <30 pg/ml as determined by the average of two measures obtained prior to baseline. ENRGISE is supported by U01 AG054099 from the National Institute on Aging.

**Communication 2:** *The ENRGISE Pilot Study: Screening, Recruitment and Retention Preliminary Results*, Jane Cauley<sup>1</sup>, Todd Manini<sup>2</sup>, Mary McDermott<sup>3</sup>, Michael Miller<sup>4</sup> ((1) Department of Epidemiology, University of Pittsburgh, Pittsburgh, PA, USA; (2) Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA; (3) Division of Geriatrics, Feinberg School of Medicine, Northwestern University, Chicago, IL, USA; (4) Department of Biostatistical Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA)

ENRGISE's recruitment goal was to randomize 75 participants to omega-3 (only) or placebo, 75 participants to losartan (only) or placebo, and 150 participants to Losartan and omega-3 or placebo. Study participants were recruited to 5 academic medical centers. Participants were recruited over 15 months starting in April 2016 using multiple approaches to identify and screen potential participants. ENRGISE phone screened 5424 persons and randomized 289. Finding persons eligible for the losartan arms was challenging; 46% of those screened reported recent use of an angiotensin receptor blocker or an ace-inhibitor, 9% reported use of potassium-sparing diuretics and 16% had low blood pressure. The study over-recruited persons for the omega-3 arm to compensate for under-recruitment in the losartan arms. The study randomized 180 participants in the omega-3 arm, 43 in the losartan only arm, and 66 in the losartan+omega-3 arm.

The mean age of ENRGISE participants was 78.3 ± 5.4 years (47% women; 22% minorities). Retention has been excellent with 93% of participants continuing in the study at 6 months.

**Communication 3:** *The Relationship between IL-6 levels and physical function in older adults with chronic low-grade inflammation*, Carlo Custodero<sup>1</sup>, Roger Fielding<sup>2</sup>, Dan Beavers<sup>3</sup>, Stephen Anton<sup>4</sup> ((1) Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA; (2) Jean Mayer USDA Human Nutrition Research Center on Aging, Tufts University, Boston, MA, USA; (3) Department of Biostatistical Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA; (4) Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA)

**Background:** Circulating levels of IL-6 greater than 2.5 pg/mL are associated with an almost two times the risk of functional decline compared to those with levels below this cut-point. Less is known about the relationship between IL-6 and physical function among persons with elevated IL-6 levels. **Purpose:** To assess the cross-sectional relationship between circulating IL-6 levels and physical function at ENRGISE study baseline. **Methods:** IL-6 levels were based on the average to two baseline fasting measures. Physical performance tests included the short physical performance battery, knee extensor strength measured by isokinetic dynamometry at 60 deg/sec and usual gait speed over 4 and 400 meters. Mean performance by IL-6 tertiles and the partial correlations between log IL-6 and performance measures were adjusted for age, gender, race, BMI, smoking status and comorbidities. **Results:** The IL-6 tertile cutpoints were: tertile 1: > 2.5 < 3.48 pg/ml; tertile 2: 3.48 - 4.61 pg/ml; tertile 3: > 4.61 < 30 pg/ml. Only mean (95% CI) adjusted muscle strength differed significantly (p < 0.05) across IL-6 tertiles -- Tertile 1: 88.7 (81.4, 96.0) Newton-meters (Nm); Tertile 2: 84.1 (77.0, 91.3) Nm; Tertile 3: 73.6 (66.3, 73.6) Nm. The partial correlation between log IL-6 and knee strength was -0.21 (p=0.002). **Conclusion:** In older persons with elevated IL-6, muscle strength was inversely associated with IL-6 levels across the high normal range.

**S2- FRAILITY RESEARCH AT THE VA GRECCS (GERIATRIC RESEARCH EDUCATION AND CLINICAL CENTER).** Jorge G. Ruiz (*Miami VAHS GRECC and University of Miami Miller School of Medicine, Miami, Florida, USA*)

**Communication 1:** *An automated cumulative deficit index to identify frailty in the VA.*, Jane Driver (*New England GRECC, Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts, USA*)

The «cumulative deficit index» (CDI), a simple count of age-related impairments, is a powerful measure of global health and mortality risk. The objective of this study was to develop an algorithm to assign an automated CDI to a national cohort of veterans and determine its value in predicting mortality. We assembled a cohort of veterans' 65 who were regular users of VA between 2002 and 2008 using VA databases linked to Medicare/Medicaid data and followed the cohort through 2014. The CDI includes a minimum of 30 age-related deficits from multiple health domains. The number of deficits is divided by the number of possible variables to give a score between 0 and 1. We created a VA-CDI that contains 32 deficits identified from diagnostic and procedure codes. Death was confirmed using the National Death Index. Frailty was defined using cutoffs established in large non-VA populations (robust < 0.1, pre-frail 0.1-0.2, frail > 0.21). We used Cox proportional hazards models to assess the association between CDI and 2-year mortality. In 2002, the cohort included 1,606,751

veterans; 36.9% were classified as robust and 29.6% as frail. By 2012, the prevalence of frailty had doubled (26.5% robust and 43.9% frail). In a subset of 1,542,786 veterans followed from 2012 to 2014, the risk of death increased logarithmically with the CDI to a maximum of 0.81; higher scores were not compatible with life. The index predicted survival more robustly than age alone, even when adjusted for age, sex and race. The VA-CDI promises to be a valuable and easily accessible tool that could be used to help individualize the care of older veterans.

**Communication 2:** *Metformin: A Potential Intervention for Preventing Frailty in Older Adults with Pre-Diabetes*, Sara E. Espinoza (San Antonio GRECC and Barshop Institute for Longevity and Aging Studies, University of Texas Health Science Center at San Antonio, Texas, USA)

Older adults with pre-diabetes are at increased risk for frailty. Metformin is a widely-used, well-tolerated drug that improves insulin sensitivity and has anti-inflammatory properties, two major contributors to frailty. Metformin is known to prevent diabetes incidence. We hypothesize that metformin will prevent frailty in older adults with pre-diabetes. We are conducting a randomized, double-blinded, placebo-controlled trial of metformin for frailty prevention over two years in adults aged 65+ years with pre-diabetes as assessed by 2-hour oral glucose tolerance test. Exclusion criteria are baseline frailty, diabetes, dementia, untreated depression, active malignancy, or severe cardiovascular, pulmonary, and neurologic diseases. Primary outcome is frailty as assessed by Fried criteria; secondary outcomes are physical function, systemic and tissue (muscle) inflammation, tissue insulin signaling, insulin sensitivity, glucose tolerance, and body composition. Baseline characteristics for 15 subjects currently enrolled in the study are reported. Mean age is 74.7 ±5.7 years, body mass index is 29.1 ±4.6 kg/m<sup>2</sup>, and Hemoglobin A1c is 5.8 ±0.3%. Eleven (73%) participants are non-frail and four (27%) are pre-frail. Metformin is being examined as a potential therapeutic agent to prevent frailty in this randomized-controlled trial. The study aims to study 120 participants over the next five years. Findings from this trial may have implications for the future screening and prevention of frailty.

**Communication 3:** *Physical Resilience and Frailty*, Heather E. Whitson (Durham VA GRECC, and Duke University Aging Center, Duke University School of Medicine, Durham, North Carolina, USA)

This session will focus on the emerging construct of physical resilience, defined as one's ability to withstand or recover from functional decline following acute and/or chronic health stressors. The session will introduce a conceptual framework for physical resilience that addresses measurement of resilience and characterization of clinically relevant resilient phenotypes. One goal will be to highlight areas of overlap with and distinction from the related construct of frailty. Whereas age-related declines associated with frailty often evolve near the end of life and represent an extreme stage in the healthspan, we conceptualize resilience as a continuous spectrum that applies across the lifespan such that young people exhibit different degrees of resilience. We propose that one's likelihood to suffer physical decline associated with frailty and one's likelihood to counteract or recover from functional loss during and after stressors (physical resilience) may depend on different mechanisms. We will consider the hypothesis that favorable biology in molecular and cellular processes involved in adaptive stress response may be particularly important determinants of resilience. Likewise, we will discuss how resilience to biomedical stressors may be enhanced by

social, psychological, and external factors. In our model, the spectrum from robustness to frailty reflects the amount of physiological reserve one has to react to stressors, while physical resilience refers to the actualization of that potential. For this reason, to quantify an individual's resilience, measurements of health and function must be collected after the stressor. Finally, we will discuss clinical test paradigms (e.g., stimulus-response tests, dual-tasking, and complex dynamical output monitoring) and biomarkers that may be useful in predicting resilience to common health stressors.

**S3- WHO-ESCEO SYMPOSIUM: "ASSESSMENT OF PHYSICAL PERFORMANCE IN DAILY CLINICAL PRACTICE: OUTCOMES OF AN EXPERTS' CONSENSUS MEETING ORGANIZED BY THE EUROPEAN SOCIETY FOR CLINICAL AND ECONOMIC ASPECTS OF OSTEOPOROSIS, OSTEOARTHRITIS AND MUSCULOSKELETAL DISEASES (ESCEO) UNDER THE AUSPICES OF THE WORLD HEALTH ORGANIZATION"** Islene Araujo de Carvalho - René Rizzoli (Geneva, Switzerland)

**S4- THE CRITICAL ROLE OF PERIODIC INACTIVITY AND MUSCLE DISUSE IN WORSENING SARCOPENIA AND HASTENING DISABILITY AND FRAILITY.** Stuart Phillips (Department of kinesiology McMaster University Hamilton Canada)

**Communication 1:** *Mechanisms of muscle loss in older persons during disuse and their consequences*, Luc J.C. Van Loon (Department of Human Biology NUTRIM School of Nutrition and Translational Research in Metabolism Maastricht, the Netherlands)

A period of muscle disuse due to sickness or injury can lead to substantial loss of skeletal muscle mass and strength in otherwise healthy individuals. The resulting health consequences, such as impaired functional capacity, decreased muscle strength, onset of peripheral insulin resistance, and a decline in basal metabolic rate, are of particular concern to older individuals, who are already functionally and/or metabolically compromised. Even a few days of disuse can already result in substantial loss of muscle mass and strength. These findings are of particular clinical relevance because hospitalization of (older) individuals with acute illness generally results in a mean hospital stay of 5–7 days. Such short successive periods of muscle disuse occurring throughout the lifespan may be instrumental in the progressive loss of muscle mass with aging. Loss of skeletal muscle mass due to disuse must be attributed to an imbalance between muscle protein synthesis and breakdown rates. A decline in basal (post-absorptive) muscle protein synthesis rates has been reported following both bed rest as well as limb immobilization. Furthermore, more recent work has shown that the muscle protein synthetic response to protein or amino acid administration becomes blunted following a period of disuse. Though declines in both post-absorptive and postprandial muscle protein synthesis rates seem to play the biggest causal role in the loss of muscle mass during a period of disuse, there is also some indirect evidence that increases in muscle protein breakdown rates occur during the first few days of muscle disuse.

**Communication 2:** *Therapeutic Intervention and strategies to alleviate loss and promote recovery*, Douglas Paddon-Jones (Department of Nutrition and Metabolism, The University of Texas Medical Branch Galveston USA)

The negative health consequences of muscular disuse (bed rest, inactivity, immobilization, sedentary behavior) are unequivocal. As little as 5 days of inactivity can significantly compromise muscle

health - particularly in middle-aged and older adults. Protecting skeletal muscle health during disuse and promoting recovery during rehabilitation is clinically and intuitively desirable. However, key knowledge gaps limit our ability to implement targeted, evidence-based, preventative and/or rehabilitative strategies. Limiters include: i) a poor understanding of the early molecular and metabolic changes during inactivity that precede overt, clinically observable outcomes; ii) a limited ability to identify at-risk individuals; iii) insufficient information to prescribe sex and age-specific therapeutic interventions and iv) the assumption that disused and healthy skeletal muscle have similar, positive responses to rehabilitative exercise. Recent clinical trials have demonstrated that i) nutrition (protein/amino acid/leucine), ii) lower volume/intensity exercise, and iii) anabolic drug interventions can partially protect muscle health during periods of disuse and may hasten recovery. Future trials should seek to refine current intervention strategies by identifying and targeting key time-sensitive elements of the disuse/recovery pathway.

**Communication 3:** *Reduced Activity Accelerates Sarcopenia and leads to metabolic Dysfunction in Aging*, Chris McGlory (Department of kinesiology, Mc Master University Hamilton Canada)

Sarcopenia, defined as the age-related loss of muscle mass and strength, begins in earnest in the 5th decade of life, and is associated with the reduced ability to perform activities of daily living as well as a host of metabolic disease states. In recent years, there has been a worldwide increase in life expectancy and thus, a greater proportion of older adults who suffer from sarcopenia. Older adults are also known to be at greater risk for periods of acute physical inactivity (API) due to, for example, hospitalization and/or convalescence from illness or surgery that independently act to hasten the loss of muscle mass and functional capacity. In a series of studies aimed at recapitulating the episodes of API experienced by older persons, our laboratory has demonstrated that reduced daily stepping for 2-weeks induces declines in muscle mass, integrated rates of muscle protein synthesis, the onset of insulin resistance, and increases in circulating inflammatory markers. Importantly, we discovered that nearly all of these factors failed to fully recover within 2-weeks of returning to habitual stepping. The reduction in rates of muscle protein synthesis and emergence of a hyperglycemic inflamed state may represent an alarming, pernicious confluence of factors that may serve to precipitate declines in metabolic health over time. Given that return to ambulation is currently the standard clinical practice for older adults convalescing from API, these recent findings suggest that proactive interventions such as exercise and or pharmacology are now needed to facilitate full recovery of metabolic function in this population.

**S5- MACROVASCULAR AND MICROVASCULAR CONTRIBUTORS TO SARCOPENIA IN AGING AND DISEASE.** Steven J. Prior (*University of Maryland, USA*)

**Communication 1:** *Skeletal muscle capillarization as a determinant of muscle fiber size and muscle mass in the development of sarcopenia*, Odessa Addison (University of Maryland School of Medicine, USA)

Primary aging may account for some proportion of sarcopenia; however, aging is associated with poor nutrition, low levels of physical activity and the presence of co-morbid conditions including diabetes and cardiovascular diseases that may also contribute. The development of sarcopenia across these conditions may at least be partially attributable to vascular dysfunction and microvascular rarefaction, resulting in limited substrate delivery and anabolic

resistance. In conditions where muscle capillarization is reduced, such as a peripheral arterial disease and type 2 diabetes, a higher incidence of sarcopenia is found when compared with age-matched populations. Furthermore, these individuals with sarcopenia have lower fitness levels and mobility function. Cross-sectional studies demonstrate the presence and degree of sarcopenia is associated decreased capillary-to-fiber ratio, and that lower capillarization is associated with reduced mobility function. Both cross-sectional and longitudinal studies in older adults show that skeletal muscle capillary-to-fiber ratio is tightly linked to muscle fiber cross-sectional area. Taken together, these studies support the hypothesis that reduced capillarization may be one important contributing mechanism to the development of sarcopenia and mobility disability in older adults. Understanding the contributions of skeletal muscle capillarization to reduced muscle mass and function is important for designing and implementing future interventions aimed at increasing muscle mass and function. **Objectives:** This communication will discuss recent findings that sarcopenia, as well as low physical fitness and function are related to low skeletal muscle capillarization, and will also present evidence that low skeletal muscle capillarization may contribute to the development of sarcopenia and reduced mobility function in older adults.

**Communication 2:** *Endothelial function and nutritive flow as potential determinants of anabolic resistance and sarcopenia*, Elena Volpi (University of Texas Medical Branch at Galveston, USA)

Nutritive blood flow normally increases in response to anabolic stimulation by feeding, insulin and exercise, and is an important component in the regulation of skeletal muscle protein anabolism and muscle homeostasis in humans. Aging is associated with endothelial dysfunction which reduces nutritive flow in response to feeding and insulin. Moreover, with advancing age skeletal muscle becomes resistant to anabolic stimulation, which contributes to sarcopenia. Recent studies have identified endothelial dysfunction as a major mechanism that underlies the muscle anabolic resistance of aging via reductions in nutritive flow. Vasodilators and aerobic exercise are important tools that enhance endothelial function and also improve nutritive flow and muscle protein anabolism in older adults. If confirmed in larger clinical trials, vasodilators and aerobic exercise may become clinical interventions for prevention and treatment of sarcopenia. **Objectives:** This communication will present evidence that endothelial dysfunction and reduced nutritive flow contribute to anabolic resistance, and that strategies to enhance endothelial function and nutritive flow may improve the anabolic potential of muscle in older adults.

**Communication 3:** *Skeletal muscle capillarization and satellite cell function; Implications for interventions targeting sarcopenia*, Tim Snijders (Maastricht University Department of Human Biology and Movement Sciences, the Netherlands)

The age-related loss of skeletal muscle mass and strength is associated with the development of functional impairments increased risk of morbidity and mortality, and the need for institutionalization. Key to the development of sarcopenia is the reduced capacity of aged muscle to regenerate, repair and remodel. Over the years, research has focused on elucidating underlying mechanisms of sarcopenia and the impaired ability of muscle to respond to stimuli with aging. Muscle specific stem cells, termed satellite cell, play an important role in maintaining muscle health throughout the lifespan. It is well established that satellite cells are essential in skeletal muscle regeneration, and it has been hypothesized that a reduction or dysregulation of this stem cell pool, may contribute to accelerated

loss of skeletal muscle mass that is observed with advancing age. The preservation of skeletal muscle tissue and its ability to respond to stimuli may be impacted with the reduced satellite cell content and impaired function observed with aging. Aging is also associated with a reduction in capillarization of skeletal muscle. We have recently demonstrated that the spatial distance between type II fiber associated satellite cells and capillaries is greater in older compared to younger adults. The greater distance between satellite cells and capillaries in older adults may contribute to the dysregulation in satellite cell activation ultimately impairing muscle's ability to remodel and in extreme circumstances, regenerate. Maximizing skeletal muscle capillarization in older adults may prove to be critical in restoring muscle satellite cell function and improve the blunted response of aged muscle to resistance exercise training, ultimately delaying and reducing the impact of sarcopenia. **Objectives:** This communication will provide an update on recent research investigating the connection between muscle satellite cell function and fiber capillarization in both young and older adults in response to exercise.

**S6- OSTEOPOROSIS AND SARCOPENIA : TWO DISEASES OR ONE ?** Olivier Bruyère<sup>1</sup>, Cyrus Cooper<sup>2</sup>, René Rizzoli<sup>3</sup>, Jean-Yves Reginster<sup>1</sup> ((1) Department of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium; (2) MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK; (3) Division of Bone Diseases, Faculty of Medicine, Geneva University Hospitals, Geneva, Switzerland)

Loss of bone and muscle with advancing age represents a huge threat to loss of independence in later life. Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture. Osteoporotic fractures, a major cause of morbidity in the population, are associated with increased mortality and generate direct costs in excess of 35 billion euros, in 2010, in the 27 EU countries. Sarcopenia corresponds to a progressive and generalized loss of muscle mass with either a loss of muscle strength or a loss of physical performance. However, a single consensual operational definition of sarcopenia is lacking and none of the definitions, proposed so far, unequivocally emerge as providing benefits over previous ones, leading to inconsistent reports across cohorts on its prevalence. Nevertheless, there is a wide consensus to consider that consequences of sarcopenia, including physical disability, nursing home admissions, depression, hospitalizations and mortality are linked to direct healthcare costs estimated in 2000, in the USA, to raise up to 18.5 billion USD. During the last decade, bone and muscle were increasingly recognized as interacting tissues, not only because of their adjacent surfaces or as a result of the mechanical effects of muscle loading on bone function. In this perspective, the «bone» «muscle» unit would be the site of privileged exchanges in which the two tissues communicate via paracrine and endocrine signals to coordinate their development and adapt their response to loading and injury from embryologic stages to involution. Growing evidence shows that sarcopenia and osteoporosis share many common pathways including the sensitivity to reduced anabolic hormone secretion, increased inflammatory cytokine activity, anabolic or catabolic molecules released by the skeletal muscle or by the bone cells (i.e. myokines and osteokines) and eventually, reduced physical activity. With adipose tissue and cartilage being also involved in their complex interactions came the suggestion that obesity, sarcopenia and osteoporosis could be concomitantly found in a subset of the population, presenting with an entity called osteosarcopenic obesity (OSO) with health outcomes likely to be worse compared with individuals with only one of these disorders. This Symposium

will review recent publications which help to better understand the complex relationship between osteoporosis and sarcopenia, hopefully paving the way for the development of chemical entities that are able to target both diseases.

**Communication 1:** *Lifetime course of muscle and bone wasting*, M. Peterson, Cyrus Cooper (Lifecourse Epidemiology Unit, University of Southampton, Southampton, UK)

**Communication 2:** *Role of nutrition and physical exercise in the prevention of bone and muscle wasting*, René Rizzoli (Division of Bone Diseases, Faculty of Medicine, Geneva University Hospitals, Geneva, Switzerland)

**Communication 3:** *What can we learn from osteoporosis to get a treatment against sarcopenia approved?* Jean-Yves Reginster, (Department of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium)

**S7- THE MID-FRAIL STUDY. EFFECTS OF THE FIRST FRAIL/PREFRIL PEOPLE WITH DIABETES MELLITUS FROM A FUNCTIONAL PERSPECTIVE. CHANGING THE PARADIGM OF APPROACHING DIABETES IN OLDER PEOPLE.** Leocadio Rodriguez-Mañas<sup>1</sup>, Alan J Sinclair<sup>2</sup> ((1) Geriatric Department, Getafe University, Hospital, Getafe, Madrid, Spain; (2) Foundation for Diabetes Research in Older People, Diabetes Frail, Medici Medical, Practice, 3 Windsor Street, Luton, LU1 3UA, UK)

**Communication 1:** *Why we undertook the European Mid-Frail Study and how the Intervention was defined?* Alan J Sinclair<sup>1</sup>, Mikel Izquierdo<sup>2</sup> ((1) Foundation for Diabetes Research in Older People, Diabetes Frail, Medici Medical Practice, 3 Windsor Street, Luton, LU1 3UA, UK; (2) Department of Health Sciences, Public University of Navarra, Spain)

**Background:** Diabetes is the commonest metabolic and disabling disorder in ageing communities and represents an important independent risk factor for the development of Frailty which is becoming an important public health priority for action. Examination of functional loss in Diabetes suggests a multimodal causology due to peripheral neuropathy, accelerated muscle loss, sarcopenic change, and frailty. Analysis of the cycle of functional decline in older adults identifies Frailty as a pre-disability condition which raises the possibility of intervention being involved to decrease disability in Diabetes since disability leads to significant health and social care expenditure and decreased quality of life. Resistance training with or without combination with endurance training has been shown to increase physical function in aging subjects with and without Frailty but studies in older diabetic subjects have been limited and small scale. The Mid-Frail study represents the first large-scale intervention study which has sought to determine if Frailty and reduced functional performance in Diabetes in older adults (>70 years) can be reversed/improved by an intervention composed of resistance exercise training, nutritional education, and optimisation of medical care. This randomised trial funded by the European Commission and will be regarded as a landmark study in this area. **Objectives:** To assess the effectiveness of a multimodal intervention in older frail and pre-frail patients with Type 2 Diabetes Mellitus

**Communication 2:** *Design and implementation of the MID-FRAIL study*, Olga Laosa (Foundation of Biomedical Research, Getafe University Hospital, Getafe, Madrid, Spain)

**Methods:** MID-Frail is an open, randomised, multicentre and international clinical trial, with random allocation by clusters to usual care group (UCG) or intervention group (IG). Main objective was to evaluate, in comparison with usual clinical practice, the effectiveness of a multi-modal intervention (educational program to avoid and detect mainly hypoglycemia, specific HbA1c and BP clinical targets in frail people according to European guidelines (EDWPOP 2011) and individualized resistance training program) in frail and pre-frail subjects 70 years with type 2 diabetes in terms of changes in function (FU: 1 year post-randomization) assessed by SPPB. Secondary objectives were changes in quality of life, caregiver burden, Barthel and Lawton index, hospitalization and permanent institutionalization rates and economical assessment. Seven European countries were involved. Country coordinator was selected in each country and was responsible to select 11-12 trial sites (TS) per country which recruited 7-23 participants each. Randomization unit was the TS to avoid the contamination bias. 98 TS were activated once all procedures had been performed and the approval from the Ethics Committees were received. Good Clinical Practices were followed to carry out the project. Participants and caregivers (if applicable) were invited to sign the informed consent form to can participate in the study. Finally, 1000 participants were included. When one TS included 7 participants was randomized to IG or UCG. TS allocated to IG contacted to country coordinator to provide them the intervention material (exercise machines, diaries, material for educational program, etc). All countries used the same material for intervention. UCG consisted in the level of routine care a patient with diabetes will normally be expected to receive from his/her local healthcare system.

**Communication 3:** *Main results and conclusions*, Leocadio Rodríguez-Mañas (Geriatric Department, Getafe University Hospital, Getafe, Madrid, Spain)

**Results:** 963 patients were included in the study along 7 EU countries (Spain, UK, France, Italy, Germany, Belgium, Czech Republic) in 74 Trial Sites. 447 patients were included in sites allocated to intervention and 516 in those receiving usual care. Between the screening and the basal visits 120 patients decided not to participate, being the final sample formed by 834 individuals (494 in UCG and 349 in IG). Mean age was  $78.0 \pm 5.4$  yrs.; 37.8 % were frail; mean years since diagnostic  $16.9 \pm 14.49$ ; mean HbA1c was  $7.27 \pm 1.21$ ; mean BMI  $29.6 \pm 4.96$ ; mean BP  $140.0 \pm 18.7$  mmHg/ $75.32 \pm 11.25$  mmHg; mean SPPB was  $8.46 \pm 2.63$ ; mean Barthel Index  $96 \pm 7.35$  and Lawton Index  $6.9 \pm 1.67$ . There were no significant differences in the characteristics of the patients allocated to any of the branches of the trial. After one year of follow up, there was an improvement in SPPB score of 1.19 (from 8.25 at baseline to 9.44 at month 12) in the IG (adjusted  $p < 0.001$ ) while this change in the UCG was 0.08 (from 8.63 to 8.71) (NS). The difference between groups was 1.11 ( $p < 0.001$ ). The 2 sensitivity analysis carried out did not show significant changes with the results obtained in the primary analysis. The improvements in SPPB were observed since the week 10 and reached its maximum at week 26 (8 weeks after finishing both the strength training and the educational programs) when the value was 9.51. Since then, SPPB score in the intervention group was maintained, showing a very mild decrease (-0.07). The improvement was observed in the three domains of SPPB (balance, gait speed and chair stand). Episodes of symptomatic hypoglycemia and hospitalization showed a tendency to improvement in IG

versus UCG (-4.3%, CI-11.5 to 3.0% and -4.2%, CI -10.2 to 1.7%, respectively) but did not reach statistical significance. No differences were found regarding IADL, ADL, quality of life and care burden. Taking into consideration the social perspective, the health benefits did not change, changing the cost items solely. The conclusion obtained according to the health perspective was not altered when we added this social perspective, as intervention was still a dominant option. Thus, switching from usual care to intervention program entails a saving of 610 EUR and a gain of 0.9222 points in SPPB score. More than 15% of individuals improved their SPPB scores at least 1 point. Accordingly, the ICER is negative, indicating that the intervention is a dominant option. When considering QALYs as a health result, intervention program saves 712 EUR in comparison with usual care and obtained 0.0527 additional QALYs. Hence, intervention program dominates again over the usual care. **Conclusion:** A multimodal intervention program, easy to implement and with a good adherence rate, produces clinically significant improvements in older frail and pre-frail patients with Type 2 Diabetes, a benefit that remains along the time. The intervention has, in addition, a good cost-effectiveness relationship, making it available for implementation by health services.

## CONFERENCE

**C1- SPRINTT CLINICAL TRIAL UPDATE.** Emanuele Marzetti<sup>1</sup> Riccardo Calvani<sup>2</sup>, Anna Picca<sup>2</sup>, Matteo Tosato<sup>1</sup> Matteo Cesari<sup>3,4</sup>, Roberto Bernabei<sup>2</sup>, Francesco Landi<sup>2</sup> ((1) *Department of Geriatrics, Neurosciences and Orthopedics, Teaching Hospital «Agostino Gemelli», Rome, Italy;* (2) *Department of Geriatrics, Neurosciences and Orthopedics, Catholic University of the Sacred Heart, Rome, Italy;* (3) *Ospedale Maggiore Policlinico, Milan, Italy;* (4) *Geriatric Unit, Department of Medical Sciences and Community Health, University of Milan, Milan, Italy*)

The proposition of sarcopenia as a major component of physical indicates that interventions specifically targeting the skeletal muscle may offer preventive and therapeutic advantages against frailty and its clinical correlates. Observational studies and some randomized clinical trials (RCTs) have suggested a positive effect of regular physical activity (PA) (and nutritional interventions) on improving physical function and/or reducing symptoms of disability in healthy older individuals and those at risk for mobility disability. Definite evidence from high-quality, large-scale RCTs is still lacking. To fill this gap in knowledge, the SPRINTT consortium has sponsored a phase III, single-blind, multicenter RCT (ClinicalTrials.gov identifier: NCT02582138) designed to compare the efficacy of a multi-component intervention (MCI) program (physical activity, nutritional counseling/dietary intervention, and information and communication technology [ICT] intervention) versus a healthy aging lifestyle education (HALE) program for preventing mobility disability in non-disabled older persons with physical frailty & sarcopenia (PF&S). The primary outcome is mobility disability, operationalized as inability to walk for 400 m within 15 min, without sitting, help of another person, or the use of a walker. Trial operations are taking place in 16 clinical sites, located in 11 European countries, under the coordination of the Department of Geriatrics at the Catholic University of Rome (Italy) and the support by members of EFPIA (Sanofi-Aventis R&D, Novartis, GlaxoSmithKline, and Servier). 1517 participants (mean age 78 years [SD 5.7], 73.3% women) have been enrolled in the SPRINTT RCT. 1203 had a SPPB score between 3 and 7 (mean SPPB 6.1 [SD1.1]), while 314 participants had a SPPB score of 8 or 9 (mean SPPB 8.7 [SD0.5]). Interestingly, more than 37% of SPRINTT participants have a BMI greater than 30. The main exclusion criteria

were: a) SPPB out of range (49.8%); b) normal muscle mass at DXA (31.2%); and c) failure to complete the 400-m walk test (6.6%). The intervention attendance is quite good. 66% of expected center-based and 74% of home-based physical activity sessions were attended. As for the HALE group, SPRINTT participants were present at more than 70% of the meetings. The dropout rate is around 6%.

**C2- INSIGHT INTO THE INTERSECTION BETWEEN SARCOPENIA AND FRAILTY: RELATIONSHIP BETWEEN MUSCLE MASS AND FRAILTY STATUS.** Paulo H. M. Chaves<sup>1</sup>, Sheila Ingham<sup>2</sup>, Antonio Carlos Carvalho<sup>2</sup>, Alberto Frisoli<sup>2</sup> ((1) Benjamin Leon Center for Geriatrics Research and Education, Hebert Wertheim College of Medicine, Florida International University; (2) Department of Orthopedics, Federal University of São Paulo, São Paulo, Brazil; (3) Division of Cardiology, Federal University of São Paulo, São Paulo, Brazil; (4) Cardiogeriatric Unit, Division of Cardiology, Federal University of São Paulo, São Paulo, Brazil)

**Introduction:** Low muscle mass has been conceptualized to play a role in the pathogenesis of frailty, a major geriatric syndrome. Consistently, low muscle mass has been linked to early clinical manifestations in the natural history of frailty, including weakness and slowness, but not to distal outcomes of frailty, including disability and hospitalization risk. The relationship of muscle mass to frailty status (as opposed to individual frailty phenotype components) in older adults remains to be better characterized, and its evaluation is this study's main objective. **Methods:** Cross-sectional analyses of observational data from the SARCopenia, Osteoporosis, and Vulnerability Outcomes Study (SARCOS), an epidemiologic investigation of older adults in a cardiology outpatient clinic in Sao Paulo, Brazil. Two traditional whole-body dual-energy X-ray absorptiometry estimates of lean mass were considered: appendicular lean mass (ALM) scaled to height squared (ALM/height<sup>2</sup>), and body mass index (ALM/BMI). Frailty phenotype status (frail, pre-frail, and robust) was defined according to a modified version of the approach proposed by Fried et al. Multinomial logistic regression was used. **Results:** Analytic sample (n=219) had a mean ( $\pm$  standard deviation [SD]) age of 78.2 ( $\pm$ 7.2); 56.4% were women. Prevalence of frailty was 14.0%; low muscle mass according to the Foundation of the National Institutes of Health (FNIH) criteria was 64.6% in men (ALM/BMI<0.789), and 47.7% in women (ALM/BMI<0.512). ALM/BMI was associated with frailty status in a linear fashion, with incrementally higher levels of ALM/BMI associated with incrementally lower odds of frailty. In an age- and gender-adjusted model, 1 SD higher ALM/BMI was associated with 63% (25%-82%, p=.006) lower odds of being classified as frail, as opposed to robust. ALM/height<sup>2</sup> was not associated with frailty after adjustment. **Conclusion:** The concept and measurement of sarcopenia have been evolving. Our results demonstrated that inferences about the muscle mass-frailty status association may change substantially by ALM estimate, and that ALM/BMI was strongly, linearly, and inversely related to frailty occurrence in older adults. Enhanced understanding about methodologies for muscle mass assessment and clinical classification may help advance knowledge about transition from sarcopenia to frailty, and potentially lead to novel preventive approaches.

**C4- SARCOPENIA AND FRAILTY GUIDELINES UPDATE IN ASIA.** Hidenori Arai<sup>1</sup>, Elsa Dent<sup>2</sup>, Chang-Won Won<sup>3</sup>, and Liang-Kung Chen<sup>4</sup> ((1) National Center for Geriatrics and Gerontology, Japan; (2) Torrens University of Australia, Australia; (3) Kyung Hee University Hospital, Korea; (4) Taipei Veterans General Hospital, Taiwan)

Sarcopenia is a major challenge to healthy aging, and affected patients tend to have worse clinical outcomes and higher mortality than those without sarcopenia. The Asian Working Group for Sarcopenia (AWGS) published regional consensus guidelines in 2014, and many research studies from Asia have been published since then. After the introduction of the AWGS consensus, the reported prevalence of sarcopenia estimated by the AWGS criteria ranges between 4.1% and 11.5% of the general older population. Reported risk factors included age, sex, heart disease, hyperlipidemia, daily alcohol consumption, and low protein or vitamin intake, whereas physical activity is a protective factor. Although AWGS 2014 diagnostic cut-offs were generally well accepted, some may require further revision in light of conflicting evidence from outcome-based studies. Due to the great impact of sarcopenia, a life course program for good nutrition and physical activities would be of great benefit. However, various research challenges remain to be resolved in the future and more outcome-based trials are needed to formulate the most optimal strategy for sarcopenia in Asia. In 2016 we organized the clinical guideline committee in the Japanese Association on Sarcopenia and Frailty and tried to publish the guidelines for sarcopenia for Japanese patients. We systematically searched PubMed, the Cochrane Library, and Ichushi-Web for RCTs from January 2000 to December 2016. We meta-analyzed the outcomes with the net difference between-group treatment from baseline to the end of the study. We also developed evidence-based clinical practice guidelines for the identification and management of frailty in older adults. The guidelines were formed using an adapted GRADE methodology, and incorporated an extensive literature search paired with the expert knowledge and experience of international experts in gerontology and geriatrics. Strong recommendations were: (i) frailty should be identified using a validated screening tool; (ii) physical activity should be prescribed that includes a resistance training component; and (iii) polypharmacy should be addressed. These clinical practice guidelines can be used to support healthcare professionals in their recognition, care and management of older persons with sarcopenia and frailty.

**C5- A NOVEL NON-PHARMACOLOGICAL INTERVENTION TO IMPROVE PHYSICAL HEALTH IN OBESE ELDERLY: CITRULLINE WITH HIGH-INTENSITY INTERVAL TRAINING.** M Aubertin-Leheudre (UQAM; Québec-Canada)

The importance of, the age-related loss of skeletal muscle mass and function, is now widely recognized. The estimated direct health care cost attributable to muscle atrophy in the United States in 2000 was \$18.5 billion. However, considering that poly-medication has deleterious effects on health and quality of life, it is therefore appropriate to implement non-pharmacological interventions in order to optimize successful aging. This has led to increasing interest in the influence of adult lifestyle, particularly in the effects of modifiable factors such as physical activity and diet on muscle mass and function in older people, with a view to identifying intervention opportunities both to prevent and manage muscle decline. There is a growing body of evidence that links insufficient intakes of protein, vitamin D, antioxidant nutrients, and n3 long-chain polyunsaturated fatty acids, to poor physical function. Interestingly, citrulline (a non-proteinogenic amino acid) supplementation (CIT) was shown, in

both rats and young human adults, to be able to increase muscle protein synthesis and increase lipolysis in adipocytes. In parallel, physical inactivity is also clearly linked to losses of muscle mass and strength, suggesting that increasing levels of physical activity should have protective effects. However, more than half of older adults are sedentary and the first self-reported cause is the lack of time. Thus, High-Intensity Interval Training (HIIT), due to its high effectiveness and short duration, is a promising avenue to prevent also muscle function decline and also metabolic disorders. Therefore, CIT may exert additional beneficial effects when combined with HIIT but their combined effects are unknown in obese older adults. Thus, the general aim of this symposium will be to present and discuss the effectiveness of combined interventional studies (HIIT training with or without citrulline supplementation on muscle function in older adults. More specifically, the speaker will present data from an interventional randomized controlled trial which examined the effects of CIT combined with HIIT on body composition (DXA) muscle strength and physical performance in 72 inactive obese older adults (mean age: 68±5y; 50% of women). Overall, this talk will highlight a new potential non-pharmacological intervention to prevent the loss of muscle function and physical performance in older adults.

**C6- A MINIMALIST APPROACH TO POWER TRAINING FOR ENHANCING LATERAL BALANCE FUNCTION AND MOBILITY IN OLDER ADULTS.** Mario Inacio<sup>1</sup>, Odessa Adison<sup>1,2</sup>, Robert Creath<sup>1</sup>, Mark W. Rogers<sup>1</sup> ((1) *University of Maryland School of Medicine Department of Physical Therapy and Rehabilitation Science, MD, USA*; (2) *Division of Gerontology and Geriatric Medicine, Baltimore VAMC GRECC*)

In addition to the points made in the rationale and conclusions in the original communication 3 abstract, this study found that just 15 mins of hip abductor-adductor (AB-AD) power training, 3 times per week for eight weeks improved: - hip AB muscle composition (CT derived muscle attenuation and intramuscular adipose tissue (IMAT) infiltration); - hip AB muscle quality and hip AB-AD rate of neuromuscular activation (derived from surface electromyography (EMG)), during standing hip AB-AD isometric maximal voluntary contractions (IMVC); - incidence of the most biomechanically optimized balance recovery stepping strategy (single lateral steps), during lateral waist-pull balance perturbations; - training-induced improvements in the four step square test (FSST), a clinical measure of functional mobility, were associated with reductions in hip AB IMAT.

**C8- EUROPEAN AND NORTH AMERICAN PRACTICES ADDRESSING ENDOCRINE ISSUES IN OLDER ADULTS WITH FRAILTY.** Willy Marcos Valencia<sup>1,2</sup>, Carmen Castillo Gallego<sup>3,4</sup>, Ana Alfaro-Acha<sup>4,5,6</sup> ((1) *Geriatrics Research, Education and Clinical Center (GRECC), Miami VA Medical Center, Miami (VAMC), FL, USA*; (2) *Dpt. of Medicine, University of Miami, Miami, FL, USA*; (3) *Hospital Virgen del Valle, Complejo Hospitalario de Toledo, Spain*; (4) *CIBER of Frailty and Aging (CIBERFES), Toledo, Spain*; (5) *Frailty Unit. Dpt. of Geriatric. Hospital Virgen del Valle of Toledo. Spain*; (6) *GENUD (Growth, Exercise, Nutrition and Development) Research group, University of Toledo. Spain*)

Points: • Older community-dwelling older adults with Frailty phenotype have multiple co-morbidities including endocrine issues. • The phenotype of older adults with impaired mobility is regularly observed in primary care clinics (PCC) but often not assessed; • There is overlap in the phenotypes of patients with frailty syndrome and falls; • Falls syndrome is more prevalent in older adults with

frailty, compared to prefrail or robust. • The comprehensive geriatric assessment detects reversible risk factors, but primary care providers are not trained and their practices often cannot accommodate the time. Hence, falls continue to go unrecognized and unassessed. • Older adults at risk for frailty or falls syndromes must undergo a comprehensive geriatric assessment, followed by a multidimensional exercise and nutrition program to optimize successful aging.

**C9- THE FUTURE OF FRAILTY MANAGEMENT.** Bertrand Fougère<sup>1,2,3</sup>, Elsa Dent<sup>4,5</sup> ((1) *Gérontopôle, Centre Hospitalier Universitaire de Toulouse, Toulouse, France*; (2) *Inserm UMR1027, Université de Toulouse III Paul Sabatier, Toulouse, France*; (3) *Division of Geriatric Medicine, Saint Louis University School of Medicine, St. Louis, Missouri, USA*; (4) *Torrens University of Australia, 220 Victoria Square, Adelaide, Australia*; (5) *Baker Heart and Diabetes Institute, Level 4, Commercial Road, Melbourne, Australia*)

**Precision Medicine (P4) in the management of Frailty and Sarcopenia (Fougère.B):** Precision medicine is an approach that recognizes individual variability in genes, lifestyle and environment for the individual. It recognizes that different persons require different treatment approaches. The 4 pillars of P4 medicine are: Predictive, Preventive, Personalized and Participatory. It requires an interprofessional approach. Frailty lends itself ideally to the P4 approach. We are rapidly learning that both a person's genes and genetic instability lead to frailty. Other factors predicting frailty are telomere attrition, epigenetic alterations, mitochondrial dysfunction and stem cell exhaustion. Precision medicine on muscle quality can also help to understand the substantial variability in individual patient response to health-related outcomes and adapt intervention programs to the individual phenotype of each patient. This will necessarily involve an individualized prescription according to the functional capacity of the person, with specific recommendations about the dose (intensity, volume, and frequency), similar to those of other medications. **Rapid Detection of Frailty in Older Adults (Dent.E):** The FRAIL scale is a useful tool for the rapid detection of frailty, and is suitable for application in multiple settings, including primary care, hospitals and population-wide health screening. Rapid screening of frailty with the FRAIL scale should be paired with a rapid response to frailty, which involves Comprehensive Geriatric Assessment, multidisciplinary case management, and individually tailored care plans.

**C12- COGNITIVE FRAILTY: FROM CONCEPTUAL PROPOSAL TO CLINICAL PRACTICE.** Liang-Kung Chen<sup>1,3</sup>, Hiroyuki Shimada<sup>2</sup>, Li-Ning Peng<sup>1,3</sup>, Chih-Kuang Liang<sup>1,3</sup>, Hidenori Arai<sup>1,2</sup> ((1) *National Yang Ming University, Taiwan*; (2) *National Center for Geriatrics and Gerontology, Japan*; (3) *Taipei Veterans General Hospital, Taiwan*; (4) *Kaohsiung Veterans General Hospital, Taiwan*)

Declines in physical and cognitive function are common age-related conditions and the synergistic impact on aging had been reported in the literature. However, previous intervention studies were mostly focused on preventing the occurrence of disabilities in either physical or cognitive domains. Although improvement in physical function may be accompanied by the improvement of cognitive performance as well, more studies are needed to prove the concepts of preventing physical disability and dementia through an integrated approach. In 2013, cognitive frailty was proposed to identify older adults with physical frailty and cognitive impairment to highlight the potential of designing a new approach to promote healthy aging.

Modified criteria have been proposed to improve the early detection rate and to ensure the potential of reversibility. However, to date, no convincing epidemiological studies had been published to demonstrate adverse outcomes of cognitive frailty and the reversibility. The Asian Association for Frailty and Sarcopenia (AAFS) proposed the modified diagnostic criteria for cognitive frailty by using the presence of weakness and/or slowness plus early cognitive impairment in any domain (defined by 1.5 SD below the age, sex, and education-matched norms). By using the diagnostic criteria among cohort studies in Japan and Taiwan, the prevalence of cognitive frailty was between 10-15% and the associations between cognitive frailty with physical disability, incident dementia, and mortality were clearly shown. Moreover, a sub-group study of a nationwide clustered randomized controlled trial clearly showed the significant improvement in physical performance and cognitive performance through an integrated multi-domain intervention study consisting of exercise, cognitive training, nutritional consultation and chronic condition management. In conclusion, modified cognitive frailty by AAFS may identify 10-15% community-living older people with higher vulnerability to physical disability, incident dementia and all-cause mortality. Moreover, a multi-domain integrated intervention program may potentially reverse the vulnerable state.

## ORAL COMMUNICATIONS

**OC1- THE RELATIONSHIP BETWEEN T-CELL RESPONSES TO CYTOMEGALOVIRUS (CMV) AND ONSET OF FRAILTY IN HIV- AND HIV+ MEN IN THE MULTICENTER AIDS COHORT STUDY (MACS).** JB Margolick<sup>1</sup>, JH Bream<sup>1</sup>, TL Nilles<sup>1</sup>, H Li<sup>2</sup>, SL Langan<sup>1</sup>, S Deng<sup>1</sup>, R Wang<sup>3</sup>, N Wada<sup>3</sup>, SX Leng<sup>2</sup> ((1) Department of Molecular Microbiology and Immunology, Johns Hopkins Bloomberg School of Public Health, USA; (2) Division of Geriatric Medicine and Gerontology, Department of Medicine, Johns Hopkins School of Medicine; (3) Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, USA)

**Backgrounds:** Both aging and treated HIV-infected populations exhibit low-level chronic immune activation of unknown etiology which correlates with morbidity and mortality. Infection with cytomegalovirus (CMV) is common in both populations but its relation to immune activation is unknown. **Objectives:** To determine whether the T-cell response to CMV is a predictor of the onset of frailty in non-frail men who have sex with men (MSM), either infected with human immunodeficiency virus (HIV+) or not (HIV-), in the MACS. **Methods:** The MACS is a longitudinal cohort study that has followed HIV- and HIV+ MSM semiannually since 1984, with frailty assessments by the Fried criteria (since 2007) and storage of peripheral blood mononuclear cells (PBMC) and serum at all study visits. Nonfrailty was defined as non-satisfaction of the Fried criteria at 2 consecutive study visits. Cryopreserved PBMC from 21 nonfrail MACS participants (11 virologically suppressed HIV+, 10 HIV-) were stimulated with peptides spanning 19 CMV open reading frames and intracellular cytokine responses (percentages of CD4 and CD8 T-cells producing IFN-, TNF-, and/or IL-2) were assessed by flow cytometry. Soluble and cellular markers of immune activation and inflammation were assessed by multiplex electrochemiluminescence and flow cytometry, respectively. Men were followed for up to 7 yr (median 6 yr) after assessment of CMV responses. **Results:** All men had detectable responses to CMV. Proportions of CMV-responsive T-cells correlated strongly ( $r=0.6$  or  $-0.6$ ) and significantly ( $p<0.05$ ) with several immunologic markers, depending on donor HIV status and frailty status. In HIV+ nonfrail men, the CD4 T-cell IL-2 response to

CMV correlated strongly ( $r=0.75$ ) with serum IL-6, a known predictor of frailty. Therefore, we asked whether this response predicted onset of frailty. Men in the upper tertile of the response ( $>2.5\%$  responding T-cells) had faster time to frailty ( $p=0.02$ ) and a higher proportion of visits with the frailty phenotype (median 30% vs 0%;  $p=0.03$ ) than men in the lower two tertiles, among HIV- men but not among HIV+ men. **Conclusion:** The magnitude of the CD4 IL-2 response significantly predicted onset of frailty in HIV- nonfrail men, but not in HIV+ nonfrail men, in this small study. T-cell responses to CMV may strongly influence chronic immune activation in HIV-uninfected and virologically suppressed HIV-infected men, and may predict frailty in HIV-uninfected men.

**OC2- MANUAL (STOPWATCH) AND INSTRUMENTAL (GAITRITE) EVALUATION OF 4-METER PREFERRED WALKING SPEED IN OLDER SUBJECTS WITH PHYSICAL FRAILTY.** Marcello Maggio, Yari Longobucco, Valentina Angileri, Sara Tagliaferri, Fulvio Lauretani (*Clinic Geriatric Unit Department of Medicine and Surgery, University of Parma, Italy*)

**Background:** GSK2881078 4m usual gait speed is one of the most used parameters to assess physical frailty and sarcopenia. Timed usual walking speed on 4-meter course is generally assessed by using both a stopwatch (4-meter manual measurement, 4-MM) but this method is potentially affected by intra and inter-operators biases. Instrumental techniques using accelerometers may have higher accuracy and GAITRite system is particularly useful on this regard because of its additional ability to determine temporal and spatial parameters of walking. **Objectives:** To compare intra and interclass variability in 4-MM and to test differences between 4-MM and instrumental (GAITRite) modalities to assess 4-meter WS in older subjects with probable physical frailty and sarcopenia. **Methods:** 168 non-disabled community dwellers ( $n=77$  men,  $n=91$  women) aged  $77.31\pm 4.73$  and probable physical frailty were asked to walk 4 meters in the GAITRite walkway for three times. The 4-MM (m/s) was performed in parallel by two different operators and measured in GAITRite walkway. Each subject underwent SPPB with a score  $\geq 9$  indicating physical frailty. The correlation between 4-MM and instrumental measurements was tested by Pearson, while the correlation between 3 tests performed by the same tester was evaluated by intraclass correlation coefficient (ICC). The difference between means was tested by regression analysis for non parametric tests. **Results:** The sample ( $n=168$ ) included 64 frail (SPPB-9) and 104 well performant (SPPB-10) individuals. In all subjects, we found a significant difference of the means of the speed assessed by two different operators, ( $p=0.03$ ). A strong correlation ( $r=0.99$ ,  $p<0.0001$ ) between means of the speed assessed by 2 testers (OP1 = 1.00088 m/s, OP2 = 1.00752), and between 4-MM and GAITRite (1.08172 m/s  $r_{OP1-GAITRite}=0.92639$ ;  $r_{OP2-GAITRite}=0.93157$ ). We also found significant difference in the three measures of the same operator ( $p<0.0001$ ). A low ICC between the means of three different measures was found for operator 1 (ICC=0.50) and 2 (ICC=0.49). In frail subjects, the means of gait speed of operator 1 (1.140 m/s) and 2 (1.143 m/s) were not significantly different but each of these measurements were significantly higher than GAITRite measure (0.97464 m/s,  $p<0.0001$ ). **Conclusion:** In older subjects with probable physical frailty, we detected intra and inter class significant difference in the gait speed measurements performed by manual (stopwatch) approach. Minimal but statistically significant differences were detected between stopwatch and GAITRITE. GAITRite system detected a slower walking speed in older frail subjects suggesting a potential higher 'diagnostic accuracy'.

**OC3- FRAILTY AND MULTIMORBIDITY: A SYSTEMATIC REVIEW AND META-ANALYSIS.** Davide L Vetrano<sup>1,2</sup>, Katie Palmer<sup>3</sup>, Alessandra Marengoni<sup>4</sup>, Emanuele Marzetti<sup>2</sup>, Fabrizia Lattanzio<sup>5</sup>, Regina Roller-Wirnsberger<sup>6</sup>, Luz Lopez Samaniego<sup>7</sup>, Leocadio Rodríguez-Mañás<sup>8</sup>, Roberto Bernabei<sup>2</sup>, Graziano Onder<sup>2</sup> on behalf of the Joint Action ADVANTAGE WP4 group ((1) Aging Research Center, Department of Neurobiology, Health Care Sciences and Society, Karolinska Institutet and Stockholm University, Stockholm, Sweden; (2) Department of Geriatrics, Catholic University of Rome, Italy; (3) San Camillo Hospital IRCCS, Venice, Italy; (4) Department of Clinical and Experimental Sciences, University of Brescia, Italy; (5) Scientific Direction, Italian National Research Centre on Aging, Ancona, Italy; (6) Department of Internal Medicine, Medical University of Graz, Austria; (7) Andalusian Public Foundation of Progress and Health, Regional Ministry of Health of Andalusia, Spain; (8) Geriatric Department, Hospital Universitario de Getafe, Madrid, Spain)

**Background:** Multimorbidity and frailty are expression of the complexity that characterizes health in older people and these constructs have been proposed as potential models of care. However, it is not clear to which extent these conditions overlap, and the evidence on their potential causal links is scanty. **Objectives:** We systematically reviewed the literature, and provide pooled estimations of any evidence regarding a) the coexistence of frailty and multimorbidity, and b) their association in adults and older adults. **Methods:** Systematic review and meta-analysis of observational studies searching PubMed and Web of Science for relevant articles up to September 2017. We retrieved studies providing information on the association between frailty and multimorbidity in adult subjects, regardless of the study setting, study design, or definition of multimorbidity and frailty. Pooled estimates were obtained through random effect models and Mantel-Haenszel weighting. Homogeneity was assessed through the I2 statistics (significant if 50%). The risk of bias was assessed through the Newcastle-Ottawa Scale. Publication bias was assessed with the Egger's and the Begg's tests. This study was a priori registered with PROSPERO (Ref. 57890) and was patronized by the European Joint Action on frailty ADVANTAGE. **Results:** A total of 48 studies involving 78122 participants were selected and 25 were included in one or more meta-analyses. Forty-five studies were cross-sectional and 3 longitudinal, with the majority of them including community-dwelling participants (n=35). Forty-three studies presented a moderate risk of bias, and 5 a low risk. In meta-analyses, the prevalence of multimorbidity in frail individual was 72% (95% Confidence Interval [95% CI] 63% to 81%; I2=91.3%) and the prevalence of frailty among multimorbid individuals was 16% (95% CI 12% to 21%; I2=96.5%). Finally, multimorbidity was associated with frailty in pooled analyses (OR 2.27; 95% CI 1.97 to 2.62; I2 47.7%). The three longitudinal studies suggest a bidirectional causal relationship between multimorbidity and frailty. **Conclusion:** Frailty and multimorbidity are two related conditions in older adults. Most frail individuals are also multimorbid but fewer multimorbid ones present also frailty. Our findings are not conclusive regarding the causal association between the two conditions. Further longitudinal and well-designed studies may help to untangle the relationship between frailty and multimorbidity.

**OC4- HEALTH CARE UTILIZATION IN NON-GERIATRIC PATIENTS WITH FRAILTY PHENOTYPE.** Miriam Zylberglait Lisigurski, Carmen Cartwright, Sharmila Ravindranathan, Sameer Shaharyar, Osman Perez, Aimee Almanzar, Jasdip Grewal, Saied Alsabagh (*Internal Medicine Residency Training Program, Aventura Hospital and Medical Center, USA*)

**Background:** The Frailty is associated with increased risk of functional decline, mortality and health care utilization in the elderly population. Data suggests that the frailty phenotype (FP) may be present in non-geriatric individuals, increasing their risk for negative health outcomes. **Objectives:** The aim of the study is to determine the level of health care utilization in non-geriatric patients with FP. **Methods:** Design: Prospective cohort of non-geriatric patients followed for 10 months. Subjects and Setting: Sample of adults (18-65 years) visiting an Academic Primary Care Clinic (August 2016 - January 2017). Measures: We administered the FRAIL Scale, and categorized patients into two groups: robust (0 points), frailty phenotype (1-5 points). Ten months later, information regarding hospital admissions (HA), telephone encounters (TE), emergency room (ER) and primary care (PCP) visits were collected. Data Analysis: We performed descriptive statistics, comparing data between robust and FP patients. Logistic regression analysis was used to ascertain the effect of FP on health care utilization. **Results:** We evaluated 174 participants, mean age of 45+/-12 years, 96(55%) were female. FP was present in 78(45%) participants. Frequency of FP was higher in females (53% vs 35%; p=0.015), no differences in age were found. Charlson Comorbidity score (CCI) was significantly higher in the FP group (1.4+/-1.6 vs 0.9+/-1.3; p=0.024). There was an increased OR for HA 2.3 [95% confidence interval (CI) 1.1-4.9; p=0.045] and >2 TE [OR= 2.4 (95% CI 1.2-4.8; p=0.019)] in the FP group. Having at least one ER visit, had an OR=1.9 (95% CI 0.9 - 3.8; p=0.06), that did not reach statistical significance. PCP visits were not affected by FP. After adjusting for age, gender and CCI, the FP group continue presenting an increased odd for HA, TE and ER, however not reaching statistical significance. **Conclusion:** Frailty phenotype, in non-geriatric community dwelling patients is associated with increased use of the health care system. The results of our study portends that FP warrants prompt targeted interventions that we anticipate will improve healthcare outcomes and potentially reduce health care utilization..

**OC5- BLOCKADE OF GDF8 AND ACTIVIN A LEAD TO INCREASES IN THIGH MUSCLE VOLUME IN HEALTHY POSTMENOPAUSAL WOMEN: A SINGLE ASCENDING DOSE STUDY.** Stephen Donahue, Shazia Ali, Dinko Gonzalez Trotter, Zhizhi Qing, Joseph Yen, Evelyn Gasparino, Pretty Meier, Marcella Ruddy, Gary Herman (*Regeneron Pharmaceuticals, Inc., Tarrytown, NY, USA*)

**Background:** In GDF8 (myostatin) and activin A are putative negative regulators of muscle growth. REGN2477 (anti-activin A) and trevogrumab (anti-GDF8) are fully human monoclonal antibodies that specifically bind and block signaling of activin A and GDF8. Preclinical data suggest that blockade of activin A and GDF8 may have greater efficacy in increasing muscle mass than either alone and is proposed to be a possible treatment of muscle diseases. We sought to corroborate this finding in humans. **Objectives:** To assess safety, tolerability, and the impact on muscle size of anti-activin A alone, anti-GDF8 alone, and the combination in healthy postmenopausal women. **Methods:** This was a phase 1, randomized, double-blind, placebo-controlled, single ascending intravenous dose study in 48 subjects. A key objective was to assess thigh muscle volume (TMV) as measured by MRI. Treatments included placebo (n=12), trevogrumab alone (n=6), REGN2477 alone (n=6), and the combination at low

(n=6), medium (n=6), and high (n=12) doses. **Results:** Blockade of GDF8 and activin A together resulted in robust and dose-dependent increases in TMV by MRI, which was corroborated by effects on appendicular lean mass by DXA. TMV increased in the REGN2477+ trevogrumab high dose group by 7.73% as compared with 0.88% in the placebo group (nominal  $p < 0.001$ ) at week 8. Trevogrumab alone also significantly increased TMV. Blockade of both GDF8 and activin A significantly decreased total fat mass (high dose group) compared with placebo. All treatments were generally well tolerated; treatment-emergent adverse events (TEAEs) were mild to moderate in severity except one severe TEAE of radius fracture reported by a placebo subject. There were no serious adverse events, no deaths, and no discontinuations due to TEAEs. **Conclusion:** This study shows for the first time that the selective blockade of GDF8 and activin A, in combination, can increase muscle size in humans and corroborates the role of these proteins as mediators of muscle homeostasis. The results also suggest the promise of REGN2477 and trevogrumab combination as potential therapeutics for the treatment of serious muscle diseases.

**OC6- PSOAS MUSCLE AREA IN HEALTHY ADULTS: EFFECT OF NORMAL AGING AND DERIVATION OF REFERENCE VALUES.** Samuel Mamane<sup>1</sup>, Christos Galatas<sup>2</sup>, Wayne Lok<sup>3</sup>, Mina Girgis<sup>2</sup>, Chams Cherid<sup>3</sup>, Louis Mullie<sup>1</sup>, Amanda Trnkus<sup>3</sup>, Antoinette Colacone<sup>4</sup>, Xiaoqing Xue<sup>4</sup>, Marc Afilalo<sup>4</sup>, Jonathan Afilalo<sup>2,3</sup> ((1) Division of General Internal Medicine, Jewish General Hospital, McGill University, Montreal, Canada; (2) Division of Cardiology, Jewish General Hospital, McGill University, Montreal, Canada; (3) Division of Epidemiology, Jewish General Hospital, Montreal, Canada; (4) Department of Emergency Medicine, Jewish General Hospital, Montreal, Canada)

**Background:** Segmentation of computed tomography (CT) images is increasingly used to estimate skeletal muscle mass. A growing body of evidence has shown the prognostic value of cross-sectional psoas muscle area (PMA) as a readily available biomarker for sarcopenia and frailty in patients with cardiovascular, oncological, and surgical conditions. However, there has yet to be a study measuring PMA in healthy adults, such that normal values and age effects remain unclear. **Objectives:** To derive sex-specific reference values for PMA in a healthy North American population. **Methods:** Consecutive CT scans of the abdominal region acquired at a single emergency department between 1/2014 and 1/2017 were retrospectively identified. Electronic health records were queried to exclude patients with significant acute or chronic medical conditions diagnosed before or after the index CT scan, and to include only those that had a presenting complaint of benign abdominal discomfort. Using the CoreSlicer.com software (version 2.0, Montreal), PMA was measured using the density threshold brush tool from the axial CT image at the level of the top of the L4 vertebrae. All measurements were repeated by 2 independent observers and the mean value was retained. Bland-Altman analysis was used to assess inter-observer reliability. A parametric approach was used to define the 2.5th percentile cutoff in males and females. **Results:** The cohort consisted of 390 healthy adults (162 males, 228 females). In age group 20-39 (N=133), mean PMA was  $32.2 \pm 6.1$  cm<sup>2</sup> in males and  $19.6 \pm 4.0$  cm<sup>2</sup> in females. In age group 40-59 (N=211), mean PMA was  $29.9 \pm 5.3$  cm<sup>2</sup> in males and  $17.7 \pm 3.7$  cm<sup>2</sup> in females. In age group 60-79 (N=46), mean PMA was  $22.6 \pm 3.3$  cm<sup>2</sup> in males and  $15.0 \pm 3.5$  cm<sup>2</sup> in females. The 2.5th percentile cutoff based on the young adult group was 20.3 cm<sup>2</sup> in males and 11.8 cm<sup>2</sup> in females. Inter-observer measurement mean difference was 0.61 cm<sup>2</sup> with 95% limits of agreement of -1.43 to 2.65 cm<sup>2</sup>. **Conclusion:** PMA is smaller in females and decreases with age, and this is the first study to define sex-specific PMA reference values in a North American

population.

**OC8- EFFECT OF DELTA-TOCOTRIENOLS AND GREEN TEA POLYPHENOLS ON GLUCOSE HOMEOSTASIS AND SKELETAL MUSCLE IN OBESE MALE MICE WITH INSULIN RESISTANCE.** C. Maxwell<sup>1</sup>, M. Dietrich<sup>1</sup>, M. Karlekar<sup>2</sup>, R. Miller<sup>2</sup> ((1) Vanderbilt University, Nashville, TN, USA; (2) Vanderbilt University Medical Center, Nashville, TN, USA)

**Background:** Geriatric trauma exemplifies the convergence of aging, frailty and injury with a high prevalence of cognitive impairment (> 40%) and physical frailty (> 50%) among patients admitted to acute care. Since 2013, initiatives at our Level I trauma center have included 1) an 18-month longitudinal examination of the influence of pre-injury frailty on patient outcomes (mortality, functional decline, readmissions to acute care); 2) use of bedside frailty screening as a trigger for early geriatric palliative care; and 3) exploration of older adults and family caregivers perceptions about frailty and the influence on patient outcomes. **Methods:** 1) Prospective longitudinal cohort study (October 2013-March 2015). 395 injured older adults were admitted over a 6-month period and we enrolled and followed 188 patients for one year. 2) Prospective quality improvement project (March-May 2015). Bedside nurses were trained to implement a validated frailty screening process on older adults admitted to our trauma unit. The process included interdisciplinary discussions and referrals for early geriatric palliative care consultations. 3) Qualitative content analysis (June-December 2016). Focus groups (2) were held at a senior living community; and individual interviews were conducted with hospitalized injured older adults (n=25) and family caregivers (n=15). Respondents were shown prognostication data on frailty and outcomes using simple pictographs. Semi-structured interviews were conducted by a trained research assistant. **Results:** 1) 34 patients (18%) died by 6 months, and 47 (25%) by 1 year. Overall, median physical frailty scores did not return to baseline in the majority of survivors at 6-months and 1-year. Multivariate regression analysis revealed that pre-injury cognitive impairment, and pre-injury physical frailty are independently associated with functional status at 6-months and 1-year. Multivariate logistic regression analysis revealed that age (OR=1.09, CI 1.04-1.14), injury severity (OR=1.07, CI 1.02-1.12), and pre-injury physical frailty (OR=1.28, CI 1.14-1.47) are independently associated with overall mortality. 2) 131 patients (age 65 and older) were admitted to the trauma unit and 64 (49%) were screened for pre-injury frailty. Forty-four of 131 (34%) patients received palliative care consultations over the project period, an increase of 150% from four consecutive prior years (2011-2014). 3) Themes emerged among five coded categories: 1) reactions to information, 2) approaching the topic/receptiveness, 3) presence of others, 4) considerations related to a fall, and 5) suggestions about information delivery. Differences among older adults were observed, based on pre-injury frailty status. **Conclusion:** Pre-injury physical frailty is the predominant predictor of poor outcomes among geriatric trauma patients. Trauma teams can implement a screening process for frailty and cognitive impairment into their daily workflow. Positive screens effectively trigger an increase in earlier referrals to palliative care. Communication with patients and families about frailty, injury, and outcomes can be enhanced with simple prognostication aids.

**OC9- LEVERAGING NON-PHYSIOLOGICAL ASPECTS OF NMES FOR BENEFICIAL NEUROMUSCULAR ADAPTATIONS IN OLDER ADULTS.** David W Russ<sup>1</sup>, Eric Leach<sup>1</sup>, Brian C Clark<sup>2</sup> ((1) *Ohio University Division of Physical Therapy, Athens, OH, US*; (2) *Ohio Musculoskeletal and Neurological Institute (OMNI) at Ohio University, Athens, OH, USA*)

**Backgrounds:** Age-related weakness increases risks of disability and mortality 4 and 2-fold, respectively. Accumulating data suggest that dynamic muscle performance parameters (e.g., power, rate of force development) may be more important to maintaining independent function and mobility in older adults than force generation. However no specific type of exercise has been found to consistently improve power more than any other. This may be due to the fact that all volitional exercise protocols involve essentially the same motor unit activation processes. Neuromuscular Electrical Stimulation (NMES) activates motor units in a non-physiological manner. **Objectives:** Our goal was to develop a novel NMES protocol, which we have TRANSIT (Therapeutic Rapid Activation of the Neuromuscular System for Interval Training), and test the potential for it to enhance neuromuscular function in older and younger adults. **Methods:** In a quasi-experimental, repeated measures design (each subject serving as his or her own control), young (n = 9) and older (n= 4) adults received the TRANSIT protocol (3x/wk) to the non-dominant knee extensor muscles. Isometric force, dynamic muscle power, muscle cross-sectional area (CSA), voluntary activation (VA) and electrically-elicited contractile properties were measured pre- and post-training. **Results:** Though muscle quality (isometric force/CSA) did not change for young or older subjects, responses of old and young adults to TRANSIT were quite different in other regards. Younger adults showed small, but significant (3%, p = 0.04) increases in CSA, that largely mirrored changes in isometric force. Older adults showed no significant increase in either CSA or isometric strength. However, improvements in dynamic, isotonic muscle performance of older adults (power, angular velocity) exceeded isometric gains substantially (+10-15%), despite the fact that TRANSIT involved an isometric training paradigm. In addition, changes in contractile responses to stimulation revealed increases in rates of force development (+15-19%) that were not due to improvements in central drive or motivation. As neither group exhibited marked reductions in VA at baseline, TRANSIT did not increase this parameter. However, the one older subject that did show a VA deficit (89%) at baseline did have increased VA post-training (97%). **Conclusion:** Training using the TRANSIT protocol markedly improved dynamic muscle performance in older adults, running counter to the idea of specificity of training. This is unlikely to be the result of improved central drive, as only one participant exhibited any central activation impairment prior to training. Combined with the improved contractile properties of the trained muscles, these data suggest that this method of training with NMES may involve mechanisms not typically responsive to volitional exercise and be of particular benefit to older adults. TRANSIT was well-tolerated by all participants and the method of application involves low joint loads and systemic cardiovascular demand, such that TRANSIT could be effectively used in the presence of common, age-associated comorbidities (e.g., osteoarthritis, cardiovascular disease).

**OC10- SARC-F: DEFINING A VALIDATED CUTOFF FOR PRE-SARCOPENIA FOR RISK ASSESSMENT AMONG COMMUNITY DWELLING OLDER PERSONS.** WS Lim<sup>1,2</sup>, L Tay<sup>3</sup>, A Yeo<sup>2</sup>, S Yew<sup>2</sup>, N Hafizah<sup>2,4</sup>, YY Ding<sup>1,2</sup> ((1) *Department of Geriatric Medicine. Tan Tock Seng Hospital. Singapore*; (2) *Institute of Geriatrics and Active Ageing. Tan Tock Seng Hospital. Singapore*; (3) *Department of General Medicine (Geriatric Medicine), Sengkang General Hospital. Singapore*; (4) *Department of Continuing and Community Care. Tan Tock Seng Hospital. Singapore*)

**Background:** The SARC-F was developed as a rapid screening tool for sarcopenia. A score of 4 or greater is predictive of sarcopenia and poor outcomes. The at-risk state of pre-sarcopenia is characterised by low muscle mass without impact on muscle strength or physical performance. Unlike analogous frailty scales where the cutoff for pre-frailty is established, the SARCF does not have a corresponding cutoff for pre-sarcopenia. **Objectives:** To compare the diagnostic performance, concurrent validity and predictive validity of two cutoffs (1 vs 2) for pre-sarcopenia among older adults without functional or cognitive impairment. **Methods:** Two-hundred community-dwelling older adults (mean age=67.9years) were assessed for frailty using modified Fried criteria; Short Physical Performance Battery (SPPB); Frenchay Activity Index (FAI); activities of daily living (ADL); Mini-Nutrition Assessment (MNA); and appendicular muscle mass using dual-energy X-ray (DXA). Outcomes at 2-years include incident sarcopenia; SPPB<10; FAI<30; incident ADL decline; and incident falls. We performed ROC analysis for sarcopenia diagnosis at baseline for diagnostic performance; 1-way ANOVA with post-hoc comparison for concurrent validity; and logistic regression of 2-year outcomes adjusted for age, gender and body mass index for predictive validity. **Results:** For diagnostic performance, using cutoff 1 identified 54 additional pre-sarcopenia subjects (sensitivity 36.7%, specificity 64.7%) compared with cutoff 2 (sensitivity 11%, specificity 92.3%). The ratios of pre-sarcopenia/sarcopenia cases were 17 and 4 respectively. When stratified into non-sarcopenic, pre-sarcopenic and sarcopenic subgroups, both cutoffs had comparable discriminant ability for frailty and appendicular mass, but cutoff 2 had higher F-values for physical performance (balance, chair-stand, and SPPB total score) and MNA. For predictive validity of 2-year outcomes, both cutoff 2 (OR=9.78,95%CI: 2.96-32.34,P<0.01) and 1 (OR=5.86,95%CI:2.02-17.01,P<0.01) predicted SPPB <10, and showed a trend for FAI<30 (p=0.080 and 0.066 respectively). Both did not predict incident sarcopenia or incident ADL decline. Only cutoff 2 showed a trend for 2-year incident falls (OR=4.56,95%CI:0.96-21.81, P=0.056). **Conclusion:** This is the first study to demonstrate proof-of-concept evidence about the validity of cutoffs for pre-sarcopenia. Using cutoff 2 provides a high specificity case-finding strategy that does not over-detect pre-sarcopenia relative to sarcopenia, and has better discriminatory ability for physical performance and malnutrition. The potential of SARC-F identified pre-sarcopenia as a separate therapeutic entity for early intervention requires further study

**OC11- CLINICAL MUSCLE WEAKNESS IS ASSOCIATED WITH MORTALITY IN A NATIONALLY REPRESENTATIVE SAMPLE OF OLDER ADULTS: THE HEALTH AND RETIREMENT STUDY.** Kate Duchowny<sup>1</sup>, Mark Peterson<sup>2</sup>, Philippa Clarke<sup>1,3</sup> ((1) Department of Epidemiology, University of Michigan School of Public Health, Ann Arbor, MI, USA; (2) Department of Physical Medicine and Rehabilitation, University of Michigan, Ann Arbor, MI, USA; (3) Institute for Social Research, University of Michigan, Ann Arbor, MI, USA

**Backgrounds:** Muscle weakness, as measured by handgrip strength, is associated with cardiovascular and all cause-mortality; however, there are wide inconsistencies in the magnitude of these effects due to divergent definitions used to define muscle weakness across studies. **Objectives:** The objective of this study was to examine the relationship between previously defined sex/race-specific cutpoints of clinical muscle weakness and early mortality. **Methods:** Data comes from the 2006-2014 Health and Retirement Study. Time-varying clinical muscle weakness, as defined by handgrip strength cutpoints, was the primary exposure. Time to death, ascertained from the National Death Index, was the outcome of interest. The association between time-varying clinical muscle weakness and early mortality across an 8-year observation period was determined using Kaplan-Meier methods and extended Cox regression. **Results:** Out of the 8,495 individuals in the study, 1,799 deaths (21%) occurred during the observation period. Median follow-up time was 8.3 years (SD  $\pm$ 1.9 years). Weak individuals had a steeper decline in their survival trajectory, compared to non-weak individuals (Log-Rank test,  $p < .001$ ). After adjusting for sociodemographic factors and time-varying smoking history, weak individuals were over 50% more likely to die earlier than non-weak individuals (HR=1.52, 95% CI= 1.15, 1.47). **Conclusion:** This is the first study to use muscle weakness cut-points derived in a nationally-representative sample to identify those individuals who may be at greatest risk for premature mortality. Results underscore the importance of muscle weakness, as defined by handgrip strength, as a key risk factor for premature mortality in older Americans.

**OC12- COMBINED EFFECTS OF BIO101 ON ANABOLISM AND MITOCHONDRIAL FUNCTION IN SKELETAL MUSCLE CELLS.** Maria Serova<sup>1</sup>, Sissi On<sup>1</sup>, Blaise Didry-Barca<sup>1</sup>, Stanislas Veillet<sup>1</sup>, René Lafont<sup>2</sup>, Pierre Dilda<sup>1</sup> ((1) Biophysitis, UPMC, BC9, Paris, France ; (2) Sorbonne Universités, UPMC Univ Paris 06, Paris-Seine Biology Institute (BIOSIPE), CNRS, Paris, France)

**Background:** Skeletal muscle progressive loss of function and atrophy are physiological consequences of aging subsequently leading to a decrease in mobility and poor quality of life. The drug candidate BIO101 previously demonstrated its potential for improving muscle quality and function in different in vitro and in vivo models. BIO101 is the API of Sarconeos currently tested in clinical IIB trial in patients with sarcopenia. **Objectives:** The aim of this study was to characterize the impact of BIO101 on cellular energy metabolism and oxidative stress. **Methods:** Mouse C2C12 myoblasts were induced to differentiate and myotube diameters were measured under fluorescent microscopy. The activation of various signalling pathways was assessed by western blot. Relative levels of mRNA expression were evaluated by qRT-PCR. Intracellular ROS were assessed using the DCFDA dye by flow cytometry. Oxygen consumption was measured using a Seahorse XF Analyzer. Twenty-two-month-old C57BL10 mice were subjected to either vehicle or BIO101 50mg/kg\*day for 14 weeks. **Results:** BIO101 treatment induced a significant increase of myofibres diameter (+24%,  $p < .001$ ) consistently with a rapid

and significant activation of AKT/mTOR and MAPK signalling pathways involved in muscle anabolism and with a significant decrease in myostatin gene expression (-45%;  $p < .01$ ). In addition to these anabolic properties, BIO101 stimulated mitochondrial function, specially increasing mitochondrial spare respiratory capacity (+23%,  $p < .05$ ). Under glucose starvation and in the presence of fatty acids, BIO101 stimulated basal respiration (+37%,  $p < .001$ ) suggesting an increased flexibility in energy metabolism. Furthermore, BIO101 treatment lowered reactive oxygen species levels in cells subjected to an oxidative stress in accordance with an AMPK activation, a key player in mitochondrial biogenesis and antioxidant systems, observed both in vitro and in vivo. **Conclusion:** This study demonstrates that the overall beneficial properties of BIO101 on muscle function rely on both anabolic and mitochondrial effects. Increases in mitochondrial respiratory spare capacity, in energy metabolism flexibility and in antioxidant capacity in response to BIO101 exposure are believed to be responsible for more energy production. These new results are key elements to better understand the effects of BIO101 in improving running ability of old mammals and justify the clinical development of Sarconeos in patients with sarcopenia.

**OC13- WEIGHT CHANGE AND RISK OF FNII SARCOPENIA PROJECT LOW LEAN MASS.** John A. Batsis<sup>1,2,3</sup>, Rebecca S. Crow, Curtis Petersen<sup>3</sup>, Courtney J. Stevens<sup>1</sup>, Todd A. Mackenzie<sup>1,2,3</sup>, Stephen J. Bartels<sup>1,2,3</sup> ((1) Geisel School of Medicine at Dartmouth, Hanover, New Hampshire, United States; (2) Department of Medicine, Dartmouth Hitchcock Medical Center, Lebanon, New Hampshire, United States; (3) The Dartmouth Institute for Health Policy, Lebanon, New Hampshire, United States)

**Background:** The Foundation for the NIH Sarcopenia Project identified cutpoints of low lean mass (LLM) in older adults at risk for physical impairment. Understanding whether weight change over the lifespan impacts the development of LLM is clinically important for identifying individuals at risk for disability. **Objectives:** Ascertain the relationship between self-report weight change and LLM in a United States older adult population. **Methods:** We identified 4,984 subjects 60 years with body composition measures from the National Health and Nutrition Examination Surveys 1999-2004, a cross-sectional survey of non-institutionalized persons in the United States. LLM was defined using appendicular lean mass (ALM): males <19.75kg, females <15.02kg. Self-reported weight was assessed at the time of the survey, at one and 10 years earlier, and at age 25. Weight changes between baseline and each timepoint were categorized as greater/less than 5% or no change (between -5% and +5%; referent). Logistic regression assessed the primary predictor of weight change (gain, loss, no change) on the outcome of LLM, after adjusting for age, sex, race, education, smoking, diabetes, arthritis, coronary artery disease, and cancer. **Results:** Of 4,984 participants (56.5% female), mean age and BMI were 71.1 years and 28.2 kg/m<sup>2</sup>. Mean ALM was 19.7 kg. Prevalence of LLM was 29.9%. We observed 8.8 and 20.3% participants with LLM gaining and losing 5% weight, respectively in the past year. In the past 10 years, weight gain and loss of 5% was observed in 27.2 and 32.3% of LLM participants. Compared to age 25, 59.9 and 21.1% of LLM participants gained and lost 5% of their weight, respectively. Weight gain over the past year was associated with a lower risk of having LLM (OR 0.57 [0.40, 0.82]) compared to individuals losing 5% weight (1.06 [0.85, 1.31]). Weight loss (5%) over 10-years had a higher risk of having LLM (OR 1.59 [1.23, 2.07]) while weight gain (5%) had a lower risk (OR 0.46 [0.37, 0.56]). Results were robust compared to weight at 25 years (weight gain OR 0.27 [0.20, 0.36]; weight loss OR 1.61 [1.13, 2.30]). **Conclusion:** Self-reported weight gain suggests a reduced risk of LLM. Future studies

using objective measures are needed to verify these findings and ascertain its relationship with physical function.

**OC14- INTER- AND INTRA-READER PRECISION ERRORS OF VOLUME OF MUSCLE AND IMAT OF THE THIGH IN T1-WEIGHTED MAGNETIC RESONANCE IMAGING.** Klaus Engelke<sup>1</sup>, Dinko González Trotter<sup>2</sup>, Ken Gøthner<sup>3</sup>, Stephen Donahue<sup>2</sup>, Shazia Ali<sup>2</sup>, Marcella Ruddy<sup>2</sup>, Joseph Yen<sup>2</sup>, Gary Herman<sup>2</sup>, Joyce Harp<sup>2</sup>, Thomas Fuerst<sup>3</sup> ((1) *Institute of Medical Physics, University of Erlangen & Bioclinica, Inc, Hamburg, Germany*; (2) *Regeneron Pharmaceuticals, Inc., Tarrytown, NY, USA*; (3) *Bioclinica, Inc, Portland, OR, USA*)

**Background:** Quantification of muscle atrophy and adipose tissue (AT) by magnetic resonance imaging (MRI) techniques is a topic of great interest. Clinical applications and active research cover muscle diseases, physical activity, obesity and sarcopenia, all of which rely on reliable and objective measurements. **Objectives:** To determine intra- and inter-operator precision of volume of total thigh muscle, subcutaneous adipose tissue (SAT), fascia, muscle and inter-muscular AT (IMAT, defined as sum of intra and perimuscular AT) in standard T1-weighted MRI sequences. **Methods:** Baseline and one week follow-up images of 48 subjects of a study of safety, tolerability, and pharmacokinetics of Regn2477 alone and in combination with Regn1033 in healthy postmeno-pausal women (Clinical trials.gov: NCT02943239) were used in this investigation. T1 weighted images of both upper legs were obtained (Axial 2D T1-w FSE multi-slice sequence, slice thickness 5 mm, slice gap 5 mm). Five slices centered mid-thigh were semi-automatically segmented using slice-based grey level tracing algorithms. The total thigh, the fascia, the entirety of all muscles within the fascia (including intramuscular AT) and IMAT were segmented. Segmentation results were corrected by a trained operator, if necessary. Results of the analyzed five slices were summed for total volume. Precision errors were calculated as root mean square % coefficients of variation (rmsCV%). In-tra-operator precision was calculated using baseline and one week FU visits independently for two operators. Inter-operator precision was assessed independently for both visits. **Results:** Results are shown in the table. Results were pooled for right-left thighs and BL and FU visits, as no differences were observed. Except for IMAT, which represents a much smaller volume, precision errors were below 2-3%, which is an excellent result for a semiautomatic segmentation. Inter-operator IMAT precision errors were about twice as high as intra-operator errors. Mean ± SD

	Intra-operator 1	Intra-operator 2	Inter-operator	mm <sup>2</sup> /slice	rmsCV%
Total thigh	182±19	1.63	1.64	0.50	
SAT	73±16	2.66	2.70	2.51	
Fascia	109±20	1.36	1.48	1.58	
Muscle	86±16	2.10	2.21	1.85	
IMAT	23±22	5.12	5.78	10.48	

**Conclusion:** In standard T1-weighted images precision errors for basic soft tissue parameters are small. However, a separate assessment of intramuscular AT and its differentiation from perimuscular AT is difficult. Here more advanced Dixon sequences are recommended.

**OC15- MUSCULAR, VISUOSPATIAL PROCESSING, AND NEUROMOTOR FACTORS AS PREDICTORS OF PHYSICAL FUNCTION IN OLDER ADULTS.** Nathan P. Wages<sup>1,2</sup>, Leatha A. Clark<sup>1,2,4</sup>, Andrew M. Bryant<sup>1,5</sup>, Julie A. Suhr<sup>1,5</sup>, Todd M. Manini<sup>6</sup>, Brian C. Clark<sup>1,2,3</sup> ((1) *Ohio Musculoskeletal and Neurological Institute (OMNI), Ohio University, Athens, OH, USA*; (2) *Department of Biomedical Sciences, Ohio University, Athens, OH, USA*; (3) *Department of Geriatric Medicine, Ohio University, Athens, OH, USA*; (4) *Department of Family Medicine, Ohio University, Athens, OH, USA*; (5) *Department of Psychology, Ohio University, Athens, OH, USA*; (6) *Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA*)

**Background:** Forty-two percent of the older adult population (i.e., > 65 yrs) report having one or more physical limitations performing essential daily tasks considered necessary for maintaining functional independence in the community. Despite much research associated with age-related reductions in physical independence, the causes of age-related losses in physical function remain unclear. The two most postulated contributors for impaired physical function in the elderly are loss of muscle mass and strength, but there are numerous other factors (e.g., muscle quality, force steadiness, visuospatial processing speed, etc.) that likely contribute as well. **Objectives:** To determine the relative contribution of skeletal musculature, visuospatial processing, and neuromotor factors in explaining the between-subject variance during different physical function tasks in older adults. **Methods:** Fifty-four seniors (77.9±5.9 yrs; range: 68-92 yrs) participated in this study. Multiple regression analyses, using nine predictor variables that represent three domains (skeletal muscle, visuospatial processing, and neuromotor function), were performed for six physical function tasks (Table 1). To minimize the effect of collinearity, only predictor variables that had r 0.60 were included in the models. To evaluate the independent contribution of each predictor, the semi-partial r (sp-r) values were calculated. The sp-r value is interpreted as the variance in the respective physical function task (the dependent variable) uniquely attributable to the given predictor variable (by factoring out shared variance contributions with other predictors). **Results:** Overall, the predictor variables explained between 27-60% of the variance in the performance of the respective physical tasks. Muscle strength and the rate of voluntary force development exhibited the highest sp-r values when considered across all physical function tasks. Refer to Table 1 for complete results. **Conclusion:** These findings suggest that measures of neuromotor function are uniquely related to physical function. They also suggest that visuospatial processing speed is uniquely related to gait and physical function tests requiring a high degree of agility/movement initiation. Interestingly, lean tissue mass was only a strong predictor of stair climb power.

**OC16- NEW VIEWS ON SARCOPENIA AND DYNAPENIA - DO WE KNOW THE COHERENCE?** A Heber<sup>1,2</sup>, K Stöver<sup>3</sup>, W. Bloch<sup>1</sup>, S. Eichberg<sup>3</sup>, K Brixius<sup>1</sup>, P Noirez<sup>2</sup> ((1) *Institute of Cardiology & Sports Medicine, Department of Molecular & Cellular Sport Medicine, German Sport University Cologne, Germany*; (2) *Institute of biomedical and epidemiological research in sport, EA7329, Université Paris Descartes, France*; (3) *Institute of Movement & Sport Gerontology, German Sport University Cologne, Germany*)

**Background:** It is considered that changes in muscle mass are directly and fully responsible for changes in strength. However, muscle strength is not solely dependent upon muscle size as the decline in muscle strength is much more rapid than the concurrent loss of muscle mass. The link in between loss of skeletal muscle mass (sarcopenia) and muscle strength (dynapenia) is still not fully

understood. **Objectives:** Hypothesizing that sarcopenia and dynapenia are associated with metabolic changes and health status in elderly, resistance training was used to stimulate the muscle tissue. **Methods:** 65-80 year old, healthy men (n=74) were divided in: group I (active), group II (non-active, obese), group III (non-active, sarcopenic obese), group IV (non-active, sarcopenic obese, protein intake). Sarcopenic obesity was measured due to the cut-off points of EWGSOP. Resistance training of the major muscles groups twice a week with 85% 1RM, 3 sets, 8-12 repetitions was performed either 12 (group I) or 16 weeks (group II-IV). Protein supplementation was taken twice per week directly after training (30g Whey protein) and every night (30g Casein) in 300ml 1,5% low fat milk. Handgrip strength (HGS) was measured with a hand dynamometer, leg strength by leg press, skeletal muscle mass (SMI) by bioimpedance analysis and dynapenia by HGS/body weight. **Results:** A significant increase in leg strength after training is indicated in all groups. The SMI in group I decreases significantly after training. Shift in sarcopenic classifications towards 'class I' or 'no sarcopenia' is significant. No changes in SMI or handgrip strength have been observed neither in group II, III nor IV. The level of dynapenia remains unchanged after training. **Conclusion:** The significant increase in leg strength in all groups supports the documented effect of resistance training in elderly. The increase of strength while observing a skeletal muscle mass decline or no mass change validated the finding that age related muscle strength is weakly associated with the loss of muscle mass. However, resistant training lead to a significant decrease in muscle mass of healthy elderly.

#### OC17- 25-HYDROXYVITAMIN D AND SARCOPENIA IN OLDER ADULTS: THE HEALTH ABC STUDY.

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**Background:** 25-hydroxyvitamin D (25(OH)D) has been shown to play a role in muscle strength and physical function; however, the effects of 25(OH)D on muscle mass are less clear. **Objectives:** We examined the association between 25(OH)D and prevalent and incident sarcopenia in community-dwelling older adults in the Health ABC study. **Methods:** Health ABC participants were initially well-functioning, community-dwelling black and white men and women aged 70-79 years from Pittsburgh, PA, and Memphis, TN, USA (n=2,696; mean (SD) age, 73.6 (2.8) years; 51% female; 39% black). Serum 25(OH)D was categorized as <20 ng/mL, 20-<30 ng/mL, and 30 ng/mL. Body composition was assessed by DXA. Usual gait speed was assessed over a 6m walk. Sarcopenia was defined as low appendicular lean mass divided by height squared (7.23 in men, 5.67 in women) and slow gait speed (<1.0 m/sec) at baseline, 2- and 4-year follow-up using the International Working Group on Sarcopenia definition. The association between 25(OH)D categories and prevalent sarcopenia was examined using logistic regression; incident sarcopenia over 4 years of follow-up was examined using Cox regression. All models were adjusted for demographics, behavioral characteristics, BMI, chronic conditions, and season. **Results:** The mean (SD) 25(OH)D was 25.7 (10.3) ng/mL, with 33%, 35%, and 32% of participants having 25(OH)D <20, 20-<30, and 30 ng/mL, respectively. At baseline, 99 (3.7%) participants had prevalent sarcopenia. Compared to participants with 25(OH)D 30 ng/mL, participants with 25(OH)D <20 ng/mL, but not 20-<30 ng/mL, had greater odds of prevalent sarcopenia (OR (95%CI): 1.94 (1.05-3.56)

and 1.48 (0.86-2.55), respectively). After excluding participants with prevalent sarcopenia and those lacking follow-up (n=351), 247 (11.0%) participants developed sarcopenia over 4 years of follow-up. However, there was no association between 25(OH)D and incident sarcopenia over 4 years of follow-up (HR (95% CI): 1.01 (0.71-1.45) and 0.77 (0.57-1.05) in participants with 25(OH)D <20 and 20-<30 ng/mL, respectively, compared to participants with 25(OH)D 30 ng/mL). **Conclusion:** Low 25(OH)D was associated with greater prevalence of sarcopenia at baseline but not incidence of sarcopenia over 4 years of follow-up among initially well-functioning, community-dwelling older adults. Further research is needed to determine the role of 25(OH)D on sarcopenia.

#### OC18- HIGH ENDOGENOUS BCAA LEVELS ARE ASSOCIATED WITH MUSCLE STRENGTH AND SIGNATURES OF MYOSTEATOSIS: FRIENDS OR FOES?

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**Background:** Branched chained amino acid (BCAA) supplementation seems to exert beneficial effects on physical functionality. However, endogenous BCAA metabolism in obesity and its relationship with ectopic lipid deposition in the skeletal muscle (namely, myosteatosis) and muscle strength has been poorly investigated to date. **Objectives:** The aim of our study was to investigate the relationship between endogenous BCAA levels and muscle strength, muscle quality and signatures of myosteatosis in adult subjects with obesity. **Methods:** Participants were enrolled among patients admitted to the High Specialization Center for the Care of Obesity, Sapienza University, Rome, Italy. Inclusion criteria were age between 18 and 65 years, and BMI 30kg/m<sup>2</sup>. Body composition (body fat, total lean body mass- LBM, and appendicular lean mass- ALM) was assessed through DXA and magnetic resonance imaging with spectroscopy was used to evaluate the signatures of sarcopenia and myosteatosis (thigh muscle cross sectional area- CSA, intramyocellular lipid content- IMCL, and intramuscular adipose tissue- IMAT). Muscle strength was assessed through the handgrip strength (HGST) test. HGST was normalized to LBM to obtain an indicator of muscle quality. FFA levels were measured. The HOMA-IR was calculated as an index of insulin resistance. In addition, study participants were divided into two groups based on the median values of ALM (below the median: low muscularity group vs. above the median: high muscularity group). **Results:** A total of 80 participants were included (women, n= 65, men, n=15), age: 48.3 ± 12.6 years, BMI: 37.69 ± 4.94 kg/m<sup>2</sup>. Participants in the low muscularity group showed significantly lower plasma BCAA levels than their high muscularity counterparts after adjustment for age and sex (p<0.05). A significant positive correlation emerged between plasma BCAA levels and HGST (r=0.26, p=0.036), muscle quality (r=0.32, p=0.013); surprisingly, BCAA levels were also correlated with IMCL (r=0.30, p=0.036), and with a segmental index of sarcopenic obesity: the IMAT/ thigh muscle CSA ratio (r=0.26, p=0.04). Multiple regression analysis confirmed those associations and revealed a negative association between BCAA concentrations and FFA levels after adjustment for HOMA-IR and body fat (all p values < 0.05). **Conclusion:** In adult subjects with obesity endogenous BCAA levels exhibited a positive association with muscle strength but as well as with some phenotypic aspects of myosteatosis. The discrepant role potentially played by BCAAs in muscle strength generation and lipid

metabolism in skeletal muscle needs to be further elucidated by future research.

**OC23- SOCIOECONOMIC GRADIENTS IN FRAILTY, DISABILITY, AND DEATH PROCESS: RESULTS FROM THE JAPAN GERONTOLOGICAL EVALUATION STUDY.** Takaaki Ikeda<sup>1,2</sup>, Jun Aida<sup>2</sup>, Toru Tsuboya<sup>2</sup>, Yusuke Matsuyama<sup>3,4</sup>, Shihoko Koyama<sup>2,5</sup>, Kemmyo Sugiyama, Katsunori Kondo<sup>6,7</sup>, Ken Osaka<sup>2</sup> ((1) Department of Rehabilitation, Sendai Seiyo Gakuin College, Sendai, Japan; (2) Department of International and Community Oral Health, Tohoku University Graduate School of Dentistry, Sendai, Japan; (3) Department of Global Health Promotion, Tokyo Medical and Dental University, Tokyo, Japan; (4) Research Fellow of Japan Society for the Promotion of Science, Tokyo, Japan; (5) Tohoku Medical Megabank Organization, Tohoku University, Sendai, Japan; (6) Center for Preventive Medical Sciences, Chiba University, Chiba, Japan; (7) Center for Gerontology and Social Science, National Center for Geriatrics and Gerontology, Aichi, Japan)

**Background:** A few studies examined the impact of socioeconomic status (SES) on frailty/disability process and the results were inconsistent. **Objectives:** This study aimed to determine the impact of SES on changes in (pre-)frailty, disability, and all-cause mortality. **Design:** Prospective cohort study. **Setting:** Twenty-Three Japanese municipalities between 2010 and 2013. **Participants:** Functionally independent community-dwelling elderlies aged 65 (n = 65,952). **Measurements:** The baseline survey was conducted between 2010 and 2012, and self-reported questionnaires were mailed to 141,452 community-dwelling elderlies (response rate 65.2%). The follow-up survey was conducted in 2013 (follow-up rate 81.7%). Discrete health stages were classified into five groups; robustness, pre-frailty, frailty, disability, and death. A frailty index was used to detect frailty status and higher scores indicated higher severity of frailty (robustness, 0-3 points, pre-frailty, 4-7 points; and frailty, 8-25 points, respectively). The onset of functional disability was defined as disability. We conducted three multinomial logistic regression models stratified by initial disability status (robustness, pre-frailty, and frailty). Educational attainment and equalized household income were separately added to the models, adjusting for covariates, including age and sex. **Results:** The prevalence of pre-frailty and frailty were 34.0% and 24.2% at the baseline, respectively. Participants with the highest educational level were less likely to experience changes in pre-frailty, frailty, and disability from robustness (to pre-frailty, the odds ratio (OR), 0.70, 95% confidence interval (CI), 0.64-0.77; to frailty, OR, 0.58, 95% CI, 0.47-0.71; and to disability, OR, 0.77, 95% CI, 0.64-0.93, respectively). Meanwhile, participants with the highest income level were less likely to experience whole adverse health status switching from robustness (to pre-frailty, OR, 0.62, 95% CI, 0.54-0.70; to frailty, OR, 0.36, 95% CI, 0.25-0.52; to disability, OR, 0.63, 95% CI, 0.44-0.89; and to death, OR, 0.57, 95% CI, 0.40-0.82, respectively). Further, they were less likely to experience change in frailty and more likely to recover to robustness from pre-frailty (to frailty, OR, 0.83, 95% CI, 0.67-1.02, and to robustness, OR, 1.23, 95% CI, 1.05-1.43, respectively). Additionally, they were more likely to recover to robustness from frailty (OR, 1.35, 95% CI, 0.96-1.90). **Conclusion:** Socioeconomic gradients were observed on health status switching among older individuals in Japan.

**OC24- INTERLEUKIN-6 AND PERCEIVED FATIGABILITY AMONG ADULTS IN MID-TO-LATE LIFE.** Amal A. Wanigatunga<sup>1,2</sup>, Ravi Varadhan<sup>2,3</sup>, Eleanor M. Simonsick<sup>4</sup>, Stephanie Studenski<sup>4</sup>, Luigi Ferrucci<sup>4</sup>, Jennifer A. Schrack<sup>1,2</sup> ((1) Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA; (2) Center on Aging and Health, Johns Hopkins University and Medical Institutions, Baltimore, Maryland, USA; (3) Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA; (4) Intramural Research Program, National Institute on Aging, Baltimore, Maryland, USA)

**Backgrounds:** Chronically elevated interleukin-6 (IL-6) levels contribute to functional decline via multiple pathways that often lead to frailty. Lesser known is the relationship between IL-6 and activity-related fatigue (fatigability), another frailty component. **Objectives:** To characterize the association of IL-6 and perceived fatigability at baseline and longitudinally. **Methods:** A total of 985 men and women from the Baltimore Longitudinal Study of Aging (BLSA; mean age of 70 +/- 10 years) were evaluated every 1-4 years (mean follow-up of 3 (range 1-8) years). IL-6 was measured in fasting blood serum samples collected at each visit and log-transformed for analyses. Several baseline IL-6 cut-points, ranging from 2.5-4.1 pg/mL, were explored to examine categorical IL-6 associations with perceived fatigability over time. Perceived fatigability was reported by the participant based on the Borg rating of perceived exertion (RPE; scored 6 to 20 where higher scores represent higher exertion) after a 5-minute, 0.67 m/s, 0% grade treadmill walk. Associations between IL-6 (baseline and repeated measures) and perceived fatigability were assessed using generalized estimating equations, adjusting for demographics, behavioral factors, and comorbid conditions. **Results:** In fully adjusted models, each 1 unit higher baseline log IL-6 was associated a 0.42 higher RPE (p=0.03). This relationship tended to remain constant over time (baseline log IL-6 by time interaction p=0.15). The sample median (3.7 pg/mL) was used to define high and low IL-6 levels. The high group reported 0.26 higher RPE (p=0.03) averaged over time (time interaction p=0.41) than the low group. Annual changes in logged IL-6 were not associated with annual changes in perceived fatigability (0.10 RPE, p=0.53). **Conclusion:** Higher baseline IL-6 was associated with higher perceived fatigability in adults in mid-to-late life. Those with IL-6 levels >3.7 pg/ml had significantly greater perceived fatigability than those with lower IL-6 levels an association that remained stable over time. Our findings suggest that after chronic IL-6 elevation becomes substantially high, subsequent increases do not materially affect fatigability. Future studies should evaluate whether subsequent reductions in IL-6 dampen the perception of activity-related fatigue. Additionally, further validation of the 3.7 pg/mL IL-6 is cut-point necessary to determine clinical utility..

**OC25- IDENTIFYING FRAILTY USING THE ELECTRONIC MEDICAL RECORD WITHIN A MEDICARE ACCOUNTABLE CARE ORGANIZATION.** Nicholas M. Pajewski<sup>1</sup>, Kristin Lenoir<sup>2</sup>, Brian J. Wells<sup>2</sup>, Jeff D. Williamson<sup>3</sup>, Kathryn E. Callahan<sup>3</sup> ((1) Division of Public Health Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA; (2) Clinical and Translational Science Institute, Wake Forest School of Medicine, Winston-Salem, NC, USA; (3) Section on Gerontology and Geriatric Medicine, Department of Internal Medicine, Wake Forest School of Medicine, Winston-Salem, NC, USA)

**Background:** Recent evidence suggests that frail and pre-frail older adults may benefit from targeted interventions, and that frailty

itself may be reversible. Despite the existence of several validated definitions, measures of frailty have not been consistently incorporated into primary care. Based on the model of deficit accumulation, investigators in England have developed an Electronic Medical Record (EMR) frailty index (eFI) for the National Health Service. However, there is no measure of frailty, including the eFI, that has yet been adapted for routine use in US health care systems. **Objectives:** To build an eFI for patients in a Medicare Shared Savings Plan Accountable Care Organization (MSSP-ACO) at our institution. **Methods:** We extracted encounter, diagnosis code, laboratory, and medication data from the EMR for 7,935 MSSP-ACO patients (95 years of age as of 7/1/2015). We used a 2 year look-back period to estimate an eFI (46 total deficits), and examined the association of the eFI with incident events over the following year. **Results:** The MSSP-ACO cohort was 57.8% female, 86.3% white, with a mean age of 76.5 (SD=6.9) years. The eFI could be calculated for 6,689 (84.3%) patients. Of these 16.1%, 51.5%, and 32.4% were classified as fit (eFI<0.10) pre-frail (0.10<eFI<0.21), or frail (eFI>0.21), respectively. Accounting for age, sex, race/ethnicity and comorbidity (Charlson Index), the eFI was an independent predictor of all-cause mortality (Explained Relative Risk = 7.6%). Allowing for the competing risk of death, patients classified as frail (compared to fit patients) exhibited increased risk for emergency department visits (Relative Risk (RR)=1.85, 95% CI: 1.47 to 2.32), inpatient hospitalizations (RR=1.82, 95% CI: 1.34 to 2.47), and injurious falls (RR = 1.75, 95% CI: 0.38 to 7.99). **Conclusion:** Our results indicate that EMR data captured during routine primary care can identify frail and at-risk older adults. While further work is needed to refine and validate the eFI, incorporating functional data from Medicare Annual Wellness Visits, implementation of the eFI could facilitate the identification of a subgroup of older patients at risk for the negative health consequences of frailty, for whom health systems may target care coordination and other health care resources.

**OC26- MULTIMODAL INTERVENTIONS TO PREVENT AND MANAGE COGNITIVE FRAILTY.** Manuel Montero-Odasso<sup>1,2,3</sup>, Quincy J. Almeida<sup>4</sup>, Richard Camicioli<sup>5</sup>, Karen Li<sup>6</sup>, Teresa Liu-Ambrose<sup>7</sup>, Laura Middleton<sup>8</sup>, Louis Bherer<sup>6,9</sup> ((1) Department of Medicine, Division of Geriatric Medicine, Schulich School of Medicine & Dentistry, University of Western Ontario, London, ON, Canada; (2) Department of Epidemiology and Biostatistics, Schulich School of Medicine & Dentistry, University of Western Ontario, London, ON, Canada; (3) Gait and Brain Lab, Parkwood Institute, Lawson Health Research Institute, London, ON, Canada; (4) Sun Life Financial Movement Disorders Research Centre, Wilfrid Laurier University, Canada; (5) Geriatric and Cognitive Neurology, University of Alberta, Canada; (6) Department of Psychology and PERFORM Centre, Concordia University, Canada; (7) Department of Physical Therapy, University of British Columbia, Centre for Hip Health and Mobility, and Djavad Mowafaghian, Centre for Brain Health, Vancouver Coastal Research Institute, University of British Columbia, Canada; (8) Department of Kinesiology, University of Waterloo, Canada; (9) Faculty of Medicine, University of Montreal, Montréal, Canada)

**Background:** Cognitive frailty has been postulated to increase the risk of dementia and to be treatable by exercise. Exercise training is beneficial for cognition even in frail older adults and in those with low mobility. Animals and humans studies have demonstrated that aerobic exercise may have neuroprotective and neurorestorative effects. The rationale of combining aerobic and progressive resistance training as a multimodal exercise intervention is supported by research that has revealed potential beneficial effects on insulin-like growth

factor-1, insulin sensitivity, and anti-inflammatory and brain-derived neurotrophic factor pathways, which are related to both sarcopenia and cognitive decline. Multimodal exercise interventions have shown positive effects on muscle/lean mass, cognition and brain volume. In addition, cognitive training (e.g., computer based cognitive process training) has been linked to improvements in brain plasticity, cognition, mobility and postural control. **Objectives:** The SYNERGIC Trial (SYNchronizing Exercises, Remedies in Gait and Cognition) is a multisite clinical trial aimed to improve cognition and delay progression to dementia syndromes in older adults with cognitive frailty, using a combination of multimodal interventions. **Methods:** A total of 200 participants with cognitive frailty will be assigned to active or sham interventions. Active interventions include combined aerobic and resistance training, cognitive training, and vitamin D supplementation. Control interventions consist of balance and toning exercises, control cognitive training, and placebo vitamin D. **Results:** Preliminary results show that the effect of combined aerobic and resistance training improved ADAS-Cog 13 (combined training: 15.51 ±5.47; balance and toning: 26.93 ±8.39; p= 0.006) and ADAS-Cog plus scores (combined training: 0.22 ± 0.56; balance and toning: 0.45 ±0.36; p= 0.394) after 6 months of intervention, compared to balance and toning exercises. An active cognitive training also improved ADAS-Cog 13 (active cognitive training: 14.47 ±3.96; control cognitive training 20.01 ±8.62; p=0.046) and ADAS-Cog plus scores (active cognitive training: 0.15 ±0.57; control cognitive training: 0.35 ±0.50; p= 0.070) after 6 months of intervention, compared to control cognitive training. **Conclusion:** Conclusion: Our preliminary results show that a multimodal intervention with physical and cognitive training is feasible and may have a synergistic effect in improving cognitive function in participants with cognitive frailty.

**OC27- AGE-RELATED DECLINE IN D3CR MUSCLE MASS (BUT NOT DXA LEAN MASS) IS CORRELATED WITH DECLINE IN WALKING SPEED.** Peggy M. Cawthon<sup>1,2</sup>, Katherine Peters<sup>1</sup>, Eric S. Orwoll<sup>3</sup>, Andrew Hoffman<sup>4</sup>, Steven R. Cummings<sup>1,2</sup>, Marc Hellerstein<sup>5</sup>, William J. Evans<sup>5,6</sup> ((1) California Pacific Medical Center Research Institute, San Francisco, CA, USA; (2) University of California, San Francisco, CA, USA; (3) Oregon Health and Sciences University, Portland, OR, USA; (4) Stanford University, Stanford, CA, USA; (5) University of California, Berkeley, CA USA; (6) Duke University Durham, NC, USA)

**Background:** Strength, walking speed and lean mass decline with age, yet declines in lean mass by DXA are modest. Direct measures of change in muscle mass by the D3Cr dilution method may be more strongly related to changes in physical performance than are changes in DXA lean mass. **Objectives:** To determine the association between change in D3Cr muscle mass and DXA lean mass with the change in grip strength and walking speed over 6 meters. **Methods:** At the Year 14 Visit of the Osteoporotic Fractures in Men (MrOS) Study, 1,382 men had D3Cr muscle mass, grip strength, walking speed, and lean mass by DXA. A convenience sample (N=41, mean age 83.3±3.9 years) returned for repeat assessments an average 1.6 years later. We calculated percent change in all measures, and tested whether this change differed from 0 using one sample t-tests. We calculated the correlation between change of D3Cr muscle mass, DXA lean mass, grip strength, walking speed, and weight. We analyzed D3Cr muscle mass alone, or divided by weight; and DXA lean mass as total lean, appendicular lean mass (ALM) alone, ALM/height<sup>2</sup> and ALM/weight. **Results:** There was no change in weight or any DXA lean mass measure (Figure, p for change not equal to zero >0.05 for all). In contrast, D3Cr muscle mass (alone or divided by weight), grip strength and walking speed all declined by 4.1-5.1% over 1.6

years (Figure;  $p$  for change not equal to zero  $<0.05$  for all). Decline in D3Cr muscle mass/weight was modestly correlated with the decline in gait speed ( $r=0.33$ ,  $p=0.037$ ) and the change in ALM/ht2 ( $r=0.48$ ,  $p=0.002$ ) but not the decline in grip strength ( $r=0.06$ ,  $p=0.70$ ). The change in ALM/ht2 was not correlated with change in walking speed ( $r=-0.10$ ,  $p=0.55$ ) or the change in grip strength ( $r=0.18$ ,  $p=0.22$ ). **Conclusion:** Declines in D3Cr muscle mass mirror changes in strength and walking speed, while changes in DXA lean mass do not. These results provide preliminary evidence that the D3Cr dilution method to assess muscle mass may more closely reflect functional changes than DXA assessments of body composition.

**OC28- HIGH AND LOW RESPONSE TO HIGH INTENSITY INTERVAL TRAINING CORRELATES WITH DISTINCT MUSCLE MIRNA MRNA PROFILES.** Kenneth L. Seldeen<sup>1</sup>, Le Yang<sup>2</sup>, Jonathan Bard<sup>3</sup>, Merced Leiker<sup>1</sup>, Norma Nowak<sup>3</sup>, Yijun Sun<sup>2</sup>, Bruce R. Troen<sup>1</sup> ((1) *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*; (2) *Department of Microbiology and Immunology, School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, NY, USA*; (3) *New York State Center of Excellence in Bioinformatics and Life Sciences and Department of Biochemistry, School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, NY, USA*)

**Background:** Frailty is a prevalent condition that increases risk for co-morbidities, loss of independence, and mortality. Exercise is emerging as an effective intervention for frailty, although participation in older populations is low and is therefore driving the need for new exercise modalities that might appeal to this demographic. We recently reported (Seldeen et al (2017) *Journal of Gerontology*) that a 3 day a week, 10 minute high intensity interval training (HIIT) regimen improved muscle mass and physical performance, and reduced frailty in aged mice (from 24-28 months of age, human equivalent of 65-75 years). **Objectives:** To identify the underlying mechanisms that facilitate the response to exercise, we examined differences in miRNA and mRNA profiles between both HIIT and sedentary (SED) mice as well as between mice that exhibited a high and low improvement in physical performance in response to HIIT. **Methods:** Micro-RNA was isolated from anterior tibialis muscles of male C57BL/6 mice that were sedentary or had been administered 4-months of HIIT, and then subjected to Next-Gen miRNA sequencing. Bioinformatics included principle component analysis and differential expression and were correlated to SED versus HIIT and high versus low responders based upon a composite physical performance score derived from treadmill, grip strength, open field activity, and gait speed. **Results:** We identified 13 differentially expressed miRNAs between SED and HIIT mice, including known regulators of metabolism, muscle, and mitochondria (mir-1A, Let-7J, mir-206, mir-146a, mir-23a, mir-185, and mir-6538). Other affected pathways include adipocyte regulation (mir-122) and inflammation (mir-709). We further examined differences between mice with the high and low responses to HIIT and found 19 differentially expressed miRNAs. Many miRNA fell in pathways associated with muscle and mitochondrial metabolism (mir-6538, mir-483, mir-3968, mir-146b, mir-23b, mir-652, mir-27a, mir-23a, mir-183, mir-200b, mir-203, mir-200c, and mir-205). Principal component analysis also identified unique clustering between SED and HIIT groups as well as between high and low responders to HIIT. Our ongoing investigations include examining differences in mRNA expression and miRNA-mRNA pathway analysis. **Conclusion:** A thrice weekly, 10 minute HIIT regimen induces distinctive miRNA profiles in muscles of aged mice. Furthermore, specific miRNA

profiles correlate with greater response to the HIIT intervention.

**OC29- HOW DOES FRAILTY INFLUENCE WHO GETS DEMENTIA?** Lindsay Wallace<sup>1</sup>, Olga Theou<sup>1</sup>, Judith Godin<sup>1</sup>, Melissa Andrew<sup>1,2</sup>, Kenneth Rockwood<sup>1,2</sup> ((1) *Department of Medicine, Dalhousie University, Halifax, Canada*; (2) *Centre for Health Care of the Elderly, Nova Scotia Health Authority, Halifax, Canada*)

**Background:** The neuropathological features of Alzheimer's disease (AD) are not always well correlated with clinical dementia. In contrast, dementia and frailty are closely linked as both are strongly related to age and vulnerability to adverse health outcomes. Possibly, frailty interacts with neuropathological features of AD to increase vulnerability to cognitive impairment and dementia. **Objectives:** To examine how frailty moderates relationships between neuropathology, cognition, and dementia status. **Methods:** This was a cross-sectional analysis of data from the Rush Memory and Aging Project, a clinico-pathological study of older Americans. Participants had annual clinical and neuropsychological evaluations and, at time of death, an autopsy. AD neuropathology was quantified by counts of neuritic plaques, diffuse plaques, and neurofibrillary tangles. Frailty was operationalized using the deficit accumulation approach, with a frailty index constructed from 41 health variables including function, comorbidities, symptoms, and signs. Cognition was operationalized using the 30-item Mini Mental State Examination (MMSE) and dementia status was ascertained by clinical consensus. Regression models tested the relationships between frailty, neuropathology, and cognition. Process syntax was applied in SPSS to evaluate moderation effects. **Results:** 700 adults were included in this analysis (83.2±5.9 years, 68.9% female). At time of death, 52.7% met criteria for dementia. Frail participants were more likely to have dementia, and worse MMSE scores ( $p<0.05$ ). Interestingly, degree of AD neuropathology did not significantly differ between frail and non-frail groups. Regressions demonstrated a significant interaction between frailty and neuropathology in the prediction of both dementia status and MMSE score. When probed, these interactions demonstrated: 1) as frailty increases, the relationship between neuropathology and dementia status weakens; and 2) as frailty increases the relationship between neuropathology and cognition strengthens. **Conclusion:** Our results suggest that frailty reduces the degree of structural deficit (neuropathology) necessary to produce functional deficit (worse MMSE score). That this relationship does not hold with dementia status as the outcome suggests that dementia depends on other constructs (i.e. activities of daily living, mobility, etc.) and not just cognition. These results challenge the notion that AD is a result of single mechanism failure and brings forth the treatment of frailty as a preventive measure for dementia.

**OC30- THE ROLE OF HOMOCYSTEINE AND B VITAMINS IN TELOMERE LENGTH: RESULTS FROM THE CROSS-SECTIONAL AND INTERVENTIONAL TRIALS.** Irene Pusceddu<sup>1,2</sup>, Markus Herrmann<sup>3</sup>, Marcus Kleber<sup>4</sup>, Susanne H. Kirsch<sup>2</sup>, Christian Werner<sup>5</sup>, Graciela Delgado<sup>4</sup>, Ulrich Hübner<sup>2</sup>, Marion Bodis<sup>2</sup>, Angela M. Di Pierro<sup>1</sup>, Silvia Giuliani<sup>1</sup>, Ulrich Laufs<sup>5</sup>, Stefan Wagenpfeil<sup>6</sup>, Jürgen Geisel<sup>2</sup>, Winfried März<sup>4</sup>, Wolfgang Herrmann<sup>1</sup> ((1) *Department of Clinical Pathology, District Hospital Bolzano, Italy*; (2) *Department of Clinical Chemistry and Laboratory, Medicine, Saarland University Hospital, Germany*; (3) *Clinical Institute for Medical and Chemical Laboratory Diagnostics Medical University of Graz*; (4) *University of Mannheim, Germany*; (5) *Department of Cardiology, Saarland University Hospital, Germany*; (6) *Department of Biometry and Epidemiology, Saarland University Hospital,*

Germany)

**Background:** Telomeres are essential for the maintenance of genomic integrity. Telomere dysfunction has been proposed as a biomarker for age-related diseases. Vitamin B12, B6 and folic acid are essential cofactors for genomic integrity as they are involved in the synthesis of nucleotides and protein/DNA methylation. B vitamin deficiencies are risk factors for the development of age-related diseases. **Objectives:** Evaluate the effects of B vitamins on telomere biology in healthy, cardiovascular and elderly subjects. **Methods:** LURIC study (3316 cardiovascular patients), STVS study (350 healthy subjects) and KNOVIB study (supplementation of 60 elderly for 1 year (group A n=31 vitamin B12, B6, folate, vitamin D and calcium; group B n=29 vitamin D and calcium)). Relative telomere length (RTL), telomerase activity, LINE-1 methylation, vitamin B6, B9, B12, homocysteine (HCY), 5-methyltetrahydrofolate (5-methylTHF), 5,10-methenylTHF, S-adenosylmethionine (SAM), dimethylglycine (DMG), methylmalonic acid (MMA), choline, IL-6, and advanced glycation endproducts (AGEs) were quantified. **Results:** STVS study: HCY correlated negatively with age-corrected RTL; higher levels of AGEs were identified in subjects with higher HCY concentrations; subjects with telomerase activity above the median were characterized by a higher concentrations of vitamin B12. LURIC study: age-corrected RTL was negatively correlated with HCY and positively with vitamin B6. IL-6 was higher in the presence of vitamin B deficiency, and IL-6 correlated negatively with age-corrected RTL. KNOVIB study: one-year of B and D vitamins supplementation significantly changed the pattern of correlation between RTL and B vitamin metabolites (MMA, 5-methyl-THF, choline and DMG). Vitamins supplementation in group B reduced LINE-1-methylation and LINE-1-methylation correlated inversely with RTL. In group B, subjects with HCY >12µmol/L had lower mean LINE-1-methylation. **Conclusion:** These results provide evidence for an association between vitamin B6, B12, folic acid, HCY and RTL. Hyperhomocysteinemia is able to negatively affect RTL in healthy, in cardiovascular patients and in elderly. On one hand hyperhomocysteinemia is able to induce an inflammatory and oxidant status that in turn induces telomere attrition. On the other hand hyperhomocysteinemia induces DNA hypomethylation that in turn induces telomere dysfunction. In fact, literature data indicates that DNA hypomethylation is associated with elongated and dysfunctional telomeres. Further analyses are needed to confirm these results.

**OC31- MIRNAS AND PROCOLLAGEN TYPE III N-TERMINAL PEPTIDE (P3NP) IN ELDERLY.** V Del Panta<sup>1</sup>, E Talluri<sup>1</sup>, J Grillari<sup>2,3</sup>, M Hackl<sup>2</sup>, S Skalicky<sup>2</sup>, S Bandinelli<sup>1</sup> ((1) *Laboratory of Clinical Epidemiology, InCHIANTI Study Group, LHTC Local Health Tuscany Center, Florence, Italy;* (2) *TAmiRNA GmbH, Vienna, Austria;* (3) *Christian Doppler Laboratory for the Biotechnology of Skin Aging, Vienna, Austria*)

**Background:** MicroRNAs (miRNAs) are short non coding RNAs with key roles in cellular regulation, aging and aging related conditions and their disruption has been linked to a variety of diseases. Procollagen type III N-terminal peptide (P3NP) is a marker of muscle growth, which has been also linked with muscle repair and fibrosis. Since muscle growth, repair and fibrosis have all been connected with sarcopenia, understanding factors that regulate the production of P3NP may shed light in the pathogenesis of this important condition with aging. **Objectives:** We hypothesized that specific miRNA can regulate the production, deposition and biological activity of P3NP. To test this hypothesis we studied the relationship between plasma levels of 77 miRNA and P3NP in community-

dwelling elderly subjects 65 years old and older. **Methods:** Plasma miRNAs determination by quantitative PCR was supported by EU-FP7 Health Project FRAILOMIC 305483. Serum P3NP was determined by radioimmunoassay. The Least Absolute Shrinkage and Selection Operator (LASSO) statistical approach was used to interrogate 77 miRNAs for their association with serum P3NP in frail (n=91) and non frail (n=189) InCHIANTI study participants aging 65 years old and older. Frailty was defined according to Fried's criteria. The reduced set of explanatory miRNAs variables selected by LASSO model was used to perform a regression multivariate analysis of miRNAs (adjusted for sex and age) versus P3NP to test whether association were similar in frail and non-frail participants. **Results:** Data on 280 InCHIANTI participants (Frail/Robust ratio: 1/3; Age =76.6; 110M, 170F) were analyzed. MiR.193b.3b was a significant correlate of P3NP in both groups. Different set of miRNAs were identified with LASSO in frail and not frail subjects considering P3NP as outcome. After multivariate regression analysis, miR.221.3p, miR.210, miR.148a.3p (all with p<0.01) and miR.188.3p (p<0.05) were significantly associated to P3NP among frail participants. Female sex was a significant correlate of P3NP in frail subjects only (p<0.05). **Conclusion:** Our findings further support the notion that miRNAs may be involved in the genesis of sarcopenia perhaps through the intermediate function of P3NP.

**OC32- PRE-HOSPITAL FRAILTY AND INCIDENT DISABILITY AFTER CRITICAL ILLNESS HOSPITALIZATIONS IN OLDER ADULTS.** Aluko A. Hope, Jammie Law, Rahul Nair, Michelle Ng. Gong (*Department of Medicine, Division of Critical Care Medicine, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, New York, USA*)

**Backgrounds:** For older adults, critical illness is a sentinel event often associated with new disabilities which often preclude returning home and can impact trajectory of recovery. **Objectives:** We aimed to 1) describe the levels of disability in Activities of Daily living at hospital discharge in non-disabled critically ill adults who were treated for acute illness in an Intensive Care Unit and 2) to estimate the association between pre-hospital frailty and post-hospitalization disability in this population. **Methods:** This is a prospective observational cohort study of adults (age>50) admitted into Intensive Care Units (ICUs) across two university hospitals in Bronx, New York. Informed Consent was obtained within 3 days of ICU admission from the patient/surrogate. Frailty was identified using the Clinical Frailty Scale, a judgment based frailty assessment tool previously validated in adult ICU patients. At study enrollment, a baseline questionnaire was administered to patient/surrogate asking about basic demographic information including frailty markers, pre-hospital disability status (assistance/supervision in completing the seven Activities of Daily Living (ADLs)). Laboratory and clinical data were collected on ICU admission and severity of illness on admission was calculated using the Sequential Organ Failure Assessment score on admission and on day 5 (120 hours). The patients were followed through hospital discharge and their vital status/disability level was collected at hospital discharge. **Results:** In a cohort of 302 adults with age (mean (standard deviation, SD) 67.2 (10.5), 195 (64.6%) of whom reported being independent in all 7 ADLs prior to the hospitalization. Of these 195 patients: only 62 (31.8%) had no disability at discharge; 24 (12.3%) had mild disability levels (1-2 ADL impairments); 15 (7.7%) had moderate disability (3-5 ADL impairment); 48 (24.6%) reported severe disability (greater than 5 ADL impairments and 44 (22.6%) died. Those patients without pre-hospital disability who survived the hospital with incident disability were significantly older than those who survived without disability (mean age (SD) 67.8 (11.0) versus 65.1 (9.6), p=0.05). Patients with pre-hospital frailty were more

likely to survive hospitalization with an incident disability (76.3% versus 50.9%,  $p=0.006$ ). Those who had an Increase in SOFA score over the first 5 days of hospitalization were also more likely to survive with incident disability (73.0% versus 54.2%,  $p$ -value 0.045). In the final multivariable model, pre-hospital frailty was associated with surviving the hospitalization with incident disability independent of age, baseline SOFA score and increase in SOFA scores (adjusted Odds Ratio (95% Confidence Interval) 2.7 (1.10-6.60),  $p=0.003$ ). Similar effect estimated were obtained if death was included in outcome as the worst disability (adjusted OR for frailty (95% CI 2.5 (1.07-6.03),  $p=0.035$ ). **Conclusion:** In a cohort of critically ill older adults, new disability at hospital discharge was common and pre-hospital frailty diagnosed in the ICU was an important predictor of this patient-centered outcome.

### **OC33- MICROBIOTA AND METABOLIC DANGER SENSING CONTRIBUTE TO SARCOPENIA.** Jonathan D. Schertzer (McMaster University, Canada Hamilton ON, Canada)

**Background:** The external environment influences chronic disease risk, including sarcopenia. However, the stimuli and biological sensors that underpin decreased skeletal muscle strength and slowing of movement during aging are ill-defined. Increased inflammation during ageing or 'Inflammaging' has been proposed as a contributor to sarcopenia, but the participatory immune components are ill-defined. **Objectives:** We aimed to determine if immune detection of commensal bacteria, specific components of bacteria or metabolic stress contributed to the progression of sarcopenia in mice. We hypothesized that germ free mice (devoid of any bacteria) and mice lacking immune sensors for the bacterial cell wall would be partially protected from age-related inflammation and sarcopenia. We also hypothesized that mice lacking an immune sensor of general metabolic danger, the NLRP3 inflammasome would be protected from sarcopenia. **Methods:** We tested 10 month old (adult) and 24 month old (aged) C57 Bl6 male mice for hindlimb muscle structural and functional indicators of sarcopenia. We tested wild type (WT) mice versus mice devoid of peptidoglycan sensing via Nod1 (Nod1-null) and mice lacking NLRP3 inflammasome (NLRP3-null). We also tested germ free WT mice versus conventionally housed, specific pathogen free mice. **Results:** We found that Germ free mice had worse indicators of sarcopenia compared to conventional mice. We found that Nod1-null mice had worse indicators of sarcopenia compared to WT mice. We found that NLRP3-null mice had an attenuation of sarcopenic indicators compared to WT mice. **Conclusion:** Surprisingly, our results in old germ free mice reveal that commensal bacteria actually protect against aspects of sarcopenia. Further, deletion of immune proteins that detect specific components of the bacterial cell wall such as peptidoglycan worsen sarcopenia. Conversely, deletion of a general metabolic danger sensor (NLRP3) protects against sarcopenia. These results warrant caution in strategies targeting the microbiome in sarcopenia and highlight the importance of immunometabolism in age-related muscle frailty.

### **OC34- COMPARING OBJECTIVE AND SELF-REPORTED MEASURES OF FRAILTY AMONG COMMUNITY-DWELLING OLDER ADULTS: A PILOT STUDY.** Brian Buta<sup>1,2</sup>, Scott Zheng<sup>1</sup>, Bukola Adeosun<sup>2</sup>, Jackie Langdon<sup>2</sup>, Jeremy Walston<sup>1,2</sup>, Karen Bandeen-Roche<sup>1,2,3</sup>, Qian-Li Xue<sup>1,2</sup> ((1) Center on Aging and Health, Johns Hopkins University School of Medicine, Baltimore, MD, USA; (2) Division of Geriatric Medicine & Gerontology, Johns Hopkins University School of Medicine, Baltimore, MD, USA; (3) Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA)

**Background:** For a self-reported version of the frailty phenotype to be useful for frailty syndrome detection in clinical settings, establishing its convergent validity against the standard phenotype is an important first step. **Objectives:** We examined self-reported questions identified from the research literature that have previously shown agreement with their objective counterparts found in the frailty phenotype. We sought to determine whether these subjective measures may have better agreement with objective measures than self-reported questions used to date. We hypothesized that agreement between objective measures in the frailty phenotype and self-reported measures can be improved by: a) dynamic questions that aim to account for changes in grip strength and walking speed; and b) multiple self-report questions instead of single questions for weakness and slowness criteria. **Methods:** We completed a prospective pilot study and analyses comparing the standard frailty phenotype to a self-reported phenotype with self-reported measures of weakness and slowness, using Cohen's kappa coefficient. Participants, ages 65 years and older, were recruited from an aging registry in a geriatric clinical studies unit at Johns Hopkins in Baltimore, Maryland (N=94). Standard frailty phenotype (walking speed, grip strength, weight loss, activity and exhaustion questions) and self-reported measures of slowness and weakness were collected. **Results:** Self-reported walking speed questions had fair to moderate agreement with objective walking speed (kappa range=0.36-0.43). For self-reported grip strength questions, there was only slight agreement with measured grip strength (kappa range=0.02-0.17). The dynamic self-reported measures of walking speed and grip strength had fair (kappa=0.37) and slight (kappa=0.17) correlations, respectively, with objective tests. The levels of agreement improved to moderate for walking speed (kappa=0.57) and to fair for grip strength (kappa=0.20) by combining multiple self-report questions in comparison to objective measurements. **Conclusion:** This pilot study provides novel information about correlations between objective and subjective frailty measurements. Our results reiterate the difficulty of approximating the physical frailty phenotype by a modified frailty phenotype substituting self-reported questions of slowness and weakness. A self-reported frailty phenotype with high agreement to the standard phenotype could be a valuable tool in clinical settings.

### **OC35- GEROPROTECTORS FOR MULTIMORBIDITY AND FRAILTY: ROADMAP TO CLINICAL TRANSLATION.** I Bellantuono<sup>1</sup>, D Ehninger<sup>2</sup>, S Howlett<sup>3</sup>, R Muller<sup>4</sup>, P Potter<sup>5</sup>, H Stemplewski<sup>6</sup>, T Tchkonja<sup>7</sup>, AU Trendelenburg<sup>8</sup>, R Vandenbroucke<sup>9</sup>, R van Os<sup>10</sup>, N van Riel<sup>11</sup> ((1) MRC Arthritis Research UK Centre for Integrated research into Musculoskeletal Ageing, University of Sheffield, UK; (2) German Centre for Neurodegenerative Disease, Bonn, Germany; (3) Department of Pharmacology, Dalhousie University, NS, Canada; (4) Institute of Biomechanics, ETH, Zurich, Switzerland; (5) Mammalian Genetics Unit, MRC Harwell, Oxford, UK; (6) Medicine and Healthcare Products Regulatory Agency, London, UK; (7) Mayo Foundation for Medical Education and Research, Rochester, USA; (8) Novartis Institute for Biomedical

Research, Cambridge, USA; (9) VIB UGENT Centre for Inflammation Research, University of Ghent, Belgium; (10) Laboratory of Ageing Biology and Stem Cells, European Research Institute for the Biology of Ageing (ERIBA), University; Medical Centre Groningen, University of Groningen, The Netherlands; (11) Academic Medical Centre, University of Amsterdam, The Netherlands)

**Background:** Human life expectancy has been increasing steadily over the last century but this has resulted in an increasing incidence of age-related chronic diseases. Patients often present with more than one disease at the same time (multimorbidity) and become frail. Multimorbidity and frailty are complex to treat, and strongly associated with disability and hospitalization. Current treatments also address each disease individually, which can lead to the complications associated with polypharmacy. New effective interventions for multimorbidity and frailty are urgently required. Geroprotectors are a new class of drugs, which target fundamental mechanisms of ageing common to multiple age-related diseases and shows promise in delaying the onset of multimorbidity and/or boosting resilience in frail older people. However, there are barriers to their clinical translation. **Objectives:** To address the lack of a clear strategy to exploit the potential of geroprotectors twenty-four experts from the European network MouseAGE and associated partners of international reputation convened in Madrid. The aim was to reach consensus and issue recommendations to speed up the clinical testing of these drugs. **Methods:** Consensus was achieved by roundtable discussion. **Results:** The group has made a number of recommendations. There is a need for a regulatory framework for the use of drugs targeting frailty or multimorbidity as these are not recognised indications by regulatory bodies at present. However, groups of patients with other indications such as cancer, hip fracture, older patients undergoing surgery and associated frailty may offer opportunities to perform proof of concept studies with these drugs. There is a paucity of animal models, which reproduce accurately those indications, and therefore there is a need to characterise in depth such models for generating preclinical data supporting an application for first in man studies. Clearly defined, validated, measurable outcomes in preclinical studies, which accurately reflects outcomes in patients are required for swift clinical translation. **Conclusion:** Geroprotectors offers new therapeutic opportunities for frailty and multimorbidity. The MouseAGE network has agreed on a strategy which should speed up their translation to patients' benefit.

#### **OC36- A NOVEL APP FOR ASSESSING THE INDIVIDUAL'S FUNCTIONS AND INTRINSIC CAPACITY.** Jean-Pierre Michel (French Academy of Medicine, Paris, France)

**Background:** Recent progresses in technology communications open doors to perform quick and scientifically reliable self-comprehensive assessment using i-Phones or androids and tablets. **Objectives:** Intrinsic capacity, an essential individual component of «healthy ageing» insists on functional abilities. The novel app assesses your health and functioning. It could be done on your own or on request of your physician, while being in the waiting room. **Methods:** The app includes a first and attractive game (less than 8 minutes) with short questions and tests which results are immediately calculated and presented in a nice and attractive way; they concern your robustness/frailty status, muscle strength and balance but also your mental agility and memory retention. The results are easily understandable and completed by short and simple comments. The second part of the application includes more personalized questions (N = 7), before proposing you to perform 5 measures a) functional (including nutrition and sarcopenia risks as well as precise measurements of your balance,

normal gait speed, functional reserve) and b) cognitive measurements based on previously validated scientific studies. **Results:** Using this application will help the user as well as the physician to immediately focus on known or new discovered health/functioning inabilities. This was the cases for the 10 adults (from 45 to 85 y.o.) who were already tested. Then physical, balance and cognitive exercises are proposed. The regular follow up of the measurements results will show you that it is never too late to intervene to reverse the frailty process or low down the age related functional decline. Indeed the medical control and follow-up of the assessment will be important in case of needed personalized interventions and treatments. **Conclusion** The effectiveness of this very easy and quick assessment and measurements followed by individualized and specific interventions will surprise the user but also the family members and convince the physician that functional abilities could «add life to years».

#### **OC37- MUSCLE ARCHITECTURE: A USEFUL TOOL TO IDENTIFY FUNCTIONAL DECLINE IN INPATIENT OLDER PEOPLE?** Livia P. Carvalho<sup>1,2</sup>, Dominic Martel<sup>1,2</sup>, Marco V. Narici<sup>3</sup>, Marc Bonnefoy<sup>4</sup>, Mylène Aubertin-Leheudre<sup>1,2</sup> ((1) Department of Physical Activity Sciences, Université du Québec à Montréal, Montreal, QC, Canada; (2) Centre de Recherche de l'Institut de Gériatrie de Montréal (CRIUGM), Université de Montréal, Montreal, QC, Canada; (3) MRC-ARUK Centre for Musculoskeletal Ageing Research, School of Medicine, University of Nottingham, Derby, UK; (4) Centre Hospitalier Universitaire de Lyon Sud, Lyon, France)

**Backgrounds:** Muscle mass and strength losses are known to be key factors in the development of long-term physical disability. These declines are even more significant in older people during hospitalizations, increasing their risk of falls, fractures, loss of quality of life further on. However, psychophysical conditions (pain, demotivation, depression and temporary physical incapacities) during hospitalization can be important barriers to the evaluation and monitoring of the functional status of these patients. Performance measurements such as the Short Physical Performance Battery (SPPB) may be difficult to assess. Therefore, identifying a new objective and clinical tool to detect the loss of functional capacity in this population at high risk of developing physical disabilities is of utmost clinical relevance. Changes in muscle architecture (MA) have been shown to be associated with sarcopenia (Narici et al. 2003; Ticinesi et al. 2017). **Objectives:** Our study aimed at: 1) Comparing MA, muscle mass and strength measurements in hospitalized older adults with different functional levels, 2) evaluating the association between these measurements and; 2) verifying whether SPPBscore could be estimated from MA measurements. **Methods:** Forty-four hospitalized older adults were divided in 2 groups: Pre-Disabled (PDis, SPPBscore: 6-9 (n=21), 81±7years old, SPPBscore:7.6±1.1) and Disabled (Dis, SPPBscore:<6 (n=23), 83±7years old, SPPBscore:3.6±1.6). Participants were submitted to the following evaluations: SPPB, body mass (BM) and composition (bioimpedance), handgrip strength (HS, dynamometer) and MA (ultrasound, Pennation angle [PA], muscle thickness [MT], Fiber length [FL] and subcutaneous fat [SCF]). **Results:** Relative muscle strength (HS/BM) (0.28±0.08 vs 0.34±0.09), PA (10.6±1.8 vs 12.3±1.9), and MT (16.4±0.4 vs 19.2 0.4mm) were significantly different between Dis and PDis, respectively. Associations between PA and the SPPBscore (r=0.37) or walking speed (r=0.38); between SCF and walking speed (r=-0.36); as well as between MT and SPPBscore (r=0.29) or walking speed (r=0.31) were observed. Linear regression analysis demonstrated that 14% (r<sup>2</sup>=0.135) of the variance in the SPPBscore is explained by PA (p=0.02, SEM=2.2). **Conclusion:** Muscle architecture seems related to functional capacities and could be a potentially useful and objective

screening tool for clinicians to tailor care during hospitalization. Further and longitudinal studies are needed to confirm our observation in hospitalized older population.

**OC38- THE EFFECT OF INTENTIONAL WEIGHT LOSS ON BIOMARKERS OF MORTALITY IN OLDER ADULTS WITH OBESITY.** Lauren Shaver<sup>1</sup>, Daniel Beavers<sup>2</sup>, Stephen Kritchevsky<sup>3</sup>, Kristen Beavers<sup>1</sup> ((1) *Health and Exercise Science*; (2) *Biostatistics*; (3) *Internal Medicine, Wake Forest University, Winston-Salem, NC., USA*)

**Background:** Intentional weight loss (WL) in older adults modestly reduces mortality risk. Observational cohorts have identified several biomarkers of mortality, but their responsiveness to intentional WL is unknown. **Objectives:** To determine the impact of intentional WL on a compilation of biomarkers, including the previously published Healthy Aging Index (composite score range: 0-10; healthiest-unhealthiest). **Methods:** 96 older adults (70.3±3.7 years) with obesity (35.4±3.3 kg/m<sup>2</sup>) were randomized into a 6-month WL (n=47) or weight stability (WS; n=49) program. Weight, HAI composite score and its component variables [systolic blood pressure, forced vital capacity (FVC), creatinine, fasting plasma glucose (FBG), Montreal Cognitive Assessment], as well as other candidate biomarkers [gait speed, grip strength, interleukin-6 (IL-6), Digit Symbol Substitution Test (DSST), forced expiratory volume in 1 second (FEV1), C-reactive protein (CRP), heart rate (HR), and cystatin-C], were measured at baseline and follow-up. **Results:** Average baseline HAI score was 3.2±1.6. WL participants lost an average of 6.6±0.4 kg (8.6±0.4%), while weight remained stable in the WS group [(-0.2±0.5 kg); 6-month p<0.01]. Treatment effect estimates, adjusted for gender and baseline value, revealed a significant reduction in HAI score in the WL group [WL: -0.80 (-1.18, -0.41) vs WS: -0.17 (-0.57, 0.23); p=0.02], driven by reduced FBG [WL: -4.31 (-8.22, -0.40) mg/dL vs WS: 1.47 (-2.61, 5.55) mg/dL; p=0.03] and marginally increased FVC [WL: 0.11 (-0.02, 0.23) L vs WS: -0.04 (-0.17, 0.09) L; p=0.08]. Of the candidate biomarkers, a significant treatment effect was only observed for cystatin-C [WL: -2.57 (-4.41, -0.73) ng/mL vs WS: 0.10 (-1.79, 1.99) ng/mL; p=0.04]. In groups combined, a 1 kg reduction in weight was associated with a 0.07 (0.01, 0.14) reduction in the HAI score (p=0.03), which is associated with 13% lower mortality risk in observational studies. **Conclusion:** Intentional WL in older adults reduces mortality risk, largely due to improvements in metabolic and pulmonary factors. This work identifies cystatin-c as an additional biologic target for reduced mortality risk with WL in older adults.

**OC42- FRAILTY, INFLAMMATION, AND MORTALITY AMONG PATIENTS WITH END-STAGE RENAL DISEASE.** Mara A. McAdams-DeMarco<sup>1,2</sup>, Hao Ying<sup>1</sup>, Alvin G. Thomas<sup>1</sup>, Fatima Warsame<sup>1</sup>, Ashton A. Shaffer<sup>1,2</sup>, Christine E. Haugen<sup>1</sup>, Jacqueline M. Garonzik-Wang<sup>1</sup>, Niraj M. Desai<sup>1</sup>, Ravi Varadhan<sup>3</sup>, Jeremy Walston<sup>4</sup>, Silas P. Norman<sup>5</sup>, Dorry L. Segev<sup>1,2</sup> ((1) *Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, MD, USA*; (2) *Department of Epidemiology, Johns Hopkins School of Public Health, Baltimore, MD, USA*; (3) *Department of Oncology, Sidney Kimmel Comprehensive Cancer Center, Baltimore, MD, USA*; (4) *Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA*; (5) *Department of Internal Medicine, Division of Nephrology, University of Michigan School of Medicine, Ann Arbor, MI, USA*)

**Background:** Among community-dwelling older adults, frailty is associated with heightened inflammation and subsequent mortality.

Although frailty is common among end-stage renal disease (ESRD) patients on the kidney transplant (KT) waitlist, the role of frailty and inflammation in this population remains unclear. We quantified the association between frailty, inflammation, and mortality in ESRD patients on the KT waitlist, and tested whether frailty and/or inflammation improves risk prediction beyond clinical factors available in registry-based models. **Objectives:** To quantify the association between frailty and mortality among ESRD patients on the transplant waitlist. To test whether frailty and/or inflammation improves risk prediction beyond clinical factors. **Methods:** We studied 1,975 prevalent ESRD patients on the KT waitlist (11/1/09-2/28/17) in a multi-center cohort study of measured frailty in patients undergoing transplant evaluation; serum inflammatory markers (interleukin-6 [IL-6], soluble tumor necrosis factor- receptor-1 [sTNFR1], and C-reactive protein [CRP]) were analyzed in 605 of these participants. We compared the C-statistic of an established registry-based prediction model adding frailty and/or inflammation (1SD change in log IL-6, sTNFR1, CRP, or an aggregate inflammatory index). **Results:** The mean age was 53.7 and 18.4% were frail. Frail candidates had elevated serum IL-6 (P<0.001), sTNFR1 (P=0.02), CRP (P=0.01), and a higher inflammatory index (P<0.001). The registry-based model had moderate predictive ability (C-statistic=0.655). Frailty was associated with increased mortality risk (frail HR=2.19, 95%CI:1.26-3.79) but did not improve mortality risk prediction (C-statistic=0.646; P=0.65). Like frailty, IL-6 (HR=2.13, 95%CI:1.41-3.22), sTNFR1 (HR=1.70, 95%CI:1.12-2.59), CRP (HR=1.68, 95%CI:1.06-2.67), and the inflammatory index (HR=2.09, 95%CI:1.38-3.16) were all associated with increased mortality risk. But unlike frailty, adding IL-6 (C-statistic=0.777; P=0.02), CRP (C-statistic=0.728; P=0.02), or the inflammatory index (C-statistic=0.777; P=0.02) substantially improved mortality risk prediction. **Conclusion:** Among adult ESRD patients on the KT waitlist, frailty and inflammation were associated with increased waitlist mortality risk, but only inflammatory markers significantly improved mortality risk prediction. Heightened inflammation may be the biological link between frailty and mortality in KT candidates.

**OC43- ROLE OF THE SERUM METABOLOME AND GUT MICROBIOME ON LEAN MASS, MUSCLE COMPOSITION, AND PHYSICAL FUNCTION IN OLDERADULTS.** Roger A. Fielding (*Tufts University HNRCA, Boston, USA*)

**Background:** In older adults (70+ years), reduced lean mass and muscle composition are associated with increased disability, hospitalization, morbidity, and mortality. Because older adults are the fastest growing global subpopulation, identification of mechanisms that underlie these outcomes will be important for addressing the public health priority of healthy aging. With use of an untargeted metabolomic approach, I recently reported significant associations between gut bacteria-related metabolites with lean mass and muscle composition in older adults (average age, 78y), evidence that suggests a role for the gut microbiome on these outcomes. To test this hypothesis, we analyzed whether the gut microbiome is significantly different when comparing older adults with low or high levels of appendicular lean mass (ALM). Moreover, we investigated the role of dietary fiber on these associations. **Objectives:** To identify associations between dietary fiber with the gut microbiome that differentiate older adults with high lean mass from low lean mass. **Methods:** Untargeted serum metabolomics (HPLC/MS, GC/MS) on 73 older adults (average age, 78y) 16S rRNA gene profiling on 189 older adults (average age, 85+ years). **Results:** 15 bacterial OTUs were significantly different when comparing older adults with a high ALM percentage (average, 74%), when compared with low (64%). Six

of these OTUs are associated with dietary fiber intake, including fiber from fruits and vegetables, beans, or grains. These 6 OTUs were not associated with age, smoking, or a physical activity score, evidence that suggests a fiber-specific role on affecting both the microbiome and lean mass and older adults. Separately, 60 serum metabolites, including urea and uremic metabolites were associated with muscle composition in older adults. Elevated urea and uremic metabolites suggest roles for an altered gut microbiome (39 metabolites), for increased intestinal permeability (10 metabolites), and increased systemic microbial burden (12 metabolites). **Conclusion:** Based on these data, interventions aimed at increased dietary fiber may be an important means for positively affecting the gut microbiome-muscle axis in older adults. Separately, future studies aimed at testing the hypothesis that the gut microbiome, intestinal permeability, and circulating microbial burden are involved in mechanisms that affect muscle composition in older adults are of interest.

**OC44- AGING-ASSOCIATED CHANGES IN SKELETAL MUSCLE MORPHOLOGY ASSESSED BY INTRAMUSCULAR ADIPOSE AND CONNECTIVE TISSUE.** Jaclyn Sesso<sup>1</sup>, Yoko Kato<sup>1</sup>, Jeremy Walston<sup>1</sup>, Karen Bandeen-Roche<sup>1</sup>, Joao AC Lima<sup>1</sup>, Bharath Ambale Venkatesh<sup>2</sup> ((1) Johns Hopkins University, Baltimore, MD, USA; (2) Radiology, Johns Hopkins University, Baltimore, MD, USA)

**Background:** Increasingly, intramuscular adipose tissue (IMAT) is identified as a major contributing factor to mobility dysfunction in older adults, a key component of frailty. IMAT is known to increase with both aging and disuse. IMAT has also been linked to increased pro-inflammatory cytokines that contribute to local metabolic dysregulation and feed into the cycle of muscle catabolism leading to functional decline of the muscle. **Objectives:** This study aims to explore these changes in healthy older adults through chemical shift-based water-fat separation magnetic resonance imaging (MRI) which has the capability to assess muscle fat percentage. **Methods:** We assessed changes in skeletal muscle morphology in 15 healthy volunteers (11 men and 4 women) between the ages of 21 and 80. Questionnaires and medical records were checked to ensure there was no prior history of associated disease conditions such as peripheral artery disease, sarcopenia, or frailty. Patients were scanned on a Toshiba 3T Galan system with a 64-channel phased array coil and a body coil to assess calf musculature. Dual-echo 3D Dixon techniques were employed to assess fat distribution and percent fat quantification. Users defined regions-of interest for each of the three muscle regions the tibialis anterior, the soleus and the gastrocnemius, and excluded areas of extensive connective tissue and nerves from the fat fraction map ( $\text{fat} \times 100 / (\text{fat} + \text{water})$ ). An average of the fat% from the 3 ROIs was used to calculate mean muscle fat% (FPm), and the standard deviation of the fat% among all the ROIs was also calculated (FPsd). Linear regression analysis was used to assess the association of age, gender and body mass index (BMI) on FPm and FPsd. **Results:** Higher FPm ( $r = 0.50, p = 0.07$ ) and FPsd ( $r = 0.61, p = 0.02$ ) were associated with older age. Similarly, higher BMI was associated with higher FPm ( $r = 0.61, p = 0.02$ ) and FPsd ( $r = 0.47, p = 0.08$ ). Calf muscle FPm and FPsd were not associated with gender. **Conclusion:** Aging was associated with increased skeletal muscle fat. MRI based skeletal muscle morphology as measured by fat fraction has the potential to be useful in the study of aging and frailty.

**OC45- THE TEMPORAL RELATIONSHIP BETWEEN CHANGE IN MUSCLE MASS AND CHANGE IN MUSCLE STRENGTH.** Nancy Chiles Shaffer, Qu Tian, Stephanie Studenski (Longitudinal Studies Section, Translational Gerontology Branch, National Institute on Aging, National Institutes of Health, Baltimore, MD, USA)

**Background:** Muscle mass and muscle strength decrease over the lifespan, with a greater rate of decline in strength compared to mass in men and women. The temporal relationship between changes in mass and strength is unclear; mass loss as sarcopenia is often considered a cause of weakness while inactive or denervated muscle is known to shrink. Thus, the question becomes: with usual aging, does mass loss lead to strength loss or vice versa? Understanding the temporal sequence with aging might inform novel strategies to promote strength and physical function, and prevent sarcopenia. **Objectives:** Assess the temporal relationship between changes in muscle mass and muscle strength in the Baltimore Longitudinal Study of Aging (BLSA). **Methods:** We identified an inception cohort without baseline low muscle mass or strength (defined as: ALM < 14.12 kg in women and < 21.38 kg in men, and grip strength < 19.99 kg in women and < 31.83 kg in men, per previous BLSA analyses) with at least three repeated measures of appendicular lean mass (ALM) and grip strength over time. ALM from dual-energy X-ray absorptiometry and grip strength from hand dynamometry, assessed every 2 years, measured muscle mass and muscle strength. Autoregressive cross-lagged structural equation models assessed the temporal sequence of change in muscle mass and muscle strength. Due to known sex differences in muscle mass and strength, all analyses were sex-stratified, and adjusted for baseline age and body mass index. **Results:** Among 214 women (mean age = 66 (range 29-94), 43% Black, 8 mean years of follow-up) and 193 men (mean age 69 (range 36-89), 25% Black, 7 mean years of follow-up), as expected, ALM predicted future ALM and grip strength predicted future grip strength. ALM predicted subsequent grip strength (coeff,  $p < .001$ ) and grip strength predicted subsequent ALM (coeff  $p < .001$ ) in women and men. **Conclusion:** With aging, the temporal relationship between changes in mass and strength is bidirectional. Interventions that solely promote muscle mass may unnecessarily miss out on the chance to attend to the non-muscle factors that affect strength with age. These factors might not only help promote preserved physical function but might also help delay muscle mass loss.

**OC47- NORMATIVE VALUES OF KNEE EXTENSORS ISOKINETIC STRENGTH FOR OLDER WOMEN AND IMPLICATIONS ON PHYSICAL FUNCTION.** Ricardo M. Lima<sup>1</sup>, Juscelia Cristina Pereira<sup>1</sup>, Silvia Gonçalves Ricci Neri<sup>1</sup>, Baruch Vainshelboim<sup>2</sup>, André Bonadiaz Gadelha<sup>1</sup>, Martim Bottaro<sup>1</sup> ((1) Faculty of Physical Education, University of Brasília, Brasília, Distrito Federal, Brazil; (2) Master of Cancer Care Program, School of Health Sciences, Saint Francis University, Loretto, PA, USA)

**Background:** Lower limbs strength is required for everyday activities and its evaluation has been especially emphasized in older people. Isokinetic testing is a gold standard method to assess muscle strength, however, lack of reference values limits its usefulness when inspecting results. **Objectives:** To develop reference values of knee extensors isokinetic strength for older women, and examine its functional implications. **Methods:** A total of 453 elderly women aged 60 to 84 years ( $67.4 \pm 5.8$ ) participated in this study. Knee extensors isokinetic strength was measured using the Biodex System dynamometer at 60°s<sup>-1</sup>. Timed Up and Go (TUG) test and the Five Times Sit to Stand Test (5tSTS) were used for functional

evaluation. Subjects were categorized into age groups of five-years range. Age-specific percentiles for muscle strength were identified for classification purposes. ANOVA and Chi-square tests were performed for functional performance comparisons, with statistical significance set at  $p < .05$ . **Results:** Mean strength values significantly decreased with advancing age ( $p < .05$ ). Below percentile 20th, between 20th and 40th, between 40th and 60th, between 60th and 80th and higher than percentile 80th, were respectively labeled as «poor», «below average», «average», «above average», and «excellent». Age-specific quadriceps strength classification for absolute (Nm) and relative to body weight (Nm/kg) values are provided. Volunteers in the lower strata of the proposed classification showed significantly reduced performance in both the TUG and 5tSTS tests ( $p < .01$ ).

**Table 1**

Classification of dominant knee extensors isokinetic strength at 60o/s (Nm/kg)

Classification	Age groups (years)				
	60-64	65-69	70-74	75-79	80-84
Poor	<1.26	<1.11	<1.08	<1.05	<0.95
Below Average	1.26-1.45	1.11-1.34	1.08-1.29	1.05-1.17	0.95-1.08
Average	1.46-1.61	1.35-1.52	1.30-1.43	1.18-1.28	1.09-1.17
Above Average	1.62-1.80	1.53-1.70	1.44-1.61	1.29-1.50	1.18-1.36
Excellent	>1.80	>1.70	>1.61	>1.50	>1.36

**Conclusion:** This study provides normative values of isokinetic knee extensors strength in older women. The proposed classification had the ability to detect reduced physical function among those classified in the lower strata, indicating a potential application when interpreting results of isokinetic tests, which may serve as a clinical screening reference for Sarcopenia. Future studies should ascertain these findings in different women populations.

**OC48- A SPECIFIC PROFILE OF CIRCULATING AMINO ACIDS CHARACTERIZES OLDER PERSONS WITH PHYSICAL FRAILTY AND SARCOPENIA: RESULTS FROM THE BIOSPHERE STUDY.** Anna Picca, Federico Marini, Alessandra Biancolillo, Emanuele Marzetti, Jacopo Gervasoni, Silvia Persichilli, Aniello Primiano, Francesco Landi, Roberto Bernabei, Riccardo Calvani (Catholic University of the Sacred Heart, Rome, Italy)

**Backgrounds:** Muscle loss (sarcopenia) and decreasing homeostatic reserve (frailty) are hallmarks of aging. Several circulating markers have been associated with these conditions in older persons. However, a «gold standard» biomarker able to predict functional impairment in older adults is currently unavailable. Muscle is crucial for several metabolic processes, including protein/aminoacid metabolism. Perturbations in protein/aminoacid metabolism may play a role in the development of physical frailty and sarcopenia (PF&S). The simultaneous analysis of an array of circulating aminoacid/metabolites may help gain relevant insights in the pathophysiology of PF&S. **Objectives:** To characterize the profile of circulating amino acids in older people with and without PF&S. **Methods:** More than five hundred persons aged 70+ years were screened. Of these, sixty (20 men and 40 women; mean age 76.9±4.8 years) were diagnosed with PF&S. Thirty (14 men and 16 women) non-sarcopenic, non-frail persons were enrolled in the control group. A panel of 37 serum amino acids and derivatives was assessed by UPLC-MS. Partial Least Squares Discriminant Analysis (PLS-DA) was used to characterize

the amino acid profile of people with and without PF&S. **Results:** The optimal complexity of the PLS-DA model was found to be four latent variables. The proportion of correct classification was  $70.4 \pm 3.6$  for persons with PF&S,  $88.3 \pm 3.9$  for non-PF&S individuals. The statistical reliability of the PLS-DA model was established by a double cross-validation procedure and randomization tests. People with PF&S were characterized by higher levels of aspartic and glutamic acid, gamma-aminobutyric acid and taurine, sarcosine, citrulline, and ethanolamine. Conversely, the profile of non-PF&S controls was defined by higher levels of alpha-aminobutyric acid, histidine, and methionine. **Conclusion:** Distinct profiles of circulating amino acids and derivatives from several metabolic patterns characterize older individuals with or without PF&S. The dissection of these patterns may provide novel insights into the role played by protein/amino acid perturbations in the disabling cascade and possible new targets for interventions.

**OC49- BODY COMPOSITION REMODELING AND INCIDENT MOBILITY LIMITATIONS IN AFRICAN ANCESTRY MEN.** Adam J. Santanasto<sup>1</sup>, Iva Miljkovic<sup>1</sup>, Ryan K. Cvejkus<sup>1</sup>, Christopher L. Gordon<sup>2</sup>, Victor W. Wheeler<sup>3</sup>, Clareann H. Bunker<sup>1</sup>, Joseph M. Zmuda<sup>1,4</sup> ((1) Department of Epidemiology, University of Pittsburgh, USA; (2) McMaster University, Hamilton, ON, Canada; (3) Tobago Health Studies Office, Scarborough, Tobago, Trinidad & Tobago; (4) Department of Human Genetics, University of Pittsburgh, USA)

**Background:** Mobility limitations are common in older adults, with higher prevalence in African Americans compared to whites, and are associated with disability, institutionalization and death. Aging is associated with losses of lean mass and a shift to central adiposity, which are more pronounced in African Americans. **Objectives:** We aimed to examine the association of baseline body composition and body composition remodeling with incident mobility limitations in older men of African Ancestry from the Caribbean island of Tobago. **Methods:** Seven-year changes in body composition were measured using peripheral computed tomography (pQCT) of the calf and whole-body dual x-ray absorptiometry (DXA) in 505 African Ancestry men aged 60 years and free of self-reported mobility limitations at baseline. At baseline and the 6-year follow-up visit, mobility limitations were defined by self-report of any difficulty walking 2-3 blocks or climbing up 10 steps due to a health/physical problem. Men with prevalent mobility limitation at baseline were excluded from analyses and incident mobility limitations at follow-up were used as the primary outcome variable for subsequent analysis. Odds of developing mobility limitations associated with baseline and change in body composition were quantified using separate logistic regression models. **Results:** Seventy-five men (14.9%) developed incident mobility limitations over  $6.2 \pm 0.6$  years. Baseline body composition was not associated with incident mobility limitations. After adjustment for covariates, gaining total and intermuscular fat were associated with incident mobility limitations a (OR: 1.60; 95% CI: 1.21-2.13; OR: 1.51; 95% CI: 1.18-1.94). Changes in DXA lean mass were not related to mobility limitations; however, maintaining pQCT calf muscle area was protective against mobility limitations (OR: 0.65; 95% CI: 0.48-0.87). **Conclusion:** Increases in body fat, and particularly intermuscular fat, and decreases in calf skeletal muscle were associated with a higher risk of developing mobility limitations. Our findings emphasize the importance of body composition remodeling in the development of mobility limitations among African ancestry men.

### OC50- CO-APPLICATION OF LMHFV AND HMB RETARDS SARCOPENIA BY REDUCING INTRAMYOCYELLULAR FAT INFILTRATION IN SARCOPENIC MICE.

J. Wang, SKH Chow, RMY Wong, YN Chim, KS Leung, WH Cheung (Department of Orthopaedics and Traumatology, Faculty of Medicine, the Chinese University of Hong Kong, Hong Kong)

**Background:** The European Working Group on Sarcopenia in Older People (EWG-SOP) defined sarcopenia as «a syndrome characterised by progressive and generalised loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life and death». Intramyocellular fat infiltration is postulated to play a role on age-related sarcopenia, which leads to dynapenia. Low Magnitude High Frequency Vibration (LMHFV) is a non-invasive biophysical intervention which has been considered as a potential approach to improve musculoskeletal system. «-hydroxy-»-methylbutyric (HMB) is a metabolite of leucine. Studies have shown that HMB had positive effects on sarcopenia. **Objectives:** We hypothesized that co-application of LMHFV and HMB can reduce fat infiltration in sarcopenic senescence-accelerated mouse (SAM) P8 mice. **Methods:** A total of 96 7-month SAMP8 male mice were randomly divided into 4 groups: Control (CTL), LMHFV treatment only (VIB), HMB only (HMB) and the combined treatment (COM) group. LMHFV (35Hz, 0.3g; 20min/day) and HMB (500mg/kg/day, 5days/week) treatments were given to the corresponding groups at month 7 of age. Grip strength and mice body composition were assessed at 1, 2, 3 months post-intervention (equivalent to age month 8, 9, 10) were compared among groups. Oil red O staining (ORO) of muscle samples was performed. Grip strength was measured by force gauge (Mark-10 Corporation, USA). Body composition and bone mineral density (BMD) were detected by dual energy X-ray absorptiometry (DXA) (Faxitron, USA). Data analysis was done with one-way ANOVA and independent t-test; the significant level was set at  $p=0.05$ . **Results:** The grip strength of HMB group, VIB group and COM group were significantly higher than the CTL group ( $p=0.012$ ;  $p=0.004$  and  $0.000$  respectively, one-way ANOVA) at month 10. The difference of grip strength at both month 8 and month 9 was not significant. Fat mass percentage of the HMB group (9.23% drop), VIB group (9.82% drop) and the COM group (9.46% drop) was significantly lower than the control group at month 9 ( $p=0.011$ ;  $p=0.007$ ;  $p=0.009$  respectively, one-way ANOVA). The percentage change in fat mass was not significant between groups at month 8 and month 10. Both the VIB and COM group presented significantly lower ORO area at month 10 ( $p=0.022$ ;  $p=0.005$  respectively, one-way ANOVA). At month 8 and 9, no significant differences of ORO area were seen among groups. At month 8, COM group showed significantly higher ( $p=0.004$ , one-way ANOVA) BMD than the CTL group. At month 9, BMD of both HMB and COM group were significantly higher ( $p=0.019$  and  $p=0.004$  respectively, one-way ANOVA) than the CTL group. **Conclusion:** Co-application of LMHFV and HMB could improve muscle function by reducing fat infiltration, which suggested this combined treatment could be used as an intervention for age-related sarcopenia. Acknowledgement: General Research Fund (Ref: 14103314)

### OC51- SARA-OBS, AN OBSERVATIONAL STUDY DEDICATED TO CHARACTERIZE AGE RELATED SARCOPENIA POPULATION SUITABLE FOR INTERVENTIONAL STUDIES.

Waly Dioh, Carole Margalef, Gianluca Zia, Stanislas Veillet and Susanna Del Signorei (Biophytis, UMPC - BC9, Paris, France)

**Backgrounds:** Sarcopenia, a key underlying cause of age related physical disability is characterized by the loss of muscle mass and function. Sarcopenia can encompass Sarcopenic obesity (SO), a condition affecting older obese individuals defined by fat mass increase associated with the loss of muscle mass and function. The SARA clinical program is built around BIO101, the oral investigational new drug developed by Biophytis and is hosted by SARA-Data, an innovative platform for clinical trials management. SARA program includes SARA-PK phase1, completed in 2016, SARA-OBS, the ongoing 6-month observational study and SARA-INT, the 6-month interventional study. **Objectives:** - Characterize the target population that will be subsequently studied in SARA-INT, the Phase 2 study in EU and US. - Estimate the prevalence of sarcopenia including sarcopenic obesity in a representative sample of older persons in US and Europe with poor physical function according to the FNIIH criteria (Studenski et al., 2014); - Define baseline characteristics of main and secondary criteria. **Methods:** SARA-OBS study consists of two main visits (baseline and 6-month) to evaluate the main (400-meter gait speed), and secondary endpoints (6-minute walk, body composition, SPPB, grip strength and physical activity through actimetry). **Patient:** Reported Outcomes and biomarkers of sarcopenia are also studied. Patients of SARA-OBS study are selected within centers in US and EU (France, Belgium and Italy), based on the FNIIH criteria (Studenski et al., 2014; SPPB 8 and ALM/BMI < 0.512 in women and < 0.789 in men or ALM < 19.75 kg in men and < 15.02 kg in women. **Results:** SARA-OBS baseline characteristics including main criterium (400 m gait speed) and key secondary criteria will be presented. The overlapping between alternative definition of sarcopenia will be discussed, e.g. grip strength newly proposed cut-points. **Conclusion:** The SARA-OBS study will contribute to a better characterization of Age-related Sarcopenia in a community dwelling older patients at risk of mobility disability. SARA-OBS patients will be used in SARA-INT, to evaluate safety and efficacy of BIO101.

### OC52- ASSOCIATION OF CIRCULATING MIRNAS WITH SARCOPENIA: THE SARCOPENIA AND PHYSICAL IMPAIRMENT WITH ADVANCING AGE STUDY (SARCOPHAGE).

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**Backgrounds:** Sarcopenia, the age-related decline in skeletal muscle mass and function, is a major health issue in geriatric medicine. With aging, skeletal muscle gene expression is significantly dysregulated suggesting that epigenetic alterations may play a crucial role in the skeletal muscle aging process. 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. The remarkable miR stability in biofluids suggests they could become non-invasive disease biomarkers. **Objectives:** We studied the

differential expression of circulating miRs in subjects with and without sarcopenia in the SarcoPhage cohort. **Methods:** The study group included Belgian subjects belonging to the population-based cohort SarcoPhage (n = 534). Expression levels of serum miR were measured in 19 healthy subjects without sarcopenia ( $77.1 \pm 6$  years, 9 men) and in 18 subjects with sarcopenia ( $79.6 \pm 6.8$  years, 9 men). Both groups were matched for age ( $p = 0.23$ ) and sex. The evaluation of sarcopenia was performed according to the European Working Group on Sarcopenia in Older People (EWGSOP): low muscle mass plus either low muscle strength or low physical performance. According to the manufacturer's protocol (EXIQON, Denmark) for the Next Generation Sequencing method, RNA sequencing was performed from 400  $\mu$ l of serum (Illumina platform). **Results:** We identified 383 miRs with an expression level  $\geq 1$  TPM (Tags per million) and 196 with an expression level  $\geq 10$  TPM. When we compared the two groups, 43 miRs showed differential expression ( $p < 0.05$ ) between controls and sarcopenia patients. After Benjamini-Hochberg False Discovery Rate (FDR) correction hsa-miR-668-3p and hsa-miR-200a-3p exhibited significantly different concentrations in sarcopenia patients and controls ( $p < 0.05$ , FDR at 5%) (see Table).

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Names	Log Fold change	p-Value	FDR	Healthy average	TMM*	Sarcopenia average	TMM*
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hsa-miR-668-3p	3.29	1.76E-06	0.001018	3.82	0.23		
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hsa-miR-200a-3p	1.53	5.74E-05	0.016988	146.33	50.5		
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\* measurements were expressed as Trimmed mean of M-values normalization method (TMM)

**Conclusion:** With a NGS screening approach, we identified 2 miRs that are differentially expressed in patients suffering from sarcopenia compared to healthy subjects. The next step will be the measurement of these specific miRs in the entire cohort to determine the clinical utility of these markers.

**OC53- HIGH PROTEIN INTAKE AND THE MAINTENANCE OF SKELETAL MUSCLE DURING ENERGY DEFICIT COMBINED WITH REDUCED DAILY ACTIVITY IN OLDER ADULTS.** Sara Y Oikawa, Chris McGlory, Nelson I Saddler, Adrienne K Morgan, Lisa K Souza, Gianni Parise, Stuart M Phillips (*Department of Kinesiology, McMaster University, Hamilton, Canada.*)

**Background:** Losses of skeletal muscle with age are accelerated during periods of inactivity such as hospitalization or convalescence from illness/injury. These periods are often accompanied by a reduction in appetite and energy deficit, which can accelerate muscle loss. Protein supplementation may offset skeletal muscle loss during inactivity and energy deficit; however, the effect of protein supplement-type in combination with mixed meals on muscle retention is unknown. **Objectives:** The purpose of this study was to determine the effects of 2wks of step-reduction (SR), during energy-restriction (ER), on the loss of skeletal muscle mass and strength in older-adults consuming either a whey protein- (WP) or collagen peptide- (CP) supplemented diet. **Methods:** Participants (16 men,  $69 \pm 3$ yr, 15 women,  $68 \pm 4$  yr) were provided with a controlled-diet containing 1.6g/kg/day of protein (HP),  $55 \pm 9\%$  of protein from diet sources and  $45 \pm 9\%$  of protein via twice-daily (30g bid) supplement of WP or CP. **Participants:** underwent 2wk of SR ( $< 750$  steps/day) while maintaining HP in combination with mild ER ( $-500$ kcal) before returning to habitual-activity for 1wk: recovery (RC). Body composition was measured by DXA for determination of leg-lean-mass (LLM), a fasted blood sample was taken to characterize insulin

sensitivity, inflammatory cytokines, and a muscle biopsy for the measurement of muscle fiber cross sectional area (CSA). Participants also performed an isometric maximum voluntary contraction (MVC) to determine knee-extensor torque. **Results:** Following SR, there was a loss in LLM in both groups ( $p < 0.001$ ) that was recovered following RC ( $p < 0.001$ ). There were no differences between groups ( $p > 0.05$ ) for LLM or following SR ( $p > 0.05$ ) on CSA (type I or II fibers). There were no differences between groups for any measure of insulin sensitivity or inflammatory cytokines ( $p > 0.05$ ). Fasted glucose and insulin were elevated following SR ( $p < 0.001$ ) and did not recover at RC ( $p < 0.001$ ). MVC was reduced following SR in both groups ( $p < 0.001$ ) and was recovered at RC but this was only in men ( $p = 0.046$ ). **Conclusion:** In conclusion, a high protein diet restores leg muscle mass following reduced activity when combined with return to habitual activity regardless of protein supplement source. Older women may be more susceptible to loss of muscle function with inactivity than men.

**OC54- SARCOPENIA AND EXERCISE INTOLERANCE IN THE OLD: NEW TREATMENTS THAT COMBINE DIET AND EXERCISE TO BUILD STRENGTH AND ENDURANCE.** Kevin Conley<sup>1</sup>, Sophia Z. Liu<sup>1</sup>, Amir S. Ali<sup>1</sup>, Baback Roshanravan<sup>1,2</sup>, Eric G. Shankland<sup>1</sup> (*(1) Departments of Radiology; (2) Medicine, University of Washington, Seattle, WA, USA*)

**Background:** Reduced muscle size and strength (sarcopenia), exercise tolerance and mobility are debilitating aspects of aging. Exercise training has been the gold-standard for improving the muscle strength or endurance lost with age but not both together. Astaxanthin is a natural product that combined with vitamin E has both anti-inflammatory and anti-oxidant properties that may improve muscle adaptation to exercise training to improve strength and endurance in the elderly. **Objectives:** To conduct a randomized, double-blind, placebo-controlled study of the impact of daily oral astaxanthin treatment (astaxanthin; 12 mg/day, vitamin E; 10 mg/day, zinc; x mg/day) with interval treadmill incline training in the elderly. **Methods:** Healthy males and females (n=41), age 65-82 yrs, undertook 3 months (3x/week for 40-60 min) of interval incline treadmill walking protocol (target 85% HRmax). The following was determined before and after training: training exercise time, 6 min walk distance, tibialis anterior (TA) muscle maximum voluntary contraction (MVC, strength) and muscle cross-sectional area (CSA by MRI). **Results:** Increases in MVC by 14.4% ( $\pm 6.2\%$ , mean $\pm$ SEM,  $P < 0.02$ , paired t-test), CSA by 2.7% ( $\pm 1.0\%$ ,  $P < 0.01$ ) and specific force by 11.6% (MVC/CSA,  $\pm 6.0\%$ ,  $P = 0.053$ ) were found with Ax treatment but no change was evident in these properties with placebo treatment (MVC,  $2.9\% \pm 5.6\%$ ; CSA,  $0.6\% \pm 1.2\%$ ; MVC/CSA,  $2.4 \pm 5.7\%$ ;  $P > 0.6$  for all). Greater endurance (exercise time in incline walking,  $> 140\%$ ) and distance in 6 min walk ( $> 8\%$ ) accompanied training in both treatments. **Conclusion:** An astaxanthin formulation uniquely improved TA muscle strength and size with the exercise endurance and walking distance increases that came with treadmill walking training. These muscle improvements are consistent with anti-inflammatory and anti-oxidant function of the astaxanthin formulation. Thus, the formulation in combination with a functional training program uniquely improved muscle strength, endurance and mobility in the elderly.

**OC55- DOES COMBINED OSTEOPENIA AND SARCOPENIA CONFER GREATER RISK OF FRACTURE THAN EITHER CONDITION ALONE IN OLDER MEN? THE CONCORD HEALTH AND AGEING IN MEN PROJECT.**

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**Background:** It is unclear whether older men with both osteopenia/osteoporosis and sarcopenia («osteosarcopenia») are at greater risk of incident falls and fractures than older men with either condition alone. **Objectives:** The primary aim of this secondary analysis of a longitudinal study of community-dwelling older men was to determine whether, compared with assessing sarcopenia and osteopenia/osteoporosis as distinct entities, combining these two risk factors into one entity (osteosarcopenia) provides a better determination of falls and fracture risk. **Methods:** 1,575 community-dwelling men aged 70 years from the Concord Health and Ageing in Men Project (CHAMP) study had appendicular lean mass, total hip and lumbar spine bone mineral density (BMD) determined by dual-energy X-ray absorptiometry, and hand grip strength and gait speed were also assessed. Osteosarcopenia was defined as a BMD T-score <-1.0SD and sarcopenia according to the European Working Group on Sarcopenia definition. Participants were contacted every 4 months for 6±2 years to ascertain incident fractures (confirmed by radiographic reports) and for 2 years for incident falls. **Results:** The prevalence of osteosarcopenia was 8%, while 34% of participants had osteopenia/osteoporosis alone and 7% had sarcopenia alone. Osteosarcopenic men had significantly increased fall rates (incidence rate ratio: 1.40; 95% CI: 1.02, 1.93) and fracture rates (hazard ratio: 1.85; 95% CI: 1.06, 3.23 compared with non-osteopenic/osteoporotic non-sarcopenic men. However, there was no statistical interaction between sarcopenia and osteopenia/osteoporosis, with no difference in fall or fracture rates for osteosarcopenic men compared with osteopenic/osteoporotic alone and sarcopenic alone men (all P>0.05). In continuous analyses of osteosarcopenia components, only higher baseline total hip BMD was predictive of reduced likelihood of fracture (odds ratio: 0.02; 0.01, 0.07 per g/cm<sup>2</sup>). **Conclusion:** Community-dwelling older men with both low bone and muscle mass do not appear to have increased rates of falls and fractures compared with those with only one of these conditions. These findings suggest that the concept of «osteosarcopenia» is of no clinical value.

**OC56- HUMAN MULTILINEAGE-INDUCIBLE CELLS MEDIATE THE REPAIR AND REJUVENATION OF TISSUES DERIVED FROM ALL EMBRYONIC LAYERS IN IMMUNOCOMPETENT RODENTS THROUGH MULTIPLE MECHANISMS.** Paul C. Schiller (Prime Cell Biomedical Inc. Miami Beach, USA)

**Background:** Cell therapies have played a central role in promoting health in many disease conditions. Developmentally immature cells, or stem cells, have been classically thought of as mediators of tissue repair primarily by replacing dysfunctional cells. It has become evident that adult progenitor cells, i.e., mesenchymal stem/stromal cells (MSCs), mediate tissue repair by mechanisms other than cell replacement. MSCs are highly heterogeneous and show therapeutic effects that vary from donor to donor and depend on donor age and tissue. **Objectives:** Identify and characterize a human early progenitor cell with broad therapeutic and rejuvenating potential useful in the clinical setting. **Methods:** Develop isolation and expansion conditions mimicking the stem cell niche. Isolated cells were assessed for homogeneity, differentiation potential, ability for tissue repair in different disease/injury animal models, immune status, and potential for regulating cell death and senescence. **Results:** Multilineage-inducible cells have been isolated from several species and exhibit similar therapeutic potentials. They express unique molecular and functional profiles that clearly distinguish them from the classical MSCs. Human MI cells are highly homogeneous among donors and have proven effective in repairing and restoring normal function in tissues derived from all three embryonic germ layers in animal models of disease. Human cells can achieve this in animal models without the need of immunosuppression, strongly indicating their immune privileged status. These cells have been highly effective in animal models of inflammatory bowel disease (repairing endoderm-derived intestinal tissue), bone repair and augmentation (mesoderm-derived), and central nervous system (ectoderm-derived) models of injury (focal and global ischemia) and degeneration (Parkinson's disease). They achieve these effects by several mechanisms including, cell replacement, immunomodulation (host tissue immune profile from a pro-inflammatory to an anti-inflammatory status), preventing host cell apoptosis, preventing host cell dysfunction and senescence by modulating cellular mechanisms involved in the accumulation of dysfunctional proteins, such as those forming plaques and tangles known to mediate neurodegenerative diseases and age-related conditions that contribute to physiological deficits. **Conclusion:** Multilineage-inducible cells have a strong potential to mediate tissue repair and organismal rejuvenation in the clinic under an allogeneic setting by modulating mechanism proven to mediate cellular senescence and organismal aging.

**OC57- INNOVATING ANIMAL MODELS OF FRAILITY: FRAILITY INDEX AND MORTALITY IN PET DOGS WITH EXCEPTIONAL LONGEVITY.** David J. Waters<sup>1,2</sup>, Emily Chiang<sup>2</sup>, Cheri Suckow<sup>2</sup>, Aimee Maras<sup>2</sup> ((1) Center on Aging and the Life Course, Purdue University, West Lafayette, IN, USA; (2) Center for Exceptional Longevity Studies, Gerald P. Murphy Cancer Foundation, West Lafayette, IN, USA)

**Background:** People are living longer lives, but persons with the same chronological age display considerable heterogeneity in their accumulation of deficits. Frailty index (FI) operationalizes frailty as the proportion of health deficits present in each individual, providing vital insights into the aging process and its consequences in terms of mortality risk and healthy life-expectancy. **Objectives:** To advance our understanding of frailty and the aging process and

to minimize adverse health consequences associated with increased life-expectancy by using a novel animal model of highly-successful human aging. **Methods:** To achieve this objective, we launched the first systematic scientific study of the oldest-living pet dogs in North America, gathering detailed data on exceptionally long-lived dogs that are physiologically equivalent to human centenarians. Frailty index was constructed assessing accumulation of 34 deficits using information from personal interviews with dog owners and validated through in-person examination by a veterinarian. Cox proportional hazard was used to determine relationship between increasing FI and mortality risk. To better understand differences in individual response to deficit accumulation, we analyzed whether duration of lifetime ovary (estrogen) exposure protected females from adverse impact of increasing FI on mortality. **Results:** Median frailty index (FI) did not differ significantly between males and females (0.44 and 0.41, respectively). For both male and female dogs, the maximum limit of FI, defined as 95th percentile of FI values, was 0.59-0.65, compared to 0.70 reported in humans by Rockwood and colleagues. In 51 male canine centenarians, each 0.1 unit increase in FI was associated with age-adjusted hazard ratio (HR) of 1.5 (95%CI,1.1-2.2)( $P=0.027$ ). In 88 females, the relationship was equally strong, with each 0.1 unit increase in FI associated with age-adjusted HR of 1.8 (95%CI,1.3-2.5) ( $P=0.0008$ ). Higher lifetime endogenous estrogen exposure did not buffer females from the adverse impact of deficit accumulation on mortality. **Conclusion:** This is the first report of using frailty index to describe and dissect the heterogeneity of deficit accumulation in pet dogs with exceptional longevity, a model of highly-successful aging. Future research using the dog model will focus on testing interventions that can delay the onset of deficit accumulation and mitigate adverse consequences of frailty.

**OC58- A DOUBLE-BLIND PLACEBO CONTROLLED TRIAL INTO THE EFFECTS OF TESTOSTERONE PROVISION UPON BODY COMPOSITION, GLYCAEMIC CONTROL AND INTRA-MUSCULAR SIGNALING PATHWAYS DURING RESISTANCE EXERCISE TRAINING IN OLDER MEN.** Nima Gharahdaghi, Supreeth S Rudrappa, Bethan E Phillips, Iskandar Idris, Matthew S Brook, Daniel J Wilkinson, Nathaniel J Szewczyk, Kenneth Smith, Philip J Atherton (MRC-ARUK Centre of Excellence and NIHR BRC, School of Medicine, University of Nottingham, UK)

**Background:** The andropause is associated with declines in serum testosterone (T), an associated loss of skeletal muscle mass and function (i.e. sarcopenia) and insulin resistance. Two of the major interventions purported to offset sarcopenia are T therapy and Resistance Exercise Training (RET). Nonetheless, the global physiological impacts and mechanisms of T therapy adjuvant to RET remain poorly defined in older individuals. **Objectives:** To determine the impacts of RET plus T (vs. placebo) in older individuals. **Methods:** Eighteen non-hypogonadic healthy older men, 65-75y, BMI 30 kg.m<sup>-2</sup> (serum T>8.3nmol.l<sup>-1</sup>) were assigned in a random double-blinded fashion to receive bi-weekly: placebo (P, n=9) or T (Sustanon 250-mg, n=9) injections over 6-weeks of whole-body RET (leg-extension, leg-press, leg-curl, lat-pull-down, shoulder-press and bench-press (3-sets, 8-10 reps at 80% 1-RM)). Subjects underwent Dual-energy X-ray Absorptiometry (DXA) to assess body-composition, ultrasound scans of m.vastus lateralis architecture, isometric dynamometer knee-extensor Maximal Voluntary Contraction (MVC) testing, Oral Glucose Tolerance Testing (OGTT) and finally, m.vastus biopsies were taken to quantify insulin and anabolic signaling pathways via immunoblotting. **Results:** T adjuvant to RET, augmented whole-body (53002±5240g to 56068±5262g vs. 54132±6331g to 54860±5870g,  $P<0.0001$ , ES=0.58) and appendicular lean mass

(23887±3190g to 25571±3336g vs. 24591±3752g to 24811±3390g,  $P<0.0001$ , ES=0.52) while decreasing body fat (1194g vs. 209g,  $P=0.01$ , ES=0.29). T also augmented m.vastus lateralis thickness (2.36±0.21cm to 2.61±0.13cm vs. 2.31±0.3cm to 2.45±0.28cm,  $P<0.0001$ , ES=0.73) and fascicle-length (7.18±0.8cm to 7.9±0.75cm vs. 7.7±0.19cm to 8.11±0.1cm,  $P=0.0008$ , ES=0.92) in addition to strength gains e.g. 1-RM leg-extension (69.89±15.11kg to 125.6±15.82kg vs. 61.22±29.58kg to 103.1±46.88kg,  $P=0.0003$ , ES=0.64) and MVC (166.6±32.7Nm to 210±38.33Nm vs. 164.8±51.25Nm to 194.6±44.23Nm,  $P=0.0119$ ). Additionally, T augmented insulin sensitivity (e.g. Cederholm index: 54.08±12.77 to 65.41±18.1 mg'L<sup>2</sup>mmol'L<sup>-1</sup>mU<sup>-1</sup>min<sup>-1</sup> vs. 46.95±10.99 to 52.05±12.29 mg'L<sup>2</sup>mmol'L<sup>-1</sup>mU<sup>-1</sup>min<sup>-1</sup>,  $P=0.028$ , ES=0.86). Finally, acute RE-induced phosphorylation of AKTser473 (0.088±0.07 to 0.2±0.1 vs. 0.034±0.02 to 0.089±0.06,  $P=0.008$ , ES=1.1) and mTORC1ser2448 (0.027±0.01 to 0.12±0.06 vs. 0.05±0.03 to 0.085±0.05,  $P=0.041$ , ES=0.59) was enhanced with T. **Conclusion:** T adjuvant to RET, enhanced phosphorylation of insulin and anabolic-related signaling pathways perhaps explaining augmented muscle hypertrophy and insulin sensitivity. Thus, T coupled to RET, is an effective short-term intervention to improve muscle mass, function and glycaemic control in older aged men.

**OC59- DISRUPTION OF IL-6 IN A FRAIL MOUSE MODEL DELAYS PHYSICAL FUNCTION DECLINE IN OLDER ANIMALS.** Lina Ma, Huanle Yang, Jackie Langdon, Reyhan Westbrook, Ruth Marx-Rattner, Jeremy Walston, Peter Abadir (Division of Geriatric Medicine and Gerontology, Johns Hopkins University, Baltimore, USA)

**Background:** Chronic inflammation (CI) is strongly associated with functional decline, chronic disease states, reduced health span, and mortality in mouse models and humans. Interleukin 6 (IL-6) is one of the markers of CI that is strongly and consistently associated with age-related adverse health outcomes, however the specific role of IL-6 has not been well defined. **Objectives:** to dissect the role of IL-6 in development of age related functional decline in the frail mouse model (IL-10tm/tm mice). **Methods:** We developed a double knockout mouse strain (DKO) on a C57BL/6 background that lacks both IL-6 and IL-10. We compared young (3 months) and old (18-23 months) DKO mice to age- and gender-matched IL-10tm/tm and C57BL/6 wild-type (WT) mice (n=5-9 per group). Treadmill tests including maximum running distance (MRD) and number of visits (NOV) were compared. Changes in inflammatory mediators, mitochondrial energetics and muscle type composition were also compared. **Results:** Old male DKO mice performed better than frail mice (IL-10tm/tm) in both MRD adjusted for body weight (MRD/weight) and NOV in 90 mins ( $p = 0.023$  and  $0.003$ , respectively). Old female DKO mice performed better than WT mice ( $p=0.019$ ) as indicated by NOV in 15 mins on the treadmill. However, these differences were observed only on the first day of a three days of treadmill testing. Two-way ANOVA revealed MRD/weight was significantly higher in DKO mice in both old male ( $p = 0.017$ ) and female ( $p = 0.028$ ) in all three days. Post-mortem tissue analysis showed old female DKO mice had reduced mass in kidney, quadriceps, extensor digitorum longus, gastrocnemius and tibialis anterior compared to WT mice (all  $p < 0.01$ ). Young male DKO mice had elevated levels of serum TNFaR1 ( $p < 0.05$ ) and a significant increase in the energetically demanding, fast type 2 muscle fibers in quadriceps ( $p = 0.002$ ), compared to WT mice. **Conclusion:** The mouse model of chronic inflammation in the absence of IL6 exhibits a better functional performance in the short term, but does not display increased physical reserve in subsequent testing. Further analysis to determine the exact biological basis of this enhanced

functional performance is in progress.

### OC60- THE ROLE OF DIMINISHING ENERGY RESERVES IN INCREASING FATIGABILITY IN MID-TO-LATE LIFE.

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**Background:** Poor energy efficiency is linked to declining health and functional status and increasing likelihood of frailty. Declining energy efficiency may manifest as reduced energy reserves and rising perceived fatigability (activity-related fatigue), but the association between perceived fatigability and energy efficiency has not been empirically evaluated. **Objectives:** To examine the longitudinal association between the energetic cost of walking as a percentage of peak energy availability and perceived fatigability in a cohort of well-functioning adults. **Methods:** 995 participants of the Baltimore Longitudinal Study of Aging (BLSA; mean baseline age 68 + 13 years) were evaluated between 2007-2017 (mean visits: 1.8, range 1-6). The energetic cost of walking (walking VO<sub>2</sub>; ml/kg/min) was assessed during a 5-minute, 0.67 m/s, 0% grade treadmill test (Medgraphics CPX-D), and perceived fatigability was defined using the Borg rating of perceived exertion (RPE; range 6-20) immediately after. Peak energy availability (peak VO<sub>2</sub>; ml/kg/min) was assessed during 400m of fast-paced walking using a portable indirect calorimeter (Cosmed K4b2, Italy). The longitudinal association between energy reserves, (a ratio of walking VO<sub>2</sub>/peak VO<sub>2</sub>) and perceived fatigability was estimated using generalized estimating equations, adjusted for demographics, body composition and history of chronic conditions. **Results:** In adjusted models, a one-unit (0.1) annual increase in the cost-capacity ratio resulted in a 0.4-unit increase in RPE (p < 0.001, z=12.1). Other significant contributors to rising fatigability included age (p < 0.001, z=8.3), and fat mass (p < 0.001, z=4.7). The addition of an interaction term between age and cost-capacity ratio suggested that the combination of age and increasing costs in relation to capacity (p < 0.001, z=4.6) were more important contributors to rising fatigability over time than age (p = 0.50) or cost alone (p = 0.02, z=-2.4). **Conclusion:** Rising energy costs in relation to capacity were strongly associated with increasing RPE with aging. These findings suggest that perceived fatigability may act as an early indicator of decreasing energy reserves, which could be used for timely identification of individuals who may benefit from interventions to curb future threats to mobility and risk of frailty. Future investigation in clinical populations is warranted.

## LATE BREAKING NEWS

### OC19- RELATIONSHIP OF INCIDENT FALLS WITH BALANCE DEFICITS AND BODY COMPOSITION IN MALE AND FEMALE COMMUNITY-DWELLING ELDERLY.

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Internal and Geriatrics Medicine, Gerontopole, CHU de Toulouse, UMR 1027 INSERM, University Toulouse III, Toulouse, France)

**Background:** Sarcopenia and obesity are reported risk factors for falls, although the data are not consistent. In most studies, falls incidence is often reported retrospectively rather than prospectively and do not make sex comparisons. **Objectives:** We investigated whether falls would be associated with the balance and gait deficits and body composition, and whether these relationships were sex-specific. **Methods:** Secondary analysis of 4-year follow-up data from 307 participants (M, n=122, 75.8 yr SD5.5; F, n=183, 74.6yr SD6.1) of the New Mexico Aging Process Study. All outcomes were assessed annually. Falls were assessed using bimonthly falls calendars. Gait and balance were assessed using the Tinetti test. Lean body mass (LBM), appendicular skeletal muscle mass (ASM), fat free mass (FFM), total fat mass (FM) were assessed by DXA. Hazard ratios (HR) for 2 point worsening in gait and balance score and falls were calculated by Cox proportional hazard for men and women. **Results:** Baseline balance deficits, and not body composition, was the strongest predictor of falls. Worsening balance had significant sex interactions with LBM (Male-HR 0.97, 95%CI 0.59-1.80; Female-HR 1.82, 95%CI 1.07-2.91 p=0.02), ASM (Male-HR 0.92, 95%CI 0.55-1.73; Female-HR 2.01, 95%CI 1.11-3.03 p=0.01), and FFM (Male-HR 0.96, 95%CI 0.61-1.83; Female-HR 1.93, 95%CI 1.16-3.18, p=0.01). The body composition relationship with balance deficits was U-shaped with the strongest predictors being low lean mass in males and high fat mass in females. **Conclusion:** This 4-year prospective investigation of the relationships between falls, body composition, balance and gait, found no direct association between falls and body composition. However, there were sex-specific relationships between body composition and worsening balance, and worsening balance with increased falls risk. Sex differences need to be further explored and taken into consideration for interventions to improve worsening balance and body composition aimed at preventing falls.

### OC20- JNK REGULATES MUSCLE HYPERTROPHY VIA MYOSTATIN/SMAD INHIBITION.

Sarah Lessard<sup>1</sup>, Tara MacDonald<sup>1</sup>, Prerana Pathak<sup>1</sup>, Myoung Sook Han<sup>2</sup>, Vernon Coffey<sup>3</sup>, Donato Rivas<sup>4</sup>, Michael Hirshman<sup>1</sup>, Roger Davis<sup>2</sup>, Laurie Goodyear<sup>1</sup> ((1) Joslin Diabetes Center; (2) University of Massachusetts Medical School; (3) Bond University; (4) Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University)

**Background:** Resistance exercise leads to hypertrophic remodeling events in skeletal muscle that increase muscle mass and strength, making this exercise modality a good therapy for combating muscle wasting. However, advanced age and chronic disease can impair the adaptive response of muscle to exercise, or physically limit the ability of an individual to undertake exercise training regimens. **Objectives:** We aimed to identify novel molecular mechanisms that mediate muscle hypertrophy in response to increased load or resistance exercise to discover novel therapeutic targets for increasing muscle mass. **Methods:** We performed bioinformatics analysis in animal models that identified the c-Jun N-terminal kinase (JNK) as a potential mediator of muscle hypertrophy with overload and exercise. We then employed a multi-disciplinary approach, including tissue culture systems, animal models, and human subjects, to determine the effect of JNK hyper-activation and loss of function on muscle fiber hypertrophy. **Results:** Using muscle-specific JNK knockout mice, we determined that JNK is necessary for overload-induced increases in muscle mass and myofiber cross-sectional area. Next, we identified phosphorylation of the transcription factor SMAD2 at specific linker region residues (Ser245/250/255) as a mechanism for JNK-

mediated muscle fiber hypertrophy. SMAD2 is a known effector of the Transforming Growth Factor' family ligand, Myostatin, which is a potent inhibitor of muscle hypertrophy. Our data in cells and animal models demonstrate that JNK-mediated SMAD phosphorylation has an inhibitory effect on Myostatin activity. Therefore, we propose that overload- or exercise-induced JNK activation leads to increased muscle mass via Myostatin/SMAD inhibition. In line with this hypothesis, we show that JNK/SMAD signaling is activated by hypertrophy-inducing resistance exercise, but not endurance exercise, in humans. **Conclusion:** This work identifies a JNK/SMAD signaling axis as a novel therapeutic target to increase muscle mass.

**OC21- METABOLOMICS OF FRAILTY SEVERITY AMONG BLACK MEN IN THE HEALTH ABC STUDY.** Megan M. Marron<sup>1</sup>, Rachel A. Murphy<sup>2</sup>, Tamara B. Harris<sup>3</sup>, Stacy G. Wendell<sup>1</sup>, Robert Boudreau<sup>1</sup>, Anne B. Newman<sup>1</sup> ((1) *Department of Epidemiology, University of Pittsburgh, Pittsburgh, PA, USA;* (2) *Centre of Excellence in Cancer Prevention, School of Population and Public Health, University of British Columbia, Vancouver, Canada;* (3) *Laboratory of Epidemiology and Population Sciences, Intramural Research Program, National Institute on Aging, Bethesda, MD, USA;* (4) *Departments of Medicine and Clinical and Translational Science, University of Pittsburgh, Pittsburgh, PA, USA*)

**Background:** Frailty is an important public health issue at both the individual- and societal-level. It is more prevalent with older age and associated with a higher risk of multiple adverse health outcomes, such as falls, hospitalization, and mortality. Currently, the understanding of the pathophysiology of frailty is incomplete. Metabolomics is a promising tool to further our understanding of the biology of frailty, to discern how to prevent or slow the progression of frailty during late-life. **Objectives:** We sought to identify metabolites that correlate with frailty severity among older black men from the Health, Aging, and Body Composition (Health ABC) study and determine significant biological pathways that contribute to frailty. **Methods:** The Health ABC study was a prospective cohort of N=3075 ambulatory older black and white men and women from Pittsburgh, PA and Memphis, TN. Metabolomics (350 metabolites) was performed by the Broad Institute using fasting plasma samples drawn at the second visit (1998-1999) from a random subset of n=319 Health ABC black men aged 70-81. Frailty severity was measured using the modified Fried Frailty Phenotype, based on unintentional weight loss, weakness, low energy, slowness, and low levels of physical activity. **Results:** Thirty-seven metabolites were correlated with frailty severity (p-value<0.05), while adjusting for age and study site, of which 14 remained significant after adjusting for multiple comparisons using a 0.30 false discovery rate. Among the 14 metabolites, 6 were negatively correlated (tryptophan, methionine, tyrosine, C14:0 sphingomyelin, 1-methylnicotinamide, and asparagine) and 8 were positively correlated (glucuronate, N-carbamoyl-beta-alanine, isocitrate, creatinine, C4-OH carnitine, cystathionine, hydroxyphenylacetate, and putrescine). Applying a pathway analysis using MetaboAnalyst, we found significantly more metabolites were involved in nitrogen metabolism and aminoacyl-transfer RNA biosynthesis than what you would expect by chance among the 14 metabolites that were correlated with frailty severity. The pathway analysis was repeated using all 37 metabolites that were correlated with frailty at a 0.05 significance level, which supported our evidence for the nitrogen metabolism and amino acyl-transfer RNA biosynthesis pathways, as well as for the citrate cycle. **Conclusion:** Nitrogen metabolism, aminoacyl-transfer RNA biosynthesis, and the citrate cycle may be involved in the pathophysiology of frailty in late-life.

**OC22- APPROACHES TO ASSESSMENT OF SARCOPENIA ON COMPUTED TOMOGRAPHY (CT): A SYSTEMATIC REVIEW.** Sean P. Boyle<sup>1</sup>, Robert D. Boutin<sup>1</sup>, Leon Lenchik<sup>2</sup>, Behrang Amini<sup>3</sup> ((1) *University of California, Davis, USA;* (2) *Wake Forest School of Medicine, USA;* (3) *The University of Texas M.D. Anderson Cancer Center, USA*)

**Background:** There is increasing use of computed tomography (CT) for the assessment of sarcopenia; however, there is no consensus on protocols used for CT assessment of sarcopenia. **Objectives:** To evaluate all relevant studies that used CT muscle measurements to assess sarcopenia to identify the differences between protocols used. **Methods:** A comprehensive search of PubMed from 1983-2017 was performed to identify peer-reviewed studies that used CT muscle measurements to assess sarcopenia. Abstracts and, as needed, text of the search results were reviewed to make the final selection. Review articles were excluded. The CT protocols were summarized and compared with emphasis on: anatomic landmark(s), analysis software, thresholding and segmentation, muscle(s) measured, key measurement (i.e., muscle attenuation, cross-sectional area [CSA], volume), derived variables, and cut-points for sarcopenia. **Results:** From the described search, 654 articles were identified and 369 studies met inclusion criteria for this systematic review. L3 level was the most common landmark, used in 151 (40%) studies. Slice-O-Matic was the most commonly used software (n=86, 23%), followed by other commercial packages (n=65, 18%). Attenuation thresholding was used in 267 (72%) studies. 235 (64%) studies used semi-automated segmentation, while 29 (8%) studies used some combination of manual, semi-automated, and automated segmentation. The most commonly measured muscle groups were all visible muscles at the selected abdominal anatomic landmark (n=145, 39%), followed by all visible muscles of some part of the lower extremity (n=114, 31%). The psoas muscle was measured in 52 (14%) studies. Muscle CSA was the most common metric (n=323, 88%), followed by muscle attenuation (n=134, 36%), and volume (n=61, 17%). 153 (41%) studies assessed more than 1 of the preceding measures. The most common derived variable was the skeletal muscle index (n= 139, 38%). 47 (13%) studies used a sarcopenia cut-point based on their own data, while 89 (24%) used a previously reported cut-point. **Conclusion:** There is considerable variation in the CT protocols used for assessment of sarcopenia. There is urgent need to develop consensus for CT protocols to better standardize the study of sarcopenia.

**OC39- SMALL-MOLECULE APPROACHES TO ATTENUATE THE E3 LIGASE MURF1 AND SKELETAL MUSCLE ATROPHY AND DYSFUNCTION.** Siegfried Labeit<sup>1</sup>, Scott Bowen<sup>2</sup>, Lee H. Sweeney<sup>3</sup>, Volker Adams<sup>4</sup> ((1) *University of Heidelberg, Germany;* (2) *University of Leeds, UK;* (3) *University of Florida, USA;* (4) *TU Dresden Germany*)

**Background:** MuRF1 is a muscle-specific ubiquitin E3 ligase that is activated in skeletal muscle wasting. Yet there remains a paucity of therapeutic interventions that directly inhibit MuRF1 function. **Objectives:** In this presentation, we will discuss the development of novel compounds targeting the central B-box-coiled coil domain of MuRF1 in order to inhibit muscle wasting in cardiac cachexia. The underlying objective is to obtain tools by chemical biology to attenuate muscle wasting. **Methods:** As screening approach, an ALPHA based high -throughput screen was applied to select novel compounds from an unbiased library. As a wasting model, we used a monocrotaline induced cardiac cachexia murine model. **Results:** Selected compounds under active study inhibit MuRF1-titin complexation with IC50 values < 25 µM; of which 3 were found to also inhibit MuRF1 E3 ligase

activity, with 1 further showing low toxicity on cultured myotubes. This last compound, EMBL chemical core ID#704946, also prevented atrophy in myotubes induced by dexamethasone and attenuated fiber atrophy and contractile dysfunction in mice during cardiac cachexia. Proteomic studies provide novel mechanistic insights on the downregulated stress pathways that are attenuated by ID#704946 treatment. These include a normalization of proteins associated with apoptosis (BAX), with protein synthesis co-factors, and metabolic enzymes. **Conclusion:** Small molecules directed to MuRF1's central myofibrillar protein recognition domain may be useful for drug development approaches. Our current data show at least for one compounds an attenuation of in vivo muscle wasting and contractile dysfunction in a mouse model for cardiac cachexia.

**OC40- RELATIONSHIP BETWEEN PATIENT-REPORTED OUTCOME MEASURES AND LEG EXTENSOR MUSCLE WEAKNESS IN OLDER ADULTS.** Janet E. Simon<sup>1,2</sup> Todd M. Manini<sup>3</sup>, Anoop Balachandran<sup>3</sup>, Leatha A. Clark<sup>1,4,5</sup>, Simon Moskowitz<sup>1</sup>, Brian C. Clark<sup>1,4,6</sup> ((1) *Ohio Musculoskeletal and Neurological Institute, Ohio University, Athens OH, USA*; (2) *School of Applied Health Sciences and Wellness, Ohio University, Athens, OH, USA*; (3) *Institute on Aging and the Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA*; (4) *Department of Biomedical Sciences, Ohio University, Athens, OH, USA*; (5) *Department of Family Medicine, Ohio University, Athens, OH, USA*; (6) *Department of Geriatric Medicine, Ohio University, Athens, OH, USA*)

**Background:** A loss of voluntary muscle strength predisposes older adults to a 4-fold increase in functional limitations and a 2-fold increase in mortality. The importance of the patients' points of view on their health status and use of health care is widely recognized. However, it is unclear how well patient-reported measures are associated with clinically-relevant muscle weakness. **Objectives:** To determine the degree to which patient-reports of physical limitations and fatigue can classify isokinetic leg extensor weakness in older adults. **Methods:** Fifty-seven older adults (77.6±5.9 years, 72.4±15.6 kg, 36 women and 21 men) underwent an isokinetic (60 degrees/sec) maximal leg extensor strength test of the non-dominant limb. Individuals were grouped into strong, intermediate, and weak groups based on previously established isokinetic leg extensor strength/body weight ratio cut-points that identify older adults at risk for mobility limitations. All participants completed 15 questions from the Patient-Reported Outcomes Measurement Information System (PROMIS) Lower Extremity Function, Fatigue, and Upper Extremity Function scales. A discriminant function analysis was conducted to assess the discriminant capability of the PROMIS questions on isokinetic leg extensor strength strata. **Results:** The discriminant function analysis was statistically significant, =0.52, 2=30.7, p=0.04. High scores on the discriminant function were associated with the questions related to difficulty 'climbing step over step', 'getting up off the floor', 'getting in and out of a car', 'going up and down stairs', and 'forcing myself to get up because I was physically too weak' (r=0.43-0.54, p<0.05). Overall, 59.6% of cases were classified correctly with 42.9% of cases in the strong group, 76.2% in the intermediate group, and 54.5% in the weak group classified correctly. **Conclusion:** These data suggest that the PROMIS questions had limited predictive ability only correctly classifying approximately 60% of all individuals. Specifically, worse classification was observed in individuals in the strong and weak groups. While these data should be interpreted within the context of the relatively small sample size and the specific strength cut-points, they do suggest that existing patient-reported outcomes loosely map onto objectively measured lower extremity muscle strength. These

results suggest that new patient-reported outcomes are needed to better distinguish clinically-significant weakness.

**OC41- HIGHER EXPRESSION OF MIR-19B-3P ASSOCIATED WITH INCREASED FAT-FREE MASS FOLLOWING 6 MONTHS OF RESISTANCE EXERCISE IN OLDER MEN AND WOMEN.** Donato A Rivas, Roger A. Fielding, Lee M. Margolis (*USDA Human Nutrition Research Center on Aging at Tufts University, USA*)

**Background:** Anabolic stimulation by resistance exercise (RE) may delay the progression of muscle loss and prolong independence among community-dwelling elders. However, a high degree of variability in the responses to RE has been observed. Differences in expression of microRNA (miRNA) in skeletal muscle have been identified as a potential mechanism regulating gains in muscle to RE training. Whether discrepancies in circulating miRNA expression profiles can also predict responses in body composition and function after RE training remain unclear. **Objectives:** Determine if alterations in c-miRNA expression can distinguish the responses in body composition and function in mobility-limited older-adults following 6-mo of RE. **Methods:** Seventy three mobility-limited elders (70-85 years, men; n = 30, women; n = 43) completed a 6-mo progressive high-intensity RE training program. Body composition was assessed by DXA before and after training. Participants were dichotomized by gain (Gainers; n = 40) or loss (Losers; n = 33) of lower-body limb mass. Total RNA was extracted from serum from 44 participants (22 per group) using miRVANA PARIS kit. 17 miRNA highly associated with skeletal muscle homeostasis were analyzed using TaqMan MicroRNA Assays following multiplex RT and preamplification. **Results:** After training Losers experienced declines (P<0.05) in body mass (-1.0 ± 2.4 kg), primarily from fat mass (-0.73 ± 1.6 kg), while Gainers increased (P<0.05) body mass (1.3 ± 1.9 kg), due to increased fat-free mass (1.1 ± 1.2 kg). Six c-miRs (miR-1-3p, miR-19b-3p, miR-92a, miR-126-5p, miR-133a-3p, and miR-133b) were differentially (P<0.05) expressed between Losers and Gainers. Bioinformatics analysis identified the anabolic PI3k-Akt pathway as the most commonly targeted pathway of these 6 miRNA. Additionally, miR-19b-3p, was positively associated with changes in fat-free mass for Gainers (r = 0.615, P<0.05) and change in fat mass (r = 0.570, P<0.05) for Losers. **Conclusion:** Divergent responses in body composition between Gainers and Losers were most highly predicted by expression of miR-19b-3p. These findings may indicate that circulating miR-19b-3p may be a valuable biomarker to predict the variability in the response to RE.

**OC46- THE DIAGNOSTIC SIGNIFICANCE OF PQCT AND DXA IN GERIATRIC PATIENTS.** Michael Drey<sup>1</sup>, Michaela Henkel<sup>1</sup>, Sophie Petermeise<sup>1</sup>, Uta Ferrari<sup>1</sup>, Marietta Rottenkolber<sup>1</sup>, Ralf Schmidmaier<sup>1,2</sup> ((1) *Geriatric Department, Klinikum der Universität München, Munich, Germany*; (2) *Endocrinological Department, Klinikum der Universität München, Munich, Germany*)

**Background:** The loss of bone and muscle mass increases the risk of osteoporotic fractures. Especially in geriatric patients the Dual-Energy X-ray Absorptiometry (DXA) is often confounded by degenerative changes. **Objectives:** The purpose of this study was to compare associations of DXA and peripheral quantitative computed tomography (pQCT) measurements with major fractures. **Methods:** Bone mineral density (BMD) and muscle area (MA) of 168 patients aged 65 years and older (mean: 76.3±6.5) were measured with pQCT at distal forearm additionally to an osteoporosis basic assessment consisting of anamnesis, blood test and DXA of lumbar spine

and femur. Prior fractures were categorized in major osteoporotic fractures. Logistic regression was used to show the association of BMD ascertained with DXA and pQCT as well as muscle area with major fractures. **Results:** Only pQCT-BMD and pQCT-MA were significantly associated with major fractures (total and trabecular BMD OR 0.555 and 0.487,  $p < 0.001$ ; muscle area OR 0.701,  $p = 0.031$ ), whereas DXA-BMD was without significant association. These associations remained significant after adjustment for age, sex, BMI, physical activity and other risk factors. Hip fractures were significantly

associated with cortical pQCT-BMD (OR 0.520,  $p = 0.010$ ) and total hip DXA-BMD (BMD OR 0.520,  $p = 0.048$  and T-Score OR 0.527,  $p = 0.028$ ). In the adjusted model for patients  $> 75$  years only the pQCT-MA was significantly associated (OR 0.187,  $p = 0.026$ ) with major fractures. **Conclusion:** Measurement of bone and muscle with pQCT seems to have advantage over DXA in fracture prediction in geriatric patients. This supports the significance of the hazardous duet of osteosarcopenia, especially in geriatric patients.

## POSTER

### **BIOLOGY OF FRAILTY AND AGING**

**P1- MELANIN, THE UNSUSPECTED BIOENERGETIC MOLECULE AND THE BIOLOGY OF FRAILTY AND AGING.** Arturo Solis Herrera, M del Carmen Arias Esparza, Ruth Isabel Solis Arias ((1) Human Photosynthesis (TM) Research Center, Aguascalientes, Mexico)

**Background:** Frailty, theoretically defined as a clinically recognizable state of growing vulnerability, seems to result from aging- associate decline in reserve and function across body systems. Fried et al hypothesized that aging and frailty are mutually exacerbating cycle of negative energy balance, sarcopenia, and diminished strength and tolerance for exertion. The hypothesis of a cycle of negative energy balance is very descriptive and allows us to advance in the knowledge about the causes originating individuals evolve from a status of non-frail to a progressive stage of fragility. Although the initial manifestations of fragility are heterogeneous, weakness and slowness of movement seem to be the most common. **Objectives:** If we insist on continue placing glucose as the quintessential eukaryote cell power source, then we do not come to nothing. But if we analyze the process of ageing and frailty from the point of view of the unsuspected intrinsic property of melanin make visible and invisible light into chemical energy, through the dissociation of the molecule of water, such as chlorophyll in plants, then a new panorama opens. The glucose is only source of carbon chains, which the body knows from the beginning of time, why the body uses it as a building block of almost all biomolecules that are synthesized constantly, but glucose is not able to provide the energy that is required for their own metabolism. Our body takes energy, defined as anything that causes a change, of the visible and invisible light, and does so through a mechanism similar to the plant, i.e. decoupling the water molecule. However, the molecule that carries out the dissociation in plants is chlorophyll, and which does so in humans is melanin. **Methods:** We treated 25 patients with substantive signs and symptoms of ageing (sarcopenia, frailty, loss of memory) while the therapeutic approach of balance between mass and energy (from melanin). **Results:** You observe a progressive and remarkable improvement in the ability to wander, in the balance, the cognitive sphere, as in memory. Compared with patients treated with therapies prevalent, in our group of patients, progressive deterioration stopped almost in full and they tended to regain his powers, in a surprising way. **Conclusion:** The ability of the body to capture the energy of light, starts to decrease by approximately 10% each decade from the 26 years, which is consistent with the onset of loss of muscle strength. And as the generation and distribution from the melanin, continues declining, are failures in other systems, because the power failure, in any system tend to have generalized dysfunctions. The discovery of the intrinsic property of the melanin in transforming the visible and invisible light into chemical energy through the dissociation of the molecule of water, such as chlorophyll in plants, will mark a before and an after in studies about the fragility and aging that they affect the human body, and will allow the development of effective therapeutic methods that contribute to substantially improve the standard of living of the population concerned.

### **P2- IMPAIRMENT IN NEURAL ACTIVATION IS A KEY CONTRIBUTOR TO CLINICALLY MEANINGFUL MUSCLE WEAKNESS (I.E., DYNAPENIA) IN ELDERLY WOMEN.**

Leatha A. Clark<sup>1,2</sup>, Shinichi Amano<sup>1,6</sup>, David W. Russ<sup>1,3</sup>, Tim D. Law<sup>1,2,4</sup>, Brian C. Clark<sup>1,4,5</sup> ((1) Ohio Musculoskeletal and Neurological Institute (OMNI) at Ohio University, Athens, OH, USA; (2) Department of Family Medicine at Ohio University, Athens, OH, USA; (3) School of Rehabilitation and Communication Sciences, Ohio University, Athens, OH, USA; (4) Department of Geriatric Medicine at Ohio University, Athens, OH, USA; (5) Department of Biomedical Sciences at Ohio University, Athens, OH, USA; (6) Department of Biomedical Engineering, University of Southern California, Los Angeles, CA, USA)

**Background:** Muscle weakness is a well-known contributor to impaired physical function in the elderly and has historically been ascribed to muscle wasting. However, recent longitudinal data clearly indicate that muscle wasting is moderately associated, at best, with the loss of strength. Many scientists have suggested that impairments in the nervous system's ability to activate muscle (i.e., voluntary, or neural, activation) could be a key mechanism/contributor to muscle weakness. **Objectives:** In this study, we sought to test the hypothesis that impaired neural activation of the quadriceps femoris is a key contributor to clinically meaningful muscle weakness (i.e., dynapenia) in elderly women. **Methods:** Nine severely dynapenic (82.1±4.7 years) and seven non-dynapenic (74.1±5.4 years) elderly women participated in this study.<sup>1</sup> Participants performed a maximal voluntary isometric contraction (MVC) of the quadriceps femoris and received a supramaximal electrical stimulus (100-Hz doublet) during and after the MVC. The evoked force during the MVC was expressed relative to that evoked at rest and the percent of voluntary activation was calculated. **Results:** Consistent with our hypothesis, the severely dynapenic elderly women exhibited significantly lower levels of voluntary activation of the quadriceps femoris (83.5±13.2%; range: 53.2-92.4%) when compared to the non-dynapenic elderly women (93.5±3.7%; range: 89.2-98.2%) (p=0.023). A quadratic relationship was observed between relative strength and voluntary activation with 65% of the between subject variance in muscle strength being explained by impairments in voluntary activation (R<sup>2</sup>=0.65, p<0.01). **Conclusion:** These data indicate that impaired neural activation is a key contributor to clinically meaningful muscle weakness (i.e., dynapenia) in the quadriceps femoris of elderly women. These findings have implications for the development of rational, targeted interventions to enhance muscle and physical function, and suggest that many pharmacological interventions for increasing skeletal muscle mass may have limited impact in this regard. 1. Severe dynapenia and non-dynapenia were operationally defined as an isokinetic leg extensor strength/body weight ratio 1.01 Nm/kg and 1.34 Nm/kg, respectively. These cutpoints have been shown to identify elderly women at high and low risk, respectively, for the development of mobility limitations (Manini et al., 2007). Acknowledgements: This work was funded by a grant from the National Institute on Aging/ National Institutes of Health (R01AG044424 to BC Clark).

**P3- PHYSICAL ACTIVITY AND SEX HORMONE-BINDING GLOBULIN IN OLDER ADULTS: RESULTS OF THE ACTIFE-STUDY.** Dietrich Rothenbacher<sup>1</sup>, Dhayana Dallmeier<sup>2</sup>, Michael D Denkinger<sup>2</sup>, Bernhard O Boehm<sup>3</sup>, Wolfgang Koenig<sup>4,5</sup>, Jochen Klenk<sup>1</sup> ((1) Institute of Epidemiology and Medical Biometry, Ulm University, Ulm, Germany; (2) Agaplesion Bethesda Clinic Ulm, Geriatric Center Ulm/Alb-Donau, Ulm, Germany; (3) Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore and Imperial; College London, UK; (4) University of Ulm Medical Center, Department of Internal Medicine II-Cardiology, Ulm, Germany; (5) Deutsches Herzzentrum München, Technische Universität München, DZHK (German Centre for Cardiovascular Research), partner site Munich Heart Alliance, Munich, Germany)

**Backgrounds:** Besides its known function as transport protein for testosterone and other steroid hormones, sex hormone-binding globulin (SHBG) is a biomarker associated with many adverse health effects in older adults including diabetes, particular cancers, bone mineral density and fractures. Physical activity is an important determinant of health, however its relationship to SHBG remains unclear. **Objectives:** To investigate the association of objectively measured physical activity with SHBG serum levels in older adults. **Methods:** We included n=1506 community dwelling older adults aged 65 or older in the ActiFE-study, located in Ulm, Southern-Germany. Physical activity was measured over one week using a thigh-worn uni-axial accelerometer (activPAL; PAL Technologies, Glasgow, Scotland). SHBG in serum was determined using the ElectroChemiLuminescence ImmunoAssay (Elecsys) SHBG Test. We calculated least-square means of daily walking duration in minutes with 95% confidence interval (CI). All estimates were adjusted for age, sex, history of cardiovascular diseases, diabetes, smoking, and in a second step for body mass index (BMI). **Results:** Overall 1259 older adults (43.4 % females) with measurement of physical activity and SHBG with a mean age of 75.6 years (SD=6.5) were included into the final analysis. Average daily walking duration was 104.2 minutes (SD 40.4). Of the participants 50.6% and 24.4% were overweight (BMI 25.0-<30 kg/m<sup>2</sup>) and obese (30 kg/m<sup>2</sup>), respectively. SHBG serum levels (median 61.9 nmol/L (interquartile range 46.4-82.1) were negatively associated with BMI, lower in subjects with diabetes compared to others (51.9 vs. 63.3 nmol/L), higher in females compared to males (70.5 nmol/L vs. 57.0 nmol/L) and increased with age from 55.6 nmol/L (65-69 yrs.) to 69.2 nmol/L (80 yrs.). A positive dose-response relationship of daily walking duration with quartiles of SHBG was seen after adjustment for age, sex, history of cardiovascular diseases, diabetes, smoking (p for trend <0.001), which however, disappeared after adjustment for BMI (p for trend = 0.15). **Conclusion:** SHBG, which is a risk factor for many age-related comorbidities and functional deficits, is negatively related to BMI and positively related to physical activity. However, BMI seems to be among the main determinants of SHBG and an important confounding factor in the relationship of physical activity and SHBG.

**P4- AGING-ASSOCIATED CHANGES IN SKELETAL MUSCLE MORPHOLOGY ASSESSED BY INTRAMUSCULAR ADIPOSE AND CONNECTIVE TISSUE.** Jaclyn Sesso<sup>1</sup>, Yoko Kato<sup>1</sup>, Jeremy Walston<sup>1</sup>, Karen Bandeen-Roche<sup>1</sup>, Joao AC Lima<sup>1</sup>, Bharath Ambale Venkatesh<sup>2</sup> ((1) Johns Hopkins University, Baltimore, MD, USA; (2) Radiology, Johns Hopkins University, Baltimore, MD, USA)

**Backgrounds:** Increasingly, intramuscular adipose tissue (IMAT) is identified as a major contributing factor to mobility dysfunction in older adults, a key component of frailty. IMAT is known to increase

with both aging and disuse. IMAT has also been linked to increased pro-inflammatory cytokines that contribute to local metabolic dysregulation and feed into the cycle of muscle catabolism leading to functional decline of the muscle. **Objectives:** This study aims to explore these changes in healthy older adults through chemical shift-based water-fat separation magnetic resonance imaging (MRI) which has the capability to assess muscle fat percentage. **Methods:** We assessed changes in skeletal muscle morphology in 15 healthy volunteers (11 men and 4 women) between the ages of 21 and 80. Questionnaires and medical records were checked to ensure there was no prior history of associated disease conditions such as peripheral artery disease, sarcopenia, or frailty. Patients were scanned on a Toshiba 3T Galan system with a 64-channel phased array coil and a body coil to assess calf musculature. Dual-echo 3D Dixon techniques were employed to assess fat distribution and percent fat quantification. Users defined regions-of interest for each of the three muscle regions the tibialis anterior, the soleus and the gastrocnemius, and excluded areas of extensive connective tissue and nerves from the fat fraction map (fat\*100/(fat+water)). An average of the fat% from the 3 ROIs was used to calculate mean muscle fat% (Fpm), and the standard deviation of the fat% among all the ROIs was also calculated (FPsd). Linear regression analysis was used to assess the association of age, gender and body mass index (BMI) on Fpm and FPsd. **Results:** Higher Fpm (r = 0.50, p = 0.07) and FPsd (r = 0.61, p = 0.02) were associated with older age. Similarly, higher BMI was associated with higher Fpm (r = 0.61, p = 0.02) and FPsd (r = 0.47, p = 0.08). Calf muscle Fpm and FPsd were not associated with gender. **Conclusion:** Aging was associated with increased skeletal muscle fat. MRI based skeletal muscle morphology as measured by fat fraction has the potential to be useful in the study of aging and frailty.

**P5- GENOME-WIDE ASSOCIATION STUDY OF SERUM CREATININE IDENTIFIES SEVERAL LOCI FOR MUSCLE MASS.** Juha J Hulmi<sup>1</sup>, Mikko Kuokkanen<sup>2</sup>, Jarkko Järvinen<sup>1</sup>, Katja Borodulin<sup>2</sup>, Pekka Jousilahti<sup>2</sup>, Markus Perola<sup>2</sup> ((1) Biology of Physical Activity, Faculty of Sport and Health Sciences, University of Jyväskylä, Finland; (2) Department of Public Health Solutions, National Institute for Health and Welfare, Helsinki, Finland)

**Background:** Muscle mass is highly heritable polygenic trait, but genetic variants contributing its variation are poorly known. Serum creatinine is an important measure of renal health. However, it is also a surrogate of muscle mass as about 95 % of total body creatinine is in skeletal muscle. Low serum creatinine that correlates with low lean mass has been associated with increased risk of mortality and morbidity. Genomewide association studies (GWAS) allows to investigate genetic variants that play a role in sarcopenia. Currently no large-scale GWA studies have been conducted with serum creatinine focusing in skeletal muscle. **Objectives:** To identify loci and thus genes that associate with serum creatinine. **Methods:** Data were pooled from four population-based Finnish studies: FINRISK 1997, 2002, 2007 and 2012 (n=21 067). Individuals with possibly decreased renal function were removed based on eGFR cut-off (eGFR60) as well as based on duplicates and close relatives. Thus, GWAS for serum creatinine was conducted from n=18 930 individuals (aged 25-74 years). GWAS was conducted on ~14.5 million genotyped and imputed (imputation quality >0.3) variants with minor allele frequency >1%. Serum creatinine was adjusted with age, sex, region in Finland, cohort, PCAs C1-C5 as well as genotyping batch. **Results:** Several loci were found to be strongly (P < 1x10<sup>-8</sup>) or at least suggestively genomewide (P < 1x10<sup>-5</sup>) associated with serum creatinine in individuals with no abnormal renal function. The most strongly associated loci were in/near genes such as PRKAG2/

RHEB (chromosome 7) and PEX14 (chromosome 1). These results remained unaltered when cystatin C, a marker of renal function without association with muscle mass, was used as a covariate, available in FINRISK 1997 study (final eGFR60 n=6596). In general, the associations between found loci and serum creatinine tended to be stronger in younger (< 50 years) than in older (> 50 years) individuals. **Conclusion:** We have identified new serum creatinine-associated gene variants that may regulate muscle mass in humans using a hypothesis-free approach.

**P6- MIRNAS AND HEMOGLOBIN IN ELDERLY.** E Talluri<sup>1</sup>, V Del Panta<sup>1</sup>, J Grillari<sup>2,3</sup>, M Hackl<sup>2</sup>, S Skalicky<sup>2</sup>, S Bandinelli<sup>1</sup> ((1) Laboratory of Clinical Epidemiology, InCHIANTI Study Group, LHTC Local Health Tuscany Center, Florence, Italy; (2) TAmiRNA GmbH, Vienna, Austria; (3) Christian Doppler Laboratory for the Biotechnology of Skin Aging, Vienna, Austria)

**Background:** Hemoglobin (Hb) is one of the main biomarkers of health status, especially in the older population and anemia is a powerful correlate and predictor of frailty in older persons. Blood circulating microRNAs (miRNAs) are an emerging class non-coding RNAs that modulate a wide variety of essential biological processes and there is evidence that aging and aging related conditions are often associated with miRNA dysfunction. Despite the mechanism by which miRNAs contribute to biological processes and disease is still an active area of research, there is a great interest in understanding whether circulating levels of miRNAs can be useful in the early diagnosis of complex diseases. **Objectives:** In this study, we examined relationships of plasma miRNAs and Hb blood concentration in community-dwelling elderly subjects 65 years old and older. **Methods:** plasma miRNAs determination by quantitative PCR was supported by EU-FP7 Health Project FRAILOMIC 305483. The Least Absolute Shrinkage and Selection Operator (LASSO) statistical approach was used to relate 77 miRNAs with Hb blood concentration in 303 frail and robust InCHIANTI participants (Frail/Robust ratio: 1/3; Age =76.4; 126M, 177F). The reduced set of explanatory miRNAs variables selected by LASSO model was used to perform a multivariate regression analysis of miRNAs (adjusted for sex and age) versus Hb blood concentration. Analyses were conducted separately in frail (n=95) and non frail (n=208) participants. Frailty was defined according to Fried's criteria. **Results:** A set of five significant miRNAs was identified that was similar in frail and non-frail participants, although size of the coefficients was quite different between groups. Multivariate analyses identified the common miR.451a associate to Hb concentration (p<0.01). MiR.154.5p (p<0.01) and miR.624.5p (p<0.05) were significantly associated with Hb in the overall analyses and in the frail group, but the association was not significant in the robust group. A set of ten significant miRNAs was found in frail participants. MiR188.3p was found the most significant biomarker after multivariate regression analysis (p<0.05). **Conclusion:** These results suggest that specific miRNAs may be implicated in the pathogenesis of anemia in older persons, although anemia in frail older persons may be driven by a different miRNA pathway.

**P7- GAIT SPEED IMPAIRMENT ASSOCIATED WITH SLEEP DISTURBANCES IN COMMUNITY OLDER PEOPLE IN PERU.** N Leyva, C Paredes, F Vargas, T Tello, PJ Ortiz, JE Peinado, E Aliaga, P Casas, H Tapia, L Varela (Gerontology Institute. Cayetano Heredia University. Lima, Peru)

**Background:** Sleep disturbances and insomnia are common in older people. It has been reported bad sleep quality in older people

form 63.8% to 74%, prevalence of insomnia of 10% and excessive daytime sleepiness from 23% to 38.4%. Those conditions were independently associated with frailty in older people. **Objectives:** To assess the association between sleep disturbances and gait speed in a community-dwelling older people in Lima, Peru. **Methods:** A cross-sectional study of a sample of 164 older adults living independently without cognitive decline in community. Sleep quality was evaluated using the «Pittsburgh Sleep Quality», daytime sleepiness with the Epworth scale and a complete clinical evaluation for comorbidities and use of medication to sleep. Gait speed was measured by walking a distance of 8 meters. General Linear regression model was used to determine the association of gait speed with sleep disturbances. **Results:** One hundred and sixty four older adults were evaluated, 94 women, the average age was 69.4 ± 6.9 years and the average gait speed was 1.16 ± 0.35 m/s. Poor sleep quality was identified in 61.6%, daytime sleepiness in 69.5%, and a gait speed lower than 1 m/s were found in 6.7%. Low gait speed was found in older adults with poor sleep quality (1.09 m/s DE: 0.31 vs 1.27 m/s DE: 0.41, p=0.003) and with prolonged sleep latency (p=0.001) and short duration of sleep (p=0.014). Poor sleep quality was independently associated with low gait speed (adjusted OR: 0.18, 95%CI: 0.06-0.51, p=0.001) and the presence of daytime sleepiness (adjusted OR: 17.14, 95%CI: 2.05-142.93, p=0.009) in the multivariate analysis. **Conclusion:** We found an association between poor sleep quality with low gait speed and the presence of daytime sleepiness

**P8- CANDIDATE BIOMARKERS OF INTRINSIC CAPACITY IN THE TOLEDO STUDY OF HEALTHY AGING: A LONGITUDINAL STUDY.** S Walter<sup>1,2</sup>, B Davies<sup>1</sup>, F García<sup>2</sup>, L Rodriguez-Mañas<sup>1,4</sup> on behalf of the FRAILOMIC Consortium ((1) Fundación para la Investigación Biomédica Getafe University Hospital, Madrid, Spain; (2) Dept. of Epidemiology and Biostatistics, University of California San Francisco, United States; (3) Geriatrics Department, Virgen del Valle Hospital, Toledo, Spain; (4) Geriatrics Department, Getafe University Hospital, Madrid, Spain)

**Background:** Population ageing is a major challenge to society. Frailty, a syndrome that is strongly associated to dependency, falls, and mortality, is the only phenotype of aging for which validated interventions for prevention and recovery exists. Unfortunately, the classification into the frail phenotype is rather broad. The frailty trait scale has been suggested as continuous measure of intrinsic capacity underlying the expression of the frailty phenotype. **Objectives:** To assess the association between candidate OMIC markers of frailty with level and change of intrinsic capacity as operationalized by the Frailty Trait Scale. **Methods:** The study population consists of 474 participants (>65 years, 109 frail) from the Toledo Study of Health Aging that form part of the FRAILOMIC initiative. The Frailty Traits Scale, a measure combining 7 frailty dimensions (energy balance-nutrition, physical activity, nervous system, vascular system, strength, endurance, and gait speed) into a single scale associated with several comorbidities and biomarkers classically associated with frailty as defined using the Linda Fried criteria was used as measure of intrinsic capacity. We ran multivariate linear regression models adjusted for age and sex to corroborate the association of Vitamin D, citrate, troponin T, Lutein, proBNP, Retinol, miRNAs (194.5p, 125b.5p, 454.3P), glycation end products receptor, and malondialdehyde with intrinsic capacity. **Results:** After reweighting the study population to the original sampling population, vitamin D (p=0.013), citrates (p < 0.001), troponin T (p=0.003), proBNP (p=0.028), and miRNA 125b.5p (p < 0.001) were significantly associated to level of intrinsic capacity as measured by FTS at baseline. A 1 SD higher level of Vitamin D and miRNA 125b.5p expression were associated with higher intrinsic

capacity while 1 SD higher levels in citrates, troponin T, and proBNP were associated to lower intrinsic capacity. A 1SD higher expression in miRNA 125b.5p ( $p=0.036$ ) and level of citrates ( $p=0.04$ ) were associated to higher intrinsic capacity at follow-up independent of the level of FTS at baseline. **Conclusion:** OMIC markers associated with frailty were also associated to intrinsic capacity as measured by FTS. miRNA 125b.5p and citrates significantly predicted level and slope of intrinsic capacity over the course of 3 years of follow-up.

**P9- INFLAMMATORY BIOMARKERS IN SOCIALLY ACTIVE OLDER PEOPLE: DESCRIPTION AND ASSOCIATION WITH SARCOPENIA AND ITS DIAGNOSTIC CRITERIA.** Karen Mello de Mattos Margutti<sup>1,2</sup>, Natielen Jacques Schuch<sup>2,3</sup>, Adriane Rosa Costodio<sup>4</sup>, Thiago Duarte<sup>5</sup>, Marta Maria Medeiros Frescura Duarte<sup>5,6</sup>, Maria Gabriela Valle Gottlieb<sup>1</sup>, Carla Helena Augustin Schwanke<sup>1</sup> ((1) Graduate Program in Biomedical Gerontology, Institute of Geriatrics and Gerontology (IGG), Pontifical Catholic University (PUCRS), Porto Alegre, RS, Brazil; (2) Nutrition Course, Health Sciences, Franciscan University Center, Santa Maria, RS, Brazil; (3) Master's Program in Health and Life Sciences, Franciscan University Center, Santa Maria, RS, Brazil; (4) Graduate Program in Gerontology, Federal University of Santa Maria (UFSM), Santa Maria, RS, Brazil; (5) Graduate Program in Pharmacology, Federal University of Santa Maria (UFSM), Santa Maria, RS, Brazil; (6) Center for Health Sciences, Lutheran University of Brazil, Santa Maria, RS, Brazil)

**Background:** Sarcopenia is characterized as a geriatric syndrome that is aggravated by the presence of the inflammatory process. However, there is a lack of studies that investigate the relationship between the inflammatory process and sarcopenia in the elderly, especially the socially active ones. **Objectives:** To describe the inflammatory biomarkers in socially active elderly, and to analyze the association with sarcopenia and its diagnostic criteria. **Methods:** A cross-sectional study was carried out with 400 elderly people (60 years old), participants of community groups (socially active). The diagnostic criteria for sarcopenia (low muscle mass, low muscle strength and low physical performance) were evaluated according to the European Working Group on Sarcopenia in Older People (EWGSOP). 500 L of serum was used for analysis of inflammatory markers [high sensitivity C-reactive protein (HS-CRP), interleukin-6 (IL-6) and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ )]. **Results:** The majority of the sample was women (85.5%), and the mean age was 70.28 $\pm$ 6.40 years (range from 60 to 89 years). The frequency of sarcopenia was 27.8%. No associations of sarcopenia and low muscle mass were found with the serum concentrations of hs-CRP, IL-6 and TNF- $\alpha$ . Older people 80 years had higher serum concentrations of IL-6 [185.00 pg/mL (152.00-266.50 pg mL;  $P<0.001$ ) x 100.00 pg/mL (68.25-160.75 pg/ml)] and TNF- [219.10 $\pm$ 74.58 x 141.05 $\pm$ 56.65;  $P<0.001$ ] when compared to the elderly with age between 60-79 years. In the total sample, low muscle strength was shown to be associated with higher hs-CRP concentrations when compared to adequate muscle strength [2.90 (1.40-5.85) x 2.20 (1.30-4.60);  $P=0.042$ ]. And the low physical performance was associated with higher concentrations of IL-6 [139.00 (78.00-177.00) x 99.00 (66.00-154.75);  $P=0.003$ ] and TNF- [161.61 $\pm$ 68.64 x 140.69 $\pm$ 58.07;  $P=0.007$ ] compared to those with adequate physical performance. Women with low physical performance had higher concentrations of hs-CRP [3.25 (1.58-6.63) x 2.20 (1.30-4.38);  $P=0.004$ ], IL-6 [144.50 (77.00-178.75) x 92.00 (60.00-153.00);  $P=0.001$ ] and TNF- $\alpha$  [163.39 $\pm$ 71.25 x 135.64 $\pm$ 54.85;  $P=0.002$ ]. **Conclusion:** Higher serum concentrations of IL-6 and TNF- were found among individuals with 80 years old. There was no difference between the sexes. An association between

inflammatory biomarkers with low muscle strength and low physical performance was observed. There was no association of inflammatory biomarkers with sarcopenia and low muscle mass.

**P10- COMPARISON OF THE OCCURRENCE OF FALLS AND ANTHROPOMETRIC MEASUREMENTS BETWEEN SARCOPENIC AND NON-SARCOPENIC ELDERLY WOMEN.** Patrícia Parreira Batista, Luana Almeida de Sá Cavaleiro, Jéssica Rodrigues Almeida, Isabella Letícia de Pádua Cruz e Souza, Lygia Paccini Lustosa (Postgraduate program in Rehabilitation Sciences, Physiotherapy Department, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil)

**Background:** Aging changes such as sarcopenia and changes in body composition predispose elderly people to repercussions on their health condition, such as functional disability, falls, and frailty. Obesity aggravates the systemic inflammatory profile, accelerating the evolution of chronic diseases. Higher percentage of fat associated with loss of mass and muscle function (sarcopenic obesity) may lead to exponential progression of functional impairment. These factors may influence the greater occurrence of falls. **Objectives:** To compare the occurrence of falls and anthropometric measurements between Brazilian sarcopenic elderly women and non-sarcopenics. **Methods:** In this study have participated women (65 years or older); sedentary (three months and more); community dwelling without distinction of race and / or social class. Those with cognitive deficit were excluded, according to schooling; self-reported neurological diseases or sequelae and / or rheumatic diseases; dependent gait; acute pain; history of arthroplasty; cancer history. All subjects have performed gait speed test (4m), handgrip strength (HGS) and dual-emission x-ray densitometry (DXA) for identification of sarcopenia (European Working Group on Sarcopenia in Older People). Body mass index (BMI), waist circumference (WC) and occurrence of falls in the last year were evaluated. Comparisons were made using the Mann-Whitney test ( $= 5\%$ ). **Results:** In this study, 36 sarcopenic women (SE, 76.25  $\pm$  5.40 years) and 67 non-sarcopenic women (NSE, 75.88  $\pm$  7.26 years) were evaluated. The SE group had a BMI of 21.99  $\pm$  2.87 kg/m<sup>2</sup> and WC of 85.03  $\pm$  9.31 cm. In the NSE group, the BMI was 28.70  $\pm$  5.59 kg/m<sup>2</sup> and WC was 95.70  $\pm$  12.70 cm. The occurrence of falls was in 48 (46.6%) elderly. When comparing the groups, there was a significant difference in BMI ( $p= 0.001$ ), WC ( $p= 0.001$ ) and occurrence of falls ( $p= 0.031$ ). **Conclusion:** This study has demonstrated that sarcopenic elderly women are different in relation to BMI, WC and the occurrence of falls when compared to non-sarcopenic, confirming that in the presence of sarcopenia there is a greater risk of adverse health conditions. Obesity and falls can be prevented in clinical practice, which should be objective of health professionals considering the possibility of worsening sarcopenia.

#### **PHYSICAL FRAILTY AND AGE-RELATED BODY COMPOSITION MODIFICATIONS**

**P11- THE DISCRIMINATIVE ABILITY OF SARQOL® ACCORDING TO THE DEFINITION OF SARCOPENIA : THE OFELY STUDY.** E. Sornay-Rendu<sup>1</sup>, C. Beaudart<sup>2</sup>, O. Bruyère<sup>2</sup>, R. Chapurlat<sup>1</sup> ((1) INSERM UMR1033 and Université de Lyon, Lyon, France; (2) Department of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium)

**Backgrounds:** A health-related quality of life questionnaire specific to sarcopenia has been developed and validated in Belgium (SarQoL®). **Objectives:** The aim was to evaluate the discriminative ability of SarQoL® in French women aged 65 years or more from

the Os des Femmes de Lyon (OFELY) cohort. **Methods:** The self-administered questionnaire was completed in 307 women, mean age  $77 \pm 5$  yrs at the 25th annual follow-up of the ongoing prospective study, one year after the measurement of appendicular lean mass (ALM) using DXA (Hologic®, QDR4500), grip strength (GS), height and weight. The SMI (ALM/height<sup>2</sup>) and the ALMBMI (ALM/BMI) were calculated. **Results:** Using the definition of the European Working Group on Sarcopenia in Older People (EWGSOP : SMI < 5.5 Kg/m<sup>2</sup> and GS < 20 Kg), or of the Foundation for the National Institute of Health sarcopenia project (FNIH : ALMBMI < 0.512 and GS < 16 Kg), few women (4 and 1 respectively) had sarcopenia. Thus, we identified women in the lowest quartile of both SMI and GS (Q1SMIGS, n=23), and of both ALMBMI and GS (Q1ALMBMIGS, n=29). No significant difference in the total score of the SarQoL® was observed between Q1SMIGS and other women. In contrast, Q1ALMBMIGS had a significantly reduced total score (median [IQR] of 60.4 [22.4]) compared with other women (71.7 [21.6], p=0.0001). Six of the seven domains of the SarQoL® were altered in Q1ALMBMIGS (p=0.02 to p<0.0001). Only eight women (28%) were belonging to both Q1SMIGS and Q1ALMBMIGS. In all women, the total score was positively correlated with GS (Spearman  $r=+0.23$ ) and ALMBMI ( $r=+0.29$ ), and inversely with age ( $r=-0.33$ ), BMI ( $r=-0.31$ , p<0.0001 for all), and SMI ( $r=-0.13$ , p=0.02). **Conclusion:** Only few women had sarcopenia defined by EWGSOP and FNIH. A significantly reduced quality of life assessed by the SarQoL® was shown in French women with both low grip strength and muscle mass defined according to ALMBMI but not to SMI, may be explained by the negative effect of high BMI on quality of life.

#### **P12- THE CORRELATION BETWEEN FAST GAIT SPEED AND ECHO INTENSITY IN OLDER ADULTS IS INFLUENCED BY SUBCUTANEOUS TISSUE THICKNESS.**

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**Background:** Investigators and clinicians have become increasingly interested in not only the loss of muscle mass (sarcopenia) during aging, but also the deterioration of skeletal muscle tissue quality. Ultrasonography-derived echo intensity reflects intramuscular adipocyte and fibrous tissue infiltration. Studies in older adults have demonstrated that echo intensity is strongly correlated with functional performance outcomes such as muscle strength, usual gait speed, and independence. Recently, a regression equation that allows investigators to correct echo intensity for subcutaneous adiposity was reported in the literature. It is unclear, however, if this correction significantly affects data interpretation. **Objectives:** We evaluated the relationship between rectus femoris echo intensity versus 10- and 400-m fast gait speed under two conditions: 1) with uncorrected values and 2) after correction for subcutaneous tissue thickness. **Methods:** Twenty-three healthy adults (eleven men, mean  $\pm$  SD age =  $74 \pm 7$  years, BMI =  $26.2 \pm 3.6$  kg/m<sup>2</sup>; twelve women, age =  $71 \pm 5$ , BMI =  $26.6 \pm 3.1$ ) participated. B-mode ultrasonography was used to obtain panoramic images of the rectus femoris while the participants rested in the supine position. ImageJ software was used to quantify echo intensity (arbitrary units) and subcutaneous thickness (cm)

using the histogram and straight-line functions, respectively. Short and long distance fast gait speed were assessed from 10- and 400-m tests. The participants were instructed to walk -as fast as possible at a maintainable pace and without running-. Four partial correlations (controlling for age) were performed to assess associations between 10- and 400-m fast gait speed versus uncorrected and corrected echo intensity. **Results:** Our analyses with uncorrected values demonstrated no significant partial correlations for 10- ( $r = 0.137$ ,  $p = .544$ ) and 400-meter ( $r = .008$ ,  $p = .971$ ) fast gait speed. In contrast, correction resulted in a significant correlation for 10-meter speed ( $r = .452$ ,  $p = .035$ ) and a similar trend for 400-m ( $r = .416$ ,  $p = .054$ ). **Conclusion:** In contrast to previous studies, we found no association between echo intensity and gait speed, but correction for subcutaneous tissue thickness significantly altered our interpretations. Collectively, the decision to correct echo intensity for subcutaneous tissue thickness is not trivial.

#### **P13- EVALUATION OF CALF CIRCUMFERENCE AND MEDIAL GASTROCNEMIUS THICKNESS IN PREFRIL COMMUNITY-DWELLING OLDER WOMEN.**

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**Background:** Aging process is characterized by a decrease in muscle thickness, and it might be related to a reduction in functional capacity. One of the methods used to estimate muscle mass is the calf circumference (CC) but obesity can mask the real muscle mass. However, ultrasound imaging is an alternative method to measure muscle thickness without subcutaneous fat. **Objectives:** Correlate the calf circumference (CC) and muscle thickness of medial gastrocnemius (MTMG) in pre-frail older women. **Methods:** Twenty-five older women ( $71.7 \pm 4.6$  years-old, BMI  $29.1 \pm 4.6$  kg/m<sup>2</sup>) were classified as prefrail (1 or 2 criteria) by Fried's phenotype: unintentional weight loss; self-reported exhaustion; low physical activity; slowness; weakness. The MTMG was assessed through ultrasound equipment (LogiqBookXP, GE®) B-mode and transducer with linear arrangement (50mm, 11 MHz, GE®) 4 cm. The images were analyzed by ImageJ software (Version 1.46r). It was considered 1.5 cm the cut-off for muscle thickness reduction. The CC was measured at the most prominent region of the right leg, and it was considered the cut-off <31cm for decreased muscle mass. Data are described as mean, standard deviation, and absolute and relative frequency. Pearson's test was used to verify correlation between variables (p<0.05). **Results:** Participants were classified as mildly obese. All participants showed adequate muscle mass ( $37.04 \pm 3.9$ cm) when assessed by CC. On the other hand, the most part of the sample (56%, n=14) presented a reduction in muscle mass when MTMG ( $1.4 \pm 0.2$ cm) was measured. There was no correlation ( $r=0.133$ ,

$p=0.268$ ) between CC and MTMG. **Conclusion:** Calf circumference was not proper to detect a decrease in muscle mass in prefrail older women mildly obese. Instead, muscle mass assessed by ultrasound imaging can be an alternative method to identify reduction in muscle mass of prefrail older women. Sarcopenia might be earlier detected through ultrasound in prefrail older women mildly obese.

#### **P14- COMPARISON OF DIFFERENT METHODS TO ASSESS MUSCLE MASS IN PREFRAIL COMMUNITY-DWELLING OLDER WOMEN.**

Luiza Bendhack<sup>2</sup>, Jarbas Melo Filho<sup>1</sup>, Simone Biesek<sup>2</sup>, Audrin Said Wojciechowski<sup>3</sup>, Isabela Riceto<sup>4</sup>, Estela Iraci Rabito<sup>5</sup>, Adriana Pereira Miró<sup>6</sup>, Victoria Zeghibi Cochenski Borba<sup>7</sup>, Anna Raquel Silveira Gomes<sup>8</sup> ((1) PhD Student in Physical Education, Federal University of Parana. Curitiba. Parana. Brazil; (2) PhD Student in Physical Education, Federal University of Parana. Curitiba. Parana. Brazil. Course of Nutrition, Centro Universitário Autônomo do Brasil (UNIBRASIL). Curitiba. Paraná, Brazil; (3) Master Student in Physical Education, Federal University of Parana. Curitiba. Parana. Brazil; (4) Physiotherapy undergraduation.. Federal University of Paraná. Curitiba. Parana. Brazil; (5) Master in Food and Nutrition Graduate Program at Department of Nutrition, Federal University of Parana, Curitiba. Paraná. Brazil; (6) Geriatric Physician in Hospital de Clínicas of the University of Paraná. Curitiba. Paraná. Brazil; (7) Master and PhD Programs in Internal Medicine, Federal University of Paraná. Curitiba. Paraná. Brazil; (8) Master and PhD Programs in Physical Education. Prevention and Rehabilitation in Physiotherapy Department, Federal University of Paraná. Curitiba. Paraná, Brazil)

**Backgrounds:** Physical Frailty (PF) is an age-related syndrome associated with adverse outcomes, such as weakness, low physical activity and unintentional weight loss whose might lead to a decrease in the skeletal muscle mass known as sarcopenia. **Objectives:** The aim of this study was to compare muscle mass estimated by electrical bioimpedance (BIA), dual energy X-ray absorptiometry (DXA) and calf circumference (CC) of prefrail older women. **Methods:** Twenty-five older women (71.7±4.6 years-old, BMI 29.1±4.6 kg/m<sup>2</sup>) participated in this study. Prefrail (1 or 2 criteria) was assessed by the Fried's Phenotype: unintentional weight loss; self-related exhaustion; low physical activity; slowness; weakness. DXA was performed using Lunar Prodigy Advance PA + 302284, Madison-USA. The BIA was performed with the tetrapolar body composition analyzer (Maltron Msr 916-Bioscan®). The skeletal muscle mass index (SMI) was estimated by appendicular skeletal muscle mass (ASM)/height<sup>2</sup> with cut-off 5.67kg/m<sup>2</sup> and 6.42kg/m<sup>2</sup> for DXA and BIA, respectively, to indicate muscle mass decrease. The CC was measured at the most prominent region of the right leg, and <31cm was the cut-off considered for muscle mass reduction. Data are described as mean, standard deviation, and absolute and relative frequency. Spearman's test was used to verify correlation between methods ( $p<0.05$ ). **Results:** All participants showed adequate muscle mass assessed according to: DXA (7.5±0.9 kg/m<sup>2</sup>); BIA (7.5±1.0 kg/m<sup>2</sup>) and CC (37.04±3.9 cm). Positive and strong association was detected between: SMI-DXA and SMI-BIA ( $r=0.688$ ;  $p=0.000$ ); SMI-DXA and CC ( $r=0.628$ ,  $p=0.000$ ) and positive moderate association between SMI-BIA and CC ( $r=0.545$ ,  $p=0.003$ ). **Conclusion:** The prefrail older women presented adequate SMI assessed by all the methods. DXA and BIA methods did not differ to estimate SMI.

#### **P15- FACTORS ASSOCIATED WITH TIME TO OCCURRENCE OF FUNCTIONAL DISABILITY OR DEATH IN NON-OBESE ELDERLY PEOPLE - EPIDOSO PROJECT**

Naveira Miguel, Ramos Luiz Roberto, Andreoni Solange (Department of Preventive Medicine of the Federal University of São Paulo (Brazil))

No abstract

#### **P16- BODY COMPOSITION AND PHYSICAL PERFORMANCE IN MIDDLE AGED AND ELDERLY WOMEN: A CROSS-SECTIONAL COMMUNITY-BASED STUDY IN NORTHEAST BRAZIL.**

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**Background:** Aging is a gradual and multifactorial process that involves biological, genetic, psychological, social and cultural aspects. An important aspect of female aging is the occurrence of menopause. Significant changes in body composition, weight gain and adiposity, mainly central, in addition to accentuated reduction of muscle mass are phenomena that constantly affect women at the end of their reproductive life. However, there are few studies in the literature regarding the relationship between body composition and physical performance in middle-aged and elderly women. **Objectives:** To analyze the relationship between body composition and physical performance in middle-aged and elderly women of northeastern Brazil. **Methods:** This is a cross-sectional community-based study of 536 women, aged 40 until 80 years. We collected demographic and socioeconomic data, physical performance and body composition measures. For the physical performance we collected grip strength, knee extensor and flexor strength, gait speed and chair stand test. And for the body composition measures we collected body fat percentage and lean mass, skeletal muscle mass index (SMI), waist circumference (WC), waist-hip ratio (WHR) and body mass index (BMI). Multiple linear regression analyzes were carried out with dependent physical performance variables, being adjusted for covariates with  $p < 0.20$  in the bivariate analysis. **Results:** It was observed that handgrip strength, knee extensor and flexor strength were related to BMI, SMI and body fat percentage, but in relation to knee extensor only BMI and body fat percentage remain related. Besides, chair stand test and gait speed were related to WC. Furthermore, gait speed remains associated to lean mass percentage and BMI. **Conclusion:** There is a relationship between body composition and physical performance in middle-aged and elderly women of northeastern Brazil. We emphasize that the body composition and physical performance measures used are valid and non-invasive, and can be used in clinical practice. These measures have shown as important predictors for mortality, therefore making their assessment relevant. Body composition assessment is a fundamental tool to prevent the reduction of physical performance caused by possible changes in body composition from middle-aged and elderly women.

#### **P17- INFLAMMATORY FRAILTY INDEX AND MORTALITY AFTER KIDNEY TRANSPLANTATION.**

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**Background:** Frailty is a clinical phenotype of decreased physiologic reserve to stressors and is associated with a pro-

inflammatory state. Fried frailty (measured by 5 components: slowed walk speed, unintentional weight loss, decreased grip strength, low physical activity, and exhaustion) was developed and validated in community dwelling older adults and is associated with poor outcomes after kidney transplant (KT) including mortality, longer length of stay after KT, early hospital readmission, and delayed graft function. However, Fried frailty does not directly capture inflammatory biomarkers like interleukin 6 (IL6) and tumor necrosis factor alpha (TNFalpha) that are associated with increased post-KT mortality. Therefore, we sought to identify a novel frailty index that combines inflammatory biomarkers and measured physical components. **Objectives:** 1. To test whether a biologically informed measure of frailty is associated with post-KT mortality; 2. To identify which marker of inflammation improves risk prediction when added to the Fried physical frailty phenotype. **Methods:** We identified 378 KT recipients at Johns Hopkins Hospital from 2009-2013 who consented to enrollment in a prospective cohort. Fried frailty and inflammatory markers (IL6, TNFalpha, highly sensitive C reactive protein [HSCRP]) were collected at the time of admission for KT. We evaluated novel inflammatory-frailty indices combining Fried frailty phenotype (comprised of 5 components) plus the addition of individual inflammatory biomarkers (highest tertile of IL6, TNFalpha, HSCRP, or inflammatory index, separately) as a 6th component. Therefore, scores for each novel inflammatory frailty index were 0-6 points, and the presence of 3 components was considered frail. We used Kaplan-Meier methods and Cox proportional hazards model to assess mortality risk after KT by inflammatory frailty index. We adjusted Cox models for recipient age, sex, race, Charlson comorbidity index, and donor type. **Results:** Five-year survival for patients with and without each novel inflammatory frailty index for frail vs nonfrail was: 81% vs 93% (IL6-frailty), 87% vs 89% (HSCRP-frailty), 83% vs 91% (TNFalpha-frailty), and 83% vs 91% (Inflammatory index-frailty). After adjustment, mortality was 2.04-fold higher for IL6-frail recipients compared to non-IL6-frail (95%CI:1.02-4.10, p=0.05); there were no associations between the mortality and the other inflammatory-frailty indices (HSCRP-frail:1.01, 95%CI:0.51-0.98, p=0.9; TNFalpha-frail:1.94, 95%CI:0.98-3.83, p=0.06; or inflammatory index-frail:1.66, 95%CI:0.84-3.30, p=0.14) recipients. 40.2% of the KT recipients were IL6-frail. However, when considered separately, there was no association between the Fried frailty (HR:1.63, 95%CI:0.75-3.51, p=0.2) or IL-6 (HR:1.37, 95%CI:0.68-2.73, p=0.4). **Conclusion:** IL-6 frailty is a unique phenotype, combining an inflammatory biomarker with the physical components of the Fried frailty phenotype. This new phenotype improves upon the Fried frailty phenotype and is more strongly associated with post-KT mortality than either individual phenotype. Combining measured IL-6 and frailty can help guide risk assessment and patient counseling for KT recipients.

**P18- ASSOCIATION BETWEEN ADIPOSITY AND FATIGABILITY IN MIDDLE-AGED AND OLDER ADULTS.** Pablo Martinez-Amezcuca<sup>1,2</sup>, Eleanor M. Simonsick<sup>3</sup>, Amal A. Wanigatunga<sup>1,2</sup>, Jennifer A. Schrack<sup>1,2</sup> ((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) Intramural Research Program, National Institute on Aging, Baltimore, Maryland, USA)

**Background:** Fatigue is a component of frailty and a frequent side effect of sarcopenia that is difficult to measure due to its subject nature and confounding through reduced physical activity (PA). While fatigability, the perception of fatigue in relation to a

standardized task, has been linked to PA and functional performance, its association with adiposity is not clear. **Objectives:** To evaluate the association between different measures of adiposity and fatigability in a group of community-dwelling, well-functioning adults aged 50. **Methods:** In 1,008 participants of the Baltimore Longitudinal Study of Aging (mean 70.3 ± 10 years), fatigability was measured after a slow-paced 5-minute treadmill walk at 0% grade using the Borg rating of perceived exertion (RPE; range 6-20). Adiposity was assessed using: BMI, BMI category, percent fat mass, and lean-to-fat mass ratio (LTFR) as measured by dual-energy X-ray absorptiometry. Fatigability was modeled as a continuous and binary variable where high fatigability = RPE 10. Regressions were used to estimate the effect of each measure of adiposity on RPE adjusting for demographics; additionally, adjustment for PA was performed in a subset (n=502). **Results:** Over 60% of participants were overweight or obese (mean BMI 27 ± 4.5). All adiposity measures were associated with fatigability: (i) a one-unit increment in BMI was associated with 0.1 higher RPE and 8% greater odds of high RPE (p<0.01), (ii) a one-unit increment in percent fat was associated with 0.07 higher RPE and 6% greater odds of high fatigability (p<0.01), and (iii) a one-unit increment in LTFR was associated with 0.3 lower RPE and 27% lower odds of high fatigability (p<0.01). In models adjusted for PA, compared with normal weight participants (BMI ranging 18.5-25) those who were overweight (BMI 25) had 0.46 higher RPE, but not increased odds of high RPE; obese participants (BMI-30) had 1.2 higher RPE and 217% greater odds of high RPE. **Conclusion:** Worse fatigability was observed in those with greater adiposity characteristics, particularly among those living with obesity even after adjusting for PA. Excess adiposity may contribute to high fatigability and future frailty risk by increasing the perceived effort required to perform daily activities.

**P19- PREVALENCE OF SARCOPENIA IN ELDERLY JAPANESE CHRONIC HEPATITIS C PATIENTS: THE RELEVANCE BETWEEN HANDGRIP STRENGTH AND EXERCISE HABITS.** Kenichi Kitada<sup>1</sup>, Makoto Kuboki<sup>1,2,3</sup>, Osamu Arai<sup>3</sup>, Norikuni Shiabata<sup>3</sup>, Kenji Ohmoto<sup>3</sup>, Tamae Nishi<sup>2</sup>, Akinobu Kato<sup>1</sup> ((1) Department of Gastroenterology, Morioka Municipal Hospital, Morioka, Iwate, Japan; (2) Faculty of Nutritional Sciences, Morioka University, Iwate, Japan; (3) Department of Gastroenterology, Hepatology and Nutrition, Kurashiki Medical Center, Kurashiki, Okayama, Japan)

**Background:** Sarcopenia is age-related change in structure and function of skeletal muscle. We examined the actual state of sarcopenia with chronic hepatitis C Japanese patients. **Objectives:** From January to July 2016, we analyzed seventy-seven consecutive elderly (age>65) Japanese chronic hepatitis C outpatients (men: 31;women:46). **Methods:** The skeletal muscle volume, body fat percentage, body cell mass, and calculate skeletal muscle index (SMI) were determined by bioimpedance analysis (InBody720®). We also measured handgrip strength, and cut-off values for reduced muscle mass and handgrip strength presented by the Asia Working Group for Sarcopenia (AWGS). Muscle mass and handgrip strength criteria are as follows; muscle mass (SMI; men; 7.0kg/m<sup>2</sup>, women; 5.7kg/m<sup>2</sup>), handgrip strength (men; 26 kg, women; 18 kg) respectively. **Results:** The elderly patients in case with chronic hepatitis C tend to have lowering of skeletal muscle volume, and handgrip strength, especially in female patients. Half of the elderly patients over 75 years old who have lower SMI, diagnosed as sarcopenia, despite satisfaction of criteria with handgrip strength. The elderly patients who have exercise habits showed higher SMI, despite less protein intake. **Conclusion:**

The measurement of handgrip strength is one of the easiest methods for screening of sarcopenia. However, the measurement of skeletal muscle volume is more important, especially in elderly patients. Furthermore, the maintenance of skeletal muscle volume is important not only for enough food intake but for the exercise habit.

**P20- DYSPHAGIA AND MALNUTRITION IN ELDERLY HOSPITALIZED IN CARDIOLOGY HOSPITAL.** Tatiana Magalhães de Almeida<sup>1</sup>, Raquel Gama Fernandes<sup>1</sup>, Marcela Dinalli Barbosa, Patrícia Amante de Oliveira Soares<sup>2</sup>, Isabela Pimentel Mota<sup>2</sup>, Amanda Guerra de Moraes Rego Sousa<sup>3</sup>, Carlos Daniel Magnoni<sup>2</sup> ((1) *Speech Therapy Department, Dante Pazzanese of Cardiology, São Paulo, SP, Brazil;* (2) *Nutrition Department, Dante Pazzanese of Cardiology, São Paulo, SP, Brazil;* (3) *General Director, Dante Pazzanese of Cardiology, São Paulo, SP, Brazil*)

**Backgrounds:** Dysphagia is a frequent symptom in the hospitalized elderly, physiological changes in muscles in swallowing such as decreased strength combined with hospitalization comorbidities can affect the safety of swallowing. Malnutrition is also common in this population and this may be the cause or consequence of dysphagia. These conditions may contribute to adverse outcomes such as decline in functional ability, prolonged hospital stay, increase the risk of complications and mortality. **Objectives:** Evaluate the swallowing and nutritional status; compare the results of evaluations and the outcome of the speech-language therapy follow-up of the elderly < 80 years versus adult and elderly aged > 80 years. **Methods:** Retrospective cross-sectional study. Selected 100 medical records from January to June 2017 of patients admitted to a cardiology hospital for clinical and / or surgical treatment, evaluated by the speech-language pathologists and nutritionists, clinical evaluation of swallowing and nutritional assessment were performed. Were evaluated 41 women and 59 men (mean age 67.56), 17 of patients were < 80 years. Excluding patients who died during follow-up and aged between 0 and 18 years. Fisher's Exact and Mann-Witney Tests were used for statistical analysis. **Results:** 46% of the patients presented dysphagia at the initial evaluation; patients aged < 80 years presented 3.5 times as likely (O.R = 3, 459) to dysphagia than to patients > 80 years (p = 0, 033). The elderly aged 80 years presented 2.9 times (OR = 2.931) as likely to malnutrition than to patients < 80 years (p = 0.04). Regarding the rehabilitation of dysphagia 67.6% of patients >80 years improved the dysphagia and only 23.1% of patients with 80 years (p = 0.009). **Conclusion:** Elderly patients, especially older than 80 years hospitalized for clinical and / or surgical treatment a high risk of dysphagia and malnutrition and poor prognosis of rehabilitation.

**P21- ANTHROPOMETRIC MEASUREMENTS, NUMBER OF COMORBIDITIES AND MEDICATIONS IN USE IN BRAZILIAN ELDERLY WOMEN AT RISK OF SARCOPEZIA.** Patrícia Parreira Batista, Patrícia Sena Pinheiro, Kellen C. Chaves de Almeida Antunes de Moraes, Taciane Mendes Costa Silva, Lygia Paccini Lustosa (*Postgraduate program in Rehabilitation Sciences, Physiotherapy Department, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil*)

**Background:** Sarcopenia is a complex geriatric syndrome, recognized as an independent condition by the International Classification of Diseases, associated with several negative health outcomes such as functional disability, falls, and frailty. It is believed that clinical conditions such as obesity, chronic-degenerative diseases and a greater number of medications may increase the predisposition of the elderly to health complications. **Objectives:** To evaluate the

association of anthropometric measures, number of comorbidities and medications in use in Brazilian elderly women, identified at risk of sarcopenia. **Methods:** Participated women (65 years or older); sedentary (three months and more); community dwelling; without distinction of race and /or social class. Those with cognitive deficit were excluded, according to schooling; self-reported neurological diseases or sequelae and / or rheumatic diseases; dependent gait; acute pain; history of arthroplasty; history of cancer in the last 5 years. All of them performed the gait speed test (4m) and handgrip strength (Jamar dynamometer) to screen the risk of sarcopenia, according to the European Working Group on Sarcopenia in Older People. It was used Measurements of waist circumference (WC), body mass index (BMI), and information on the presence of diagnosed chronic diseases and medications in use. Associations were evaluated by the Spearman correlation test. The significance level was 5%. **Results:** One hundred and three elderly women were evaluated, average age of 76.01 ( $\pm$  6.64) years, BMI of 26.36 ( $\pm$  5.78) kg/m<sup>2</sup>, WC of 91.97 ( $\pm$  12.66) cm, number of comorbidities of 2.57 ( $\pm$  1.38) and of medications 4.61 ( $\pm$  2.60). There was a significant positive correlation of BMI with number of comorbidities ( $\rho=0.26$ ,  $p=0.009$ ), medications in use ( $\rho=0.30$ ,  $p=0.002$ ) and with WC ( $\rho=0.40$ ,  $p=0.001$ ). There was association of WC with the number of comorbidities ( $\rho=0.41$ ,  $p=0.001$ ). Other non-significant associations ( $p>0.05$ ). **Conclusion:** The results have confirmed that elderly women at risk of sarcopenia, obese, have presented a greater number of medications and comorbidities. It is important to emphasize the need to control body weight in the elderly, as these groups can participate in the pathophysiological process of the progression of sarcopenia and its complications.

## **COGNITIVE FRAILTY**

**P25- PREVALENCE AND RELATED FACTORS OF COGNITIVE FRAILTY IN CHINA.** Lina Ma<sup>1</sup>, Li Zhang<sup>1</sup>, Yaxin Zhang<sup>1</sup>, Yun Li<sup>1</sup>, Zhe Tang<sup>1</sup>, Piu Chan<sup>1,2</sup> ((1) *Department of Geriatrics, Beijing Geriatric Healthcare Center, Beijing Institute of Geriatrics, Xuanwu Hospital of Capital Medical University, Key Laboratory on Neurodegenerative Disease of Ministry of Education, Beijing Institute for Brain Disorders, China National Clinical Research Center for Geriatric Disorders, Beijing, China;* (2) *Department of Neurology and Neurobiology, Xuanwu Hospital of Capital Medical University, Beijing, China*)

**Backgrounds:** Frailty is characterized by a nonspecific state of vulnerability, and increased risk for adverse health outcomes. Although the relationship between frailty and cognitive impairment has been recognized for decades, it is still not fully understood. Cognitive frailty (CF) is a condition characterized by the simultaneous presence of physical frailty and cognitive impairment in the absence of dementia. Nonetheless, the validity and utilization of CF as a diagnosis in China with the largest and highest growing aging population in the world remains unclear. **Objectives:** We aimed to explore the prevalence and related factors of CF in China. **Methods:** Data were obtained from the China Comprehensive Geriatric Assessment Study, 2011-2012. 5708 community-dwelling older adults without dementia were included. CF was assessed using the Mini-Mental State Examination for the evaluation of global cognitive status and the Comprehensive Geriatric Assessment-Frailty Index (CGA-FI) for the evaluation of frailty. **Participants:** with both cognitive impairment and frailty were classified as having CF. Forward stepwise logistic regression was done to explore the association between the various factors as independent variables and CF as the dependent variable. Adjustments were made for sociodemographic variables and age-related factors. **Results:** The standard prevalence of CF was 2.7%,

and increased with age in the Chinese elderly population. Women and participants living in rural areas were found to be at higher risk for CF. In the context of the robust elderly individuals, comorbidity, depression, less exercise, hearing impairment, disability and falls were independent factors influencing CF. Furthermore, when referred to the elderly individuals with PF, depression and hearing impairment were independently associated with CF. **Conclusion:** This is the first study to report the prevalence and risk factors of CF in China. Our results shed new light on the identification and related factors for CF and suggest that many health deficits are associated with CF. Therefore, in order to narrow the gap between the hopefully promising concept and the limited evidence from current studies, the reliability and predictive validity of the operational definition of CF should be clarified in future studies, as well as the underlying biological characteristics.

**P26- A QUASI-EXPERIMENTAL PILOT STUDY TO EXAMINE THE EFFECTIVENESS OF THE REMINISCENCE-BASED PROGRAM VERSUS COGNITIVE STIMULATION TO PREVENT PROGRESSION OF COGNITIVE FRAILTY IN OLDER ADULTS FROM DAY CENTERS.** João Apóstolo<sup>1</sup>, Elzbieta Bobrowicz-Campos<sup>2</sup>, Paulo Costa<sup>2</sup>, Susana Duarte<sup>3</sup>, Alberto Barata<sup>3</sup>, Paula Cordeiro<sup>3</sup>, Maria de Lurdes Almeida<sup>3</sup>, Isabel Gil<sup>3</sup> ((1) *Health Sciences Research Unit: Nursing, Nursing School of Coimbra, Portugal Centre for Evidence Based Practice: A Joanna Briggs Institute Centre of Excellence, Coimbra, Portugal*; (2) *Health Sciences Research Unit: Nursing, Nursing School of Coimbra, Coimbra, Portugal*; (3) *Nursing School of Coimbra, Coimbra, Portugal*)

**Background:** The prevention and management of physical and cognitive frailty are considered as priority goals in geriatric healthcare. The research on physical frailty shows that this condition can be successfully treated. Regarding cognitive frailty, there is still insufficient evidence on interventions preventing its progress. **Objectives:** To compare the effects of a reminiscence-based program (RBP) versus cognitive stimulation (CS) on cognitive frailty in older adults from day centers. **Methods:** A quasi-experimental study with a sample of older adults aged 65 years was conducted in seven day centers in the central region of Portugal. Of 106 subjects screened for inclusion criteria (clinical stability, capacity to participate actively in the intervention program and absence of severe cognitive decline), 56 were considered as eligible for the study, being allocated to RBP or CS. Both programs were conducted in groups and had duration of seven weeks. The outcome of cognitive frailty was measured through the Tilburg Frailty Indicator (TFI), Montreal Cognitive Assessment (MoCA) and Trail Making Test form A (TMT-A). Additionally, the short versions of Geriatric Depression Scale (GDS-10) and World Health Organization Quality of Life Scale module for older adults (WHOQOL-OLD-8) were used. **Results:** Forty-four older adults concluded the study, of which 28 participated in RBP (average age 79.33 ± 7.35, average education 3.29 ± 1.86) and 16 in CS (average age 84.63 ± 7.80, average education 4.31 ± 2.50). RBP improved the MoCA and WHOQOL-OLD-8 score ( $p < 0.05$ ). CS had a positive impact on TMT-A ( $p < 0.01$ ). Between-group differences on the post-intervention levels of global frailty were also observed (TFI:  $p < 0.05$ ). **Conclusion:** Both RBP and CS are potentially beneficial for postponing the evolution of cognitive frailty in older adults attending day centers; however, the impact of RBP on cognition seems to be greater. The positive effects of RBP were additionally observed on quality of life and global frailty, showing that the structured retrieval of significant life-events can be a protective factor for frailty progression. Future studies are needed to confirm the usefulness of RBP and CS in prevention and/or treatment of cognitive fragility.

**P27- ASSOCIATION BETWEEN FRAILTY AND COGNITIVE IMPAIRMENT: CROSS-SECTIONAL DATA FROM TOULOUSE FRAILTY DAY HOSPITAL.** Bertrand Fougère<sup>1,2</sup>, Matthieu Daumas<sup>1</sup>, Matthieu Lilamand<sup>2,3</sup>, Sandrine Sourdet<sup>1,2</sup>, Julien Delrieu<sup>1,2</sup>, Bruno Vellas<sup>1,2</sup>, Gabor Abellan van Kan<sup>1,2</sup> ((1) *Gérontopôle, Centre Hospitalier Universitaire de Toulouse, Toulouse, France*; (2) *Inserm UMR1027, Université de Toulouse III Paul Sabatier, Toulouse, France*; (3) *APHP- Department of Geriatrics, Bichat University Hospital, Paris, France*)

**Backgrounds:** A consensus panel, based on epidemiologic evidence, argued that physical frailty is often associated with cognitive impairment, possibly because of common underlying pathophysiological mechanisms. The concepts of cognitive frailty and motoric cognitive risk were recently proposed in literature and may represent a prodromal stage for neurodegenerative diseases. **Objectives:** The purpose of this study was to analyze the relationship between cognition and the components of the physical phenotype of frailty. **Methods:** Participants admitted to the Toulouse frailty day hospital aged 65 years or older were included in this cross-sectional study. Cognitive impairment was identified using the Mini-Mental State Examination (MMSE) and the Clinical Dementia Rating (CDR). Frailty was assessed using the physical phenotype as defined by Fried's criteria. We divided the participants into 2 groups: participants with normal cognition (CDR = 0) and participants who had cognitive impairment (CDR = 0.5). Participants with CDR > 0.5 were excluded. **Results:** Data from 1620 participants, mean age 82 years and 63% of women were analyzed. Cognitive impairment was identified in 52.5% of the participants. Frailty was identified in 44.7% of the sample. There were more frail subjects in the impaired group than the normal cognitive group (51% vs 38%,  $P < .001$ ). In logistic regression analyses, elevated odds for frailty were observed in patients with cognitive impairment [adjusted odds ratio (OR) 1.66, 95% confidence interval (CI) 1.12-2.46]. Subsequent analysis showed that the association between cognitive impairment and frailty was only observed considering one of the 5 frailty criteria: gait speed (adjusted OR 1.89, 95% CI 1.55-2.32). **Conclusion:** Physical frailty and in particular slow gait speed were associated with cognitive impairment. Future research including longitudinal studies should exploit the association between cognitive impairment and frailty.

**P28- PARENTING GRANDCHILDREN IS MORE BENEFICIAL TO COGNITIVE FUNCTION THAN PHYSICAL FUNCTION IN URBAN COMMUNITY DWELLING.** Yvonne S Handajani<sup>1</sup>, Linda Suryakusuma<sup>2</sup>, Yuda Turana<sup>2</sup> ((1) *Department of Public Health, Faculty of Medicine, Atma Jaya University, Jakarta Indonesia*; (2) *Department of Neurology, Faculty of Medicine, Atma Jaya University, Jakarta Indonesia*)

**Background:** Grandparenting is a key social role in later life. Grandparents have a vital function in childcare as parents return to the workforce. Grandparents are particularly popular as childcare provided by relatives and is less expensive than formal childcare. They are also perceived as more trustworthy than other childcare providers. The social activity and therefore cognitive stimulation, that is intrinsic to grandparenting can be linked to cognitive maintenance. **Objectives:** The objectives of the study was to examine whether benefits of grandparents caring grandchildren in elderly aged 60 years especially to cognitive and physical function. **Methods:** This was a cross-sectional study of 139 subjects aged > 60 years who were recruited from urban community dwelling in West Jakarta, Indonesia. All subjects underwent a standardized structural clinical evaluation and cognitive assessments were conducted using MMSE,

Verbal Fluency(VF), Visuoconstruction, and Boston Naming Test(BNT). All subjects underwent a standardized structural clinical evaluation including medical history, physical examination, and a comprehensive cognitive assessment. Physical functions (ADL and IADL) were assessed using the Barthel index and for Sarcopenia were using EWGSOP classification. Chi Square and multivariate logistic regression tests were used to find relations between cognitive and physical function with caring grandchildren. **Results:** The majority of the subjects were caring grandchildren (58.3%), cognitive impairment (53.2%), verbal fluency and BNT impairment (59.7% and 69.1%), normal visuoconstruction (56.6%), normal ADL and IADL(73.4% and 91.4%), Sarcopenia (66.2%). Cognitive impairment ( $p=0.01$ ; OR=0.68; 95% CI: 0.50-0.92) and verbal fluency ( $p=0.03$ ; OR=0.67; 95% CI: 0.51-0.87) were significantly associated with caring grandchildren by grandparents. Furthermore, based on further analysis of cognitive impairment, factor attention and calculation, language and construction were influenced. **Conclusion:** Parenting grandchildren is more beneficial to cognitive function than physical function for elderly people. Further research needs to be conducted for proving the effect of physical function and other factors.

**P29- THE INFLUENCE OF FRAILTY AND COGNITIVE DECLINE ON GAIT CHARACTERISTICS AND SKELETAL MUSCLE CLARIFIES THE COGNITIVE FRAILTY CONCEPT IN OLDER PEOPLE.** Anne-Marie De Cock<sup>1,2</sup>, Stany Perkisas<sup>2</sup>, Veronique Verhoeven<sup>1</sup>, Maurits Vandewoude<sup>2</sup>, Roy Remmen<sup>1</sup> ((1) Department of Primary and Interdisciplinary Care (ELIZA), University of Antwerp, Antwerp, Belgium; (2) University Center Geriatrics, General Hospital ZNA, Antwerp, Belgium)

**Background:** The relationship between changes in physical status, physical performance, body composition and cognitive decline still remains unclear. **Objectives:** This project aims to understand the changes of the physical and performance parameters and their interactions with ageing and cognitive decline. This may further clarify the concept of cognitive frailty. **Methods:** Cross-sectional analysis on a Geriatrics and Memory Clinic data registry evaluated demographics, disability scales (Katz and Lawton-Brody), Rockwood's Frailty index, mobility and balance tests, body-composition registered with bio-impedance analysis and quantitative gait characteristics at usual pace registered with a Gaitrite® electronic carpet in two age-categories: 70-to-80-year old and over-80-year old. The parameters were studied in different cognitive stages: cognitively healthy individuals (CHI), mild cognitive impaired, mild and moderate demented. **Results:** Temporal gait characteristics (gait speed, normalised gait speed, steps per meter, normalised steps per meter, cycle time variability and swing time variability) differed significantly between the two age-categories ( $p < 0.001$ ). Although, the gait speed in cognitively healthy older persons under-80-years-old persons was more than 0.8 m/sec in 89.5% of the cases, this was only true in 64.0% of the cases in the over-80-year-old group. Step width also varies significantly ( $p < 0.001$ ) between the two age-categories. Disability scales and frailty index worsened in parallel with increasing cognitive impairment. Skeletal muscle mass index (SMI) decreased with worsening cognitive status. Once the cognitive status in 70-to-80-year old persons met dementia criteria, the variables studied (disability, frailty, SMI, normalised mean step length, swing time variability and gait speed) distributed in a similar way as the over-80-year old CHI. **Conclusion:** Normal ageing comes with a slower walking speed and shorter and wider steps. Therefore we suggest to revise the normal gait speed cut-off values according to age and to include other quantitative gait characteristics to define normal gait in older persons. SMI decreases during cognitive decline. Dementia causes a physical ageing of ten calendar years. Simultaneous

decline of physical and cognitive parameters may correspond with progressive cognitive frailty..

**P30- DIFFERENCES IN DIETARY INTAKE AND PHYSICAL FUNCTION IN STROKE SURVIVORS WITH SELF-REPORT. COGNITIVE IMPAIRMENT.** Jessica Kelleher, Monica Serra (Atlanta VA Center of Excellence for Visual and Neurocognitive Rehabilitation and Birmingham/Atlanta VA Geriatric Research Education and Clinical Center (GRECC) and Emory University School of Medicine, Atlanta, GA, USA)

**Backgrounds:** Stroke is the leading cause of serious long-term disability in the United States. Memory loss and confusion common post-stroke may result in greater difficulties with physical functioning. Inadequate intake of specific dietary nutrients, including polyunsaturated fatty acids and B-vitamins, have been identified as contributors to cognitive impairment in older adults. However, little is known about the dietary intake of these nutrients, as well as the influence of cognitive impairment on physical function, in a population of stroke survivors. **Objectives:** To explore whether dietary intake and physical function differ between those with and without self-report cognitive impairment. **Methods:** The present study analyzes data from the 2011-2012 and 2013-2014 National Health and Nutrition Examination Survey (NHANES). Individuals were included if they self-reported a stroke and had complete data regarding the physical function questionnaire and dietary intake from 24-hr dietary recalls (N=360). Participants were determined to have cognitive impairment if they self-report «difficulty remembering» or «experiencing periods of confusion». Serum vitamin B12 (N=239) and total folate (N=122) data was available in a subset of participants. **Results:** Of the 360 stroke survivor participants (66±1 years, 54% female, 47% Caucasian; mean±SEM), 33% reported experiencing difficulties with memory or confusion. Dietary intake of total polyunsaturated fatty acids was 13% lower ( $p=0.02$ ), with a trend for 19% lower vitamin B6 intake ( $p=0.07$ ) in those who had self-reported cognitive impairment compared to those who did not, but intake of vitamin B12 and total folate did not differ between groups. Further, serum vitamin B12 and total folate did not differ between groups. Those with self-report cognitive impairment reported greater functional limitations in not only difficult activities, such as lifting or carrying objects, kneeling, pushing or pulling objects, or household chores; but also basic activities, such as preparing meals, dressing, getting out of bed, and walking between rooms ( $p<0.001$ ). **Conclusion:** These data suggest that a lower intake of polyunsaturated fat and vitamin B6 may impact cognitive function, ultimately affecting physical functioning, post-stroke. Further research is needed to determine if interventions targeting polyunsaturated fat and vitamin B6 status also influence cognitive and physical function in stroke survivors.

## **FRAILTY IN CLINICAL PRACTICE AND PUBLIC HEALTH**

**P31- OROPHARYNGEAL DYSPHAGIA AND FRAGILITY: CAN IT BE RELATED.** Gulistan Bahat<sup>1</sup>, Ozlem Yilmaz<sup>1</sup>, Sukran Durmazoglu<sup>1</sup>, Cihan Kilia<sup>1</sup>, Basar Aykent<sup>2</sup>, Mehmet Akif Karan<sup>1</sup> ((1) Istanbul University Istanbul Medical Faculty Internal Medicine Department Geriatrics Division, Istanbul University Istanbul Medical Faculty, Istanbul, Turkey; (2) Marmara University Medical Faculty Internal Medicine Department Nephrology Division, Turkey)

**Objectives:** Oropharyngeal dysphagia(OD) is described a geriatric syndrome that occurs more frequently with aging. This clinical problem is associated with deterioration in functionality, malnutrition,

infections and usually ignored. Frailty is also a geriatric syndrome that is better known. It has been suggested in the literature that OD may be present in fragile elderly without neurodegenerative disease in recent years. We aimed to investigate the association of OD with frailty in the community dwelling elderly. **Methods:** The study includes patients admitted to our outpatient clinic prospectively. Participants' demographic data were noted. OD screening was done by scanning the EAT-10 questionnaire. Two thresholds were used for the EAT-10 survey (3 and 15). FRAIL Scale was applied to determine the frailty. We recorded sarcopenia associated measurement, activities of daily living (ADL), instrumental ADL (IADL) and MNA-SF. **Results:** 1138 patients 60 years old who were admitted from July 2015 to September 2016. The mean age of the elderly was  $74.1 \pm 7.3$  (60-98). 348 (30.6%) were male and 790 (69.4%) were female. The EAT 10 survey was conducted on all participants. The frailty status was determined in 851 subjects. EAT-10 score correlated with age, number of illnesses-medications, to be fragile. BMI, hand grip strength, time and go test (TUG), usual walking speed, ADL, IADL and MNA SF. Age, total number of illnesses, total number of medicines and FRAIL score were higher in EAT 10 score 15. In the same group, hand grip strength, TUG, normal walking speed, ADL, IADL and MNA SF were significantly lower. There was a higher incidence of female gender, number of neurodegenerative diseases, and a fall / fall risk in the EAT 10 score 15 group. In the linear regression analysis performed, EAT 10 score 15 was found to be correlated with frailty irrespectively of all causes ( $p < 0.001$ ). **Conclusion:** OD in the elderly is a common public health problem that is insufficiently recognized and can be associated with severe mortality. We have shown that OD increases in the presence of frailty. To our knowledge, this is the largest serie in the literature providing data on independent association of OD with frailty.

### **P32- EFFECTS OF AN INTERGENERATIONAL EXCHANGE PROGRAM BETWEEN NURSING STUDENTS AND COMMUNITY HEALTHY ELDERLY.** Hiroe Hayashi, Pingping Zhang (*Saitama Prefectural University, Koshigaya-City, Saitama-Prefecture, Japan*)

**Background:** Japan is a rapidly aging society, and thus nursing approaches that enable the elderly to lead longer and more independent lives are needed in the health promoting. **Objectives:** The purpose of this study was to clarify the effects of an intergenerational exchange program between nursing students and community healthy elderly. **Methods:** From 2012-2014, a literature review and investigation of intergenerational exchange needs and implementation were conducted. An intergenerational exchange program was then developed and tested in a community center. From 2015-2017, the program was used to exchange activities monthly, in each session, five nursing students and 30 community healthy elderly talked about health management methods, played games, or exercised together for approximately 2 hours. After the activities, a questionnaire was given to all participants. The Ethics Committee of Saitama Prefectural University approved this study. **Results:** 26 nursing students and 28 community healthy elderly participated in the program (28 community healthy elderly participated three years). The satisfaction rating of the elderly was 92.6%. In the description comments of the elderly, positive effects such as [positive interaction with nursing students] (e.g., receiving energy from the young), [understanding the situation of nursing students] and [expectation to continue exchange activities] (e.g., desire to learn new things) were indicated. In the description comments of the nursing students, [understanding the community elderly] (e.g., grasping mental and lifestyle changes with age and community features) and [understanding the meaning of intergenerational exchange] (e.g., learning about each other for health promotion) were shown.

**Conclusion:** This study showed the usefulness of intergenerational exchange activities for improving the health and longevity of community elderly and training nursing students to assess the elderly and their community. This study was supported in part by a Grant-in-Aid for Scientific Research (C) (No. 15K11761) from the Japan Society for the Promotion of Science.

### **P33- ASSOCIATION OF FRAILTY WITH RECOVERY FROM DISABILITY AMONG COMMUNITY-DWELLING OLDER ADULTS: RESULTS FROM TWO LARGE U.S. COHORTS.** Chenkai Wu (*New York Medical College, White Plains New York*)

**Background:** Research has demonstrated that disability in activities of daily living (ADLs) is a dynamic rather than an irreversible process and transitions among different disability states are common. However, little is known about factors that affect recovery from disability. **Objectives:** To examine the association of frailty with recovery from disability among community-dwelling older adults. **Methods:** 1,023 adults aged 65 years from the Cardiovascular Health Study (CHS) and 685 adults aged 65 years from the Health and Retirement Study (HRS). Frailty, as assessed by five criteria: slowness, weakness, exhaustion, inactivity, and shrinking. Persons were classified as 'robust' (0 criteria), 'prefrail' (1-2 criteria), or 'frail' (3-5 criteria). Disability was defined as having difficulty in 1 ADL (dressing, eating, toileting, bathing, transferring, and walking across a room). Recovery from disability was defined as regaining independence in all ADLs after experiencing incident disability. Socio-demographics, smoking status, body mass index, chronic conditions, cognitive function, self-rated health, and severity of disability were at the time of frailty assessment. **Results:** A total of 539 (52.7%) CHS participants recovered from disability within one year. Almost two-thirds of robust persons recovered, while less than two-fifths of the frail had recovery. For persons who experienced mild disability (disabled in 1 ADL), 68.9%, 55.8%, and 40.0% of the robust, prefrail, and frail had recovery, respectively. For persons who had severe disability (disabled in 2 ADLs), 58.9%, 37.6%, and 26.1% of the robust, prefrail, and frail recovered, respectively. A total of 234 (34.2%) HRS participants recovered from disability within two years. Approximately half of robust persons recovered, while less than one-fifth of the frail recovered. After multivariable adjustment, prefrail and frail CHS participants were 16% and 36% less likely to recover from disability than the robust, respectively. In the HRS cohort, frail persons had a 41% lower likelihood of recovery compared with the robust. **Conclusion:** Frailty is an independent predictor of poor recovery of disability among newly community-dwelling elders. These findings validate frailty as a marker of decreased resilience and may offer new opportunities for individualized interventions and geriatric care based on frailty assessment.

### **P34- LONGITUDINAL RELATIONSHIP BETWEEN KNEE PAIN STATUS AND INCIDENT FRAILTY: DATA FROM THE OSTEOARTHRITIS INITIATIVE.** Saad M. Bindawas<sup>1</sup>, Vishal Vennu<sup>1</sup>, Brendon Stubbs<sup>2</sup> ((1) *Department of Rehabilitation Sciences, King Saud University, Riyadh, Saudi Arabia;* (2) *Physiotherapy Department, South London and Maudsley NHS Foundation Trust, Denmark Hill, London, United Kingdom*)

**Background:** Knee pain (KP) is the most common symptom of knee osteoarthritis (OA), affecting more than 100 million individuals worldwide. Studies have shown that knee OA-related pain had an increased risk of developing frailty. However, it is unclear if KP is associated with an increased risk of pre-frailty and frailty compared with healthy cohorts (who neither have knee OA nor

pain). **Objectives:** To examine the longitudinal association between knee pain and pre-frailty/frailty. **Methods:** Data from 3,053 non-frail participants aged 45-79 years at baseline from the Osteoarthritis Initiative we used in this longitudinal study. According to self-reported knee pain at baseline, the participants were placed into three groups: no knee pain (n = 1,600), unilateral knee pain (n = 822), and bilateral knee pain (n = 631). Frailty status was assessed over time using the five frailty indicators (unintentional weight loss, exhaustion, weak energy, slow gait speed, and little physical activity). Based on the number of frailty indicators present, pre-frailty (1-2) and frailty (>3) were diagnosed. Generalized estimating equations logistic regression analyses were conducted to examine the relationship between knee pain status and pre-frailty/frailty. **Results:** After adjusting for age, sex, race, education, marital status, smoking status, comorbidities, and body mass index, unilateral knee pain at baseline was associated with an increased odds of developing pre-frailty (OR = 1.14, 95% CI = 1.01-1.27) and frailty (OR = 1.89, 95% CI = 1.38-2.62), and bilateral knee pain at baseline was also associated with an increased risk of pre-frailty (OR = 1.41, 95% CI = 1.24-1.62) and frailty (OR = 2.21, 95% CI = 1.63-3.01) over time in comparison to no knee pain. The interaction of knee pain status by time was not significantly associated with either pre-frailty or frailty. **Conclusion:** Knee pain (particularly bilateral knee pain) is associated with an increased risk of developing pre-frailty and frailty over time.

**P35- SELF-RATED HEALTH AND FRAILITY: CROSS-SECTIONAL AND LONGITUDINAL RELATIONSHIPS IN OLDER ADULTS FROM THE THREE-CITY BORDEAUX STUDY.** Maturin Tabue Tegu<sup>1,2,3</sup>, Sophie Pilleron<sup>1,2</sup>, Soufiane Ajana<sup>1,2</sup>, Catherine Helmer<sup>1,2</sup>, Jean-François Dartigues<sup>1,2</sup>, Catherine Féart<sup>1,2</sup> ((1) Univ. Bordeaux, Inserm, Bordeaux Population Health Research, Bordeaux, France; (2) Center, UMR 1219, Bordeaux, France; (3) CHU de Guadeloupe/ Université des Antilles, France)

**Background:** Frailty, part of geriatric syndromes, has been associated with higher risk of negative health-related outcomes including falls, hospitalizations, disability, institutionalization, and mortality. Not considered as part of geriatric syndromes, self-rated health (SRH) is a subjective measure of health status and a good predictor of adverse outcomes including disability and mortality in various health settings. To our knowledge, no prospective studies have been interested in SRH assessed at late-life as risk factor for frailty yet. **Objectives:** To investigate cross-sectional and prospective relationships between SRH and frailty among community-dwelling elderly people aged 75+. **Design:** Prospective cohort study. **Setting:** Bordeaux center (France) of the Three-City Study. **Participants:** Cross-sectional analyses were carried out on 711 participants (62.0% females) whose 380 initially non-frail were re-examined 4 years later. **Measurements:** SRH was assessed using a self-reported 5-response-item scale at each follow-up. Frailty was defined as having at least three out of the following five self-reported criteria: unintentional weight loss; exhaustion; slowness; weakness and low energy expenditure. Multivariate logistic regression models (adjusted for age, sex, marital status, income, education level, polypharmacy and MMSE) were used to assess the cross-sectional and prospective associations between SRH and frailty and its components. **Results:** The study sample was constituted of 711 participants. Mean age was 81.1 (SD 3.8) years. Over the 4-year follow-up period, 51 participants became frail. In multivariate cross-sectional analyses, poorer SRH was significantly associated with prevalent frailty as a whole (OR= 3.2; 95% Confidence Interval (CI) [1.8 < 5.7]), and with four of its components: prevalent unintentional weight loss (OR=1.9; 95% CI [1.0 < 3.5]), prevalent exhaustion (OR=4.0; 95% CI [2.3 < 7.0]),

prevalent slowness (OR=2.3; 95% CI [1.5 < 3.4]) and prevalent low energy expenditure (OR=2.2; 95% CI [1.5 < 3.2]). No association was observed with weakness. In prospective analyses, SRH was not associated with incident frailty (OR=1.3; 95% CI [0.7 < 2.6]) or its components. **Conclusion:** In French older community-dwellers aged 75+, our findings revealed that SRH was cross-sectionally but not prospectively associated with frailty. This suggests that subjective health status is a marker of frailty but does not predict its occurrence in community dwelling older adults.

**P36- A COMMUNITY-ENGAGED APPROACH TO DESIGN, DEVELOP, AND PILOT AN EXERCISE MOBILE APPLICATION FOR MEDICAID HOME AND COMMUNITY-BASED SERVICES OLDER ADULT CLIENTS WITH FRAILITY AND HOME CARE AIDES.** Margaret Danilovich<sup>1</sup>, Laura Diaz<sup>1</sup>, Gustavo Saberbein<sup>2</sup>, William Healey<sup>1</sup>, Gail Huber<sup>1</sup>, Daniel Corcos<sup>1</sup> ((1) Northwestern University, Chicago, USA; (2) Help at Home, Inc, Chicago, USA)

**Background:** It is widely recognized that resistance exercise has significant health benefits for older adults, yet less than 15% of older adults meet the recommendation of twice-weekly participation. Participation is further reduced in females and those with advanced age, disability, greater medication use, increased number of chronic conditions, and lower socioeconomic status. These same factors predict those who receive Medicaid Home and Community-Based services (HCBS); long-term care services provided in-home. Despite the widely-known benefits, exercise is not included within the HCBS line of services. **Objectives:** We used a community-engaged approach with HCBS five home care aide (HCA)-client dyads, and physical therapist stakeholders to develop a mobile application (app) exercise intervention that could be implemented within HCBS. **Methods:** We employed a participatory action research design to co-develop the exercise intervention and mobile app through focus groups and semi-structured interviews with stakeholders. We then evaluated the acceptability and usability of the mobile intervention following a two-week pilot test. Intervention development occurred in three stages: 1) a qualitative stage focused on developing exercise program content, 2) a qualitative stage focused on developing the mobile app, and 3) a two-week pilot usability test of the app prototype with evaluation through client semi-structured interviews and HCA completion of the IBM Post-Study System Usability Questionnaire. **Results:** HCAs preferred exercise content for their clients with frailty that had: 1) exercise and motivation training needs, 2) exercise simplicity with individualization capability, 3) short intervention duration, and 4) variety while maintaining a routine. Clients desired: 1) exercise to address activities of daily living and 2) short duration. Clients did not want interventions described as 'exercise' because that appeared too difficult to complete. Both parties wanted to track progress in the app, but have methods to personalize content. Two physical therapists trained five HCAs to use the exercise app to lead the intervention during a half-day training session. HCAs then led the intervention with clients for a two-week usability test. Overall, HCAs were highly satisfied with the app formatting, usability, and noted high levels of confidence to use the exercise app. Clients overwhelmingly liked the mobile technology and found it easy to use. **Conclusion:** Through co-development with our stakeholders, we identified preferences for exercise, mobile technology, training, and facilitating adherence. Our findings contribute new knowledge into the desired exercise parameters and technological preferences among HCAs and clients with frailty, primarily that describing programs as 'exercise' among those with frailty is not desired. Alternative words such as 'activity program' to describe exercise may be needed for this population.

Further, clients with frailty embraced mobile technology. High satisfaction ratings in usability surveys suggests co-development produces a highly acceptable product.

**P37- RAPID MULTI-DOMAIN GERIATRIC SCREEN AND FITNESS ASSESSMENT IDENTIFIES (PRE)FRAILTY AND ITS POTENTIALLY MODIFIABLE RISK FACTORS IN COMMUNITY-DWELLING OLDER ADULTS.** Tay Laura<sup>1</sup>, Chua Melvin<sup>1</sup>, Tay Ee Ling<sup>2</sup>, Chan Hui Nam<sup>3</sup>, Chng Germaine<sup>4</sup>, Mohamad Rizal<sup>5</sup>, Ng Yee Sien<sup>6</sup> ((1) *Department of General Medicine (Geriatric Medicine), Sengkang General Hospital;* (2) *Physiotherapy Department, Sengkang General Hospital;* (3) *Dietetics, Sengkang General Hospital;* (4) *Service Planning, Sengkang General Hospital;* (5) *Nursing Department, Sengkang General Hospital;* (6) *Department of Rehabilitation Medicine, Singapore General Hospital*)

**Background:** Frailty develops insidiously and is often not apparent until acute health crises. The pre-frail state is less extensively investigated, despite greater potential for reversibility. **Objectives:** We explore the feasibility of a community platform for frailty assessment, and examine potentially modifiable risk factors for pre-frailty and frailty in older adults. **Methods:** Community-dwelling older adults (>50 years) underwent a rapid multi-domain geriatric screen, frailty and physical fitness assessment. Participants were categorized as robust, pre-frail or frail using FRAIL scale. The geriatric screen included social profiling, cognitive and psychological domain (Chinese Mini-Mental State Examination, Geriatric Depression Scale), nutritional assessment (Mini-Nutritional Assessment-Short Form), functional performance [activities of daily living (ADLs) (Barthel's Index), instrumental ADLs (Lawton and Brody's)]. Participants completed a battery of fitness tests for flexibility, lower limb strength and power (repeated chair-stand test), upper limb power (Box-and-Block Test), balance, and cardio-respiratory endurance (6-minute walk test). Asian Working Group for Sarcopenia cut-offs defined weak grip and slow gait, to examine diagnostic agreement between FRAIL and Fried frailty phenotype. Frailty index (FI) from a list of 35 deficits was calculated for each participant. Logistic regression was performed for independent predictors of pre-frailty/ frailty. Agreement between FRAIL and Fried was examined using kappa test. **Results:** Amongst 93 older adults, 60 (64.5%) were robust, 31 (33.3%) pre-frail, and 2 (2.2%) frail. Pre-frail older adults were more likely to be living alone ( $p=0.031$ ). Depression (15%, 45.2%, 100%,  $p=0.001$ ) and malnutrition (11.7%, 54.8%, 100%,  $p<0.001$ ) were significantly associated with pre-frailty and frailty. There was decremental lower limb power ( $p=0.004$ ) and endurance ( $p=0.042$ ) across robust, pre-frail and frail, and pre-frail had the worst balance ( $p=0.012$ ). FI increased across robust, pre-frail and frail ( $p<0.001$ ). Overall percentage agreement between FRAIL and Fried was 64.5%, with overall kappa of 0.346 indicating fair agreement. On multiple logistic regression including age and gender, malnutrition [OR=8.91 (2.74-29.06),  $p<0.001$ ] and depression [OR=1.29 (1.08-1.53),  $p=0.004$ ] were independent predictors for pre-frailty/ frailty. **Conclusion:** We have demonstrated the construct validity of FRAIL for pre-frailty/ frailty. Mood and nutrition should be targets for frailty prevention. Physical fitness declines early in frailty continuum, and exercise interventions should target resistance for lower limb strength and endurance.

**P38- HAND GRIP STRENGTH AS A MEASURE OF PHYSICAL FRAILTY OF PATIENTS IN A SUBACUTE GERIATRIC INPATIENT SETTING IN SINGAPORE.** Christine Yuanxin Chen, Thant Zin Tun, Vivian Cantiller Barrera (*department of geriatric medicine, changi general hospital, singapore*)

**Background:** Hand Grip Strength (HGS) as a measurement of muscle strength, is a good predictor of health status and health outcomes. HGS is simple, non-invasive, and easily performed within a short time. Gait speed (GS) is also a widely used measurement of mobility status. Both measurements form part of Fried's Frailty Criteria. **Objectives:** To study the correlation between HGS and GS and the FRAIL scale (Morley) and Clinical Frailty Scale (CFS, Rockwood) in a subacute inpatient setting. To assess clinical practicality of HGS and GS as part of routine geriatric assessments to identify frailty in patients who may be at risk of readmission. **Methods:** A total number of thirteen(13) male patients participated in the study. Patients who are critically ill, unable to ambulate independently with or without aids, and unable to follow instructions were excluded in the study. Frailty status using FRAIL and CFS was determined upon admission. GS over 10 meters and HGS was measured using the JAMAR digital hand dynamometer using a standard protocol. These measurements were performed on the day of admission to the subacute ward and repeated on day of discharge. Thirty (30) days and six(6) months readmission data was obtained. **Results:** The higher the HGS, the lower the FRAIL score; strong negative correlation ( $r = -0.893$  ( $p = 0.001$ )). The higher the HGS, the lower the CFS score; moderate negative correlation ( $r = -0.661$  ( $p = 0.053$ )). The higher the HGS, the lower number of comorbidities; weak negative correlation( $r = -0.436$ ( $p = 0.241$ )).Effects of GS and readmission numbers were insufficient for analysis. **Conclusion:** In conclusion, there is correlation between HGS and FRAIL scale, as well as HGS and CFS. Inpatient measurements of HGS are easy to obtain with high value as objective measures for physical frailty. This excludes the need for questionnaires which may be difficult to administer in moderately to severely frail geriatric inpatients who often have cognitive impairment. A larger sample size would be needed to study whether HGS or GS could be an independent marker for frailty and a predictor for readmission.

**P39- DISEASE ACTIVITY AND FUNCTIONAL CAPACITY INFLUENCE FRAILTY IN RHEUMATOID ARTHRITIS PATIENTS.** Rafaela Cavaleiro Espírito Santo<sup>1</sup>, Jordana Miranda Souza Silva<sup>1</sup>, Lidiane Isabel Filippin<sup>2</sup>, Priscila Schmidt Lora<sup>3</sup>, Ricardo Machado Xavier<sup>1</sup> ((1) *Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil;* (2) *Universidade La Salle, Canoas, Brazil;* (3) *Universidade do Vale do Rio dos Sinos, São Leopoldo, Brazil*)

**Backgrounds:** Rheumatoid arthritis (RA) is an autoimmune, chronic and inflammatory disease. Changes in body composition and functional limitations are observed in RA patients and are potential determinants of frailty. Frailty is a multifactorial syndrome that leads to increased vulnerability for adverse health outcomes. However, there is limited information about frailty in RA patients. **Objectives:** To assess frailty prevalence and determine its effect on clinical features of RA patients followed during 12 months. **Methods:** 81 patients with RA, according to ACR/EULAR 2010 classification criteria, aged between 40 and 70 years, were recruited from a reference university hospital, and followed for 12 months. Disease activity was assessed by Disease Activity Score-28 (DAS28). Functional capacity was assessed by Health Assessment Questionnaire (HAQ). Body composition was assessed by total body dual-energy x-ray

absorptiometry (DXA) for measurement of fat mass index (FMI; Kg/m<sup>2</sup>) and fat free mass index (FFMI;Kg/m<sup>2</sup>). Frailty was assessed by a self-report questionnaire developed by Nunes et al. 2015 (validated to Brazilian population and Portuguese language). Frequency analysis, McNemar test and GEE analyses were used and statistical significance was considered as  $p < 0.05$ . **Results:** Of the 81 patients analyzed, most were women (88.9%; 72/81), with mean age of  $56.8 \pm 7.3$  and mean disease duration time of  $11.9 \pm 9.6$  years. At baseline, we found 59 frail patients (72.8%), 19 pre frail patients (23.5%) and 3 non frail patients (3.7%). At 12 months, 51 patients (63.0%) were considered frail, 20 patients (24.7%) pre frail and 10 patients (12.3%) non frail. Frailty, pre frailty and non-frailty were not statistically different between baseline and 12 months ( $p = 0.093$ ). DAS28 and HAQ were higher in frail patients, in comparison with pre frail and non-frail patients ( $p = 0.002$  and  $p = 0.000$ , respectively). FMI and FFMI had no effects on frailty over 12 months ( $p > 0.05$ ). **Conclusion:** In this study, RA patients had high frailty prevalence. Increased DAS28 and HAQ scores influenced frailty, however, body composition did not. Frailty has clinical relevance, since it is associated with lower life quality and expectancy. Thus, further studies are necessary to elucidate the impact of frailty in RA. Financial support: CAPES, CNPq, FAPERGS, FIPE-HCPA.

**P40- ENGAGING CLINICIANS AND PATIENTS TO ASSESS AND IMPROVE FRAILTY MEASUREMENT IN ADULTS WITH END STAGE RENAL DISEASE.** Sarah Van Pilsum Rasmussen<sup>1</sup>, Jonathan Kone<sup>1</sup>, Fatima Warsame<sup>2</sup>, Hao Ying<sup>1</sup>, Brian Buta<sup>3</sup>, Christine Haugen<sup>1</sup>, Elizabeth King<sup>1</sup>, Sandra DiBrito<sup>1</sup>, Ravi Varadhan<sup>4</sup>, Leocadio Rodríguez-Mañás<sup>5</sup>, Jeremy D. Walston<sup>2</sup>, Dorry L. Segev<sup>1,5</sup>, Mara A. McAdams-DeMarco<sup>1,5</sup> ((1) Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, MD, USA; (2) Department of Epidemiology, Johns Hopkins School of Public Health, Baltimore, MD, USA; (3) Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA; (4) Department of Oncology, Sidney Kimmel Comprehensive Cancer Center, Baltimore, MD, USA; (5) Hospital Universitario de Getafe, Madrid, Spain)

**Background:** The Fried frailty phenotype, a measure of physiologic reserve defined by 5 components (exhaustion, unintentional weight loss, low physical activity, slow walking speed, and poor grip strength), is associated with poor outcomes among ESRD patients. However, these 5 components may not fully capture physiologic reserve in this specialized population. We aimed to ascertain opinions of ESRD clinicians and patients about the usefulness of Fried frailty phenotype and interventions to improve frailty in ESRD patients, and to identify novel components to further characterize frailty in ESRD. **Objectives:** To ascertain clinician and patient opinions of the Fried frailty phenotype To identify novel components that may further characterize physiologic reserve in ESRD patients To elicit opinions on interventions to improve frailty in ESRD patients. **Methods:** Clinicians who treat adults with ESRD completed a 2-round Delphi study ( $n = 41$  and  $n = 36$ , respectively; response rate = 87%). ESRD patients completed a survey at transplant evaluation ( $n = 460$ ; response rate = 81%). We compared clinician and patient opinions on the constituent components of frailty. **Results:** Clinicians were more likely than patients to say that ESRD makes patients frail (97.6% vs. 60.2%). There was consensus among clinicians that exhaustion, low physical activity, slow walking speed, and poor grip strength characterize frailty in ESRD patients; however, 29% of clinicians thought weight loss was not relevant. Patients were less likely than clinicians to say that the 5 Fried frailty components were relevant. Clinicians identified 10 new ESRD-specific

potential components including falls (64%), physical decline (61%), and cognitive impairment (39%). Clinicians (83%) and patients (80%) agreed that intradialytic foot-peddlers might make ESRD patients less frail. **Conclusion:** There was consensus among clinicians and moderate consensus among patients that frailty is more common in ESRD. Weight loss was not seen as relevant, but new components were identified. These findings are first steps in refining the frailty phenotype and identifying interventions to improve physiologic reserve specific to ESRD patients.

**P41- FRAILTY AND RISK OF ADVERSE DRUG REACTIONS AMONG HOSPITALIZED OLDER ADULTS.** WY Goh<sup>1</sup>, ST Cheong<sup>2</sup>, EH Ong<sup>1</sup>, LL See<sup>2</sup>, SN Abdul Karim<sup>2</sup>, E Chong<sup>1</sup> ((1) Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore; (2) Department of Pharmacy, Tan Tock Seng Hospital, Singapore)

**Background:** Older adults often experience adverse drug reactions (ADR) during hospitalization. Frailty is associated with multi-morbidity, which is linked to polypharmacy resulting in significant drug-drug and drug-disease interactions. It is recognized that ageing is associated with altered pharmacodynamics and pharmacokinetics, leading to a greater risk of ADR. Despite theoretical associations between frailty and ADR, there remains a paucity of data supporting the relationship between frailty and ADR, especially among hospitalized older adults. **Objectives:** We aimed to explore the relationship between frailty and ADR among hospitalized older adults. **Methods:** We retrospectively studied 150 participants (mean age  $89.7 \pm 4.0$  years, 65.6% female) admitted to the Department of Geriatric Medicine in a 1300-bed tertiary hospital. Baseline demographics, comorbidities, and prevalence of polypharmacy and ADR during hospitalization were gathered. Frailty was defined using the Clinical Frailty Scale, whilst ADR probability was determined using Naranjo scale. Outcomes of rehospitalizations, emergency department attendances, and mortality at 6 months were captured. Logistic regression analysis was performed to examine the association between frailty and outcomes of ADR and mortality, adjusting for age and sex. **Results:** Frail participants (83.3%) were more functionally dependent (84.0% vs. 4.0%,  $p < .001$ ), with higher co-morbidities (Charlson's Comorbidity Index: 8(7-9) vs. 6(5-7.5),  $p < .001$ ), including stroke (59.2% vs. 28.0%,  $p < .001$ ) and dementia (56.0% vs. 4.0%,  $p < .001$ ). Despite no differences in polypharmacy rate (frail vs. nonfrail: 90.2% vs. 84.0%,  $p = 0.36$ ), frailty was associated with having more medications on admission (10(8-13) vs. 8(5.5-11.5),  $p = 0.04$ ). In contrast, no differences in total number of medications were observed at discharge. Contrary to belief, frailty independently predicted reduced risk of ADR (odds ratio (OR) 0.69, CI 95% 0.51-0.93,  $p = 0.02$ ). This was similarly observed for the total number of ADR experienced per participant (frail vs. nonfrail: 1(1-2) vs. 2(2-2.5),  $p = 0.06$ ). By 6 months, frailty was also independently predictive of a greater risk of mortality (OR 1.68, CI 95% 1.17-2.41,  $p < 0.01$ ). **Conclusion:** In our cohort of hospitalized older adults managed by geriatricians, frailty was associated with a lower risk of ADR despite having more medications on admission. This may be a reflection of active rationalization of medications in frail individuals. Further studies are required to better understand this unique observation.

**P42- DEVELOPMENT OF A SUSTAINABLE PROGRAM FOR FRAILTY IDENTIFICATION AND INTERVENTION THROUGH NUTRITION AND EXERCISE (FINE) IN EASTERN SINGAPORE.** Christine Yuanxin Chen<sup>1</sup>, Christopher Tsung Chien Lien<sup>1</sup>, Khin Chaw Yu Aung<sup>2</sup>, Tong Shao Chuen<sup>2</sup> ((1) department of geriatric medicine, changi general hospital, singapore; (2) health services research, eastern health alliance, singapore)

**Background:** In the total 1 million population in Eastern Singapore, 12% of seniors are aged 65 and older, potentially increasing to 20% in year 2020. There is currently no established system to identify and enroll the pre-frail and mildly-frail into an effective frailty intervention program that is consistent, sufficiently intensive and progressive which would be scalable and sustainable. **Objectives:** The objectives are to develop (I) a systematic framework to identify and assess pre-Frail and mildly frail seniors in Eastern Singapore; (II) a coordinated system of program enrolment; (III) an effective, sustainable frailty prevention exercise program; and to evaluate (IV) the effectiveness of the program in reducing frailty states and other outcomes. **Methods:** In Phase 1 (design/'Proof-of-concept'), 15 participants would participate in a proven 12-week, twice weekly computer enabled HUR gym equipment based program, enhanced by aerobic, balance and cognitive components (Gym Tonic Plus/GTP) in comparison to 15 participants in a novel community based Structured Exercise Program (SEP) of similar duration. In Phase 2 (development /'Proof-of-Value'), 360 participants would be randomized into 2 intervention groups-GTP and SEP; and a third control group being given general health and exercise advice. In the final Implementation Phase, 1050 participants would be randomized into each of the 3 arms. Each phase includes: Initial case-finding and enrolment by community partners and outreach initiatives; screening and assessments done in the community including medical, dietary and physical performance assessments. Effectiveness of SEPs in improving grip strength & gait speed among other outcomes; cost-effectiveness and quality of SEPs, as well as enrolment, participant compliance and participant/provider satisfaction rates would be studied. **Results:** The multi-disciplinary study team was formed from multi-centre engagements and collaborations with partner organisations including our local Sports body, with support of our National Health Promotion Board. A novel Structured Exercise Program and frailty-targeted Medical and Dietary assessment protocols were also designed by the study team prior to the pilot phase. **Conclusion:** With the ongoing partnerships and collaborations, we plan to establish a well-coordinated system of identifying the pre-frail and mildly frail seniors who could be enrolled into an effective, sustainable and scalable frailty intervention program.

**P43- PREVALENCE OF FRAILTY AND PRESCRIPTION OF ANTICOAGULATION IN OLDER ADULTS WITH ATRIAL FIBRILLATION.** Tan Li Feng<sup>1</sup>, Christopher Koo Chieh Yang<sup>2</sup>, Wilson Goh<sup>3</sup>, Goy Shen<sup>3</sup>, Santhosh Seetharaman<sup>4</sup>, Reshma Merchant<sup>5</sup> ((1) Registrar, division of geriatric medicine, national university hospital, Singapore; (2) Registrar, department of cardiology, national university heart centre, singapore; (3) Year 4 medical student Yong loo lin school of medicine, national university of singapore; (4) Consultant, division of geriatric medicine, national university hospital, Singapore; (5) Senior consultant and head, division of geriatric medicine, national university hospital (Singapore))

**Objectives:** Atrial fibrillation (AF) is common in older adults. Older adults have higher risk of stroke, however they have more comorbidities and the decision to be on anticoagulation is not straightforward. Approximately half of elderly patients with

atrial fibrillation do not receive the recommended cardioembolic prophylaxis. **Objectives:** We sought to determine the prevalence of frailty in elderly with AF and prescription of anticoagulation. **Methods:** A cross-sectional study of elderly patients 65 years with atrial fibrillation from Dec 2016 to October 2017. Frailty was screened using the FRAIL scale and Edmonton Frail Score. Other clinically relevant data including basic demographics, caregiver, follow-ups, medications and hospital readmissions in the past 1 year, Charlson's comorbidity index and their Modified Barthel's Index were collected. We looked at whether patients were on anticoagulation or not, reasons for not being anticoagulated, type of anticoagulation and CHADS2VASC scores were also collected. **Results:** 130 older adults were screened. 69 (53.1%) were female. 47.7% (62) of elderly with AF 47.7% were frail. 82 (63.1%) were on anticoagulation. Of these 60 (73.2%) were on warfarin, 15 (18.3%) on apixaban and 7 (8.5%) on rivaroxaban. Amongst those who were frail, 58% were on anticoagulation vs 68% in non-frail elderly. Those on anticoagulation had significantly lower frailty scores of  $1.53 \pm 1.2$  on FRAIL vs.  $2.0 \pm 1.2$  ( $p = 0.048$ ) who were not anticoagulated. There was no significant difference in modified Barthel's Index  $82.8 \pm 25.1$  on anticoagulation vs.  $75.2 \pm 28.3$  ( $p = 0.128$ ). Those not on anticoagulation were older  $81.4 \pm 7.3$  vs  $78.5 \pm 7.0$  ( $p=0.026$ ) but there was no difference in gender, race, educational status, body mass index (BMI), Charlson comorbidity index or presence of caregiver. **Conclusion:** A large proportion of elderly with AF are frail and use of anticoagulation is much lower in in frail participants. Interestingly, there was no significant difference in functional status between those on anticoagulation vs those not on anticoagulation.

**P44- RAPID MULTI-DOMAIN GERIATRIC SCREEN AND FITNESS ASSESSMENT IDENTIFIES (PRE)FRAILTY AND ITS POTENTIALLY MODIFIABLE RISK FACTORS IN COMMUNITY-DWELLING OLDER ADULTS.** Tay Laura<sup>1</sup>, Chua Melvin<sup>1</sup>, Tay Ee Ling<sup>2</sup>, Chan Hui Nam<sup>3</sup>, Chng Germaine<sup>4</sup>, Mohamad Rizal<sup>5</sup>, Ng Yee Sien<sup>6</sup> ((1) Department of General Medicine (Geriatric Medicine), Sengkang General Hospital, Singapore; (2) Physiotherapy Department, Sengkang General Hospital, Singapore; (3) Dietetics, Sengkang General Hospital, Singapore; (4) Service Planning, Sengkang General Hospital, Singapore; (5) Nursing Department, Sengkang General Hospital, Singapore; (6) Department of Rehabilitation Medicine, Singapore General Hospital)

**Backgrounds:** Frailty develops insidiously and is often not apparent until acute health crises. The pre-frail state is less extensively investigated, despite greater potential for reversibility. **Objectives:** We explore the feasibility of a community platform for frailty assessment, and examine potentially modifiable risk factors for pre-frailty and frailty in older adults. **Methods:** Community-dwelling older adults (>50 years) underwent a rapid multi-domain geriatric screen, frailty and physical fitness assessment. Participants were categorized as robust, pre-frail or frail using FRAIL scale. The geriatric screen included social profiling, cognitive and psychological domain (Chinese Mini-Mental State Examination, Geriatric Depression Scale), nutritional assessment (Mini-Nutritional Assessment-Short Form), functional performance [activities of daily living (ADLs) (Barthel's Index), instrumental ADLs (Lawton and Brody's)]. Participants completed a battery of fitness tests for flexibility, lower limb strength and power (repeated chair-stand test), upper limb power (Box-and-Block Test), balance, and cardio-respiratory endurance (6-minute walk test). Asian Working Group for Sarcopenia cut-offs defined weak grip and slow gait, to examine diagnostic agreement between FRAIL and Fried frailty phenotype. Frailty index (FI) from a list of 35 deficits

was calculated for each participant. Logistic regression was performed for independent predictors of pre-frailty/ frailty. Agreement between FRAIL and Fried was examined using kappa test. **Results:** Amongst 93 older adults, 60 (64.5%) were robust, 31 (33.3%) pre-frail, and 2 (2.2%) frail. Pre-frail older adults were more likely to be living alone ( $p=0.031$ ). Depression (15%, 45.2%, 100%,  $p=0.001$ ) and malnutrition (11.7%, 54.8%, 100%,  $p<0.001$ ) were significantly associated with pre-frailty and frailty. There was decremental lower limb power ( $p=0.004$ ) and endurance ( $p=0.042$ ) across robust, pre-frail and frail, and pre-frail had the worst balance ( $p=0.012$ ). FI increased across robust, pre-frail and frail ( $p<0.001$ ). Overall percentage agreement between FRAIL and Fried was 64.5%, with overall kappa of 0.346 indicating fair agreement. On multiple logistic regression including age and gender, malnutrition [OR=8.91 (2.74-29.06),  $p<0.001$ ] and depression [OR=1.29 (1.08-1.53),  $p=0.004$ ] were independent predictors for pre-frailty/ frailty. **Conclusion:** We have demonstrated the construct validity of FRAIL for pre-frailty/ frailty. Mood and nutrition should be targets for frailty prevention. Physical fitness declines early in frailty continuum, and exercise interventions should target resistance for lower limb strength and endurance.

#### **P45- ACTIVITIES PROFESSIONALS PLAY CRITICAL ROLES IN LONG-TERM CARE.** Celia M Ross (*Delaware Gerontology Institute, LLC, Wilmington DE, USA*)

**Backgrounds:** Activities directors are healthcare professionals who engage in continuing education to remain current on topics such as how to adapt activities to the needs and capabilities of a diverse elder population. **Objectives:** The objective of this research project was to collect vignettes of interactions between activities professionals and residents in long-term care. **Methods:** Activities professionals, who were working in a variety of regions across the United States, were recruited via LinkedIn posting, conference networking, and snowball sampling methods. Informed consent to participate was obtained and study eligibility was determined. Qualitative data were collected via telephone using in-depth interviews. All interviews were recorded and transcribed. The interviews were then summarized in vignette form and analyzed. **Results:** 1. Activities professionals provide diverse therapeutic enrichment opportunities that can spark memories in residents with dementia; 2. Activities professionals provide emotional support to residents in a long-term care setting; 3. Activities professionals facilitate the residents' endeavors to achieve a sense of purpose and pride; 4. Activities professional assist other members of the healthcare team by sharing relevant information; 5. Activity professionals educate others about topics, such as Alzheimer's disease **Conclusion:** Activities professionals are far more than just nursing home party planners; they are key members of the therapeutic team in a long-term care setting.

#### **P46- SARCOPENIA, BUT NOT FRAILITY, PREDICTS FALLS IN WELL OLDER ADULTS WITH PRE-DIABETES AND DIABETES.** Delwyn Lim<sup>1</sup>, Tay Laura<sup>2</sup>, Noor Hafizah<sup>3</sup>, Yeo Audrey<sup>3</sup>, Yew Suzanne<sup>3</sup>, Ding Yew Yoong<sup>4</sup>, Lim Wee Shiong<sup>4</sup> ((1) *Lee Kong Chian School of Medicine, Nanyang Technological University, Singapore*; (2) *Department of General Medicine (Geriatric Medicine), Sengkang General Hospital, Singapore*; (3) *Institute of Geriatrics and Active Ageing, Tan Tock Seng Hospital, Singapore*; (4) *Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore*)

**Backgrounds:** Falls in diabetic patients may lead to disability, lower quality of life and increased health care costs. The contribution of frailty and sarcopenia to falls risk amongst well community dwelling older adults with pre-diabetes/diabetes is

unclear. **Objectives:** We examined the factors associated with falls in independent community dwelling older adults with type II pre-diabetes and diabetes mellitus (DM). **Methods:** Two-hundred older adults who were independent in activities of daily living were studied. Diabetes and pre-diabetes were diagnosed based upon previous diagnosis, anti-diabetic medications or fasting glucose 6.1 mmol/L. Frailty and sarcopenia were identified using the FRAIL and SARC-F screens respectively. We also assessed comorbidities, cognition, mood, self-rated health, nutrition, physical activity, physical performance and number of falls in the past 12 months. We performed logistic regression to identify independent predictors of falls. **Results:** Our study comprises 64 (32%) DM and 136 (68%) non-DM participants. Older adults with DM were more likely to report at least one fall in the past year compared with non-DM counterparts [unadjusted OR=2.49 (1.231-5.03),  $p=0.01$ ]. DM subjects had a significantly higher SARC-F score [0.61 (0.94) vs 0.38 (0.62),  $p=0.037$ ], although there was no difference in FRAIL scores [0.23(0.46) vs 0.19(0.48),  $p=0.549$ ]. Other significant differences include greater waist circumference ( $p=0.007$ ), more vascular risk factors ( $p<0.001$ ) and lower scores on the Short Physical Performance Battery (SPPB) ( $p=0.032$ ), in particular the balance test component ( $p=0.01$ ), among the DM subjects. In logistic regression adjusted for age, gender, waist circumference and vascular risk factors, the risk of falls increased further for DM subjects [OR=3.88 (1.39-10.87),  $p=0.010$ ]. SARC-F [OR=8.95 (4.43-18.09),  $p<0.001$ ] and SPPB [OR=2.73 (1.05-7.11),  $p=0.040$ ] scores independently predicted falls in the past year. **Conclusion:** Pre-diabetes and diabetes increased the risk of falls among well community-dwelling older adults. Sarcopenia appears to be the predominant risk factor, conferring 8-fold increased odds even in the absence of physical frailty. Physical performance, especially in the balance domain, is also important. Our findings corroborate the critical and early role played by sarcopenia in the pathophysiology of falls in pre-diabetes and diabetes.

#### **P47- THE GERONTOPOLE FRAILITY DATABASE (FDB): A TOOL TO HIGHLIGHT THE SPECIFIC NEEDS OF THE FRAIL ELDERLY PEOPLE.** Christine Lafont, Justine de Kerimel, Neda Tavassoli, Maria Soto, Sandrine Sourdet, Fati Nourhashemi, Bruno Vella (*Toulouse Gerontopole, Regional Team on Aging and Prevention of Dependency, Toulouse University Hospital, France*)

**Background:** Frailty has been conceptualized as a state of increased vulnerability, which increases the risk of adverse health outcomes. For the frail persons, a Geriatric Comprehensive Assessment (GCA) allows to identify the causes of frailty and to purpose integrated care to maintain intrinsic capacities (WHO). The GCA explores several fields using validated scales: nutrition, physical performances, cognition, mood. This assessment can be conducted by different health professionals who use the same tools. The Toulouse Gerontopole (France) built a database collecting data from the assessments of frail older subjects. The evaluation methods (in hospital, primary care and health promotion programs) are also recorded. So this database could be used to identify different profiles in the evaluated populations and help in the implementation of prevention programs. **Objectives:** Describe the population assessed in order to know its specific prevention needs. **Methods:** According to the assessment method, the subjects included in the FDB (2014-2017) were divided into 3 groups: G1) multidisciplinary evaluation, in « Geriatric Frailty Clinic », G2) nurse and family physician, in primary care, G3) Gerontopole nurse with support of a geriatrician, in health promotion programs. These 3 groups were compared: age, sex, frailty status, causes of frailty and the data of the scales used in GCA (MMSE, IMC, MNA, SPPB, GDS) **Results:** From the FDB (2572

subjects) we analyzed 1780 subjects: G1: 964 subjects, G2: 507, G3: 309. In G1 the subjects are oldest 82.4+/- 7 years (G2: 81.6+/-6, G3: 80.8+/-6) and more frail: 40.2% frail, 39.3% pre-frail and 5.9% no frail vs G2: 22.5% frail, 51.9% pre-frail and 20.9% no frail and G3: 25.6% frail, 55.3% pre-frail and 16.2 % no frail). The main frailty domains identified were different in the 3 groups. G1: sensorial field (80.0%), physical performances (63.7%) and nutrition (40.8%) vs physical performances (61.8%), mood (56.8%) and cognition (43.8%) for G2 and mood (56.4%), physical performances (54.8%), and cognition (29.2%) for G3. **Conclusion:** The FDB allows us to describe different profiles of frail elderly subjects which could be a help to implement a gradation in the supply of care and propose a targeted prevention.

**P48- OLDER PERSONS IN ASSISTED LIVING FACILITIES: A TARGET POPULATION FOR PREVENTIVE INTERVENTIONS TO DELAY DEPENDENCY.** Justine de Kerimel, Neda Tavassoli, Christine Lafont, Maria Soto, Yves Rolland, Bruno Vellas (*Toulouse Gerontopole, Regional Team on Aging and Prevention of Dependency, Toulouse University Hospital, France*)

**Background:** In France and others countries, demographic and societal evolution conduct many people over 75 years to live in institution. Entering into a nursing home for the elderly is often linked to medical problems and a loss of autonomy. Between home and nursing home exists an intermediate habitat for elderly people still independent in activities of daily living. There are called assisted living facilities. In France, nearly 130,000 people live in private apartments of assisted living facilities. People who live in these buildings usually have their own private apartments with services which can be included: laundry, food cooked and served, escorts to activities... The mean age of entry into these assisted living facilities now exceeds 80 years, which is 5 years lower than the age of entry into nursing homes. **Objectives:** To know and describe the profile of residents in assisted living facilities to identify their needs in term of prevention, in order to propose preventive interventions to delay the entry into dependency. **Methods:** A prospective, observational and descriptive survey for elderly people living in assisted living facilities. 2 questionnaires were used, one for the managers of assisted living facilities, and the second for elderly residents. In the resident questionnaire different areas were explored: physical performance, nutrition, cognition? **Results:** 29 assisted living facilities participated in the survey. 1274 questionnaires were sent. The responders (n=807, 63.3%) had a mean age of 83.0 years, 74.5% were women, the mean ADL score was 5.4 and the mean IADL score was 5.5. 53.7% were frail, 42.1 % had an impaired mobility, and 4.2% were robust. 37.2% were sarcopenic. 41.6% complained about their memory, 24.7% declared sleep disturbances and 14.6% seemed to be malnourished. **Conclusion:** Our survey shows that a great majority of residents in assisted living facilities are frail or mobility impaired. It is a target population who could have a frail assessment and adapted prevention programs.

**P49- EVALUATION OF THE REPONSIVENESS OF THE SARQOL® QUESTIONNAIRE: RESULTS FROM THE SARCOPHAGE STUDY.** Anton Geerinck, Olivier Bruyère, Médéa Locquet, Jean-Yves Reginster, Charlotte Beaudart ((1) *Research Unit of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium*)

**Background:** The Sarcopenia Quality of Life (SarQoL®) questionnaire was developed to fill the need for a quality of life instrument specific to sarcopenic subjects. The psychometric properties of the SarQoL® were evaluated in 2016 and the

questionnaire was demonstrated to be a valid, consistent and reliable instrument. However, until now, its ability to detect change over time has not been examined. **Objectives:** To evaluate the responsiveness (also known as sensitivity to change) of the SarQoL® questionnaire in a prospective, longitudinal cohort of community-dwelling, older, sarcopenic subjects. **Methods:** Subjects from the SarcoPhAge (Sarcopenia and Physical impairment with advancing Age) study who were diagnosed as sarcopenic according to the EWGSOP criteria were included in the analysis. The responsiveness evaluation was approached in a manner similar to the evaluation of the questionnaire's construct validity, namely by the confirmation or rejection of pre-specified hypotheses on correlations with other questionnaires, a technique in accordance with the COSMIN guidelines. The evolution of the scores on the SarQoL® questionnaire after a 2-year interval was compared to the evolution of the scores on the SF-36 and the EQ-VAS through 9 pre-specified hypotheses on expected correlations between the different questionnaires and their strength. **Results:** A total of 42 sarcopenic subjects were included. The median age of the sample was 72.9 (68.9 - 78.8) years, 59.5% were female, and the mean BMI was 23.28 ± 3.60 kg/m<sup>2</sup>. A good responsiveness was obtained, as evidenced by the confirmation of 8 out of 9 hypotheses, well above the 75% confirmation threshold. Strong correlations ( $r > 0.6$ ) were found for 3 hypotheses, moderate correlations ( $0.412 < r < 0.467$ ) for 5 hypotheses and a low correlation ( $r=0.312$ ) for 1 hypothesis (all  $p < 0.05$ ). **Conclusion:** The first data available on the ability of the SarQoL® questionnaire to detect change over time indicates that the questionnaire has a good responsiveness. This, together with the previously established psychometric properties, confirms that the SarQoL® questionnaire is a relevant instrument for the assessment of quality of life in sarcopenic populations.

**P50- THE IMPACT OF FRAILTY ON SHORT-TERM OUTCOMES AFTER ELECTIVE HIP AND KNEE REPLACEMENT SURGERY IN OLDER ADULTS: A SYSTEMATIC REVIEW.** Abigail M. Schmucker<sup>1</sup>, Nathaniel Hupert<sup>2</sup>, Lisa A. Mandl<sup>2,3</sup> ((1) *Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA, USA*; (2) *Weill Cornell Medicine, New York, NY, USA*; (3) *Hospital for Special Surgery, New York, NY, USA*)

**Background:** Frailty, which has been shown to predict poor postoperative outcomes better than chronologic age in various surgical populations, has not been definitively studied in lower extremity total joint replacement (TJR). As the number and age of patients undergoing TJR increase, clinical care will benefit from a better characterization of the impact of frailty on outcomes after TJR and the potential for risk-reducing interventions. **Objectives:** To review evidence about the clinical impact of frailty on outcomes after TJR in patients 65 years and older, including assessments of interventions to mitigate the effects of frailty. **Methods:** PubMed, EMBASE, Cochrane, SCOPUS, Ageline, and Web of Science Conference Proceedings Index, plus the grey literature and article references, were searched from 1991 through December 15, 2016. Articles evaluating the relationship between preoperative frailty and adverse events or clinical outcomes within 90 days of discharge were included. Data extracted included study design, patient characteristics, frailty instruments, and postoperative outcomes. Risk of bias was assessed using the Newcastle-Ottawa scale for cohort studies and the Cochrane Risk of Bias Tool for randomized controlled trials (RCTs). Two investigators reviewed each study. **Results:** Of 1389 abstracts identified, 64 full-text articles were reviewed, and 8 met inclusion criteria. These 2 RCTs, 4 prospective cohort studies, and 2 retrospective cohort studies together evaluated 165,570 patients,

used 11 different frailty instruments, and evaluated 21 different outcomes. Given the heterogeneity between studies, meta-analysis was not possible. All 6 cohort studies reported a significant association between frailty and poor outcomes and had low risk of bias. The 2 RCTs, which evaluated interventions to improve frailty pre-operatively, did not show any significant associations between frailty-modifying interventions and post-operative outcomes and had high risk of bias. **Conclusion:** Although the evidence base is small, frailty appears to be associated with adverse events and worse clinical outcomes after TJA. This review highlights the need for standardized frailty measures and large-scale, multi-center, prospective studies evaluating the effect of frailty on longer-term TJA outcomes. Such studies would provide evidence on which to base targeted interventions, which could improve the quality of life for those seeking pain-free and mobile old age.

**P51- CONSTRUCTS OF A FRAIL IDENTITY WITHIN A NHS DAY HOSPITAL SETTING.** Chantel Cox<sup>1,2</sup>, Caroline Ellis-Hill<sup>2</sup>, Michele Board<sup>2</sup>, Michael Vassallo<sup>1,2</sup> ((1) *The Royal Bournemouth and Christchurch Hospital NHS Foundation Trust, Bournemouth, England*; (2) *Bournemouth University, Bournemouth, England*)

**Background:** In the UK 50% of people over 85 are living with frailty (Age UK 2017). To date, frailty research has mainly focused on physical interventions and measurements of frailty. Clinically operational definitions of frailty have been debated amongst healthcare professionals but in wider society frailty is commonly seen as a negative term. Older people often do not wish to be defined as frail and this can discourage people from accessing and engaging with frailty services (Age UK and BGS, 2015). **Objectives:** This study aims to understand how a person's sense of self and identity in relation to frailty is created in a NHS Day Hospital which is rated highly by patients. Through exploration of their socio-cultural experiences of care we aim to determine how identity in frail older people is understood and constructed, and how key positive processes could be transferred to support future best clinical practice in other health care settings. **Methods:** Approximately 84 hours of participant observer data were collected from a medium sized NHS Day Hospital. Observations and interviews were made with patients, relatives/carers, staff and volunteers in order to gain insight into the discursive and behavioural processes which contribute to the identities of frail older people within the day hospital. **Results:** The study is ongoing. Initial themes identified relate to a) the work force feeling valued at all grades b) colleague compassion within the team c) patients experiencing many losses d) recognition of the time needed to adapt to new realities rather than expecting a quick recovery and e) small rehabilitation gains being seen and supported by staff, patients and carers. **Conclusion:** Developing and delivering services for frailty is challenging. Patients with frailty need time to adapt to their changing identities. Managing patient expectations and supporting a positive sense of self for both patients and staff is key to continued therapeutic engagement. References: Age UK and British Geriatric Society, 2015. Frailty: Language and Perceptions. London: Age UK and British Geriatric Society. Age UK, 2017. Briefing: Health and Care of Older People in England. Available From [www.ageuk.org.uk/Documents/EN-GB/For-professionals/Research/The\_Health\_and\_Care\_of\_Older\_People\_in\_England\_2016.pdf]

**P52- IS FRAILTY ASSOCIATED WITH ADVERSE EVENTS AFTER TOTAL JOINT ARTHROPLASTY?** Lisa A. Mandl<sup>1,2</sup>, Abigail M. Schmucker<sup>1,3</sup>, Nathaniel Hupert<sup>2</sup>, Mayu Sasaki<sup>1</sup>, Justin T. Do<sup>1</sup>, Charles N. Cornell<sup>1,2</sup>, Michael B. Cross<sup>1,2</sup>, Alejandro Gonzalez Della Valle<sup>1,2</sup>, Mark P. Figgie<sup>1,2</sup>, Seth A. Jerabek<sup>1,2</sup>, Jackie Szymonifka<sup>1</sup>, Steven K. Magid<sup>1,2</sup> ((1) *Hospital for Special Surgery, New York, NY, USA*; (2) *Weill Cornell Medicine, New York, NY, USA*; (3) *Sidney Kimmel Medical College, Philadelphia PA, USA*)

**Background:** The increased volume of Total Joint Arthroplasty (TJA) due to the aging population requires a better understanding of the effect of physiological frailty, in addition to chronologic age, on TJA-associated complications. **Objectives:** To examine the prevalence of frailty among older TJA patients, and to evaluate the association between frailty and short-term complications. **Methods:** Patients 65 years old and medically cleared for elective total knee (TKA) or hip (THA) arthroplasty were recruited. Pre-operative frailty was defined as at least 3/7 frailty characteristics based on the Fried frailty phenotype and a composite frailty score previously validated in surgical populations. Subjects completed the PROMIS-29, SF-12, Depression Screen (CES-D 10), Katz Index of Independence in Activities of Daily Living (ADL), and Hip/Knee Injury and Osteoarthritis Outcome Score (HOOS/KOOS). Grip strength was measured and normalized by age and gender. Cumulative adverse events were recorded at 30 days post-discharge. Stepwise multivariable logistic regressions were performed to ascertain if frailty, or any of its components, were independent risk factors for short-term adverse events (AEs). **Results:** 571 subjects enrolled: mean age 72.9,(65-94), 94.5% white, 62.2% female, 59.1% TKA, 40.9% THA. 8.1% were frail; (7.9% THA, 8.3% TKA). Among patients who reached 30-day follow-up, 108/507 (21.3%) had 161 minor AEs and 34/507 (6.7%) had 53 severe AEs. Controlling for gender, age, and which joint was replaced, Parkinson's disease (OR=1.03; 95% CI 1.01-1.06) was associated with having a moderate AE. For severe adverse events frailty (OR=3.10; 95% CI 1.05-9.20) and age, (OR 1.1; 95% CI 1.03-1.2) were independent predictors of severe AEs. For THA, PROMIS-29 Fatigue T-score (OR=1.07; 95% CI 1.02-1.13), and a history of stroke (OR=15.9; 95% CI 1.27-198.8) were predictors of having a moderate AEs. A higher number of frailty markers (OR=3.84; 95% CI 1.29-11.5) predicted having a severe AEs. There were no independent predictors among TKA. **Conclusion:** Approximately 8% of TJA patients are frail. Frailty/number of frailty criteria were the strongest risk factors for short term severe adverse events among TJA and THA. Whether frailty is associated with long-term adverse events, pain, or function, needs to be established in longitudinal trials.

**P53- FRAILTY AS A RISK OF FALLS AMONG COMMUNITY DWELLING BRAZILIAN OLDER ADULTS.** Paulo Cesar Barauce Bento<sup>1</sup>, Natália Boneti Moreira<sup>1,2</sup>, Andre Luiz Felix Rodacki<sup>1</sup>, Gleber Pereira<sup>1</sup> ((1) *Physical Education Department, Federal University of Paraná, Curitiba, Paraná, Brazil*; (2) *Physiotherapy Department, Dom Bosco College, Curitiba, Paraná, Brazil*)

**Background:** Frailty and falls have been related to increased physical dependence and mortality among older adults. **Objectives:** To verify the relationships between different frailty stages and the fall incidence rates of community-dwelling Brazilian older adults. **Methods:** This cross-sectional study assessed 1,826 older adults (1,392 women; 70.78 ± 7.27 years-old and 434 men; 71.46 ± 7.38 years-old). Frailty was assessed by the Fried Phenotype: unintentional weight loss, exhaustion, low activity, slowness and weakness. The stages of frailty were classified in score 3 frail, 1 or 2 prefrail and 0 not frail. The fall incidence was obtained by questioning individuals

the number of falls experienced in the last 12 months. The Ordinal Logistic Regression and Odds Ratio (OR) were used to determine the relationships between variables. **Results:** The overall incidence of frail was 10.5% (n = 192), 58.8% pre frail (n = 1,073) and 30.7% not frail (n = 561). Forty percent (n = 733) reported at least one fall in the last 12 months, in which 23.0% experienced a single fall episode (n = 419). There was relationship between fall incidence rates and frail (OR = 1.70, p < 0.001, 95%CI = 1.36-2.10), prefrail (OR = 1.49, p < 0.001, 95%CI = 1.22-1.98), not frail (OR= 0.36, p < 0.001, 95%CI = -0.25-[-0.49]). **Conclusion:** Frail older adults demonstrated the greatest risk of falls, followed by pre frail and not frail. These results reveal the importance of intervention strategies to prevent frailty in a challenge to reduce fall incidence rates and its consequences among older adults.

**P54- FALLS AND FRAILTY: WHICH OF THE FRAILTY CRITERIA HAS THE HIGHEST RELATION WITH FALLS AMONG OLDER ADULTS?** Natália Boneti Moreira<sup>1,2</sup>, Andre Luiz Felix Rodacki<sup>2</sup>, Gleber Pereira<sup>2</sup>, Jarbas Melo Filho<sup>2</sup>, Anna Raquel Silveira Gomes<sup>3</sup>, Paulo Cesar Barauce Bento<sup>2</sup> ((1) *Physiotherapy Department, Dom Bosco College, Curitiba, Paraná, Brazil;* (2) *Physical Education Department, Federal University of Paraná, Curitiba, Paraná, Brazil;* (3) *Prevention and Rehabilitation in Physiotherapy Department, Federal University of Paraná, Curitiba, Paraná, Brazil*)

**Backgrounds:** Frailty is defined as a clinical syndrome that is characterized by higher risk for falls, incapacity, and mortality among older adults. **Objectives:** To verify the relationship between frailty criteria and fall history among community-dwelling Brazilian older adults. **Methods:** This cross-sectional study assessed 1,826 older adults both genders (70.98 ± 7.30 years-old). Fried Frailty Phenotype was characterized when three or more criteria as follow: unintentional weight loss; exhaustion; low activity; slowness and weakness. The history of falls was obtained by questioning individuals the number of falls experienced in the last 12 months. The Ordinal Logistic Regression and Odds Ratio (OR) were used to determine the relationship between the outcomes. **Results:** The overall prevalence of frailty was 10.5% (n = 192). The criteria prevalence's to define frailty were: 28% exhaustion (n = 173); 25.7% weakness (n = 159); 23.1% low activity (n = 143); 13.8% unintentional weight loss (n = 85) and 9.4% slowness (n = 58). Sixty-three percent (n = 121) of frail older adults reported at least one fall in the last 12 months. There was relationship of history of falls with the following criteria: low activity (OR = 1.67, p = 0.004, 95%IC = 1.44-1.72), weakness (OR = 1.61, p = 0.002, 95%IC = 1.37-1.82), and unintentional weight loss (OR = 1.54, p = 0.008, 95%IC = 1.13-2.05). **Conclusion:** The low activity indicated the greatest risk for falls, followed by weakness and unintentional weight loss. This finding revealed the importance to promote and encourage older adults to improve physical activity level, which consequently can enhance strength and lean body mass, reducing the frailty clinical components.

**P55- THE POSTAL VERSION OF THE FRAIL SCALE: A COMPARISON WITH THE INTER-FRAIL POSTAL QUESTIONNAIRE.** Zubair Rahaman<sup>1</sup>, Kimberly Cabrera<sup>1</sup>, Shivani Priyadarshni<sup>1</sup>, Michael J. Mintzer<sup>1,2</sup>, Stuti Dang<sup>1,3</sup>, Willy Marcos Valencia<sup>1,3</sup>, Jorge G. Ruiz<sup>1,3</sup> ((1) *Miami VAHS GRECC Veterans Successful Aging for Frail Elders (VSAFE), Miami, USA;* (2) *FIU Herbert Wertheim College of Medicine, Miami, USA;* (3) *University of Miami Miller School of Medicine, Miami, USA*)

**Background:** Frailty is a state of vulnerability to stressors which may result in higher morbidity, mortality and healthcare utilization in older adults. Multiple instruments are used to measure frailty; some

need to be administered, most are time-consuming. **Objectives:** To evaluate the FRAIL scale as a postal screening for frailty in older Veterans compared to the INTER-FRAIL questionnaire. **Methods:** This is a cross-sectional study of community-dwelling Veterans 65 years and older who use the Miami VAMC for healthcare. From January 4th through 14th, 2017, we mailed 1413 Veterans the FRAIL scale and the INTER-FRAIL questionnaire and asked them to complete both. The FRAIL scale is a validated, 5-item questionnaire that categorizes patients into robust (0 points), pre-frail (1-2 points) and frail (3-5 points); the INTER-FRAIL is a 10-item validated postal questionnaire developed by expert consensus. A Pearson correlation was used to assess the relationship between the two tools. We compared the means using one-way ANOVA. We only used completed survey responses for comparisons and correlations. **Results:** The response rate for the mailed instruments was 32% (n=450). These Veterans mean age was 73.05 (SD=6.64) and they were 98.2% male, 61.2% White, 79.2% non-Hispanic and 29.3% live alone. We obtained 404 complete responses (90%). Results from the FRAIL scale showed: 172 (42.6%) robust, 135 (33.4%) prefrail, and 97 (24.0%) frail. We found a large positive correlation between the FRAIL and INTER-FRAIL scales (r=0.729, p=0.01). The INTER-FRAIL questionnaire was statistically significantly different between robust, prefrail and frail groups (Welch's F(2, 226.213)=222.003, p<.0005). The INTER-FRAIL score increased from the robust group (3.10 (SD=1.25, 95% CI [2.91-3.29]), to the prefrail (4.85 (SD=1.73, 95% CI [4.56-5.15]) and frail (6.66 (SD=1.40, 95% CI [6.38-6.94]) groups, in that order. Post hoc analysis revealed that the increase from robust to prefrail (1.75, 95% CI [1.34-2.17]) was statistically significant (p=.05), as well as the increase from prefrail to frail (1.81, 95%CI [1.32-2.30], p=.005). **Conclusion:** The postal version of the FRAIL scale is a feasible and practical screening for frailty in older adults and compares favorably with the INTER-FRAIL postal questionnaire. Postal screening may assist clinicians in targeting patients with frailty for further geriatric assessment.

**P656- COEXISTING FRAILTY AND DEPRESSION IN OLDER VETERANS: OUTPATIENT CARE, EMERGENCY ROOM AND HOSPITAL UTILIZATION.** Sruthi Nelluri<sup>1</sup>, Mercedes Rodriguez<sup>2,3</sup>, Zubair Rahaman<sup>1</sup>, Kimberly Cabrera<sup>1</sup>, Shivani Priyadarshni<sup>1</sup>, Michael J. Mintzer<sup>1,4</sup>, Stuti Dang<sup>1,3</sup>, Willy Marcos Valencia<sup>1,3</sup>, and Jorge G. Ruiz<sup>1,3</sup> ((1) *Miami VAHS GRECC Veterans Successful Aging for Frail Elders (VSAFE), Miami, USA;* (2) *Miami VAHS Mental Health Service, Miami, USA;* (3) *University of Miami Miller School of Medicine, Miami, USA;* (4) *FIU Herbert Wertheim College of Medicine, Miami, USA*)

**Background:** Frailty is a state of vulnerability to stressors resulting in higher morbidity, mortality and healthcare utilization in older adults. Depression and frailty often coexist in older individuals suggesting a bidirectional relationship that may further amplify the effects of each condition on healthcare utilization. **Objectives:** The purpose of this study was to determine the effects of concurrent frailty and depression on healthcare utilization of older Veterans. **Methods:** Prospective cohort study included 566 Veterans, 65 years and older receiving care at the Miami VAMC. Over 1-year, we collected socio-demographic, medical and utilization data; we also administered the 5-item FRAIL Scale (frail 3; pre-frail 1-2; robust 0 points). At year's end, we aggregated data on patients with a least one outpatient visit, hospitalization and/or ER visit. We compared demographic and healthcare utilization data among the 4 possible combinations of coexistent frailty and depression: non-frail/non-depressed (NF-ND); non-frail/depressed (NF-D); frail/non-depressed (F-ND); and frail/depressed (F-D). We used one-way ANOVA for

continuous and Chi square for categorical variables. **Results:** Patient were 97.7% male, % 63.8 White, 75.2 % non-Hispanic and the mean age was 77.11 (SD=8.23) years. Veterans with depression represented 32.5% (n=184) of the total. There were more hospitalizations in the F-D (n=31, 35.2%) group than any of the other groups: F-ND (n=36, 27.5%), NF-D (n=25, 26.0%) and NF-ND (n=29, 11.6%). However, only the difference between F-D and the NF-ND group was significant (p=.0005). The number of ER visits was significantly higher in the F-D group (n=54, 61.4%) than the other groups: F-ND (n=53, 40.5%), NF-D (n=36, 37.5%), and NF-ND (n=70, 27.9%) in that order (p<.0005). Only 4 patients required hospital admission and 10 patients had an ER visit due to mental illness. There were no differences in total outpatient visits between groups, however, there were more patients with a least one outpatient visit to mental health in F-D (n=62, 70.5%), NF-D (n=62, 64.6%), than the F-ND (n=40, 30.5%) and NF-ND (n=53, 21.1%), p<.0005. **Conclusion:** This study shows that older Veterans who are frail and depressed have higher utilization of costly healthcare services - that are not mental-health related - than frail/non-depressed, non-frail/depressed or non-frail/non-depressed individuals.

#### **P57- THE INTERACTION OF FRAILTY AND SARCOPENIA IN ADVANCED EPITHELIAL OVARIAN CANCER PATIENTS UNDERGOING PRIMARY DEBULKING SURGERY.**

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**Background:** Patients with advanced epithelial ovarian cancer (EOC) have high rates of morbidity and mortality after primary debulking surgery (PDS). **Objectives:** We have found clinically significant independent subsets of frail and sarcopenic patients with EOC undergoing PDS. **Methods:** Patients undergoing PDS for Stage IIIC/IV EOC between 2006-2011 were included. A Rockwood frailty index (FI) was calculated for all patients in the study. Body composition was evaluated using Slice-O-Matic software v4.3 (TomoVision). Recursive partitioning was utilized to categorize patients with similar overall survival based on MSA and FI. **Results:** 170 patients were included, with a mean age of 64.4 (SD, 10.3) years. Median FI was 0.08 (IQR, 0.03-0.15), and the average mean skeletal attenuation was 33.5 (SD, 10.1) Hounsfield units (HU). Overall median survival for the entire cohort is 40.2 months. Recursive partitioning methods split patients into three groups according to overall survival. Group 1 includes 21 patients with MSA <21.6 HU. Group 2 and 3 both had MSA<21.6 HU, but were further differentiated by FI. Group 2 includes 55 patients with MSA <21.6 HU and FI <0.1. Group 3 includes 94 patients with MSA < 21.6 HU and FI < 0.1. Median overall survival for Groups 1, 2, and 3 is 24.7, 40.2, and 52.2 months, respectively. Group 1 had the lowest rate of high complexity surgery despite a similar stage distribution compared to the other two groups. This resulted in a higher rate of suboptimal resection in Group 1 (28.6% versus 12.7% and 3.2% in Groups 2 and 3). There does not appear to be differences in grade 3+ Accordion complications between groups, (23.8%, 23.6%, and 20.2% in Groups 1-3), however death within 90 days of surgery was highest in in Group 1 (14.3% versus 5.5% and 5.3% in Groups 2 and 3). **Conclusion:** Patients undergoing primary debulking surgery for ovarian cancer commonly have poor muscle quality and frailty. Patients with poor muscle quality have the worst outcomes, however a FI can further discriminate patients who may experience worse peri-operative and oncologic outcomes.

**P58- THE CARE ASSESSMENT NEED (CAN) SCORE AS A SCREENING FOR FRAILTY.** Shivani Priyadarshni<sup>1</sup>, Zubair Rahaman<sup>1</sup>, Kimberly Cabrera<sup>1</sup>, Michael J. Mintzer<sup>1,2</sup>, Stuti Dang<sup>1,3</sup>, Willy Marcos Valencia<sup>1,3</sup>, Jorge G. Ruiz<sup>1,3</sup> ((1) *Miami VAHS GRECC Veterans Successful Aging for Frail Elders (VSAFE), Miami, USA*; (2) *FIU Herbert Wertheim College of Medicine, Miami, USA*; (3) *University of Miami Miller School of Medicine, Miami, USA*)

**Background:** Frailty is a state of vulnerability to stressors resulting in higher morbidity, mortality and healthcare utilization in older adults. Multiple instruments are used to measure frailty but are time-consuming. The VHA developed and implemented the Care Assessments Needs (CAN) score as a predictive analytic tool, automatically generated from electronic health record data using a statistical model and expressed as a percentile, ranging from 0 to 99. At a percentile 95, the CAN score predicts hospitalization and mortality at one year with good areas under the receiver operating characteristic (ROC) curve. **Objectives:** The purpose of the study was to validate the CAN score as a screening tool for frailty among older adults in clinical practice. **Methods:** This cross-sectional study compared the CAN score with a reference standard, a 40-item Frailty Index, generated using retrospective data collected during a Comprehensive Geriatric Assessment (CGA). To assess the ability of the CAN score to screen for frailty, we calculated the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and diagnostic accuracy (assessed by the area under the ROC curve) at two percentile scores: 95 and 55 (a score that provides a sensitivity over 90% to identify frailty). **Results:** 184 patients over age 65 were included in the study: 98% male, 61% White, 80% non-Hispanic. Our CGA-based Frailty Index defined 13% as robust, 55% as prefrail and 32% as frail. At the 95th percentile, the CAN score provides sensitivity, specificity, PPV and NPV of 43%, 89%, 63% and 78% respectively; at the 55th percentile, the sensitivity, specificity, PPV and NPV are 92%, 40%, 43%, and 91%, respectively. Area under the ROC curve was 0.736 (SE=0.038, p<.0005, 95% CI= 0.661 - 0.811). **Conclusion:** The automatically generated CAN score is a potential screening tool for frailty among older adults. A CAN score of 55 will reduce the population of those who may need further frailty screening but geriatric resources may be needed to identify and eliminate those defined as false positives. At the 95 percentile, the CAN score provides acceptable diagnostic accuracy to proceed with frailty interventions but some patients with frailty will escape early recognition.

#### **P59- ASSOCIATION BETWEEN PTSD AND THE FRAILTY SYNDROME IN OLDER VETERANS.**

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**Background:** Frailty is a state of vulnerability to stressors resulting in higher morbidity, mortality and healthcare utilization in older adults. Studies confirm frailty is a common syndrome in older veterans. PTSD is also prevalent in older veterans and has a relationship with exposure to trauma. There is an association between PTSD and other mental/ physical conditions that may contribute to frailty. As the number of older veterans increases, a significant proportion will experience simultaneous PTSD and frailty. **Objectives:** To study the cross-sectional association between PTSD

and the frailty syndrome in older Veterans. **Methods:** This was a cross-sectional study of Veterans 65 years and older using the Miami VA Medical Center for outpatient healthcare. We collected socio-demographic information and administered the 5-item (1 point/item) FRAIL Scale. Frail patients were defined as 3 points or greater; pre-frail as 1 or 2 points; robust as no points. We extracted data from the VA electronic health record (EHR) regarding medical and psychiatric conditions. We reported descriptive statistics and compared prevalence of PTSD between robust, pre-frail and frail groups. We used one-way ANOVA for continuous and Chi square for categorical variables. A binomial logistic regression was performed to study the cross-sectional association between PTSD and the frailty syndrome. We dichotomized the variables into frail and not-frail, robust and prefrail individuals. **Results:** 566 patients over age 65 were part of the study: 97.7% male, % 63.8 White, 75.2 % non-Hispanic. The mean age was 77.11 (SD=8.23) years. The proportion of robust, pre-frail and frail patients was 48.9 % (n=277), 33.2% (n=188) and 17.8% (n=101) respectively; 17.8% (n=101) of the total also had PTSD. There were no differences in the prevalence of PTSD between the groups (p=.583): robust (n=46, 16.6%). prefrail (n=38, 20.2%) and frail (n=17, 16.8%) groups. In binomial logistic regression, PTSD was not significantly associated with frailty (OR=.906, 95% CI=.416-1.971). **Conclusion:** In our study, PTSD is not associated with the frailty syndrome in older Veterans. Prospective studies are needed to confirm this finding.

**P60- RELATION BETWEEN FRAILTY CRITERIA AND QUALITY OF LIFE IN PRE-FRAIL COMMUNITY-DWELLING OLDER WOMEN.** Hilana Rickli Fiuzza Martins<sup>1</sup>, Ruan Felipe Michalowski<sup>2</sup>, Gabriela Carrascosa Molina<sup>2</sup>, Luiza Bendhack<sup>2</sup>, Audrin Said Wojciechowski PT<sup>3</sup>, Simone Biesek<sup>1</sup>, Jarbas Melo Filho<sup>1</sup>, Luiza Hermínia Gallo<sup>1</sup>, Anna Raquel Silveira Gomes<sup>4</sup> ((1) student in Physical Education, Federal University of Paraná, Curitiba, Paraná, Brazil; (2) Student in Physiotherapy Undergraduate Course, Federal University of Paraná, Curitiba, Paraná, Brazil; (3) Master student in Physical Education, Federal University of Paraná, Curitiba, Paraná, Brazil; (4) Prevention and Rehabilitation in Physiotherapy Department and PhD and Masters Programs in Physical Education (Brazil)

**Backgrounds:** Physical frailty is a common clinical syndrome in older adults, especially in women, and it is associated with increased vulnerability to adverse outcomes, such as disability and falls, that can lead to decrease quality of life. **Objectives:** This study investigated the association between physical frailty criteria and multiple domains of quality of life in pre-frail community-dwelling older women. **Methods:** Twenty-eight pre-frail older women (71±5 years-old; 29±5 kg/m<sup>2</sup>) participated in this study. Frailty was evaluated according to Fried criteria (nonintentional weight loss; self-reported exhaustion/fatigue; low hand grip strength; slowness and low physical activity). Participants were included classified as pre-frail, with one criteria (42.8%; n=12) or two criteria (57.1%; n=16). The following outcomes were assessed: physical activity level (weekly energy expenditure in Kcal, Minnesota), anthropometry (body mass, stature and BMI); grip strength (dynamometer); gait speed (4m) and quality of life (Short Form-36; SF-36). Data are described as mean, standard deviation, absolute and relative frequency. Spearman's test was used to verify correlation between variables (p<0.05). **Results:** Most part of the sample was classified as active (5753,59 ± 3847,12 Kcal; 92.8%, n=26) although mild obesity. The most frequent frailty criteria were grip strength (20.3 ± 6.3 Kg; 53.3%; n=15) and exhaustion/fatigue (50%; n=14). Mean gait speed was 0.76 m/s, classified as slow. The SF-36 domains social aspects (76 ± 20) and functional capacity (72±20) showed the highest scores. Negative moderate association

was detected between exhaustion/fatigue and: vitality (rs= -0.488; p= 0.008); social aspects (rs= -0.440; p= 0.019); emotional limitation (rs= -0.378; p= 0.048); and mental health (rs= -0.413; p= 0.029). It was also verified correlation between grip strength and social aspects (rs= -0.482; p= 0.009). **Conclusion:** Both the most reported frailty criteria, exhaustion/fatigue and low hand grip strength, were related with quality of life domains. The higher is exhaustion/fatigue, lower will be vitality, social aspects, emotional limitation and mental health of pre-frail older women. And, although participants were classified as physically active, they were still mildly obese and slowness.

**P61- ASSOCIATION OF DIABETES MELLITUS WITH FRAILTY PHENOTYPE AND SARCOPENIA IN YOUNG, MIDDLE AGED AND OLDER ADULTS.** Miriam Zylberglait Lisigurski, Carmen Cartwright, Sharmila Ravindranathan, Sameer Shaharyar, Osman Perez, Aimee Almanzar, Jasdip Grewal, Saied Alsabagh (*Internal Medicine Residency Training Program. Aventura Hospital and Medical Center, Aventura, USA*)

**Background:** The correlation between Diabetes Mellitus (DM) and Frailty phenotype (FP) may be explained by the presence of insulin resistance in older adults. DM and FP are predictors of negative health outcomes; early management and prevention of both conditions may improve prognoses. **Objectives:** The aim of our study is to evaluate the correlation between components of the FP and DM in a group of adult patients. **Design:** Prospective, descriptive study evaluating patients > 18 years old in an academic primary care clinic. Measures: Demographic data and DM diagnoses reviewed from medical records. We used the FRAIL scale, deeming patients as robust (R=0 points) or Frailty Phenotype (FP ≥1 points). Handgrip strength (JAMAR dynamometer) was used to divide patients based on presence or not of sarcopenic (S). We combined these tools, and if both were present, patients were designated as FPS. Data Analysis: We performed descriptive statistics, comparing DM and no-DM patients. Chi-square and t-tests were used for categorical and continuous variables respectively. Logistic regression analysis was utilized to ascertain the effect of FP, S, and FPS on DM. **Results:** We evaluated 245 participants, mean age of 51±17 years (range:19-97), 54(22%) were > 65 and 129(53%) were female. Fifty-six (23%) were diabetic. FP, S, and FPS were present in 101(41%), 124(51%) and 65(27%) participants respectively. No significant differences existed in gender (26% vs 21%; p=0.37), or age group (22% vs 28%; p=0.38) between DM and Non-DM. Frequency of FPS (18% vs 31%; p=0.018), S (20% vs 26%; p=0.25) and FP (20% vs 33%; p=0.036) were increased in DM, however not reaching statistical significance in the case of sarcopenia. Increased odds of DM in FP (OR=1.6 95% CI 1.12-3.7) and FPS (OR=1.9 95% CI 1.04-3.7), but not in S patients (OR=1.4 95% CI 0.7-2.6). FP and FPS persistently lead to increased odds of having DM; statistical significance only for FP. **Conclusion:** DM seems to be associated with FP regardless of age or gender. Future studies should focus on recognizing the long-term consequences of the coexistence of these entities and identify methods to prevent negative outcomes for diabetic patients that present with characteristics of frailty phenotype.

**P62- CHARACTERISTICS OF THE FRAILTY PHENOTYPE ON YOUNG, MIDDLE-AGED, AND OLDER ADULTS. A SINGLE CENTER EXPERIENCE.** Miriam Zylberglait Lisigurski<sup>1</sup>, Sameer Shaharyar<sup>1</sup>, Carmen Cartwright<sup>1</sup>, Omar Jamal<sup>1</sup>, Chi Chan Lee<sup>1</sup>, Sharmila Ravindranathan<sup>1</sup>, Matteo Cesari<sup>2</sup> ((1) Internal Medicine Residency Training Program. Aventura Hospital and Medical Center, USA; (2) Centre Hospitalier Universitaire de Toulouse. France)

**Background:** Frailty phenotype has been well described in the elderly, however, there is limited data in middle aged and younger populations. Sarcopenia, a pillar of the frailty syndrome, affects individuals since the second-third decade of life and is strong predictor for negative health outcomes. **Objectives:** The aim of this study is to evaluate the prevalence and characteristics of the frailty phenotype in young and middle age individuals using the FRAIL scale. **Methods:** Prospective, descriptive study that evaluated a sample of patients 18 year and older in an academic primary care clinic. Using tertiles, patients were divided in 3 age groups (19-44, 45-58, and 59-97). Based on the FRAIL scale; patients were defined as robust (0 points), pre-frail (1-2 points), and frail ( $\geq 3$  points). We performed descriptive statistics; Chi-square and t-tests were used for categorical and continuous variables respectively. **Results:** We evaluated 236 patients, mean age of 51.5 +/- 16.6 years, 44.1% male; 9.3% were frail, 36.9% pre-frail and 53.8% robust. Frailty was more prevalent in the 45-58 and 59-97 groups (11% and 14% vs 2.6% respectively;  $p=0.038$ ). Fatigue and weight loss were the most frequent components of the FRAIL scale in the 19-44 and 45-58 age groups (26% and 20% respectively). In the oldest group, difficulty with resistance was the most frequent component, followed by impaired ambulation and fatigue (28%, 22% and 21% respectively). When compared age groups among males, no differences were found on frequency of frailty or their components. Impaired resistance (10.8% vs 18.8% vs 40.4%;  $p=0.004$ ) and abnormal ambulation (7.8% vs 11.1% vs 21.8%;  $p=0.02$ ) were more frequent in the oldest than youngest women. **Conclusion:** The present study discloses a high prevalence of young and middle-aged adults with frailty phenotype. The components of the frailty phenotype appear to differ across age groups and gender. Further studies should focus in evaluating and understanding the long-term clinical implications of the frailty phenotype in young and middle age populations.

**P63- DIAGNOSTIC CRITERIA AND PREVALENCE OF SARCOPENIA IN MIDDLE AGED AND ELDERLY WOMEN FROM NORTHEAST BRAZIL: A CROSS-SECTIONAL COMMUNITY BASED STUDY.** Rafaella Silva dos Santos, Mariana Carmem Apolinário Vieira, Rafaela Andrade do Nascimento, Mayle Andrade Moreira, Saionara Maria Aires da Câmara, Álvaro Campos Cavalcanti Maciel (Universidade federal do rio grande do norte (ufrn, Brazil)

**Background:** Sarcopenia originally refers to skeletal muscle mass loss with aging. Although, the most current definitions associate sarcopenia not only to muscle mass reduction, but also to impairments in muscle function and strength. International Working Group on Sarcopenia (IWGS), the European Working Group on Sarcopenia in Older People (EWGSOP) and the Asian Working Group for Sarcopenia (AWGS) are the main consensus studying sarcopenia around the world, however, there are differences regarding their diagnostic criteria. **Objectives:** To verify differences in the prevalence of sarcopenia using IWGS, EWGSOP and AWGS. **Methods:** Cross-sectional analytical study, composed by 671 women between 40 and 80 years old, divided in 3 groups (40 to 50, 51 to 60 and 61 to 80 years

old). Demographic and socioeconomic data, physical activity and anthropometric measurements were collected. Muscle mass, handgrip strength and walking speed were evaluated. In statistical analysis, mean and standard deviation were used for quantitative variables and absolute and relative frequencies for categorical variables. From the frequencies, the prevalence of sarcopenia was verified through the diagnostic criteria of each consensus. **Results:** In the 40 to 50 age group, the lowest prevalence of sarcopenia observed among the three consensuses used was 2.40% (IWGS) and the highest was 6.70% (AWGS). In the 51 to 60 age group, the lowest prevalence was 2.70% (IWGS) and the highest was 5.90% (EWGSOP and AWGS). In the 61 to 80 age group, the lowest prevalence was 18.90% (IWGS) and the highest was 25.60% (EWGSOP and AWG). **Conclusion:** In all age groups, the lowest prevalence of sarcopenia was found using the IWGS diagnostic criteria. The prevalence of sarcopenia using EWGSOP and AWGS diagnostic criteria were very similar and always higher than the prevalences according to the IWGS criteria.

**P64- SIDE BY SIDE COMPARISON OF ROCKWOOD INDEX AND RISK ASSESSMENT INDEX AS PREDICTORS OF SURGICAL COMPLICATIONS AT A TEXAS SAFETY NET HOSPITAL SERVING A LARGE HISPANIC POPULATION.** Alex F. Bokov, Desiree S. Wilson, Sara E. Espinoza, Paula K. Shireman (UT Health, San Antonio, TX USA)

**Background:** In 2013, an international expert panel organized by the American Medical Directors Association published a consensus report stating that frailty is a clinically important syndrome that is tractable to interventions and recommending that all patients older than 70 be screened for frailty. Frailty is one of the best predictors of 30-day postoperative complications and early hospital readmissions. A number of studies have used the Administrative Risk Analysis Index (RAI-A) (Melin et al. 2015; Isharwal et al. 2017) to retrospectively predict frailty in the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) registry. However RAI-A depends on variables that not all ACS NSQIP sites record in their registries (such as cognitive status) and it cannot be calculated from electronic medical record (EMR) data, precluding future use as an automated decision support tool in surgery. Despite these limitations RAI-A has proven to an accurate predictor of surgical complications but there is room for further improvement both in predictive accuracy and adaptability to EMR systems. An alternative, the Rockwood Index (RI) (Rockwood and Mitnitski 2006), comes from geriatrics and public health. It is robust against variable selection, does not use variable-weights, and can be calculated directly on ICD-10 codes and laboratory value flags. An abbreviated form was used to predict surgical outcomes (Jokar et al. 2016) but it relied on questionnaires rather than coded electronic data. **Objectives:** 1. Determine whether RAI-A can be re-scaled to be an accurate predictor of 30-day readmissions, mortality, and Clavien-Dindo level-4 complications even in the absence of information about the patient's cognitive status. 2. Determine whether the predictive accuracy of RAI-A can be further improved by re-weighting of the variables that comprise it. 3. Derive RI for ACS NSQIP and determine whether it has a comparable predictive accuracy than RAI-A. **Methods:** The outcomes of interest were 30-day readmissions after surgery, all cause mortality, and number of Clavien-Dindo level-4 complications that were not already present at the time of surgery. For the first two, Cox proportional hazard models were used. For the last, Poisson regression was used. The performance of the three predictors was compared using AUC. Model development was done on a randomly sampled developmental set, and hypothesis testing of the final models was done on a the remaining data. **Results:** Re-scaling and re-weighting

improved the predictive accuracy of RAI-A and RI accuracy was equal to or better than both of them. **Conclusion:** Unlike RAI-A, RI is portable to EMR systems, and its good performance side by side with RAI-A suggests that RI can be developed into an automated EMR-based tool for surgeons.

**P65- CLINICAL AND BIOMETRICAL FACTORS ASSOCIATED TO FRAGILITY IN ELDERLY FROM HOSPITAL UNIVERSITARIO DE SANTANDER IN YEARS 2016 AND 2017.** Mario Corzo, Claudia Figueroa, Miguel Cadena, Andrés Ochoa, Fabio Suárez, Paula Casanova, Diego Moreno (*Internal Medicine Department. Universidad Industrial de Santander. Hospital Universitario de Santander, Bucaramanga, Santander, Colombia*)

**Background:** Fragility syndrome leads to severe deterioration of functionality associated to adverse outcomes like disability, multiple hospitalizations, falls, loss of mobility and cardiovascular disease. In Colombia has been reported a prevalence of 12.5%. **Objectives:** measure the prevalence of fragility according to Fried criteria in patients older than 65 years old from Hospital Universitario de Santander and the behavior of biometric and clinical factors associated to fragility. **Methods:** Transversal cut analytic observational study with non-probabilistic sampling since January 2016 to June 2017 in patients older than 65 years old in tracing >48 hours by internal medicine service. **Results:** It has been included 155 patients, 65.1% (n=101) were women. Median of body mass index was 23.4 Kg/m<sup>2</sup>, of calf circumference was 33 cm. Walking speed had a median of 0.7 meters/second and Barthel index of 95 points. Prevalence of fragility was 60.6% (n=94), in bivariate analysis it was found an association of fragility risk with having a calf circumference <31 cm (p=0.000), pre-tension strength <15 Kg/f (p=0.003), walking speed <0.8 m/sec (p=0.000), Charlson comorbidity index >2 (p=0.013), Barthel Index <90 (p=0.000) and age >75 years old (p=0.001). Regarding fragility in multivariate analysis, it was found OR=3.9 for calf circumference <31 cm (IC95%:1.6-9.9; p=0.03), OR=6.1 for walking speed <0.8 meters/second (IC95%:2.7-14; p=0.000), OR=2.4 for age >75 years old (IC95%:1.04-5.7; p=0.039), OR=4.5 for Barthel Index <90 points (IC95%:1.3-15.2; p=0.015); this last variables showed an area under the curve ROC of 0.84. Additionally, protection tendency for fragility was observed when being men (p=0.005) and having a body mass index >27 Kg/m<sup>2</sup> (p=0.16); multivariate analysis for fragility showed OR=0.2 (IC95%:0.08-0.5; p=0.001) for being men y OR=0.25 (IC95%:0.10-0.62; p=0.003) for having a body mass index >27 Kg/m<sup>2</sup>. **Conclusion:** Fragility prevalence in elderly was 60.1%. Patients older than 75 years with walking speed <0.8 m/sec, calf circumference <31 cm and Barthel Index <90 points have more risk of fragility; while being men and have overweight can be protective factors.

**P66- A COMPARISON OF FRAILTY CRITERIA IN HISPANIC/LATINO AND NON-HISPANIC/LATINO OLDER ADULTS IN SOUTH FLORIDA.** Katalina F. McInerney, Joyce Gomes-Osman, Nikhil Banerjee, Sarah Getz, Sun Ni Li, Annelly Bure-Reyes, Marina Sarno, Stacy Merritt, Wendy Gaztanaga, Chuanhui Dong, Xiaoyan Sun, Tatjana Rundek, Bonnie Levin (*University of Miami; Evelyn F. McKnight Brain Research Institute, Miami, USA*)

**Background:** Frailty is defined as a clinical decline in age related functioning that results in increased vulnerability and reduced ability to cope with stressors. Fried's frailty phenotype has been used to operationally define frailty as consisting of five clinical features: unintentional weight loss, grip weakness, slow gait, low physical

activity and self-reported fatigue. There is limited literature regarding the prevalence of frailty among the Hispanic/Latino (H/L) population. **Objectives:** The aim of this study was to identify whether H/L individuals differ in their risk of frailty compared to their non-H/L counterparts. **Methods:** Participants from the Evelyn F. McKnight University of Miami Frailty Registry were included in the study. All participants completed demographic questionnaire and a frailty assessment based on Fried. A dichotomous variable was created to identify individuals who met criteria for non-frail or pre-frail (1 - 2 components)/frail (> 3 components). H/L and non-H/L groups were compared based on their frailty classification along the new dichotomous variable as well as performance on individual phenotypic criteria. Age and education were controlled for. Significance was set at p<0.05. **Results:** Two hundred and thirty-three participants (85 H/L, 146 female, mean age 68.74±10.29, mean years of education 14.91±3.19) completed the study. Results from a logistic regression controlling for age and education indicated H/L individuals are at significantly higher risk of meeting criteria for pre-frail or frail (p=.036). An analysis of performance on the various frailty features showed the H/L group presented with more unintentional weight loss (t (222)=-2.33, p=.021) and slower gait speed (t (222)=-2.33, p=.03). No differences were observed on the other Fried criteria. **Conclusion:** In a sample of ethnically diverse aging adults from South Florida, Hispanic/Latino individuals carry an elevated risk of pre-frailty, independent of age and education, characterized by weight loss and slow gait speed. Funding source: Evelyn F. McKnight Brain Research Institute.

**P67- LOW EMOTIONAL RESERVE AS A RISK FACTOR FOR THE FRAILTY SYNDROME INDEPENDENT OF GENDER.** Sarah J. Getz, Katalina F. McInerney, Nikhil Banerjee, Joyce Gomes-Osman, Sun Ni Li, Stacy Merritt, Wendy Gaztanaga, Annelly Bure-Reyes, Marina Sarno, Chuanhui Dong, Xiaoyan Sun, Tatjana Rundek, Bonnie Levin (*University of Miami, Miami, USA*)

**Background:** Frailty is highly prevalent, occurring in 25% of elderly individuals, up to 50% of people over 85, and is associated with a significant increase in the risk of disability, extended long-term care, and death. The relationship between frailty and cognition is bidirectional. Few studies have examined the role of emotional factors in frailty. **Objectives:** This investigation explores the impact of emotional reserve on the frailty syndrome. **Methods:** 192 participants from the Evelyn F. McKnight University of Miami Frailty Registry (ages 50 to 91) completed the Adverse Childhood Experiences (ACE) questionnaire, Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI-II), and a full frailty assessment based on Fried criteria. Participants were grouped by frailty phenotype (non-frail or pre-frail & frail) and categorized according to level of emotional reserve. Participants were also grouped into Normal (NER) vs. Low emotional reserve (LER) based on ACE, BAI, and BDI-II scores. A binary logistic regression was performed. Age and education were included as covariates in the model. The same model was run for men and women independently. **Results:** Of the 192 participants, 140 met criteria for frail/pre frail and 75 were classified as having LER. 41 participants were classified as normal (i.e., average levels of emotional reserve and non frail). The logistic regression model was statistically significant, (X<sup>2</sup> (3) = 23.13, p < .001), explaining 16% (Nagelkerke R<sup>2</sup>) of the variance in frailty phenotype and correctly classifying 75% of cases. LER participants were 4.16 times more likely to be frail. The model remained significant when women (p < .05) and men (p < .05) were independently included. **Conclusion:** Results from a binary logistic regression indicate that LER, as defined by anxious and depressive symptomatology in the presence of a history of

childhood adversity, is an important predictor of frailty risk. Outcomes from this model did not differ based on gender. This conclusion is further supported by the lack of significant change in our model after controlling for age and education. These data suggest that history of adverse childhood events and emotional factors should be considered an important component of frailty evaluations for both men and women.

**P68- FRAILTY AND SURGERY POST COMPLICATIONS IN ELDERLY PATIENTS WITH SEVERE CARDIAC VALVE PATHOLOGY.** José Losa-Reyna, Elisa García-Tercero, Susana Martín-Braojos, Julián Alcázar, Pedro Lima, M<sup>a</sup> Pilar Pareja, Alfonso Cañas, Ignacio Ara, Francisco José García-García, Ana Alfaro-Acha (*Frailty Unit. Dpt. of Geriatric. Hospital Virgen del Valle, Toledo, Spain*)

**Background:** Frailty prevalence is approximately twice in patients with cardiac valve pathology after accounting for age and frail patients are in increased risk for cardiac and cerebrovascular adverse events, morbi-mortality and functional deterioration. Duration in intensive care unit (ICU) and in-hospital stay is greater in frail patients after a cardiac procedure. However, frailty classification is not commonly used in Cardiac Units. **Objectives:** To determine post-surgery complications and functionality in frailty groups of elderly (>70 years) with severe cardiac valve pathology undergoing cardiac surgery. **Methods:** Before surgery, patients derived from Cardiology Unit underwent a Comprehensive Geriatric Assessment [1] and data was collected including demographic characteristics, toxic habits, comorbidity, functional (Barthel) and cognitive status, nutritional assessment, physical activity habits, physical function tests [Short Physical Performance Battery (SPPB) and handgrip strength] and frailty phenotype [2]. Heart failure was assessed with the New York Heart Association (NYHA) Functional Classification. Robust and pre-frail patients were given exercise and nutrition instructions and went through surgery. Frail subjects were checked by the Heart Team and each case was considered individually. **Results:** A total of 47 patients (57% women, median age 81.4 years, range 74-91) were assessed and 26 intervened. A 79 % were derived with moderate or severe aortic stenosis and 13 % with severe mitral pathology and 8% with both. Additionally, patients had a NYHA grade II (37%), grade III (60%) and grade IV (3%). In the initial evaluation, prevalence of frailty was 32% (57% pre-frail and 11% robust). Frail subjects had a lower gait speed, SPPB (vs. pre-frail and vs. robust,  $p<0.01$ ) and Barthel (vs. robust,  $p<0.01$ ). Robust patients had higher handgrip (vs. pre- and frail,  $p<0.05$ ). After cardiac intervention, 4% of patients died, spent  $5.2\pm 7.1$  days (1-39) in ICU and  $6.1\pm 8.0$  days (0-44) hospitalised, suffering  $1.8\pm 1.3$  post-surgical complications. However, groups of frailty did not experience differences in complications outcomes in our sample. **Conclusion:** Baseline frailty before surgery and functionality was worse in frail patients although this may influence peri- and post-surgical complications in elderly patients undergoing cardiac valve repair/replacement surgery. Future studies should increase sample size and include additional frailty measures and a Comprehensive Geriatric Assessment for a better stratification of surgical risk, planification of intervention and pre-rehabilitation of patients.

**P69- FRAILTY IS AN PREDICTOR OF COGNITIVE IMPAIRMENT: EVIDENCE FROM TOLEDO STUDY FOR HEALTHY AGING.** Cristina Rosado-Artalejo, Jose Antonio Carnicero, Jose Losa-Reyna, Beatriz Cobos Antoranz, Ana Alfaro-Acha, Carmen Castillo-Gallego, Leocadio Rodríguez-Mañas, Francisco José García-García (*Hospital Virgen del Valle, Complejo Hospitalario de Toledo, Spain*)

**Background:** Cognitive decline and frailty are entities related to aging that have a negativesocio-economic impact, as they can progress to dementia and disability. Both entities show a close relationship at cross-sectional level, but there are few studies that analyze the joint evolution at the longitudinal level. This study evaluates the reciprocal relationship of both entities over time. **Objectives:** To analyze the relationship between frailty and cognitive decline over time (5 years of follow-up), evaluating the impact of the increase in frailty according to cognitive dimensions in a Mediterranean population. **Methods:** A longitudinal study using data from the Toledo Study for Healthy Aging (TSHA), a population-based cohort of older adults. 1551 participants community-dwelling and institutionalized people aged 65 years old, without cognitive impairment, with 5 years follow-up. Underwent an extensive neuropsychological evaluation of different cognitive domains included the Mini-Mental State Examination (MMSE), Short and Long-Term Memory Recalling Test, the Boston Naming Test, Verbal Fluency Test, Digit Span Forward, Go/No-go Test, Luria Orders Test, and Serial Word Learning Test. Frailty status was assessed by Frailty Trait Scale (FTS). The relationships between the score of the scales and frailty status (baseline and change to follow-up) were assessed using multivariate linear regression models adjusted by age, sex, comorbidity and educative level as possible confounders. **Results:** As FTS score increases, individuals were older, predominantly women, with lower education and higher morbidity. Global cognition, measured through MMSE ( $\beta$  0.01,  $p<0.05$ ) and executive function (frontal Battery) , short-term and long-term free memory (both  $\beta$  0.02,  $p<0.05$ ) are affected early, and their decline is associated with baseline frailty level and changes of the latter over time. On the other hand, free recalling was only associated with frailty level at follow-up ( $\beta$  -0.02,  $p<0.05$ ). When the model only took into account change of frailty level over time, we observed that cognitive decline behaved also as a predictor of frailty. **Conclusion:** Cognition is affected by the evolution of frailty status and this relationship is bidirectional. Both entities evolve rhythmically. Given that frailty is potentially reversible, it could be considered a therapeutic target in the prevention and treatment of cognitive deterioration and dementia.

**P70- EFFECTS OF TWO DIFFERENT PHYSICAL EXERCISE-BASED STRATEGIES TO TREAT FRAILTY.** Iván Baltasar-Fernández<sup>1</sup>, Ana Alfaro-Acha<sup>2,3</sup>, María Isabel Uceta-Espinosa<sup>2</sup>, Roberto Navarro-Cruz<sup>1</sup>, Carlos Rodríguez-López<sup>1</sup>, Francisco José García-García<sup>2,3</sup>, Luis Alegre-Durán<sup>1,3</sup>, José Losa-Reyna<sup>1,2,3</sup> ((1) *GENUD (Growth, Exercise, Nutrition and Development) Research group, University of Castilla-La Mancha, Toledo, Spain;* (2) *Frailty Unit. Dpt. of Geriatric, Hospital Virgen del Valle of Toledo, Toledo, Spain;* (3) *CIBER of Frailty and Aging (CIBERFES), Spain*)

**Background:** Frailty has been described as an age-related multidimensional syndrome characterized by a lack of physiological reserve with an increased vulnerability to stress factors, leading to enlarge risks of adverse health outcomes. Approximately 50% of people over 65 years are categorized as frail or pre-frail in Spain, generating an increase in demands of long-term care and health care costs. There is also a compelling need for effective interventions that restore and/or maintain functional independence and reverse the frailty

process and exercise seems to be the best medicine. **Objectives:** The aim of the present study was to describe the effect of two different physical intervention programs to treat frailty in adults aged 70 years in frailty status and low physical function. **Methods:** Twenty-two elderly people (83.5±4.7 years) classified as frail or pre-frail (based on Fried Frailty criteria) were recruited by the frailty unit and included in the In-Hospital Exercise Program (HEP) (n=17) or in a Home-Based Exercise Program (VEP) (n=5), according to their availability. The HEP performed 1 hour twice a week of combined resistance (leg press machine), focused on muscle power and aerobic training (treadmill), while VEP performed 1 hour three times a week of a multicomponent training based on the Vivifrail Program (calisthenics, balance, gait and flexibility exercises). Physical function and frailty was evaluated with Short Physical Performance Battery (SPPB) and Fried Frailty Scale respectively at baseline and after 8 weeks of each exercise programme. **Results:** The HEP showed statistically significant improvements on 4m gait speed, balance test and chair stand test, improving total SPPB score from 5.9±1.9 to 10.2±1.8 points (p<0.01) and Frailty criteria from 3.5±1.2 to 2.1±1 (p<0.01), while VEP didn't improve neither SPPB score nor Frailty criteria (7.2±2.4 to 7.8±1.9 points and 2.8±1.6 to 2.4±1.5 points respectively, with no statistically significant differences). Finally, seven frail patients of HEP (41%) became pre-frail in contrast to VEP with only one frail patient (20%). **Conclusion:** Eight week of combined exercise power-based HEP, prescribed and professional-supervised, is a safe and well-tolerated strategy to improve physical function and frailty status in elderly people, apparently better than VEP.

**P71- THE PICTORIAL FIT-FRAIL SCALE.** Olga Theou<sup>1</sup>, Emma J Squires<sup>1</sup>, Lisa McGarrigle<sup>1</sup>, Lindsay Wallace<sup>1</sup>, Judah Goldstein<sup>2</sup>, Melissa Andrew<sup>1</sup>, Kenneth Rockwood<sup>1</sup> ((1) *Division of Geriatric Medicine, Department of Medicine, Dalhousie University and Nova Scotia Health Authority, Halifax, Nova Scotia, Canada;* (2) *Emergency Medical Services, Department of Emergency Medicine, Dalhousie University and Nova Scotia Health Authority, Halifax, Nova Scotia, Canada*)

**Introduction:** Several frailty scales have been proposed, but most have significant limitations. Some require performance tests not feasible for the severely frail and many evaluate only the patient's or clinician's perspective. **Objectives:** The purpose of this study was to develop a Pictorial Fit-Frail Scale (PFFS) to measure frailty levels using visual prompts and then evaluate its psychometric properties in clinical settings. **Methods:** A multidisciplinary team identified 14 domains for inclusion in the PFFS (e.g. mood, vision, and mobility). Each domain includes 3-6 levels representing progressively worsening health which allows the assessor (healthcare professionals, patients, and caregivers) to select which picture best represents the patients' health status within each domain. After the initial pictures were developed by a graphic designer, testing was conducted with 345 healthcare professionals, patients and caregivers to provide feedback on the content of the preliminary version of the PFFS. We are currently testing the psychometric properties (feasibility, concurrent validity, inter-rater reliability, intra-rater reliability, responsiveness, and predictive validity) of the final version of the PFFS in three settings: geriatric day hospital, memory clinic, and primary care clinic; ~50 patients per setting. **Results:** Testing during the development phase showed that participants completed the scale in 3.1±1.6 minutes. When participants were asked to rate the scale, 86% of the participants reported that they understood the pictures well, 88% reported that the instructions were clear, and 95% reported that the font and picture size were appropriate. When participants were asked about the usefulness of the scale, 82%, 80%, and 70% reported that the PFFS is useful

if it is completed by a healthcare professional, caregiver, or patient, respectively. Based on feedback, the scale was modified to improve clarity and understanding. Currently we have completed testing for the psychometric properties of the final version of the PFFS with 22 patients (out of the ~150 planned). **Conclusion:** The PFFS is easy to administer, sensitive to cultural differences, and a practical approach for identifying frailty.

**P72- PSOAS LUMBAR VERTEBRAL INDEX (PLVI) AS A PREOPERATIVE CENTRAL SARCOPIENIA PREDICTS THE EARLY CLINICAL OUTCOMES IN ELDERLY CARDIAC SURGERY PATIENTS.** Hiroshi Furukawa, Takeshi Honda, Takahiko Yamasawa, Kazuo Tanemoto (*Department of Cardiovascular Surgery, Kawasaki Medical School, Kurashiki, Japan*)

**Background:** Recently, psoas lumbar vertebral index (PLVI) has provided the potential of central sarcopenia which is easy to measure at the same cross-sectional area of computed tomography (CT). **Objectives:** We retrospectively evaluated the clinical efficacy of PLVI as a central sarcopenia in elderly patients who underwent cardiac surgery (CS). **Methods:** To define the preoperative sarcopenia, PLVI measured by preoperative CT were selected in this study. The same cross-sectional areas of bilateral psoas muscle and vertebral body were easily and manually measured at the fourth lumbar vertebra, and PLVI was calculated using bilateral psoas muscle area / vertebral body area. One hundred sixty consecutive elderly patients older than 75 years old (mean age: 80±4 years, 75~96 years, female:male=76:84) who underwent CS in our institute between 2010 and 2017 were analyzed in this study. Patients with destroyed or highly calcified vertebral body were excluded. The mean PLVI is 1.02±0.31 with range from 0.32 to 1.83. The patients were divided in three groups, group S (GS, sarcopenia, N=23, PLVI < 0.71), group P (GP, pre-sarcopenia, N=113, PLVI 0.71~1.33) and group N (GN, no sarcopenia, N=24, PLVI > 1.33). Early clinical outcomes including survival, postoperative infection-related complication, major cerebrovascular disease (CVD) and the postoperative activities of daily living were retrospectively compared in three groups. **Results:** In-hospital mortality in three groups were 13.0% in GS, 3.5% in GP and 0% in GN, but not statistically significant (p=0.07). The prevalence of infection-related complications in GS was higher than that of GP and GN (GS:13.0%, GP:3.5%, GN:0%, p=0.07), but major CVD was almost similar in three groups (GS:4.3%, GP:4.4%, GN:0%, p=0.58). In GS, the rate of independent walking at discharge was lower than other two groups (GS:70.0%, GP:83.5%, GN:95.7%, p= 0.07). In a mean follow-up period of 21.2±21.3 months, a Kaplan-Meier (K-M) analysis in three groups revealed that 6-month, 1-year and 3-year survival rates were GS: 79.1%, 79.1%, 79.1%, GP: 91.7%, 89.0%, 79.1%, GN: 100%, 92.9%, 92.9%, respectively (p=0.19). **Conclusion:** From these results, PLVI might be a useful prognostic factor as a preoperative central sarcopenia which affects the early clinical outcomes in elderly CS patients.

**P73- FRAILTY AND ADVERSE QUALITY OF LIFE AMONG PERSONS AGING WITH HIV IN BARBADOS.** Damani A. Piggott<sup>1</sup>, Anton Best<sup>2</sup>, T. Alafia Samuels<sup>3</sup>, R. Clive Landis<sup>4</sup>, Gregory D. Kirk<sup>1</sup> ((1) *Johns Hopkins University, Baltimore, MD, USA;* (2) *Barbados Ministry of Health, Bridgetown, Barbados;* (3) *University of the West Indies George Alleyne Chronic Disease Research Centre, Bridgetown, Barbados;* (4) *University of the West Indies Cave Hill, Bridgetown, Barbados*)

**Background:** Frailty is a critical aging-related syndrome marked by increased vulnerability to stress, heightened in HIV and predictive

of major adverse clinical outcomes, including hospitalization and death. The Caribbean region has the second highest HIV prevalence worldwide. Despite a rising proportion of older HIV-infected adults, no data exist characterizing frailty among Caribbean HIV-infected persons. Further limited data exist on the relationship of frailty to quality of life in HIV. **Objectives:** To characterize burden and determinants of frailty and its relationship to quality of life among HIV-infected persons in Barbados. **Methods:** HIV-infected participants were systematically recruited from the main public specialty HIV clinic in Barbados from July 2016 through May 2017. Frailty was assessed based on the 5 physical frailty domains weight loss, low physical activity, exhaustion, decreased grip strength, and slow gait. Health-related quality of life (QoL) was assessed using the Medical Outcomes Study-Human Immunodeficiency Virus health survey. Multinomial logistic regression models were used to estimate the odds (odds ratios) with 95% confidence intervals (CI) for covariates associated with frailty. **Results:** Among 542 study participants (~1/3 of HIV+ patients in active care), 50% were 50 years, 45% were female, 15% had less than a primary school education, and 48% were unemployed. The prevalence of HIV viremia (HIV viral load>200) was 21%, of having 3 chronic comorbidities 11%, and of frailty 11%. Older age, lower educational attainment, unemployment and HIV viremia were significantly associated with frailty. Adjusting for sociodemographics, comorbidity and HIV disease stage, being frail was significantly associated with increased hospitalization (OR 4.11; 95% CI, 1.07, 15.8), increased fear of falls (OR 11.1; 95% CI, 4.65, 26.5) and significantly lower scores in most QoL domains: pain, physical functioning, role functioning, social functioning, mental health, energy, health distress, cognitive functioning, general health perceptions and overall summary scores for physical and mental health. **Conclusion:** Persons living with HIV in Barbados have a high frailty burden strongly associated with socioeconomic disadvantage and poor virologic control, with a significant adverse impact on quality of life. Further elucidation of frailty pathways may facilitate interventions to improve quality of life for aging HIV-infected persons in Barbados and the Caribbean region.

**P74- FRAILTY STATUS AND ADVANCE DIRECTIVE.** Alejandro A. Robles-Torres<sup>1</sup>, Shivani Priyadarshni<sup>2</sup>, Michael J. Mintzer<sup>2,3</sup>, Stuti Dang<sup>2,4</sup>, Willy Marcos Valencia<sup>2,4</sup>, Jorge G. Ruiz<sup>2,4</sup> ((1) Jackson Memorial Hospital, Miami, Florida, USA; (2) Miami VAHS GRECC Veterans Successful Aging for Frail Elders (VSAFE), Miami, Florida, USA; (3) FIU Herbert Wertheim College of Medicine, Miami, Florida, USA; (4) University of Miami Miller School of Medicine, Miami, Florida, USA)

**Background:** Frailty is a state of vulnerability to stressors resulting in higher morbidity, mortality and healthcare utilization in older adults. The value of having advance care planning (ACP) and advance directives (AD) may be greater among frail older Veterans as they are more likely to have a shorter life expectancy than non-frail older patients. The process of advance directive completion may foster goals of care discussions in these patients. **Objectives:** The purpose of the study was to assess the relationship between frailty and AD completion in a group of community dwelling older Veterans. **Methods:** Retrospective chart review included 566 Veterans, 65 years and older receiving care at the Miami VAMC. We collected data on socio-demographics, medical problems, hospitalizations for the year preceding the first visit to frailty clinic. Data also included the FRAIL Scale score (frail(F) 3; pre-frail(PF) 1-2; robust(R)=0 points) and documentation of AD instruments/ACP discussions: living will (LW), durable power of attorney for healthcare (DPOAH), do not resuscitate orders (DNR) and designated healthcare surrogate (HCS). We used

one-way ANOVA for continuous and Chi square for categorical variables. A binomial logistic regression was performed to study the cross-sectional association between completion of advance directives and frailty. We dichotomized AD completion as any AD versus none. **Results:** Patients were 97.7% male, % 63.8 White, 75.2 % non-Hispanic, mean age 77.11 (SD=8.23) years. 314 (55.5%) patients had an ACP discussion, 137 (24.2%), completed a LW, 136 (24%) a DPOAH, 8.7% had a DNR order, and 138 (24.4%) had a HCS. There were no racial, or ethnic differences. Percentage comparisons show: evidence of an ACP discussion (R:45.1%, PF:62.8%, F:70.3%; p.0005), LW (R:14.1%, PF:31.4%, FR:38.6%; p.0005), DPOAH (R:14.1%, PF:30.3%, F:39.6%; p.0005), and a HCS (R:14.4%, PF:30.9%, F:39.6%; p<.0005). Frail patients were more likely to have a DNR discussion than robust (R:5.4%, PF:9%; FR:16.8%; p.0005). In binomial logistic regression, frailty (OR=1.729, 95% CI=1.045-2.858) and hospitalizations (OR=4.118, 95% CI=2.523-6.721) were significantly associated with AD completion. **Conclusion:** Frailty was associated with higher completion of advance directives but the overall completion in this study was low. Strategies that foster advance directives completion are needed in this population.

**P75- PREDICTIVE VALIDITY OF THE BRAZILIAN VERSION OF THE RAPID GERIATRIC ASSESSMENT.** Fabiana de Souza Orlandi, Rafaela Brochine Lanzotti, Juliana Gomes Duarte, Silvia Matumoto, Henrique Novais Mansur, Marcia Regina Cominetti, Sofia Crsitina Iost Pavarini, Marisa Silvana Zazzetta (Federal University of São Carlos, Brazil)

**Background:** The Rapid Geriatric Assessment (RGA) is a useful tool for health professionals to screen for important geriatric syndromes in older people (Morley, Little and Berg-Werger, 2017). It was recently developed at the University of Saint Louis (Morley and Adams, 2015). **Objectives:** To verify the predictive validity of the RGA in Brazilian elderly in the community. **Methods:** This is a methodological study related to the predictive validation of the RGA with Brazilian elderly in the community, performed with people aged 60 years or older, who are primary health care users of São Carlos, São Paulo, Brazil. After the signing of the informed consent, participants were interviewed in their homes, responding to a sociodemographic characterization instrument, the RGA, the Fried frailty phenotype, the Mini Nutritional Assessment and the Addenbroke-Revised Cognitive Examination. In addition, bone densitometry was performed, in which the appendicular muscle mass index was verified, in order to verify one of the criteria for sarcopenia. A descriptive statistical analysis and analysis of the Receiver Operating Characteristic Curve (ROC Curve) were performed. All ethical precepts have been respected. **Results:** It is observed that of the 148 elderly people evaluated, female participants (n = 101, 68.2%), aged between 60 and 69 years (n = 81, 54.8%), (n = 108, 73.0%), married (n = 81, 54.7%), with 1 to 8 years of schooling (n = 94, 63.5%). As to the predictive validity of the RGA, satisfactory ROC Curve values were found in the four RGA instruments. The area under the FRAIL curve was 0.858 (p-value <0.001 and IC95% of 0.723 - 0.993), with a cut-off point for fragility of 3 points. For SARC-F, the area under the curve was 0.775 (p-value = 0.001 and IC95% of 0.640-0.909), with cut-off point for 4-point sarcopenia. For Rapid Cognitive Screening, the area under the curve was 0.873 (p-value <0.001 and 95% CI 0.772-0.974), with a cut-off point for 6-point sarcopenia. For SNAQ, the area under the curve was 0.733 (p-value 0.0012 and IC95% of 0.569-0.896), with cut-off point for 16-point sarcopenia. **Conclusion:** Based on the proposed objective and obtained results, it is concluded that the RGA presented satisfactory predictive validity for the evaluation of the Brazilian elderly in the community.

### **P76- EVALUATION OF FRAILTY IN ELDERLY PEOPLE IN THE COMMUNITY OF SÃO CARLOS, SÃO PAULO, BRAZIL.**

Fabiana de Souza Orlandi<sup>1</sup>, Rafaela Brochine Lanzotti<sup>1</sup>, Juliana Gomes Duarte<sup>1</sup>, Marisa Silvana Zazzetta<sup>1</sup>, Silvia Matumoto<sup>2</sup> ((1) Department of Gerontology, Federal University of São Carlos, Brazil; (2) Nursing School of Ribeirão Preto - University of São Paulo, Brazil)

**Background:** At present frailty represents a priority in public health since it has become a highly prevalent condition in the elderly population. Early identification of the frailty of the elderly, especially in primary health care, can reduce or prevent future disabilities and impacts on the elderly, the family and the health system can be minimized. **Objectives:** In this context the present study aimed to verify the level of frailty in the elderly from São Carlos, São Paulo, Brazil. **Methods:** This is a descriptive cross-sectional study with a quantitative approach carried out with elderly people who are patients of health primary care units in São Carlos. The elderly who accepted to participate in the study, with the signing of the Term of Free and Informed Consent, were interviewed in their homes, where an instrument of scientific characterization and Phenotype of Fried Frailty was applied. A descriptive statistical analysis was performed. All ethical precepts have been respected. **Results:** Among the 148 elderly subjects the majority of participants were female (n = 101, 68.2%), aged 60-69 years (n = 81, 54.8%), white n = 108, 73.0%), married (n = 81, 54.7%), with 1 to 8 years of schooling (n = 94, 63.5%) and with per capita income of R\$ 501.00 to R\$ 1,000.00 (n = 65, 43.9%). Concerning prevalence of frailty syndrome, 39 elderly individuals were robust (26.3%), 76 were pre-frail (51.3%) and 33 were frail (22.4%). **Conclusion:** Based on the proposed objective and results obtained, it is concluded that there is a high percentage of elderly people in the frailty process which is similar to other Brazilian studies findings. It is recommended that interventions are made by the health professionals who assist this population aiming to the reversal or stabilization of frailty syndrome.

### **FUNCTIONAL ASSESSMENT**

#### **P81- MUSCLE MASS ADJUSTED FOR BODY MASS INDEX REVEALS BETTER EFFICACY IN RELATION OF SARCOPENIA WITH FUNCTIONAL MEASURES (MUSCLE MASS ADJUSTMENT METHODOLOGY INFLUENCES THE ASSOCIATION OF LOW MUSCLE MASS WITH FUNCTIONALITY).**

Gulistan Bahat<sup>1</sup>, Sevilay Bovatekan<sup>1</sup>, Yaldaray Topau<sup>1</sup>, Cihan Kilia<sup>1</sup>, Birkan Alhan<sup>1</sup>, A Tufan<sup>2</sup>, Mehmet Akif Karan<sup>1</sup> ((1) Istanbul University Istanbul Medical Faculty Internal Medicine Department Geriatrics Division, Turkey; (2) Marmara University Medical Faculty Internal Medicine Department Geriatrics Division, Turkey)

**Background:** The low muscle mass (LMM) definition differs among the consensus groups in terms of adjustment methods. Some authors suggest to adjust skeletal muscle mass (SMM) by height while some others by weight or body mass index (BMI). The prevalence of sarcopenia differs according to its adopted definition. We aimed to examine which LMM adjustment method reveals better efficacy in relation to its functional outcomes. **Methods:** LMM was evaluated according to our national data [SMM index (SMMI) by height(H): females(F)<7.4 kg/m<sup>2</sup>, males(M)<9.2 kg/m<sup>2</sup>; SMMI by weight(W): F<33.6, M<37.4, SMMI by BMIa: F<0.82 M<1.05 kg/BMI; by BMIb: F<0.68 kg/BMI M <1.02 kg/BMI]. Bioimpedance analysis (BIA) and hand grip strength(HGS) were assessed. The relation of SMMI with hand grip strength, usual gait speed (UGS), activities

of daily living (ADL), instrumental ADL (IADL) and frailty were examined between different adjustment methods. **Results:** 1307 older adults (>60 years old, 421 M, 886 F) were included. The prevalences of LMM were 2.1%, 47.2%, 63.4% and 21% with adjustments by H, W, BMIa and BMIb, respectively. 39.4% had low HGS and 36.1% had low UGS with a total of 54.5% low muscle performance. Prevalences of sarcopenia were 1.3%, 23.9%, 35.2% and 13.2% with adjustments by H, W, BMIa and BMIb, respectively. HGS was correlated with all SMMIs (most being with BMI)(H, r=0.286; W, r=0.298; BMI, r=0.548, p<0.001). UGS, ADL, IADL were not correlated with LMM adjusted by H respectively p=0.267, p=0.71, p=0.49 but those were correlated with W (r=0.077, p=0.009; r=0.08, p=0.008; r= -0.059, p=0.045 respectively) and BMI (r=0.223, p<0.001; (r=0.17, p<0.001; r=0.066, p=0.026 respectively). The LMM by H was only related to ADL (p=0.002) and LMM by W was only related to HGS (p<0.001). LMM by BMIa and BMIb were related to HGS, UGS, ADL, IADL, frailty (p<0.001 for all). **Conclusion:** The prevalences of LMM and sarcopenia change significantly between SMM adjustment methods. Muscle mass adjustment with BMI proves better relation with functional associations of sarcopenia.

#### **P82- CUT-OFF POINTS FOR WEIGHT AND BODY MASS INDEX ADJUSTED BIOIMPEDANCE ANALYSIS MEASUREMENTS OF MUSCLE MASS.**

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**Background:** Absolute muscle mass is subjected to change with height(H), weight(W), body fat mass(BFM). Different indices of muscle mass adjusted for H, W, BFM, body mass index (BMI) have been suggested. Some studies are suggested to have higher degrees of associations with functional parameters and cardiometabolic syndrome. There is lack of data regarding LMM cut off points adjusted for W and BMI which limits the studies performed with these definitions. We aimed to introduce the reference cut-off points by the skeletal muscle mass index (SMMI) adjusted for W and BMI in Turkish population. **Methods:** Healthy young adults between 18-39 years of age and community-dwelling older adults <60 years of age were included. SMMI adjusted for W and BMI were calculated. Muscle strength was assessed by measuring hand grip strength and body composition was assessed with bioimpedance analysis (BIA). LMM was evaluated from the healthy young adults as SMMI being mean-2 SD. SMMI cut points that predict low muscle strength was calculated with ROC analysis. To define low muscle strength, we used 3 currently suggested low muscle strength thresholds i.e. 32 kg/22 kg, 30 kg/20 kg, 26 kg/16 kg in males(M) and females(F), respectively. **Results:** 301 healthy young adults (187M, 114F) and 992 older people (308M, 684F) were included. For skeletal muscle mass adjusted for weight LMM cut points were 37.4% and 33.6% for males and females, respectively. For skeletal muscle mass adjusted for BMI, cut points were 1.049 kg/BMI and 0.823 kg/BMI for males and females, respectively. The muscle mass cut points that best predicts the low grip strength for 32 kg/22 kg, 30 kg/20 kg, 26 kg/16 kg thresholds were 1.017 kg/BMI and 0.677 kg/BMI; 1.014 kg/BMI and 0.710 kg/BMI; 1.036 kg/BMI and 0.770 kg/BMI for males and females, respectively. **Conclusion:** Muscle mass adjustment methods and techniques show diversity among the studies and have impact on the LMM cut-off points. This study presents population specific LMM thresholds for SMM adjusted for weight and BMI aiming to increase and improve the general applicability of the leading sarcopenia consensus definitions.

More worldwide studies are needed to obtain better reference values that would promote the benefit.

**P83- AGE-RELATED MUSCLE ATROPHY IS ASSOCIATED WITH DECLINES IN MUSCLE QUALITY IN OLDER MEN AND IN LEAN BODY MASS IN OLDER WOMEN.** Hiroshi Akima<sup>1</sup>, Akito Yoshiko<sup>1</sup>, Aya Tomita<sup>1</sup>, Ryosuke Ando<sup>1,2,3</sup>, Madoka Ogawa<sup>1,3</sup>, Hisashi Maeda<sup>1</sup>, Noriko I. Tanaka<sup>1</sup> ((1) Nagoya University, Aichi, Japan; (2) Japan Institute of Sports Sciences, Japan; (3) Japan Society for the Promotion of Science, Japan)

**Background:** Sarcopenia is known as primarily taking place in the lower limb muscles such as quadriceps femoris (QF). However, it is not well known how sarcopenia of QF is characterized by physical and functional characteristics in older men and women. **Objectives:** The purpose of this study was to investigate relationship of quadriceps femoris (QF) muscle size with variables of body composition and physical performance in older men and women. **Methods:** Ninety-five men (n = 47; age, 72.5 ± 4.7 years; height, 164.9 ± 5.6 cm; weight, 62.0 ± 4.1 kg; BMI, 22.8 ± 2.0 kg/m<sup>2</sup>; lean body mass (LBM), 46.9 ± 5.4 kg) and women (n = 48; age, 71.3 ± 5.0 years; height, 152.8 ± 4.5 cm; weight, 50.4 ± 6.4 kg; BMI, 21.6 ± 2.4 kg/m<sup>2</sup>; lean body mass (LBM), 34.8 ± 4.4 kg) participated in this study. The muscle thickness and echo intensity, which is known as muscle quality, of the QF at the mid-thigh were measured using ultrasonography. Sit-up, supine-up, sit-to-stand, 5-m maximal walk and 6-min walk tests were evaluated. **Results:** As expected, there were inverse relationships between muscle thickness and age in men (r = -0.386, P = 0.004) and women (r = -0.321, P = 0.013). Among the tested variables, muscle thickness was closely related with echo intensity in men (r = -0.505, P = 0.001) and with %LBM (=LBM/weight\*100) in women (r = -0.372, P = 0.005). Stepwise multiple regression analysis with the muscle thickness as a dependent variable revealed echo intensity in men (R = 0.505, adjusted R<sup>2</sup> = 0.239, P = 0.001, regression coefficient = -0.309) and %LBM and age in women (R = 0.515, adjusted R<sup>2</sup> = 0.232, P = 0.001; regression coefficient of %LBM and age = -0.385 and -0.380, respectively), to be significant independent variables. **Conclusion:** These results suggest that age-related atrophy of QF is associated with a decline in muscle quality, e.g. increase of fatty infiltration into muscle, in older men; however, that is associated with a decline in the relative proportion of LBM in older women.

**P84- SARC-F: DEFINING A VALIDATED CUTOFF FOR PRE-SARCOPENIA FOR RISK ASSESSMENT AMONG COMMUNITY DWELLING OLDER PERSONS.** WS Lim<sup>1,2</sup>, L Tay<sup>3</sup>, A Yeo<sup>2</sup>, S Yew<sup>2</sup>, N Hafizah<sup>2,4</sup>, YY Ding<sup>1,2</sup> ((1) Department of Geriatric Medicine. Tan Tock Seng Hospital. Singapore; (2) Institute of Geriatrics and Active Ageing. Tan Tock Seng Hospital. Singapore; (3) Department of General Medicine (Geriatric Medicine), Sengkang General Hospital. Singapore; (4) Department of Continuing and Community Care. Tan Tock Seng Hospital, Singapore)

**Background:** The SARC-F was developed as a rapid screening tool for sarcopenia. A score of 4 or greater is predictive of sarcopenia and poor outcomes. The at-risk state of pre-sarcopenia is characterised by low muscle mass without impact on muscle strength or physical performance. Unlike analogous frailty scales where the cutoff for pre-frailty is established, the SARC-F does not have a corresponding cutoff for pre-sarcopenia. **Objectives:** To compare the diagnostic performance, concurrent validity and predictive validity of two cutoffs (1 vs 2) for pre-sarcopenia among older adults without functional or cognitive impairment. **Methods:** Two-hundred community-dwelling older adults (mean age=67.9years) were assessed for frailty using

modified Fried criteria; Short Physical Performance Battery (SPPB); Frenchay Activity Index (FAI); activities of daily living (ADL); Mini-Nutrition Assessment (MNA); and appendicular muscle mass using dual-energy X-ray (DXA). Outcomes at 2-years include incident sarcopenia; SPPB<10; FAI<30; incident ADL decline; and incident falls. We performed ROC analysis for sarcopenia diagnosis at baseline for diagnostic performance; 1-way ANOVA with post-hoc comparison for concurrent validity; and logistic regression of 2-year outcomes adjusted for age, gender and body mass index for predictive validity. **Results:** For diagnostic performance, using cutoff 1 identified 54 additional pre-sarcopenia subjects (sensitivity 36.7%, specificity 64.7%) compared with cutoff 2 (sensitivity 11%, specificity 92.3%). The ratios of pre-sarcopenia/sarcopenia cases were 17 and 4 respectively. When stratified into non-sarcopenic, pre-sarcopenic and sarcopenic subgroups, both cutoffs had comparable discriminant ability for frailty and appendicular mass, but cutoff 2 had higher F-values for physical performance (balance, chair-stand, and SPPB total score) and MNA. For predictive validity of 2-year outcomes, both cutoff 2 (OR=9.78, 95%CI: 2.96-32.34, P<0.01) and 1 (OR=5.86, 95%CI:2.02-17.01, P<0.01) predicted SPPB <10, and showed a trend for FAI<30 (p=0.080 and 0.066 respectively). Both did not predict incident sarcopenia or incident ADL decline. Only cutoff 2 showed a trend for 2-year incident falls (OR=4.56, 95%CI:0.96-21.81, P=0.056). **Conclusion:** This is the first study to demonstrate proof-of-concept evidence about the validity of cutoffs for pre-sarcopenia. Using cutoff 2 provides a high specificity case-finding strategy that does not over-detect pre-sarcopenia relative to sarcopenia, and has better discriminatory ability for physical performance and malnutrition. The potential of SARC-F identified pre-sarcopenia as a separate therapeutic entity for early intervention requires further study.

**P85- A NEW WAY TO ILLUSTRATE CHANGES IN MUSCULOSKELETAL HEALTH USING INERTIAL SENSORS: THE T-SCORE.** Alexander D. Lee (MSK Metrics, Velocity Sports Medicine & Rehabilitation, Canada Mississauga Ontario)

**Background:** Poor musculoskeletal (MSK) function can impact one's health over a lifespan. The early detection of subtle declines in dynamic MSK function is imperative to inform early interventions to prevent a health trajectory leading to sarcopenia. Ambulatory motion sensors have demonstrated an enhanced ability to evaluate MSK function compared to standard functional physical performance tests. To conduct sensor-based health risk assessments, a normative database across age must be established, and clinically informative methods for benchmarking MSK function must be developed. T-scores provide a method of comparison where an individual's function is compared to an optimal reference mean. Sarcopenia prevention could benefit from the use of T-scores to assess dynamic MSK performance. **Objectives:** To develop a normative database of neck and spine function using inertial sensors, and to investigate the clinical utility of benchmarking MSK function with T-scores. **Methods:** Neck and spine kinematic data were collected from 394 and 274 healthy participants respectively using inertial sensors. Age cohorts were constructed for each decade starting from the 2nd decade. The data were converted into T-scores by using the mean and standard deviation of a young normal population. Statistical comparisons were made between age cohorts. A prospective observational study was conducted to investigate the responsiveness of the sensor-based T-score to track the effect of a 12 week, whole-body resistance exercise intervention on 20 healthy, untrained, middle-aged adults. Neck and spine kinematics were evaluated using inertial sensors at baseline, 4, 8 and 12 weeks. Statistical comparisons were made between assessment

points. **Results:** Neck and spine function declined across age, with statistically significant differences identified across age cohorts. The sensor-based T-score was able to identify the positive improvements in neck and spine function as a result of the 12-week whole body exercise intervention. Statistically significant improvements were identified at 4, 8 and 12 weeks. **Conclusion:** Inertial sensor-derived measures, expressed as T-scores, were able to identify declines in neck and spine function across age, and track the positive responses of whole body exercise in a group of untrained middle-aged healthy adults. Dynamic movements assessed by inertial sensors and expressed as T-Scores can aid in the early detection of sarcopenia.

#### **P86- PREDICTIVE VALIDITY OF A NOVEL COMPREHENSIVE ASSESSMENT TOOL FOR SARCOPENIA (SARCOPENIA SCALE): A RELATIONSHIP WITH THE INCIDENCE OF FALLS.** Yosuke Osuka, Narumi Kojima, Ken Fujino, Hunkyung Kim (*Research Team for Promoting Independence of the Elderly, Tokyo Metropolitan Institute of Gerontology, Japan*)

**Background:** A diagnosis of sarcopenia based on the guidelines prescribed by the European Working Group on Sarcopenia in Older People is not sufficient to estimate the degree of progression and improvement of this condition owing to the summarization of this condition into a nominal scale. We developed a novel comprehensive assessment tool for sarcopenia (sarcopenia scale) that uses a continuous scale. The sarcopenia scale is able to estimate the degree of progression and improvement in patients with sarcopenia. **Objectives:** This study aimed to demonstrate our tool's validity for predicting falls by identifying the longitudinal association between the sarcopenia scale and the incidence of falls. **Methods:** This 4-year prospective cohort study included 872 community-dwelling older women aged 75-84 years with no fall history within one year of the baseline measurement. A principal component analysis was applied for three sarcopenia-related variables: walking speed, grip strength, and skeletal mass index. The sarcopenia scale was formulated by computing the first principal component score. The sarcopenia score calculated by the sarcopenia scale was used as the independent variable. Falls that occurred in the 4-year follow-up period were investigated using face-to-face or postal interviews and fall incidence was used as the dependent variable. To demonstrate the predictive validity of the sarcopenia scale, multiple logistic regression analyses were used to obtain the adjusted odds ratios (ORs) and 95% confident intervals (CIs) of the incidence of falls based on the quartile (Q) of the sarcopenia score. **Results:** Falls were observed in 176 participants (20.2%) during the 4-year follow-up period, and the prevalence of falls was as follows: Q1: 28.0%, Q2: 22.1%, Q3: 18.8%, and Q4: 13.6%. A multiple logistic regression analysis adjusted for confounders revealed that a higher sarcopenia score was associated with significantly lower ORs and 95% CIs for falls (Q1: 1 (reference), Q2: 0.78 [0.49-1.23], Q3: 0.67 [0.42<1.08], Q4: 0.48 [0.29<0.80], P for trend = 0.002). **Conclusion:** A higher sarcopenia score was significantly and independently associated with a lower future incidence of falls in older women. This suggests that our sarcopenia scale can be used as a fall-risk assessment tool in community-dwelling older women.

#### **P87- SIMPLE PHYSICAL ACTIVITY INDEX PREDICTS PROGNOSIS IN OLDER ADULTS.** Lina Ma<sup>1</sup>, Zhe Tang<sup>1</sup>, Piu Chan<sup>1,2</sup> (*(1) Department of Geriatrics, Beijing Geriatric Healthcare Center, Beijing Institute of Geriatrics, Xuanwu Hospital, Capital Medical University, Key Laboratory on Neurodegenerative Disease of Ministry of Education, Beijing Institute for Brain Disorders, China National Clinical Research Center for Geriatric Disorders, Beijing, China; (2) Department of Neurology and Neurobiology, Xuanwu Hospital, Capital Medical University, Beijing, China*)

**Background:** Frailty, which involves low physical activity (PA), is a well-established factor of increased risk of hospitalization, disability, and mortality. Despite the fact that frailty screening tools can effectively identify patients at highest risk for adverse outcomes, most of the instruments to measure PA are designed and validated with western populations, few if any specific PA questionnaires exist for Chinese older adults. **Objectives:** As part of the Beijing Longitudinal Study of Aging (BLSA), we aimed to develop the BLSA Leisure-Time Physical Activity Questionnaire (BLSA-PAQ) and assess its association with physical function and examine its prediction of mortality. **Methods:** 1810 Chinese older adults completed the BLSA-PAQ containing four items: walking, outdoor chores, low-intensity exercise, and moderate-intensity exercise. Physical function was assessed through the balance test, chair-stand test, ADL, and IADL. Frailty was evaluated using a modified frailty phenotype and frailty index. **Results:** The following equation was obtained based on the 8-year mortality for the four BLSA-PAQ components: BLSA-PAQ index = Walking score + Outdoor chores score + 2 × (low-intensity exercise score) + 3 × (moderate-intensity exercise score). The BLSA-PAQ index decreased with age ( $r = -0.190$ ,  $p < 0.001$ ), and was negatively related to modified frailty phenotype score ( $r = -0.457$ ,  $p < 0.001$ ) and frailty index ( $r = -0.369$ ,  $p < 0.001$ ). Low PA and pre-low PA statuses were associated with poorer results in the balance and chair-stand tests, ADL dependency, IADL dependency, and frailty. After adjusting for age and gender, the 8-year mortality HRs were 1.453 (95% CI, 1.166-1.811) and 2.358 (95% CI, 1.856-2.995) for low PA and pre-low PA, respectively. **Conclusion:** Our findings provided evidence that shorter and easy-to-administer PA questionnaires, such as the BLSA-PAQ, are suitable for large epidemiologic studies, and specifically for Chinese elderly populations. To the best of our knowledge, this is the among the first studies to examine the role of PA in the prediction of mortality in Chinese older adults. Our study also indicates that increasing PA might be an important approach to reduce mortality among older persons. Further longitudinal studies including objective measures of PA are necessary to confirm these results.

#### **P88- RELATIONSHIP COGNITION FUNCTIONS, PHYSICAL CAPABILITY AND NUTRITION OF THE ELDERLY** Olena Tomarevska, Oleksandr Poliakov (*Institute of Gerontology by D.F. Chebotarev of National Academy of Medical Sciences of Ukraine, Ukraine Kyiv*)

**Background:** The actual nutrition influenced on speed of functional aging what leads to problems of working capability, reduction of the hand grip strength and endurance, independence and frailty of elderly persons. **Objectives:** The purpose of this study was to determine the relationship physiological capabilities and factual nutrition that could sustain the work performance and functional aging rate of the elderly. **Methods:** It has been studied anthropometric and functional parameters of respiration, physical performance, mental capability, sensory skills, as well as the rate of functional aging 120 persons aged 60-89 years and 43 men aged 20-30 years. We have also

analyzed the professional history, social status, and factual nutrition of the elderly. **Results:** It was found general involution trends, which deals to the deterioration of anthropometric and functional parameters. Cognitive functions, hand grip strength and endurance, vital capacity, functional parameters of external respiration are have the correlation associate ( $p < 0.001$ ) declines with age ( $p < 0.001$ ). The best indicators of the hand grip strength of the elderly were associated with the lower severity of labor in the last professional activity in women and men ( $p < 0.05$ ). According to the study, a decrease in muscle strength was observed in elderly men by 55% and 27% in older men, the elderly women was 69%, and the older - 48% compared with young adults accordance. Analysis of the results the people over 60 years showed a decrease in the density of associates between the muscular endurance with the strength and the parameters of external respiration ( $p < 0.01 - 0.001$ ) with the body fat percentage and with functional age ( $r = -0.247$   $p < 0.01$ ). In people aged over 60 years physiological capabilities provide residual capacity at the level of 47.54% comparatively to young people, due to the accelerated tempo of functional aging. The nutrition is a prognostic factor of 10.53%, which determined the amount of residual capacity in the retirement age. **Conclusion:** Artificial restriction in the diet of humans, relatively healthy, after 65 years of age has a negative prognostic impact on physical and cognitive capabilities and accelerated function aging rate.

**P89- IDENTIFYING FRAILTY USING THE ELECTRONIC MEDICAL RECORD WITHIN A MEDICARE ACCOUNTABLE CARE ORGANIZATION.** Nicholas M. Pajewski<sup>1</sup>, Kristin Lenoir<sup>2</sup>, Brian J. Wells<sup>2</sup>, Jeff D. Williamson<sup>3</sup>, and Kathryn E. Callahan<sup>3</sup> ((1) *Division of Public Health Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA*; (2) *Clinical and Translational Science Institute, Wake Forest School of Medicine, Winston-Salem, NC, USA*; (3) *Section on Gerontology and Geriatric Medicine, Department of Internal Medicine, Wake Forest School of Medicine, Winston-Salem, NC, USA*)

**Background:** Recent evidence suggests that frail and pre-frail older adults may benefit from targeted interventions, and that frailty itself may be reversible. Despite the existence of several validated definitions, measures of frailty have not been consistently incorporated into primary care. Based on the model of deficit accumulation, investigators in England have developed an Electronic Medical Record (EMR) frailty index (eFI) for the National Health Service. However, there is no measure of frailty, including the eFI, that has yet been adapted for routine use in US health care systems. **Objectives:** To build an eFI for patients in a Medicare Shared Savings Plan Accountable Care Organization (MSSP-ACO) at our institution. **Methods:** We extracted encounter, diagnosis code, laboratory, and medication data from the EMR for 7,935 MSSP-ACO patients (<95 years of age as of 7/1/2015). We used a 2 year look-back period to estimate an eFI (46 total deficits), and examined the association of the eFI with incident events over the following year. **Results:** The MSSP-ACO cohort was 57.8% female, 86.3% white, with a mean age of 76.5 (SD=6.9) years. The eFI could be calculated for 6,689 (84.3%) patients. Of these 16.1%, 51.5%, and 32.4% were classified as fit (eFI<0.10) pre-frail (0.10<eFI 0.21), or frail (eFI>0.21), respectively. Accounting for age, sex, race/ethnicity and comorbidity (Charlson Index), the eFI was an independent predictor of all-cause mortality (Explained Relative Risk = 7.6%). Allowing for the competing risk of death, patients classified as frail (compared to fit patients) exhibited increased risk for emergency department visits (Relative Risk (RR)=1.85, 95% CI: 1.47 to 2.32), inpatient hospitalizations (RR=1.82, 95% CI: 1.34 to 2.47), and injurious falls (RR = 1.75, 95% CI: 0.38 to 7.99). **Conclusion:** Our results indicate that EMR data

captured during routine primary care can identify frail and at-risk older adults. While further work is needed to refine and validate the eFI, incorporating functional data from Medicare Annual Wellness Visits, implementation of the eFI could facilitate the identification of a subgroup of older patients at risk for the negative health consequences of frailty, for whom health systems may target care coordination and other health care resources.

**P90- THE ROLE OF DIMINISHING ENERGY RESERVES IN INCREASING FATIGABILITY IN MID-TO-LATE LIF.** Jennifer A. Schrack<sup>1</sup>, Amal A. Wanigatunga<sup>1</sup>, Pablo Martinez-Amezcu<sup>1</sup>, Vadim Zipunnikov<sup>2</sup>, Stephanie A. Studenski<sup>3</sup>, Eleanor M. Simonsick<sup>3</sup> ((1) *Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA*; (2) *Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, USA*; (3) *National Institute on Aging, Baltimore, USA*)

**Background:** Poor energy efficiency is linked to declining health and functional status and increasing likelihood of frailty. Declining energy efficiency may manifest as reduced energy reserves and rising perceived fatigability (activity-related fatigue), but the association between perceived fatigability and energy efficiency has not been empirically evaluated. **Objectives:** To examine the longitudinal association between the energetic cost of walking as a percentage of peak energy availability and perceived fatigability in a cohort of well-functioning adults. **Methods:** 995 participants of the Baltimore Longitudinal Study of Aging (BLSA; mean baseline age 68 + 13 years) were evaluated between 2007-2017 (mean visits: 1.8, range 1-6). The energetic cost of walking (walking VO<sub>2</sub>; ml/kg/min) was assessed during a 5-minute, 0.67 m/s, 0% grade treadmill test (Medgraphics CPX-D), and perceived fatigability was defined using the Borg rating of perceived exertion (RPE; range 6-20) immediately after. Peak energy availability (peak VO<sub>2</sub>; ml/kg/min) was assessed during 400m of fast-paced walking using a portable indirect calorimeter (Cosmed K4b2, Italy). The longitudinal association between energy reserves, (a ratio of walking VO<sub>2</sub>/peak VO<sub>2</sub>) and perceived fatigability was estimated using generalized estimating equations, adjusted for demographics, body composition and history of chronic conditions. **Results:** In adjusted models, a one-unit (0.1) annual increase in the cost-capacity ratio resulted in a 0.4-unit increase in RPE ( $p < 0.001$ ,  $z=12.1$ ). Other significant contributors to rising fatigability included age ( $p < 0.001$ ,  $z=8.3$ ), and fat mass ( $p < 0.001$ ,  $z=4.7$ ). The addition of an interaction term between age and cost-capacity ratio suggested that the combination of age and increasing costs in relation to capacity ( $p < 0.001$ ,  $z=4.6$ ) were more important contributors to rising fatigability over time than age ( $p = 0.50$ ) or cost alone ( $p = 0.02$ ,  $z=-2.4$ ). **Conclusion:** Rising energy costs in relation to capacity were strongly associated with increasing RPE with aging. These findings suggest that perceived fatigability may act as an early indicator of decreasing energy reserves, which could be used for timely identification of individuals who may benefit from interventions to curb future threats to mobility and risk of frailty. Future investigation in clinical populations is warranted.

### **P91- GENDER-RELATED EFFECTS OF A MULTICOMPONENT EXERCISE PROGRAM ON PHYSICAL FITNESS OF OLDER ADULTS.**

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**Background:** The inevitable fitness decline with age leads to a decrease muscle mass and lean body mass decline, entailing decline of muscle strength and physical fitness (PF) 10-15% per decade in individuals aged 60-94years. Exercise programs that are structured, with longer duration, and multicomponent, seem to be promising for preserving functional and cognitive performance in older adults. A significant decrease in PF occurs with advancing age, especially in those abilities that are related to mobility and risk for falls. **Objectives:** The purpose of this study was to assess the effects of a multicomponent exercise program on PF gender-related of older adults at a day care center. **Methods:** Sixty older adults not institutionalized but users of a day care center, 42 females, 18 males, aged 77.8±6.5 years old, body mass index 27.6±4.6 kg.m<sup>2</sup>. were assigned to a specific multicomponent training composed by an aerobic endurance, strength, balance/coordination exercises, 45-min session, for 8 weeks, twice a week. The physical parameters assessed were strength (sit and stand; arm curl), aerobic endurance (2-min step test), flexibility (back-scratch and sit-and-reach) and agility/balance (8-foot up-and-go). All subjects gave their written informed consent prior to inclusion. **Results:** The PF values before and after the intervention test were significant different (p<0.001), 30-second chair stand 10.2±2.1 vs. 16.4±2.6 repetitions, arm curl 11.5±4.1 vs. 1.5±4.2 seconds, 2-min step 72.8±18.0 vs. 99.1±11.8 steps, 8-foot up-and-go 9.5±3.7 vs. 6.9±1.5 seconds, chair sit-and-reach 22.3±10.1 vs. 11.1±8.9cm, and for the back scratch test -15.1±8.7 vs. -10.2±3.2cm, respectively. When we compare by sex, we found significant differences in the modification rates for the 30-seconds chair test (males 77.8, females 27.3 with p<0.001), arm curl test (males 60, females 46.2 with a p<0.001), 8-foot up-and-go (males -28.4, females -22.2 with p=0.002) and in the chair sit-and-reach test (males -54.5, females -38.9 with p<0.001). **Conclusion:** This multicomponent training program was effective in improving all PF components related to daily living activities, and the results showed that these types of programs have different impacts according to gender. Demonstrating the importance of elderly participation in physical exercise, which was associated with a lower risk of falls, observed for greater agility and balance.

### **P92- PHYSICAL PERFORMANCE CORRELATION WITH FRAILTY INDEX IN ELDERLY PATIENTS.**

Melissa Hughes<sup>1</sup>, Ricardo Salinas<sup>1</sup>, Gladys Garza<sup>1</sup>, Xochitl Ortiz<sup>2</sup> ((1) Geriatric Unit, University Hospital Dr. Jose Eleuterio Gonzalez UANL, Monterrey, NL, Mexico; (2) Faculty of Psychology UANL, Monterrey, NL, Mexico)

**Background:** Ageing is associated with a progressive and significant decrease in muscle function (muscle strength and performance), which is recognized as a common feature of the frailty syndrome. Frailty is defined as a clinical state of increased vulnerability to poor resolution of homeostasis after a stressor event that increases the risk of adverse outcomes, including falls, delirium and disability. **Objectives:** The aim of this study is to associate the

relationship between frailty index and physical performance measured by Short Physical Performance Battery (SPPB). **Methods:** This is an observational and descriptive study where community dwelling subjects older 60 years were invited for assessment. Geriatric clinimetry was performed including physical performance test, frailty index, grip strength and anthropometric measurements. Based on the Fried Criteria (weight loss, weakness, poor endurance and energy, slowness and low physical activity level) the participants were selected based on the presence of one or two deficits indicating a pre-frail condition, and a total of three or more deficits diagnose frailty, while the absence of deficits indicates a robust state. Physical performance was evaluated using SPPB test (balance, 6-m gait speed and a chair stand test). The maximum score is 12 points. The cut-off value used to assess poor physical performance is 8 points, according to the EWGSOP group (European Working Group on Sarcopenia in Older People). Pearson correlation was used to determine the association between physical performance and frailty. **Results:** In total, 101 patients were included in this analysis. The mean age of the sample is 69.80 years (SD± 7.49), 89 (88.1%) were women. The prevalence of frailty is 27.8%, pre-frailty 22.2% and robustness 50%. Compared to non frail subjects, frail and pre-frail subjects had lower physical performance (<8 points) measured by SPPB (r=- 0.54, p <.0001), finding a negative correlation. **Conclusion:** Frailty, according to Fried's definition, seems to be associated with a poor physical performance by SPPB, suggesting a higher level of disability and an increased risk to develop major clinical consequences. An above 8 SPPB score supports a clinical diagnosis of robust aging in the absence of clinical frailty criteria.

### **P93- ASSOCIATION OF HANDGRIP STRENGTH WITH MULTIMORBIDITY IN COMMUNITY DWELLING CHILEAN OLDER PEOPLE.** Bárbara Angel, Lydia Lera, Carlos Márquez, Cecilia Albala (Department of Public Health Nutrition, Institute of Nutrition and Food Technology (INTA), University of Chile)

**Background:** The prevalence of multimorbidity (MMB) is high among older adults, a trend that increases even more with the increase in life expectancy. Muscular strength has gained popularity in the last decade and it is suggested that it plays a key role in the prevention of numerous chronic diseases. **Objectives:** To study the association of handgrip strength and multimorbidity in community dwelling Chilean older people. **Methods:** Cross-sectional design of ALEXANDROS and HTSmayor cohorts designed to study the disability associated with obesity and sarcopenia in people living in the community of 60 years or older living in Santiago, Chile. Data were collected in 1439 subjects (69% women) for the identification of multimorbidity (co-occurrence of three or more chronic diseases), anthropometric measurements, grip strength, mobility and DXA measurements were made. Obesity was defined according to the WHO criteria, low muscle strength was defined by hand dynamometer < 27 kg in men and 15 kg in women (<25th percentile). Plasma levels of US-CRP were determined. Immunoturbidimetry. Comparison of the variables was performed with t-test and Pearson chi<sup>2</sup>. Logistic regression was performed to study the association of multimorbidity with low muscle strength adjusted for age, sex, nutritional status, number of drugs, smoking history, physical activity, mass lean/fat mass ratio and hs-CRP levels. **Results:** Prevalence of MMB was 23.3% (95% CI: 21.2-25.6%) higher in women than men (26.5%vs16.0%, p<0.001). Low Muscle strength was present in 19.8% of the sample, similar in both sexes. The prevalence of obesity was 35.2% higher in women (39.0%) than in men (26.4%), p<0.001. The levels of hs-CRP were higher in the elderly with MMA but similar in people with low vs normal dynamometry. After logistic regression analysis adjusted

by age, gender, nutritional state, medications number, history of smoking, physical activity, lean mass/fat mass ratio and hs-CRP levels, low muscle strength was associated with multimorbidity OR=4.44 95%CI 1.28-15.45; p=0.019. **Conclusion:** Lower levels of handgrip strength are associated with multimorbidity in community dwelling Chilean older people, even after adjusting for traditional and novel confounders. Funding: FONDEF Grant IT15i10053 and FONDECYT Grant 1130947.

**P94- GRIP STRENGTH IN ADULTS WITH HIP FRACTURE COMPARED TO AMBULATORY POPULATION.** Sagrario Niñez<sup>1</sup>, Javier Guerra<sup>2</sup>, Daniel Gamez<sup>1</sup>, Victor Peña<sup>2</sup>, Gonzalez Blanca<sup>3</sup>, Juan-Francisco Torres<sup>1</sup>, Michelle Leyva<sup>1</sup>, Ricardo Serna MD1, Ricardo Salinas<sup>1</sup> ((1) *Servicio de Geriatria del Hospital Universitario Dr. José Eleuterio González Monterrey, Nuevo León, Mexico*; (2) *Servicio de Traumatología y Ortopedia del Hospital Universitario Dr. José Eleuterio González Monterrey, Nuevo León, Mexico*; (3) *Consulta de Nutrición del Servicio de Endocrinología del Hospital Universitario Dr. José Eleuterio González Monterrey, Nuevo León*)

**Background:** Low muscle strength is directly related with the development of geriatric syndromes, including sarcopenia and frailty, associate with greater susceptibility to falls. Grip strength has been well described in elderly individuals from the general population but its epidemiology in hospitalized patients with hip fracture has not been explored. **Objectives:** Compare the results of grip strength, plus demographic and nutritional characteristics of a group of ambulatory elderly people versus hospitalized acute hip fracture patients. **Methods:** This is an observational, cross-sectional, descriptive study carried out from November 2016 to June 2017. The populations studied were men and women over 60 years old from two different groups: ambulatory patients from the Geriatric clinic, and hospitalized patients with acute hip fracture. Grip strength was measured using the dominant hand with a Takei TKK5401 Dynamometer (grip'D digital hand grip gauge) and the Southampton protocol in the hip fracture group. Cut-offs were applied according to EWGSOP. **Results:** A total population of 140 patients, 50 hospitalized and 90 ambulatory were studied; 103 women and 35 men. Mean age of was 80.9 years (hip fracture group) and 75.4 years (ambulatory patients). Mean grip strength in hospitalized patients was 11.517 kg, compared to 17.187 kg in ambulatory. Hospitalized patients had lower grip pressure adjusted by age range (p = .001). **Conclusion:** Elderly individuals in a hospital setting had less grip strength than ambulatory patients. It was also notable that ranges of grip strength in ambulatory population were far below that proposed in the European Consensus (EWGSOP): 20 kg in women (mean 15.55 kg [SD 6.3]) and 30 kg in men (mean 22.25 kg [SD 7.9]) compared to our hip fracture group (mean 9.11 kg [SD 3.7] in women, 14.45 kg [SD 7.13] in men) Our limitation was the use of two different validated methods for both populations.

**P95- FUNCTIONAL NEED AND FRAILTY.** Sandra Richardson, Brian Bandle, Raina Josberger (*New York State Department of Health, Albany, NY, USA*)

**Background:** The New York State Managed Long-Term Care (MLTC) program includes four types of health insurance products that provide a range of health and long-term care services to eligible individuals and requires a comprehensive assessment every six months. An assessment-based functional scoring algorithm quantifies functional need on a scale of 0 (independent) to 48 (maximal dependence), and is used to determine eligibility for some types of MLTC products. A Level of Care (LOC) score of five or greater

indicates need of nursing home level services. This assessment also includes diagnosis codes. A validated frailty indicator, using diagnosis codes and defining frailty as probability of < 0.2, was found to be predictive of nursing home admission, hospital admission within five years, disability within five years, and death within five years. **Objectives:** This analysis compared the LOC score with a validated frailty indicator. We hypothesized that frailty and functional need were correlated, and that the importance of frailty predictors would differ for LOC. **Methods:** Assessment data for individuals enrolled in an MLTC plan between January through June 2016 was utilized to calculate LOC score and a validated frailty indicator. Statistics such as the Pearson correlation coefficient and parameter estimates were used to evaluate the relationship between the LOC score and the frailty indicator. Frailty predictors and various frailty indicator thresholds were also assessed. **Results:** Frailty probability and LOC were correlated with a Pearson's rho of 0.4. The importance of significant frailty predictors differed for LOC. Two frailty predictors did not significantly predict LOC. The 0.2 frailty probability threshold was reasonable for this population as evidenced by a steady increase in LOC quartiles with increasing frailty probability beyond this threshold. However, some with a low LOC were frail and some with a high LOC were not frail. Within five mutually exclusive LOC groupings the percentage of frail increased as LOC increased, although there was little difference between the two highest LOC groupings. **Conclusion:** Although frailty and functional need were related, they provided different information. Both frailty and functional need may inform and improve planning and provision of care for the MLTC population.

**P96- PEAK FLOW IS USEFUL FOR SARCOPEZIA SCREENING IN COMMUNITY-DWELLING PATIENTS WITH STABLE CHRONIC OBSTRUCTIVE PULMONARY DISEASE.** Dolores Sánchez-Rodríguez<sup>1</sup>, Jesús López-Escobar<sup>2</sup>, Eva M. Pascual<sup>3</sup>, Xavier Duran<sup>4</sup>, Monique Messaggi-Sartor<sup>5</sup>, Diego A. Rodríguez<sup>6</sup>, Anna Guillén-Solà<sup>7</sup>, Ester Marco<sup>8</sup> ((1) *Geriatric Department, Parc de Salut Mar (Centre Fòrum-Hospital del Mar). Rehabilitation Research Group, Hospital del Mar Medical Research Institute (IMIM). Universitat Autònoma de Barcelona. Universitat Pompeu Fabra, Barcelona, Catalonia, Spain*; (2) *Physical Medicine and Rehabilitation Department, Hospital General Universitario de Castellón, Castellón de la Plana, Spain*; (3) *Physical Medicine and Rehabilitation Department, Parc de Salut Mar (Hospital del Mar-Hospital de l'Esperança). Rehabilitation Research Group, Hospital del Mar Medical Research Institute (IMIM), Barcelona, Catalonia, Spain*; (4) *Methodological and biostatistical advisory service, Hospital del Mar Medical Research Institute (IMIM), Barcelona, Catalonia, Spain*; (5) *Physical Medicine and Rehabilitation Department, Parc de Salut Mar (Hospital del Mar-Hospital de l'Esperança); Rehabilitation Research Group, Hospital del Mar Medical Research Institute (IMIM), Barcelona, Catalonia, Spain*; (6) *Respiratory Diseases Department. Hospital del Mar. School of Medicine, Universitat Autònoma de Barcelona (UAB) and Universitat Pompeu Fabra. Barcelona, Catalonia, Spain*; (7) *Physical Medicine and Rehabilitation Department, Parc de Salut Mar (Hospital del Mar-Hospital de l'Esperança); Rehabilitation Research Group, Hospital del Mar Medical Research Institute (IMIM). School of Medicine, Universitat Autònoma de Barcelona, Catalonia, Spain*; (8) *Physical Medicine and Rehabilitation Department, Parc de Salut Mar (Hospital del Mar-Hospital de l'Esperança); Rehabilitation Research Group, Hospital del Mar Medical Research Institute (IMIM). School of Medicine, Universitat Autònoma de Barcelona, Catalonia, Spain*)

**Background:** Sarcopenia affects up to 15% of patients with stable chronic obstructive pulmonary disease (COPD). The measurable

variables to identify sarcopenia in research and practice are muscle mass and strength, and physical performance. Given that recommended techniques to assess muscle mass are not always available in clinical practice, some of the assessments usually conducted in COPD patients might be useful for sarcopenia screening. **Objectives:** To determine the relationship of the peak expiratory flow rate (peak flow) with the variables used in the algorithm for sarcopenia case finding suggested by the European Working Group on Sarcopenia in Older People (EWGSOP) in community-dwelling patients with stable COPD. **Methods:** Cross-sectional study of 80 patients (mean age 67.5±7.5 years; 78.8% males) with stable moderate-severe COPD from a larger prospective study. Main outcome variables: peak flow (mL/min), fat-free mass (Kg) assessed by bioimpedance analysis, handgrip strength (Kg), and gait speed (m/s) in a 4-m test; values less than 80% of the reference data, adjusted for age and sex, were considered decreased. Other collected variables were: respiratory function tests and maximal inspiratory and expiratory pressures (P<sub>lmax</sub> and P<sub>Emax</sub>, respectively). Spearman correlation coefficients were used to describe the relationship between quantitative variables; the association of peak with fat-free mass and handgrip strength was obtained with median regression analysis. **Results:** Patients with sarcopenia presented significantly low peak flow, body mass index and respiratory function tests. A moderately significant correlation was found between peak flow and fat-free mass (R= 0.566, p<0.001) and non-dominant handgrip strength (R= 0.446, p<0.001); no differences in gait speed were observed in a 4-m test. In a median regression analysis, a peak flow increase of 10 mL/min was significantly associated with a change of 0.66 Kg in fat-free mass (p<0.001); it was also associated with an increase of 1.69 Kg in handgrip strength when adjusting for body mass index, FEV1 and P<sub>Emax</sub> (p=0.002). **Conclusion:** A causal relationship was observed between peak flow and fat-free mass and handgrip strength. Further studies are required to determine if peak flow rate could be useful in the diagnosis, screening and staging of sarcopenia not just in COPD, but in all geriatric patients.

**P97- ASSOCIATION BETWEEN ANTHROPOMETRIC MEASURES AND FUNCTIONAL PERFORMANCE IN BRAZILIAN ELDERLY WOMEN AT RISK OF SARCOPIENIA.** Patrícia Parreira Batista, Cláudia Venturini, Camilo Cândido Santos, Vitor Augusto Kersul; Lygia Paccini Lustosa (*Postgraduate program in Rehabilitation Sciences, Physiotherapy Department, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil*)

**Background:** Elderly at risk of sarcopenia are more vulnerable to adverse health outcomes, including functional disability, and postural instability. It is believed that early identification of this condition may lead to a better understanding of the health profile of the elderly. Thus, identifying factors associated with sarcopenia may contribute to its prevention and treatment, especially considering the functionality and physical independence. **Objectives:** To evaluate an association of anthropometric measures and functional performance in Brazilian elderly women identified as at risk of sarcopenia. **Methods:** In this study have participated women (65 years or older); sedentary for more than three months; community dwelling; without distinction of race and / or social class. Those with cognitive deficit were excluded, according to schooling; self-reported neurological diseases or sequelae and / or rheumatic diseases; dependent gait; acute pain; history of arthroplasty; history of cancer in the last 5 years. All of them performed the gait speed test (4m) and handgrip strength (Jamar dynamometer) to screen the risk of sarcopenia, according to the European Working Group on Sarcopenia in Older People. They also performed the Short Physical Performance Battery (SPPB) test;

measurement of waist circumference (WC) and body mass index (BMI). Associations were analyzed by the Spearman correlation test. The significance level was 5%. Approval of the Research Ethics Committee of the Federal University of Minas Gerais (CAAE 39702014.2.0000.5149). **Results:** One hundred and three elderly women were evaluated, average age of 76.01 (± 6.64) years, BMI 26.36 (± 5.78) kg/m<sup>2</sup>, WC 91.97 (± 12.66) cm. The mean of SPPB was 7.62 (± 2.11). There was a weak, negative, significant correlation between BMI and functional performance (rh = -0.27, p= 0.006), indicating that the more obese women were in worse functional conditions. There was no association with central obesity (WC). Non-significant analyzes (p> 0.05). **Conclusion:** The results have pointed out a need for greater detailing of the health and functional profile of elderly women at risk of sarcopenia, as well as their body composition. These results confirmed the literature that indicates a loss of functionality of the elderly at risk of sarcopenia, more pronounced in those obese.

**P98- BODY COMPOSITION AND PHYSICAL PERFORMANCE IN MIDDLE-AGED MEN AND WOMEN.** Vera Zymbal, Diana Luís, Filomena Carnide (*Exercise and Health Laboratory, CIPER, Faculdade de Motricidade Humana, Universidade de Lisboa, Portugal*)

**Background:** Body composition (muscle mass) and physical performance (gait speed and handgrip strength, HGS) are the main determinants of sarcopenia. Sarcopenia is a prevalent condition in the elderly since it is associated with the aging process (primary sarcopenia) and has consequences on the quality of life (health and functional independence). **Objectives:** In order to prevent sarcopenia, we intend to analyze associations between body composition markers (skeletal muscle mass index, SMI vs. ratio of fat mass to fat free mass, FM/FFM) and physical performance (gait speed vs. HGS vs. muscle power) in middle-aged adults of both sexes. **Methods:** The participants were 239 adults (156 women) with a mean age 45.2 ± 9.4 yrs. Muscle mass, fat mass and fat free mass were evaluated by Bioelectrical Impedance Analysis (BIA, 50 kHz BIA 101 RJL, Akern Bioresearch, Florence, Italy Akern). The gait speed was determined from the Up&Go test, the HGS was evaluated with Jamar® dynamometer and the muscle power relative to body mass (P<sub>max</sub>/mass) was assessed during a single two-legged jump with hands on waist on a force platform (Leonardo Mechanograph, Novotec Medical, Pforzheim, Germany). **Results:** Linear regressions by stepwise evidenced in women associations of muscular power with SMI (= 0.280, p = 0.001, adjR<sup>2</sup> = 7.2%) and with FM/FFM (= -0.423, p <0.001, adj R<sup>2</sup> = 17.3 %). In men, HGS was associated with SMI (= 0.381, p = 0.001, R<sup>2</sup> = 13.4%) and with FM/FFM (= -0.310, p = 0.006, adjR<sup>2</sup> = 8.4%). Gait speed was excluded in both models in both sexes. The gait speed remains only in the FM/FFM model in females (= 0.285, p <0.001, adjR<sup>2</sup> = 7.5%) when muscle power is not inserted. **Conclusion:** At middle age, muscle power explains a greater variance of FM / FFM in women while HGS explains a greater variance of SMI in men revealing sexual dimorphism in the associations between body composition and physical performance.

### P99- CHAIR-STAND TEST IS A BETTER PREDICTOR OF FUNCTIONAL LIMITATIONS THAN TUG IN OLDER CHILEANS AT THE PRIMARY CARE SETTING.

Cecilia Albala, Carlos Marquez, Lydia Lera, Barbara Angel, Rodrigo Saguez, Mario O Moya (INTA, Universidad de Chile Patricia Arroyo Clinical Hospital Faculty of Medicine, Universidad de Chile, Chile)

**Background:** Physical performance is a key indicator for functional limitation risk in older people. **Objectives:** To study the risk of functional limitation according baseline observed physical performance in older Chileans at primary care centres. **Methods:** Follow up of the Alexandros cohorts designed to study disability associated with obesity in community-dwelling people 60y and older living in Santiago/Chile. At baseline 1314 participants, mean age  $74.6 \pm 6.5y$  (min 65;max 99), 70.2.3% women, underwent home interviews including history of chronic diseases, self-reported disability/functional limitations, mobility and ability to walk 8 blocks. Anthropometry, dynamometry, Timed up and go (TUG) and Chair-stands were measured. Functional limitation (FL) was defined as having limitations in one ADL or MMSE <22 or 2 IADL or 3 mobility limitations. Age and sex adjusted Relative Risk of FL according baseline TUG and chair stands were estimated. TUG and Chair stands were categorized as good when performed in <10 sec or nor good when performed in >10sec **Results:** At baseline 63.3% of the participants were in the category of good TUG and only 35.5% in in the category of good chair stand test. After a median follow up of 4.4 years (RIQ 2.9-5.3), the crude RR of having functional limitations according baseline was RR= 1.27 (95%CI:0.98-1.65)  $p=0.079$  for TUG and RR =2.62 (95%CI:1.5-4.5)  $p<0.001$  for chair stands After adjusting by age and sex the RR for FL associated with having a TUG not good at baseline was RR= 1.13 (95%CI:0.85-1.25) and the FL associated with having chair stand test not good at baseline was RR=2.62 (95%CI:1.5-4.5). The ability to walk eight blocks was inversely associated with FL with an adjusted RR of 0.72 (95%CI 0.58-0.89) **Conclusion:** Among measures of physical performance at the primary care level, the chair- stand test is a better predictor of FL than TUG. Besides, is easy, chip, little time consuming and do not require space out of the attention box for it performance. On the other hand, the ability to walk 8 blocks is a protective factor for FL. Funding: Fondecyt Grants 1080589 & 1130947

### P100- SARCOPENIA ASSESSMENT IN A MIDDLE-AGED APPALACHIAN POPULATION.

Margaret Drazba, Allison Morris, Melissa Ventura Marra (Division of Animal and Nutritional Sciences, West Virginia University, Morgantown, West Virginia, USA)

**Background:** Sarcopenia is the age-related reduction of muscle mass, strength and function associated with age. In recent years, cutoff values have been suggested to assess sarcopenia risk in older adults. While loss of lean body mass increases exponentially during middle-age, little research is available regarding sarcopenia risk in this population. **Objectives:** To assess sarcopenia risk among a middle-aged Appalachian population using established parameters for low muscle mass and hand grip strength and to determine if the estimate of skeletal muscle mass (SMM) is related to hand grip strength. **Methods:** This study was a cross-sectional analysis of middle-aged adults ( $n= 96$ ; 43% male; BMI=  $30.85 \pm 7.23$ ; age=  $54.17 \pm 4.63$  years). SMM was estimated by multi-frequency, segmental bioelectrical impedance analysis. Isometric hand grip strength was assessed in both hands, with the highest value of the stronger hand used for analysis. Height-adjusted SMM (SMMht) and hand grip strength stratified by BMI was used to assess sarcopenia risk based on the European Working Group on Sarcopenia in Older People (EWGSOP)

guidelines. Risk was classified as normal, pre-sarcopenia (low SMM), or sarcopenia (low SMM + low hand grip strength). Pearson's chi-squared was used to identify differences in sarcopenia risk classification by gender. Pairwise correlations were used to determine the relationship between SMMht and hand grip strength. Reported values are mean  $\pm$  SD. **Results:** SMMht was  $7.73 \pm 1.37$  kg/m<sup>2</sup> and  $10.44 \pm 1.42$  kg/ m<sup>2</sup> and hand grip was  $23.85 \pm 5.03$  kg and  $44.43 \pm 9.47$  kg in females and males, respectively. Using EWGSOP guidelines, 14 (25.5%) females were presarcopenic and 2 (3.6%) were sarcopenic. In males, 24 (58.5%) were presarcopenic and 4 (9.8%) were sarcopenic. Males were significantly more likely to be presarcopenic or sarcopenic compared to females (2 (1,  $n=96$ ) = 14.54,  $p=0.0001$ ). SMMht was positively associated with hand grip strength ( $r= 0.63$ ;  $p <.0001$ ). **Conclusion:** While overall prevalence of sarcopenia was low, a large proportion of male participants were identified as at risk for sarcopenia, suggesting middle-aged males may benefit from preventive interventions to reduce loss of muscle mass and strength.

## PRECLINICAL STUDIES

### P104- THE INFLUENCE OF BODY COMPOSITION ON EFFICACY OF BIOLOGICAL TREATMENT WITH TNF INHIBITORS IN PATIENTS WITH CROHN'S DISEASE.

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**Background:** The efficacy of biological treatment with TNF-a Inhibitors (TAI) Infliximab [IFX] or Adalimumab [ADA] in patients with Crohn's disease [CD] varies and the variation may be related to body composition or muscle strength. **Objectives:** To investigate whether the efficacy of measured by Harvey-Bradshaw Index (HBI) of biological treatment in Crohn's disease (CD) is associated with body composition (BC). **Methods:** A cross-sectional study including patients treated with IFX or ADA at Aalborg University Hospital, were investigated for the following: Body composition, measured by bioelectrical impedance analysis (BIA); muscle strength by handgrip strength (HGS); quality of life by Short Health Scale (SHS) and the presence of most common side effects in a questionnaire. High dose regimes were compared to standard dose regimes (IFX: 5 mg/kg every 8 week. ADA: 20 mg every 2 week), and statistical comparisons were made. **Results:** Out of 127 patients, 83 patients participated. Of these, 25 patients [30.1 %] scored HBI 5 indicating active disease, 25 [30.1 %] were in high dose regimes and 37 [44.6 %] reported side effects.

**Table 1**  
Patient characteristics

	N=83
Weight, kg [SD]	76.88 [14.13]
BMI, kg/m <sup>2</sup> [SD]	25.40 [4.53]
Fat mass index, kg/m <sup>2</sup> [SD]	7.54 [3.80]
FFM index, kg/m <sup>2</sup> [SD]	17.96 [2.28]
HGS, kg [SD]	42.68 [11.26]

A positive correlation was seen between HBI and weight ( $p=0.023$ ), and fat mass index ( $p=0.004$ ) indicating a more severe

disease activity in patients with high fat parameters. FFM index furthermore showed a trend at being lower in patients receiving high dose regimes ( $p=0.131$ ). A positive correlation was identified between HBI and SHS showing that increased disease activity is associated with decreased QoL ( $p=0.000$ ). Negative correlations, however insignificant were seen between HBI and FFMi and HGS indicating FFM and increased muscle strength to be protective factors against increased disease activity. **Conclusion:** About one third of the patients in this study were disease-active, despite treatment with TAI. A higher weight and FFMi was associated with increased disease activity, and reduced QoL. FFMi seemed to be lower in patients receiving high dose regimes. No significant body composition parameters were associated with the presence of side effects.

**P105- ARA290, A SMALL NON-HEMATOPOIETIC PEPTIDE DERIVED FROM ERYTHROPOIETIN, ATTENUATES THE AGE-ASSOCIATED DECLINE IN THE HEART'S STRUCTURE AND FUNCTION, PROLONGS HEALTHSPAN TO ATTENUATE FRAILTY IN ADVANCED AGE.** Alay Nanavati<sup>1</sup>, Jack Moen<sup>1</sup>, Jessie Axsom<sup>1</sup>, Melissa Krawczyk<sup>1</sup>, Max Beyman<sup>1</sup>, Christopher Ramirez<sup>1</sup>, Irene Alfaras<sup>2</sup>, Sarah Mitchell<sup>2</sup>, Rafael de Cabo<sup>2</sup>, Edward Lakatta<sup>1</sup> ((1) *Laboratory of Cardiovascular Sciences, National Institute on Aging, Baltimore, USA;* (2) *Translation Gerontology Branch, National Institute on Aging, Baltimore, USA*)

**Background:** The emergence of frailty, a state of high vulnerability to adverse health outcomes due to cellular and molecular alterations in various bodily systems, in advanced age is linked to age-associated structural and functional declines and chronic inflammation. **Objectives:** To determine where a novel 11-aa nonerythrombogenic, anti-inflammatory synthetic peptide derived from erythropoietin, ARA290, can delay age-associated deteriorations in the heart and attenuate frailty. **Methods:** 18-month-old Fischer 344 x Brown Norway (FBN) male rats ( $n = 50$ ) were randomized to receive bi-weekly injections of ARA290 or saline. Echocardiograms (ECHO) and electrocardiograms (ECG) were performed at baseline and 22, 26, 30, and 33 months of age. ECG recordings assessed heart rate (HR) and rhythm before (basal) and during a double autonomic blockade (intrinsic). The difference between basal and intrinsic HR (HR) was taken as an index of the extent of autonomic modulation of HR. Body weight (BW) was recorded every two weeks until death. At the final time point, a 33-item frailty index (FI), scored on a scale of 0 (least frail) to 1 (most frail), assessed an ensemble of health deficits in the integument, musculoskeletal, vestibulocochlear, ocular, neurological, digestive, and respiratory systems. Data was analyzed via linear mixed effects models, and Student's t-Tests. **Results:** ARA290 ameliorated an age-associated decline in the basal heart rate by 2.46 beats per minute (BPM) per month ( $p < 0.04$ ). The HR remained constant throughout the study for the ARA290 group ( $p = 0.9$ ), but declined at a rate of 1.73 BPM per month for the saline group ( $p < 0.06$ ). ARA290 maintained a left ventricular ejection fraction (Teichholz method) that was 5.08% higher at each time point ( $p < 0.0001$ ) and delayed the rate terminal BW decline by 0.18 grams per month<sup>2</sup> ( $p < 0.006$ ). ARA290 treated rats scored 0.07 lower on the FI ( $p < 0.001$ ). **Conclusion:** ARA290 ameliorated the terminal BW's rate of decline and postponed the onset of frailty by enhancing the left ventricular function and maintaining the effect of autonomic modulation on the HR to expand healthspan.

**P106- CONCORDANCE FOR THE MEASUREMENT OF SKELETAL MUSCLE MASS BETWEEN BIPOLAR AND TETRAPOLAR IMPEDANCE METER.** Uan Carlos Galvis Rincon, Alberto Piragauta Ardila, Yelenka Velasco (*Sports medicine physician, fundacion universitaria de ciencias de la Salud Luis, Bogota, Columbia*)

**Background:** Impedance testing is a widely used method for the measurement of body composition (skeletal muscle mass, fat tissue and other variables depending on the instrument). But the agreement between bipolar and tetrapolar impedance instruments has not yet been defined. **Objectives:** Establish the agreement of the results in the measurement of the skeletal muscle mass and body fat between the impedance of two electrodes and the impedance of four electrodes in a population of students of the Fundación Universitaria de ciencias de la Salud - FUCS and administrative personnel and patients or attendant of the patients of the Hospital Infantil Universitario de San José. **Methods:** A descriptive concordance study was carried out for consistency to which 161 subjects, over 18 years of age, entered. A concordance analysis was made for fat and muscle between the impedance meter of two and four electrodes using the Lin concordance coefficient and Bland and Altman graphs. Frequencies, measures of central tendency and dispersion were used to summarize the information. **Results:** The median age was 29 years (RIQ 22-52), 52.8% were men, the Lin coefficient for fat was 0.78, CI: 95% (0.72-0.83) and for muscle 0.38, CI: 95% (0.32). -0.44). **Conclusion:** The level of agreement between the impedance meter of two electrodes and four electrodes to measure fat and muscle by very high data is poor, these values of the bipolar instruments with respect to the tetrapolar.

## CLINICAL TRIALS

**P107- EFFECTS OF 3 MONTHS MULTICOMPONENT EXERCISE PROGRAM ON PHYSICAL FUNCTION IN NURSING HOME RESIDENTS: A RANDOMIZED CONTROLLED TRIAL.** Jon Irazusta<sup>1</sup>, Haritz Arrieta<sup>1</sup>, Chloe Rezola<sup>1</sup>, Idoia Zarrazquin<sup>2</sup>, Iñaki Echeverria<sup>1</sup>, José Javier<sup>3</sup>, Miren Iturburu<sup>3</sup>, Susana María Gil<sup>1</sup>, Ana Rodríguez-Larrad<sup>1</sup> ((1) *Department of Physiology, Faculty of Medicine and Nursing, University of the Basque Country (UPV/EHU). Barrio Sarriena, s/n, E-48940 Leioa (Bizkaia), Spain;* (2) *Department of Nursing I, Faculty of Medicine and Nursing, University of the Basque Country (UPV/EHU). Barrio Sarriena s/n, E-48940 Leioa (Bizkaia), Spain;* (3) *Matia Institute. Fundación Instituto Gerontológico Matia-Ingema. Camino de los Pinos 35, E-20018 Donostia-San Sebastian (Gipuzkoa), Spain*)

**Background:** The inadequacy of provisions for readily recognizable and remedial problems in nursing home (NH) residents highlighted the need to develop prevention interventions to avoid their physical deterioration. Physical exercise appears to be effective for improving the overall physical status of older adults and preventing disability and other adverse outcomes. **Objectives:** The aim of this study was to evaluate the effects of a multicomponent exercise intervention on physical fitness within NH residents. **Methods:** 112 NH residents that met the following criteria: aged  $< 70$  years, scored  $< 50$  on the Barthel Index, scored 20 on MEC Test (an adapted version of MMSE in Spanish) and who were all capable to stand up and walk independently for 10 meters were included in the study. The participants were randomly assigned to the intervention (IG) or the control group (CG). The IG participated in a 3-month multicomponent exercise intervention focused on strength, balance, stretching exercises and walking recommendations. Subjects in the CG participated in the routine activities. The studied variables were Senior Fitness Test battery and Short Physical Performance Battery (SPPB). The

analyses were performed in the entire sample and in two subgroups, classified according to participants' physical function score at baseline. Differences in the evolution of physical fitness parameters between both groups were assessed by mixed ANOVA. **Results:** The group-by-time interaction was significant for the entire sample and for the participants of low physical function subgroup in 30-s chair-stand, arm-curl, 8-ft timed up-and-go, SPPB score, and gait speed ( $p<.05$ ). In participants with higher physical function significant group-by-time interaction was observed in the SPPB score ( $p<.05$ ). **Conclusion:** Our study showed that a multicomponent exercise program is effective for older people living in NH. This is especially relevant in those with lower physical baseline scores. The lower efficacy of the program in participants with better function might be due to the insufficient exercise demands of our intervention for more fit residents. Future studies should analyze the effects of programs with higher intensities in older people with intermediate to high physical function.

**P108- EXERCISE IMPROVES OR MAINTAINS THE COGNITIVE FUNCTION AND PHYSICAL ACTIVITY LEVEL IN NURSING HOME RESIDENTS: A RANDOMIZED CONTROLLED TRIAL** Ana Rodriguez-Larrad<sup>1</sup>, Haritz Arrieta<sup>1</sup>, Chloe Rezola<sup>1</sup>, Susana María Gil<sup>1</sup>, Maider Kortajarena<sup>2</sup>, José Javier Yanguas<sup>3</sup>, Miren Iturburu<sup>3</sup>, Javier Gil<sup>1</sup>, Jon Irazusta<sup>1</sup> ((1) *Department of Physiology, Faculty of Medicine and Nursing, University of the Basque Country (UPV/EHU). Barrio Sarriena s/n, E-48940 Leioa (Bizkaia), Spain;* (2) *Department of Nursing II, Faculty of Medicine and Nursing, University of the Basque Country (UPV/EHU). Paseo Dr. J. Beguiristain 105, E-20014 Donostia - San Sebastian (Gipuzkoa), Spain;* (3) *Matia Institute. Fundación Instituto Gerontológico Matia-Ingema. Camino de los Pinos 35, E-20018 Donostia-San, Sebastian (Gipuzkoa), Spain*)

**Background:** Brain health and physical performance have been associated within the aging process. Although there is a consensus that aerobic and resistance training does benefit brain function in community dwelling older adults, there are few studies, which showed mixed results, performed in nursing home (NH) environment. **Objectives:** The aim of this study was to evaluate the effects of a 6-month multicomponent exercise intervention on cognitive function and physical activity level within NH residents. **Methods:** 112 NH residents who met the following criteria: aged 70 years, scored 50 on the Barthel Index, scored 20 on MEC Test (an adapted version of MMSE in Spanish) and who were all capable to stand up and walk independently for at least 10 meters were included in the study. The participants were randomly assigned to the intervention (IG) or the control group (CG). The IG participated in a 6-month multicomponent exercise intervention focused on strength, balance, stretching exercises and walking recommendations. Subjects in the CG participated in routine activities. Cognitive functioning was assessed by MOCA and WAIS-IV tests. Habitual physical activity was recorded with an accelerometer (Actigraph GT3X model) that participants wore on the hip with a belt for a seven-day period. Differences in the evolution of cognitive function and physical activity level parameters between both groups were assessed by mixed ANOVA. **Results:** A significant group-by-time interaction in favor of the IG was observed after the intervention for the MOCA and Symbol Search (WAIS-IV) tests ( $p<.05$ ). The number of steps per day and time in light physical activity increased in the IG and decreased in the CG. However, the group-by-time interaction for these variables did not reach the statistical significance ( $p=.107$  and  $p=.052$  respectively). **Conclusion:** The results of this study support that a multicomponent physical exercise program is effective to maintain the processing speed (Symbol Search test), visuospatial/executive function, naming,

memory, attention, language, abstraction, delayed recall, and orientation capacities, and thus the global cognition (MOCA) in NH residents. Further interventions should be carried out to assess the effectiveness of other physical exercise programs aimed at increasing physical activity in this population.

**P109- PHYSICAL FRAILITY AND QUALITY OF LIFE - BASELINE DATA A LARGE EUROPEAN MULTI-CENTRE TRIAL (DO-HEALTH).** Michael Gagesch<sup>1,2</sup>, Patricia Chocano-Bedoya<sup>1,2</sup>, John A. Kanis<sup>3</sup>, Bruno Vellas<sup>4</sup>, René Rizzoli<sup>5,6</sup>, Heike A. Bischoff-Ferrari<sup>1,2</sup> for the DO-HEALTH investigators ((1) *Department of Geriatrics and Aging Research, University Hospital Zurich and University of Zurich, Zurich, Switzerland;* (2) *Centre on Aging and Mobility, University of Zurich, Zurich, Switzerland;* (3) *Centre for Metabolic Bone Diseases, University of Sheffield, United Kingdom;* (4) *University of Toulouse, Toulouse, France;* (5) *Scientific Advisory Board of the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis, Liege, Belgium;* (6) *University of Geneva, Geneva, Switzerland*)

**Background:** Physical Frailty influences quality of life of seniors, and both have been associated with multiple negative health outcomes and increased mortality. However, there is limited data on the association of physical frailty and quality of life in community-dwelling seniors living in different European countries. **Objectives:** (1) To investigate the association of physical frailty/pre-frailty and quality of life (EuroQoL) among DO-HEALTH participants. (2) To investigate if the self-rated health component of EuroQoL could rule out physical frailty/pre-frailty among DO-HEALTH participants. **Methods:** DO-HEALTH is the largest European healthy aging trial testing the role of vitamin D and/or omega 3-fats and/or a simple home exercise program among 2157 community-dwelling seniors age 70 and older. Participant recruitment was performed in 7 trial centers (Basel, Geneva, Zurich, Berlin, Innsbruck, Toulouse and Coimbra). To address our 2 objectives we took advantage of the now available baseline data of DO-HEALTH including all 2157 community-dwelling DO-HEALTH participants age 70+. For frailty assessment, we used an adapted Fried-Frailty phenotype (robust, pre-frail, frail), for health-related quality of life we used the EQ5D-3L, and for self-rated overall health we used the EQ5D-3L visual analogue scale component. For objective (1), we used age, gender, and centre adjusted linear models - stratified by gender and age groups (75 vs >75). For objective (2), we used ROC-curve analyses adjusted for age and center to establish optimal cut points. **Results:** There were significant differences in health related quality of life between robust seniors and frail seniors (mean scores=0.98 vs 0.97 respectively,  $p<0.0001$ ), but not between pre-frail and robust seniors (mean score=0.98,  $p=0.09$ ). Regarding self-rated health, robust seniors had higher scores than those who were pre-frail and frail (mean scores were 85, 78 and 64 respectively,  $p<0.0001$  for all comparisons). In ROC analysis, self-rated health had high discriminative ability (AUC=0.91) to predict frailty, with a suggested cut-off of 75 points. **Conclusion:** Health related-quality measured by the EQ5D-3L of life is strongly associated with frailty, and its self-rated health component may help rule-out frailty.

**P110- DAILY MOBILITY PROFILE IN AGE-RELATED SARCOPENIA: ACTIMETRY BASELINE DATA FROM SARA-OBS, A SIX-MONTH OBSERVATIONAL MULTICENTRE CLINICAL STUDY IN EU AND US.** Gianluca Zia<sup>1</sup>, Lorenzo M Donini<sup>2</sup>, Waly Dih<sup>3</sup>, Carole Margalef<sup>3</sup>, Stanislas Veillet<sup>3</sup>, Luca Feletti<sup>4</sup>, Susanna Del Signore<sup>1,3</sup> ((1) *Bluecompanion Ltd, United Kingdom*; (2) *Sapienza University, Rome, Italy*; (3) *Biophytis, Paris, France*; (4) *Caretek s.r.l., Torino, Italy*)

**Background:** SARA-Obs is a multicentre six-month observational clinical study conducted in the EU and in the US. Patients taking part to SARA-Obs have been asked to wear a connected device over the entire duration of the study to continuously record data on daily physical activity. The use of a connected device like the ADAMO watch is aimed to easily collect information on the physical activity of elderly patients in a continuous and non-invasive way, evaluating their health with specific reference to the evolution of frailty and sarcopenia. **Objectives:** The interest of collected data is to analyse the pattern of physical activity, e.g. a sedentary life style and its relationship with the patient reported difficulty in physical function, assessed by auto-evaluation questionnaires and with established functional tests, e.g. 400 metre walking test. **Methods:** The watch records anonymous raw data from its sensors and process them, updating inside recorded monitoring parameters. Every 10 minutes, it transmits the processed information to its coupled base-station located in the patient house via a short-range radio protocol. Data transfer between watch and base-station is encrypted and encoded using the «Idea» algorithm and transferred over a radio link, respecting personal data privacy. The base station forwards such information to the SARA DATA server using the M2M mobile network (IOT). Mobility data automatically recorded by the watch include the level (5 levels from very low physical activity to sustained physical activity) and other specific outcome measures (i.e. falls events). Data recorded on servers every 10 minutes (quasi real time) are made available for review via a web-based analytical tool. The observation time range and the parameters of interest can be selected to test any interval the patient wore the device i.e. first month of study. **Results:** The baseline profile of included patients will be presented and discussed versus functional tests and autoevaluation questionnaires. **Conclusion:** Connected actimetry implemented in SARA-Obs allows to gather relevant information about mobility patterns of the older participants throughout the trial period without interfering with everyday activity - an innovative application of the Internet of Things (IOT) to clinical trials.

## **NEW DRUG DEVELOPMENTS**

**P112- COMBINED EFFECTS OF BIO101 ON ANABOLISM AND MITOCHONDRIAL FUNCTION IN SKELETAL MUSCLE CELLS.** P Dilda<sup>1</sup>, Maria Serova<sup>1</sup>, Blaise Didry-Barca<sup>1</sup>, Stanislas Veillet<sup>1</sup>, René Lafont<sup>2</sup> ((1) *Biophytis, UPMC - BC9, Paris, France*; (2) *Sorbonne Universités, UPMC Univ Paris 06, Paris-Seine Biology Institute (BIOSIPE), CNRS, Paris, France*)

**Backgrounds:** Skeletal muscle progressive loss of function and atrophy are physiological consequences of aging subsequently leading to a decrease in mobility and poor quality of life. The drug candidate BIO101 previously demonstrated its potential for improving muscle quality and function in different in vitro and in vivo models. BIO101 is the API of Sarconeos currently tested in clinical IIB trial in patients with sarcopenia. **Objectives:** The aim of this study was to characterize the impact of BIO101 on cellular energy metabolism and oxidative stress. **Methods:** Mouse C2C12 myoblasts were induced to

differentiate and myotube diameters were measured under fluorescent microscopy. The activation of various signalling pathways was assessed by western blot. Relative levels of mRNA expression were evaluated by qRT-PCR. Intracellular ROS were assessed using the DCFDA dye by flow cytometry. Oxygen consumption was measured using a Seahorse XF Analyzer. Twenty-two-month-old C57BL10 mice were subjected to either vehicle or BIO101 50mg/kg\*day for 14 weeks. **Results:** BIO101 treatment induced a significant increase of myofibres diameter (+24%, p<0.001) consistently with a rapid and significant activation of AKT/mTOR and MAPK signaling pathways involved in muscle anabolism and with a significant decrease in myostatin gene expression (-45%; p<0.01). In addition to these anabolic properties, BIO101 stimulated mitochondrial function, specially increasing mitochondrial spare respiratory capacity (+23%, p<0.05). Under glucose starvation and in the presence of fatty acids, BIO101 stimulated basal respiration (+37%, p<0.001) suggesting an increased flexibility in energy metabolism. Furthermore, BIO101 treatment lowered reactive oxygen species levels in cells subjected to an oxidative stress in accordance with an AMPK' activation, a key player in mitochondrial biogenesis and antioxidant systems, observed both in vitro and in vivo. **Conclusion:** This study demonstrates that the overall beneficial properties of BIO101 on muscle function rely on both anabolic and mitochondrial effects. Increases in mitochondrial respiratory spare capacity, in energy metabolism flexibility and in antioxidant capacity in response to BIO101 exposure are believed to be responsible for more energy production. These new results are key elements to better understand the effects of BIO101 in improving running ability of old mammals and justify the clinical development of Sarconeos in patients with sarcopenia.

**P113- BIO103 DEMONSTRATES SHARP IMPROVEMENT OF SKELETAL MUSCLE FUNCTION IN AN ANIMAL MODEL OF HINDLIMB IMMOBILIZATION.** M Latil<sup>1</sup>, Anne-Sophie Foucault<sup>1</sup>, Stanislas Veillet<sup>1</sup>, Pierre Dilda<sup>1</sup>, René Lafont<sup>2</sup> ((1) *Biophytis, UPMC - BC9, Paris, France*; (2) *Sorbonne Universités, UPMC Univ Paris 06, Paris-Seine Biology Institute (BIOSIPE), CNRS, Paris, France*)

**Background:** Muscle atrophy and function loss are serious concerns for patients afflicted by limb restriction after surgery, or following cast immobilization. They extend the duration of incapacity following the healing of the skeletal injury. Currently, only day-to-day activities during the remobilization period could help patients to recover muscle strength. Sarconeos is a first-in-class Mas activator, currently in clinical development (Phase 2b) for sarcopenia. **Objectives:** The aim of this study was to characterize the impact of BIO103, a Sarconeos hemisynthetic derivative, on muscle quality and function in a disuse experimental model. **Methods:** BIO103 was continuously administered orally (50mg/kg\*day) to 8-week-old C57BL6/J mice throughout a 14-day hindlimb immobilization phase. Tibialis anterior (TA) mass and specific maximal force were recorded before and at completion of the immobilization. Gene expression was evaluated by qRT-PCR. **Results:** In vehicle-treated animals and after 14 days of leg immobilization, an atrophy in tibialis anterior was observed (-34.8% p<0.001) in comparison with control non-immobilized mice. BIO103 treatment tends to compensate for this atrophy (-22.2%). In situ functional studies revealed that maximal specific strength decreased in vehicle-treated animals by 57.5% and only by 8.0% (p<0.001) in BIO103 treated animals. BIO103 treatment prevents the loss of muscle functionality and improved the muscle strength by 105.6% after 14 days of immobilization compared to vehicle-treated muscle. Histological analyses (performed after 14 days of immobilization) revealed that the observed functional

differences were neither related to changes in muscle fiber area nor fiber type composition. Molecular analyses showed that BIO103 treatment increased the expression of antioxidant-related genes such as Trx1 compared to vehicle-treated mice (+72.3%) that could limit the enhanced oxidative damage during the late phase of disuse muscle atrophy and autophagy-related genes such as FoxO1 (+77.8%), Beclin-1 (+104.5%) and p62 (+85.2%) that are able to prevent the accumulation of damaged organelles and maintain cellular homeostasis. **Conclusion:** These results demonstrate the efficacy of BIO103 in the prevention of muscle weight and strength loss in a hindlimb immobilization animal model. BIO103, a hemisynthetic derivative of Sarconeos could offer a new options for the treatment of disuse muscle atrophy, which is commonly associated with severe acute and chronic complications.

**P114- SARA-INT, A DOUBLE-BLIND, PLACEBO CONTROLLED, RANDOMIZED CLINICAL TRIAL TO EVALUATE SAFETY AND EFFICACY OF SARCONEOS (BIO101).** Waly Diah<sup>1</sup>, Carole Margalef<sup>1</sup>, René Lafont<sup>2</sup>, Philippe Dupont<sup>1</sup>, Pierre Dilda<sup>1</sup>, Gianluca Zia<sup>3</sup>, Stanislas Veillet<sup>1</sup>, Susanna Del Signore<sup>1,3</sup> ((1) *Biophytis, UMPC - BC9, Paris, France*; (2) *Sorbonne Universités, UPMC Univ Paris 06, CNRS - Institut de Biologie Paris Seine (BIOSIPE), Paris, France*; (3) *Bluecompanion Ltd, London, United Kingdom*)

**Background:** The SARA clinical program is built around Sarconeos (BIO101), an oral investigational new drug purified at 97% from the edible plant *Stemmacantha carthamoides*. It includes: -SARA-PK, the phase1 study that showed safety and tolerability of BIO101 in older healthy volunteers. -SARA-OBS, the 6-month observational study currently characterizing sarcopenia, including sarcopenic obesity. - SARA-INT, the 6-month interventional study recently cleared by the FDA. The SARA program is supported and hosted by SARA-Data, an innovative platform for clinical trial management. **Objectives:** The objective of SARA-INT is to evaluate safety and efficacy of BIO101 in a randomized placebo controlled study in patients 65 years suffering from sarcopenia and considered at risk of mobility disability. SARA-INT study will estimate BIO-101 effect on improvement of physical function versus placebo in the target population. SARA-INT will also estimate BIO101 effect on decreasing the risk of mobility disability after a 6 month treatment. **Methods:** SARA-INT will take place in 21 sites in EU and US and will consist of four main visits (baseline, Month1, Month3, and Month6).The main end-point is the gait speed at the 400-meter walking test). Key secondary end-points are the questionnaire PF-10 within SF-36 and raising from a chair at SPPB. Other endpoints include the 6-minute distance, body composition, grip strength and physical activity by actimetry. Patient Reported Outcomes (SF-36, SarQoL and TSD-OC) and biomarkers of sarcopenia will be also studied. Patients are selected based on the FNIH criteria (Studenski at al., 2014; SPPB - 8 and ALM/BMI < 0.512 in women and < 0.789 in men or ALM <19.75 kg in men and <15.02 kg in women. Patients retained from SARA-OBS and newly recruited will be dosed at BIO101- 175 mg b.i.d. and 350 mg b.i.d. during 26 weeks versus placebo. **Results:** The rationale behind SARA-INT regulatory strategy will be discussed and the clinical design including main and secondary criteria will be presented. **Conclusion:** SARA-INT clinical design is based on the European Medicines Agency scientific advice and FDA IND considerations.

## PHYSICAL EXERCISE

**P115- A NOVEL NON-PHARMALOGICAL INTERVENTION TO IMPROVE BODY COMPOSITION IN OBESE ELDERLY: CITRULLINE WITH HIGH-INTENSITY INTERVAL TRAINING.** MC Dulac<sup>1,3</sup>, G El Hajj Boutros<sup>2,3</sup>, LP Carvalho<sup>4</sup>, V Marcangeli<sup>2,3</sup>, P Gaudreau<sup>5</sup>, G Gouspillou<sup>2,3</sup>, JA Morais<sup>3,6</sup>, P Noirez<sup>2,3,7</sup>, M Aubertin-Leheudre<sup>2,3</sup> ((1) *Department of Biology*; (2) *Department of Physical Activity Sciences*; (3) *GRAPA, University of Quebec at Montreal, Montreal, Canada*; (4) *Department of Physical Therapy, Federal University of Sao Carlos, Sao Carlos, Brazil*; (5) *Department of Medicine, University of Montreal, Montreal, Canada*; (6) *Department of Medicine, Division of Geriatric Medicine, McGill University, Montreal, Canada*; (7) *University Paris Descartes, IRMES EA7329, Paris, France*)

**Background:** With aging, muscle mass decreases whereas adipose tissue mass increases. These changes are associated with an increased risk of developing metabolic alterations and functional decline. High-Intensity Interval Training (HIIT), due to its high effectiveness and short duration, is a promising avenue to prevent these phenomena. Citrulline (a non-proteinogenic amino acid) supplementation (CIT) was shown, in both rats and young human adults, to increase muscle protein synthesis and increase lipolysis in adipocytes. Therefore, CIT may exert additional beneficial effects when combined with HIIT. **Objectives:** The aim of this study was to determine the effects of CIT combined with HIIT in inactive obese older adults. **Methods:** Thirty-nine men (fat mass: 34±5%; age: 68±5y) and 36 women (fat mass: 43±5%; age: 67±4y) were involved in a 12-week elliptical HIIT program (cycle: 30 seconds at 85% and 90 seconds at 65% of maximal age-predicted heart rate; 3 x 30 minutes/week) and randomly and double-blindly divided into 2 groups according to gender: 1) HIIT+CIT (18 men; 19 women) and 2) HIIT+Placebo (PLA, 21 men; 17 women). CIT (10 g/day) or PLA (isovalent products) was ingested once a day for the duration of the exercise program. Body composition [DXA: fat-free mass and fat mass (total and appendicular)] was measured pre- and post-intervention. A two-way repeated-measure ANOVA was used to determine the effect of the intervention (HIIT) and supplementation. (CIT vs. PLA) in men and women groups. p <0.05 was considered significant. **Results:** At baseline, subjects were comparable for all variables. Following the HIIT intervention, total fat mass was further decreased in CIT (CIT: 37.3±4.1 vs 35.6±3.4kg) vs. PLA group (PLA: 34.7±3.9 vs 34.2±4.1kg, p=0.022) in men. In Women, total fat-free mass was further increased in CIT (CIT: 44.1±3.9kg vs 46.6±3.4kg) vs. PLA group (PLA: 40.7±5.1 vs 41.2±5.5kg; p=0.039) following the HIIT intervention. **Conclusion:** Addition of CIT supplementation to HIIT significantly ameliorates body composition in elderly obese people. These effects appear to involve different sex-dependent mechanisms of action, which is reflected in men by a decrease in adipose tissue mass, but in women by an increase in muscle mass.

**P116- EFFECT OF HIGH-INTENSITY INTERVAL TRAINING COMBINED WITH CITRULLINE SUPPLEMENTATION ON FUNCTIONAL CAPACITY AND MUSCLE FUNCTIONS IN DYNAPENIC-OBESE OLDER ADULTS.** Livia P. Carvalho<sup>1</sup>, Maude C. Dulac<sup>2</sup>, Guy El Hajj Boutros<sup>2</sup>, Vincent Marcangeli<sup>2</sup>, Pierrette Gaudreau<sup>2,4</sup>, José A. Morais<sup>5</sup>, Gilles Gouspillou<sup>1</sup>, Philippe Noirez<sup>6</sup>, Mylène Aubertin-Leheudre<sup>1</sup> ((1) Department of Physical Activity Sciences, Université du Québec à Montréal, Montreal, QC, Canada; (2) Department of Biology, Université du Québec à Montréal, Montreal, QC, Canada; (3) Centre Hospitalier de l'Université de Montréal Research Center, Canada; (4) Department of Medicine, University of Montreal, Montreal, QC, Canada; (5) Department of Medicine, Division of Geriatric Medicine, McGill University, Montreal, QC, Canada; (6) Institute for Research in Biomedicine and Epidemiology of Sport, Université Paris Descartes, Paris, France)

**Background:** Aging is associated with loss of muscle strength [dynapenia,DY] and an increase of fat mass, both leading to physical declines. DY and obesity (O) induce a greater decline in functional capacities than O or DY alone. Considering the prevalence of obesity in older adults, novel strategies must be developed to counteract O-DY. Physical activity (PA), such as the high-intensity interval training (HIIT), appears to mitigate most adverse effects on functional capacity. Interestingly, citrulline (CIT) supplementation has been shown to influence muscle and fat metabolism in rats. **Objectives:** Thus, we aimed to examine the effect of HIIT+CIT on functional capacity and muscle functions in DY-O older adults. **Methods:** Fifty-six sedentary obese (fat mass[FM]: Men>25%, Women>35%) and dynapenic subjects (handgrip strength[HS;kg]/body weight[BW;kg] <0.44[women] and <0.61[men]) were double-blindly randomized in two groups: 1)HIIT+CIT (n=26; 50% women/men; age:68±4y; BMI:30.5±4.1kg.m-2; BF:39±6%) and 2)HIIT+Placebo(PLA) (n=30; 50% women/men; age:66±5y; BMI:30.4±4.9kg.m-2; BF:39±8%). Participants followed a 12-week elliptical HIIT program (cycle: 30sec at 85% and 90sec at 65% of maximal heart rate; 3 x 30min/week) and they took a 10g-dose of CIT or PLA every day during the experimental protocol. BW, composition (FM and lean mass [LM]) and distribution (waist circumference [WC]), functional capacity (fast Timed Up-and-Go[TUGf]/normal[nTUG], 4-meter(4MWT) and 6-minute(6MWT) walking tests, unipodal balance, chair and step tests), relative HS(HS/BW), knee extensor strength(KES/BW), and muscle power(MP/BW) were measured. A repeated-measure ANOVA and Mann-Whitney tests were used. **Results:** At baseline, groups were similar regarding age, BMI, body composition and functional capacity (p>0.05). There was a significant within-group effect for all functional tests (p<0.001, effect size [ $\hat{I}$ ] range: 0.36-0.81); HS/BW (p<0.001,  $\hat{I}$ »=0.27), KES/BW (p=0.001,  $\hat{I}$ »=0.19), MP/BW (p<0.001,  $\hat{I}$ »=0.49); FM (p<0.001), WC (p<0.01) and LM (p=0.03). HIIT+CIT improved significantly more HS ( $\hat{I}$ »9.3±10.7% vs  $\hat{I}$ »3.3±8.5%, p=0.04), HS/BW ( $\hat{I}$ »10.9±11.6% vs  $\hat{I}$ »5.3±16.0%, p=0.01) and TUGf performance ( $\hat{I}$ »-16.1±8.0% vs  $\hat{I}$ »-11.8±7.8%, p=0.04) than HIIT+PLA. **Conclusion:** These results indicate that HIIT induces beneficial effects on body composition, functional capacity, relative muscle strength and power (muscle quality) in dynapenic-obese older adults. Since supplementation with CIT increases further muscle strength (dynapenia criteria) and gait speed, it will be important to elucidate the mechanisms by which HIIT+CIT exert their actions.

**P117- SKELETAL MUSCLE ADAPTATION IN RESPONSE TO HIGH INTENSITY INTERVAL TRAINING IN OLDER ADULTS ACCORDING TO DAILY PROTEIN INTAKE DISTRIBUTION.** V Marcangeli<sup>1,2,3</sup>, G El Hajj-Boutros<sup>1,2,3</sup>, LP Carvalho<sup>1,2,3</sup>, MD Dulac<sup>2,3</sup>, CH Pion<sup>2,3</sup>, M Belanger<sup>1,2,3</sup>, G Gouspillou<sup>1,2,3</sup>, P Gaudreau P<sup>4</sup>, S Chevalier<sup>5</sup>, JA Morais<sup>5</sup>, M Aubertin-Leheudre<sup>1,2,3</sup> ((1) Department of Exercise Science, Université du Québec à Montréal, Montreal (Qc), Canada; (2) Groupe de recherche en activité physique adapté (GRAPA), Université du Québec à Montréal, Montreal (Qc), Canada; (3) Centre de Recherche de l'Institut Universitaire de Gériatrie de Montréal, Montreal (Qc), Canada; (4) Centre de Recherche du Centre Hospitalier Universitaire de Montréal and Département de médecine, Université de Montréal, Montreal (Qc), Canada; (5) The Research Institute of the McGill University Health Centre and Division of Geriatric Medicine, McGill University, Montreal (Qc), Canada)

**Background:** Aging is associated with declines in muscle mass, strength and quality, leading to physical declines. An even protein distribution in daily meals has recently been proposed along with adequate total protein intake as important modulators of muscle mass. In addition, high-intensity interval training (HIIT) has been highlighted as a promising intervention to prevent physical deterioration due to its short duration. However, the interaction between daily protein intake distribution and HIIT intervention in elderly remains unknown. **Objectives:** To investigate muscle adaptation following HIIT in older adults according to daily protein intake distribution. **Methods:** Thirty-four sedentary obese (fat mass: men>25%; women>35%) subjects (68±5yrs) who completed a 12-week elliptical HIIT program (cycle: 30sec at 85% and 90sec at 65% of maximal age-predicted heart rate; 3 x 30min/week) were matched and divided a-posteriori into 2 groups according to the amount of protein ingested at each meal: <20 g in at least one meal (P20-, n=17) and ≥20g in each meal (P20+, n=17). Nutritional intakes were analysed from self-reported 3-day food diaries using the Candat software. Functional capacity (4m-walking speed, chair and step tests), physical endurance (6MWT), knee extensor strength (KES), and muscle power (MP) were measured pre- and post-intervention. A two-way repeated ANOVA was used to determine the effect of the intervention (HIIT) and protein distribution (P20- vs P20+, p<0.05). **Results:** No difference was observed at baseline between groups. Following the HIIT intervention, we observed significant improvements on 6MWT (558 vs 629m), KES (353 vs 379N), MP (159 vs 189W), functional capacities (4-m walking speed: 2.98 vs 2.72sec; step test: 29 vs 34rep; chair test: 18.4 vs 15.3sec). However, no protein distribution effect was observed. **Conclusion:** A 12-week HIIT program is achievable and efficient to improve physical endurance, functional capacities as well as lower limb muscle strength and power in older obese adults. However, having at least 20gr of proteins across meals does not further enhance muscle performance in response to HIIT intervention. A randomized controlled trial will be needed to confirm these results since protein distribution was not in the initial design but studied a posteriori.

**P118- PROGRAM PREFERENCES AND (DIS)INCENTIVES OF OLDER PEOPLE TO PARTICIPATE IN NUTRITIONAL AND PHYSICAL EXERCISE PROGRAMS.** Lenore Dedeyne<sup>1</sup>, Louise Dewinter<sup>1</sup>, Aniko Lovik<sup>2</sup>, Sabine Verschuere<sup>3</sup>, Jos Tournoy<sup>1,4</sup>, Evelien Gielen<sup>1,4</sup> ((1) *KU Leuven University of Leuven, Department of Chronic Diseases, Metabolism and Ageing, Leuven, Belgium*; (2) *KU Leuven University of Leuven, Department of L-BioStat, Leuven, Belgium*; (3) *KU Leuven University of Leuven, Department of Rehabilitation Sciences, Leuven, Belgium*; (4) *UZ Leuven, Department of Geriatric Medicine, Leuven, Belgium*)

**Background:** Recently, a growing number of studies in older people has been examining beneficial effects of non-pharmacological interventions, such as physical exercise (PE) and nutritional supplementation, to target age-related syndromes such as sarcopenia and frailty and their consequences. However, it is reported that the recruitment of older people is challenging, and that their adherence to interventions is low. **Objectives:** The aim of this study in older adults (< 65 years) is (1) to evaluate the interpersonal, intrapersonal and community (dis)incentives towards participation in a hypothetical PE or nutritional program and; (2) to determine the preferred program formats of a PE (location) and nutritional program (intake form and timing) and to compare these in participants with or without frailty and with or without a risk of sarcopenia. **Methods:** A questionnaire was developed and filled in by 115 community-dwelling older adults after content (n = 7 experts) and face validation (n = 8 older adults). We assessed (1) the agreement with a statement (a statement with which > 70% of the participants agrees or strongly agrees is considered as a common statement); (2) concepts of motivation by an exploratory factor analysis and; (3) program preferences by nonparametric Wilcoxon or Friedman's Analysis of variance (ANOVA) and post-hoc Wilcoxon signed rank tests. **Results:** Intrapersonal motivators (e.g., health benefits) were the most common motivators to participate in a PE or nutritional program. Identified concepts to participate in a PE intervention were intrinsic health beliefs, fear of falling or injuries, influence of significant others and environment and (para)medical encouragement (Cronbach alpha 0.75; 72% variance explained). Intrinsic health beliefs, influence of significant others and (para) medical encouragement were identified as concepts that motivates older people to participate in a nutritional intervention (Cronbach alpha 0.77; 78% variance explained). No favorability of exercise location was identified, however older people preferred a protein supplement in tablet form compared to liquid or powder form and in a pulsed timing compared with a spread intake. **Conclusion:** Program preferences of older people towards nutritional interventions need to be taken into account in future clinical trials and implementation programs to increase recruitment and adherence to interventions.

**P119- EFFECTS OF 12 MONTHS RESISTANCE AND ENDURANCE TRAINING ON MUSCLE QUANTITY, QUALITY AND PHYSICAL FUNCTIONS IN ELDERLY REQUIRING LONG-TERM CARE.** Akito Yoshiko<sup>1</sup>, Takashi Kajii<sup>2</sup>, Hiroki Sugiyama<sup>2</sup>, Teruhiko Koike<sup>1</sup>, Yoshiharu Oshida<sup>1</sup>, Hiroshi Akima<sup>1</sup> ((1) *Nagoya University, Nagoya, Japan*; (2) *Kajinoki Medical Clinic, Gifu, Japan*)

**Blackground:** Muscle quality, which is defined as the fat content within muscles, becomes worse with losing of muscle quantity in elderly. It has been shown that muscle quality inversely related with insulin resistance and physical dysfunction. Importantly, elderly individuals requiring long-term care may have increased fat content within muscles and less muscle quality due to lower physical activity. Several researches suggested the validity of physical training, i.e.

resistance and aerobic, to improve muscle quality; however, it is unclear how such training intervention affects muscle quality in elderly requiring long-term care. **Objectives:** The purpose of this study was to assess the effects of 12 months physical training on muscle quantity, quality and physical functions in elderly requiring long-term care. **Methods:** Seventeen elderly individuals, who need long-term care while doing almost all activities of daily living, participated in this study (age 78 ± 8 years). They performed physical training consisting of resistive and aerobic exercises once or twice a week for 12 months. B-mode ultrasound images were taken from anterior and posterior thigh before and after the training. Echo intensity (EI) and muscle thickness was calculated as an index of muscle quality and quantity, respectively. The subjects performed physical performance tests, i.e. isometric knee extension peak torque, one-leg stand, chair stand, handgrip strength, 5-m normal/maximal walk, and timed up and go, before and after the training. **Results:** The EI after 6 months of training was significantly lower than baseline, and it returned to the initial level after 12 months of training (baseline, 70.2 ± 8.3 a.u.; 6 months, 64.1 ± 11.2 a.u.; 12 months, 72.3 ± 7.2 a.u.). The muscle thickness was increased, and knee extension torque and 5-m maximal speed walking were improved after the training. **Conclusion:** The physical training induced muscle hypertrophy with improvement of physical functions in elderly individuals requiring long-term care. On the other hand, muscle quality showed once decreased then returning to the baseline during the training period. We conclude that this type of training has the potential to contribute improvement of the muscle functional abilities of elderly requiring long-term care.

**P120- THE EFFECTS OF STAIR CLIMBING ON ARTERIAL STIFFNESS, BLOOD PRESSURE AND LEG STRENGTH IN POSTMENOPAUSAL WOMEN WITH STAGE-1 HYPERTENSION.** Alexei Wong<sup>1</sup>, Arturo Figueroa<sup>2</sup>, Won-Mok Son<sup>3</sup>, Song-Young Park<sup>3,4</sup> ((1) *Marymount University, Arlington, VA, USA*; (2) *Texas Tech University, Lubbock, TX, USA*; (3) *Pusan National University, Busan, Republic of Korea*; (4) *University of Nebraska-Omaha, Omaha, NE, USA*)

**Background:** Menopause is accompanied by a progressive arterial stiffening associated with increases in blood pressure (BP) and the age-related loss of muscle mass and strength, known as sarcopenia. It is crucial to reduce the negative effects of menopause on vascular and muscular function by implementing appropriate lifestyle interventions, such as exercise training. Stair climbing (SC) has been found to increase leg strength in young women. However, the possibility of SC improving arterial stiffness and leg strength in hypertensive postmenopausal women is currently unknown. **Objectives:** The purpose of this study was to examine the effects of a SC regimen on arterial stiffness (pulse wave velocity, PWV), BP, fat free mass (FFM) and leg strength in postmenopausal women with stage-1 hypertension. **Methods:** Forty-one postmenopausal women [age (59 ± 1 years) with stage-1 hypertension were randomized to either SC (n = 21) or no-exercise control group (n = 20) for 12 weeks. SC consisted of climbing a 192 steps stairwell 2-5 times per session 4 x week. The program began with two climbs per session in weeks 1-3, increasing by one climb a session every three weeks. By the last three weeks (10-12) of the study, all subjects were completing 5 climbs per session. Participants' brachial to ankle PWV (baPWV), BP, heart rate (HR), leg strength and FFM were measured at baseline and after 12 weeks. **Results:** There were significant group x time interactions (P<0.05) for baPWV, systolic BP, diastolic BP and HR which significantly decreased (P<0.05); and leg strength which significantly increased (P<0.05) following SC compared to no changes after control. The changes in baPWV were correlated with changes in

systolic BP ( $r = 0.66$ ,  $P < 0.05$ ) and leg strength ( $r = -0.47$ ,  $P < 0.05$ ). No significant changes were observed in FFM after 12 weeks for both groups. **Conclusion:** SC led to reductions in arterial stiffness, BP and increases in leg strength in stage-1 hypertensive postmenopausal women. The decrease in arterial stiffness partially explained the improvements in systolic BP and leg strength. SC may be an effective intervention in the prevention and treatment of menopause/aging related vascular complications and muscle weakness.

**P121- FEASIBILITY AND POTENTIAL EFFICACY OF HIGH INTENSITY WALKING IN FRAIL OLDER ADULTS**  
**AUTHOR.** Margaret Danilovich<sup>1</sup>, David E. Conroy<sup>2</sup>, T. George Hornby<sup>3</sup> ((1) *Northwestern University, USA*; (2) *Penn State University, USA*; (3) *Indiana University, USA*)

**Background:** Walking is an effective and preferred mode of exercise for older adults, yet limited evidence exists on the optimal walking intensity for frail older adults. Low to moderate intensity walking has shown improvements in physical functioning, but minimal impact on frailty. **Objectives:** The purpose of this study was to investigate the feasibility and efficacy of a high intensity walking training (HIWT) intervention for pre-frail and frail older adults in an assisted living facility. **Methods:** We used a pretest-posttest design to investigate a 12-session HIWT intervention where the goal was 30 minutes of walking at 70-80% of heart rate (HR) maximum or a Borg Rating of Perceived Exertion (RPE) between 15 (Hard) and 17 (Very Hard). Exercise sessions were individually supervised and consisted of fast walking, limb loading through the use of ankle cuff weights, and variable tasks including obstacle negotiation, compliant surfaces, outdoor surfaces, and directional changes. Participants performed stair climbing each session and were instructed to reduce handrail use, incorporate faster speeds, and reduce rest breaks between floors as able. Feasibility was determined by HR and RPE, program evaluations, and adverse events. The primary outcome was frailty as measured by the SHARE-FI. Secondary outcomes were the Berg Balance Scale, 6-minute walk test, gait speed, 30 second chair rise, and Modus StepWatch-assessed ambulatory activity. **Results:** HIWT is feasible in frail populations. Participants viewed HIWT as highly satisfactory (mean 9.6/10) and 100% recommended that HIWT be routinely performed. Primary outcomes of frailty (pretest:  $3.6 \pm 0.94$  vs posttest:  $1.2 \pm 1.03$ ), fast gait speed (pretest:  $0.7\text{m/s} \pm 0.31$  vs. posttest:  $0.9\text{m/s} \pm 0.30$ ), 6 minute walk test (pretest:  $217\text{ m} \pm 150$  vs. posttest:  $401\text{ m} \pm 202$ ) and Berg Balance (pretest:  $32.2 \pm 9.23$  vs. posttest:  $37.8 \pm 9.04$ ) were all statistically significant ( $p < .05$ ). All participants improved at least one frailty category (e.g. frail, pre-frail, non-frail) following exercise. Mean daily steps per day increased 17%. No adverse events occurred and all participants reached RPE target intensity in all 12 sessions. **Conclusion:** This study offers the first evidence of the feasibility and potential efficacy of HIWT for frailty. Results show that HIWT significantly reduces the degree of frailty and contributes to improved mobility and balance considerably higher than published minimally clinically important differences.

**P122- ASSOCIATIONS BETWEEN L-ARGININE PATHWAY METABOLITES, SKELETAL MUSCLE MASS AND FUNCTION, AND THEIR RESPONSES TO RESISTANCE EXERCISE, IN OLDER ADULTS.** Mariasole Da Boit<sup>1</sup>, Sara Tommasi<sup>2</sup>, David Elliot<sup>2</sup>, Angelo Zinellu<sup>3</sup>, Salvatore Sotgia<sup>3</sup>, Judith R Meakin<sup>5</sup>, Richard M Aspden<sup>4</sup>, Ciriaco Carru<sup>3,6</sup>, Arduino A Mangoni<sup>2</sup>, Stuart R Gray<sup>7</sup> ((1) *Faculty of Health and Life Sciences, De Montfort University, Leicester, United Kingdom*; (2) *Department of Clinical Pharmacology, College of Medicine and Public Health, Flinders University, Adelaide, Australia*; (3) *Department of Biomedical Sciences, University of Sassari, Sassari, Italy*; (4) *Institute of Medical Sciences, University of Aberdeen, Aberdeen, United Kingdom*; (5) *Exeter MR Research Centre, University of Exeter, Exeter, United Kingdom*; (6) *Quality Control Unit, University Hospital (AOUSS), Sassari, Italy*; (7) *Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, United Kingdom*)

**Background:** Sarcopenia impairs physical function, reducing the quality of life. The potential role of L-arginine pathway metabolites, regulating nitric oxide synthesis and blood flow, in skeletal muscle homeostasis is supported by recent studies in older populations. Resistance training is known to improve muscle strength and function in older people, but it is still unknown whether specific L-arginine metabolites, prior to resistance exercise, are associated with the changes in established parameters of muscle mass and function following exercise. **Objectives:** The main aim of this study was to investigate associations between L-arginine pathway metabolites, muscle mass and function, in a cohort of healthy older adults. A secondary aim was to determine associations between pre-exercise L-arginine metabolites and changes in muscle mass and function after resistance exercise training. **Methods:** 50 healthy older adults undertook an 18-week resistance exercise program, and were randomly assigned to a nutritional intervention (fish oil vs. placebo). Serum homoarginine, ornithine, citrulline, asymmetric dimethylarginine (ADMA), NG-monomethyl-L-arginine (L-NMMA), and symmetric dimethylarginine (SDMA), maximal voluntary contraction (MVC) and isokinetic torque of the knee extensors at 30° s-1 (MIT), muscle cross sectional area (MCSA) and quality (MQ) were measured at baseline and after the intervention. **Results:** No significant exercise-induced changes ( $P > 0.05$ ) were observed in metabolite concentrations. After adjusting for age, glomerular filtration rate and fish oil intervention, citrulline ( $P = 0.002$ ) and ornithine ( $P = 0.022$ ) were negatively associated with MCSA at baseline in males but not females. However, baseline citrulline was negatively correlated with exercise-induced changes in MVC ( $P = 0.043$ ) and MQ ( $P = 0.026$ ) amongst females. Furthermore, amongst males, baseline homoarginine was positively associated with exercise-induced changes in MVC ( $P = 0.026$ ), ADMA was negatively associated with changes in MIT ( $P = 0.026$ ), L-NMMA ( $p = 0.048$ ) and ornithine ( $P < 0.001$ ) were both positively associated with changes in MCSA, and ornithine was negatively associated with changes in MQ ( $P = 0.039$ ). **Conclusion:** Excluding citrulline, there are significant sex differences in the associations between L-arginine metabolites and muscle mass and function in healthy older adults. The measurement of these metabolites might enhance sarcopenia risk stratification, and the success of exercise programs, in old age.

**P123- PHYSICAL ACTIVITY LEVELS AND FRAILTY IN PORTUGUESE COMMUNITY-DWELLING OLDER ADULTS - A CROSS-SECTIONAL STUDY.** Duarte Barros<sup>1</sup>, Mayra Weege<sup>2</sup>, Raquel Silva<sup>1,3</sup>, Joana Carvalho<sup>1</sup> ((1) CIAFEL - Research Centre in Physical Activity, Health and Leisure, Faculty of Sport Science, University of Porto, Porto, Portugal; (2) ISS - Institut für Sportwissenschaft und Sport, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen, Germany; (3) CNPQ)

**Background:** Population aging is a worldwide phenomenon with consequences on several aspects of society, such as high prevalence of chronic degenerative diseases and functional limitations that can result in frailty (Santos-Eggimann & Sirven, 2016). Frailty is emerging as a common syndrome among older adults. Among others, regular physical activity (PA) has been shown to be protective against several components of frailty in older men and women, including sarcopenia, functional impairment, cognitive performance and depression. However, despite the highly broadcast benefits PA, the overwhelming majority of older people in Portugal do not meet the minimum physical activity levels needed to maintain health. **Objectives:** To compare PA levels between robust, pre-frail and frail elderly people and verify the proportion of individuals that don't meet PA recommendations. **Methods:** Sample consisted of 105 community-dwelling older adults (mean age=73,3± 5.8 yrs, 62 women) that were evaluated by Fried's five criteria for physical frailty. PA was objectively measured by accelerometry. One-way ANOVAs and Kruskal-Wallis tests were used to analyze, respectively, PA levels and the proportion of individuals who did not meet recommendations in the different categories of frailty. **Results:** i) overall, 61% (n=64) of the sample do not meet weekly moderate-to-vigorous physical activity (MVPA) recommendations and, on average, engaged in 7,8 hours of sedentary daily time; ii) there were no significant differences in the sedentary and light PA between fragility categories; iv) the frail elderly presented reduced MVPA (0.1h / day) and significantly different from the other groups (p <0.001); v) 90.9% of the frail, 72.4% of the pre-frail and 33.3% of the robust did not comply with the recommendations, being these differences among the groups significant (p <0.001). **Conclusion:** Portuguese older adults present high levels of sedentary behavior. Moreover, MVPA seems to be an important influence in the frailty syndrome, since the most frailer elderly present lower values compared to pre-frail and robust. Although these findings provide some clue concerning the importance of PA in frailty of community-dwelling older adults, additional evidence is needed to validate and build upon our findings using a larger and more representative sample. Acknowledgments. Support from IPDJ and CIAFEL is Supported by FCT with grant UID/DTP/00617/2013

**P124- PHYSICAL EXERCISE PROGRAM FOR SARCOPENIA OF OLD ELDERS.** Alice MK Wong<sup>1,2</sup>, Yin Chou Lin<sup>1</sup>, Chih Kuang Chen<sup>1</sup> ((1) Chang Gung Memorial Hospital, Tao-Yuan Branch, Taoyuan, Taiwan; (2) Healthy Aging Research Center, Chang Gung University, Taoyuan, Taiwan)

**Background:** Aging is characterized by a gradual decline in physical strength and function. The loss of muscle mass, muscle strength and muscle endurance-capability in the elderly results in a reduction in muscle function and performance is described to sarcopenia. This changes in function play a role in the increase in weakness, falls, fractures and loss of independence. Dual-energy X-ray absorptiometry (DEXA) is a standard way to measure the muscle mass. Since there is no effective pharmacologic agent for the treatment of sarcopenia. The management of sarcopenia is

primarily focused on physical training for muscle strengthening and gait. **Objectives:** This study is to investigate the effect of physical exercise program for prevention and management of sarcopenia in elders. **Methods:** We invited the old elders in our Chang Gung silver village, with the diagnosis of sarcopenia by DEXA and in independent walking and activities of daily living to joint this study of physical training. Those with unsteady gait, prominent impairment of cardiopulmonary function or motor ability were excluded. There were 23 elders with diagnosis of sarcopenia, 24 with pre-sarcopenia, and 11 with non-sarcopenia enrolled in this study. The experimental groups of sarcopenia, pre-sarcopenia, and non-sarcopenia received aerobic and resistance training for 24 weeks, twice a week for 1 hour each. They also received grip force, 6 minutes walking, balance test, and urinary metabolomics test before and after intervention. The repeated variability analysis was used to compare three groups of patients for differences in these tests. Data were compared by non-parametric K independent sample test and linear regression. **Results:** Results showed high dropout rates in all groups (15-60 %) during physical training due to physical illness as well as psychological problems. There was a tendency of improvement in grip force and walking speed in all groups, and some improvement in balance. Urinary metabolomics data suggested that sarcopenia in male might be more related to metabolic condition while in female related to nutrition. **Conclusion:** Physical exercise program might be effective in functional improvement by grip force, walking speed, and balance but not increase in muscle mass for elders with sarcopenia. Therefore, prevention of sarcopenia will be an important issue.

**P125- EXERCISE MAINTENANCE AND PHYSICAL FUNCTION IN OLDER ADULTS 1 YEAR AFTER COMPLETION OF A 12 WEEK EXERCISE TRAINING INTERVENTION: A MIXED METHODS APPROACH.** James Timmons<sup>1,2</sup>, Colin Griffin<sup>1</sup>, Karl E. Cogan<sup>1</sup>, James J. Mathews<sup>1</sup>, Brendan Egan<sup>1,3</sup> ((1) School of Public Health, Physiotherapy and Sports Science, University College Dublin, Ireland; (2) Medfit Proactive Healthcare, Blackrock, Ireland; (3) School of Health and Human Performance, Dublin City University, Ireland)

**Background:** Exercise training is effective for improving physical and cognitive function in older adults, but long-term effects on function and/or maintenance of exercise after the cessation of training interventions are inadequately described. Moreover, few studies have employed mixed methods in follow-up research meaning that aspects such as facilitators and barriers of exercise maintenance are underexplored. **Objectives:** To examine the effects of a 12 week exercise training intervention on body composition, physical and cognitive function assessed 1 year after completion, and to explore determinants of exercise maintenance after participation in a supervised exercise training intervention. **Methods:** One year after the completion of the exercise training intervention incorporating aerobic, resistance, and concurrent training groups, 53 participants (m/f, 30/23; age 70.8±3.9 y) of the original 63 participants completed follow-up testing. Assessments included body composition by DXA scan, the Short Physical Performance Battery, one repetition maximum for chest and leg press, Chester step test, and Montreal Cognitive Assessment (MoCA). Semi-structured interviews were conducted with 16 participants using the Theoretical Domains Framework to inform the interview guide. Thematic analysis was used to analyse the data simultaneously using inductive and deductive methods. **Results:** At 1 year follow-up, body fat increased (4.3±5.2%, p<0.05), while LBM (-0.6±2.0%, p<0.05) and ALM (-1.1±3.0%, p<0.05) decreased. Additionally, a range of parameters of strength (1RM leg press; -5.6±10.0%, p<0.05, 1RM chest press; -11.0±11.3%, p<0.05) and

cognitive function ( $-3.7\pm 7.0\%$ ,  $p<0.05$ ) significantly decreased. No change was observed in aerobic capacity, lower limb power and blood pressure. The interviews revealed key facilitators (environmental factors, social aspect of the exercise training intervention, education around understanding the benefits of maintaining regular exercise and a positive attitude) and barriers (affordability, general aversion to gyms and lack of government intervention) to long-term exercise maintenance in this population. **Conclusion:** Adverse changes in body composition, physical and cognitive function were observed in older adults 1-year after the cessation of supervised exercise training intervention. Key barriers and facilitators to exercise maintenance were identified, which will inform the development of future behaviour change interventions to boost exercise maintenance and participation in the elderly population. Acknowledgement: Supported by Irish Research Council grant EBPPG/2014/39.

**P126- PHYSICAL ACTIVITY UNVEILS THE RELATIONSHIP BETWEEN MITOCHONDRIAL ENERGETICS, MUSCLE QUALITY AND PHYSICAL FUNCTION IN OLDER ADULTS.** Giovanna Distefano, Robert A. Standley, Xiaolei Zhang, Elvis A. Carnero, Fanchao Yi, Heather H. Cornell, Paul M. Coen (*Translational Research Institute for Metabolism and Diabetes, Florida Hospital, , Orlando, FL, USA*)

**Background:** The concept of mitochondrial dysfunction in aging muscle is highly controversial. In addition, emerging evidence suggests that reduced muscle oxidative capacity and efficiency underlie the etiology of mobility loss in older adults. **Objectives:** Here, we hypothesized that studying well phenotyped older cohorts across a wide range of physical activity would unveil a range of mitochondrial function in skeletal muscle and in turn allow us to more clearly examine the impact of age per se on mitochondrial energetics. This also enabled us to more clearly define the relationships between mitochondrial energetics and muscle lipid content with clinically relevant assessments of muscle and physical function. **Methods:** Thirty-nine volunteers were recruited to the following study groups; Young Active (YA,  $n=2F/8M$ , age= $31.2\pm 5.4$  yrs.). Older Active (OA,  $n=2F/8M$ , age= $67.5\pm 2.7$  yrs.) and Older Sedentary (OS,  $n=8F/11M$ , age= $70.7\pm 4.7$  yrs.). Participants completed a graded exercise test to determine fitness ( $VO_{2peak}$ ), a submaximal exercise test to determine exercise efficiency, and daily physical activity (PA) was recorded using a tri-axial armband accelerometer. Mitochondrial energetics were determined by 1)  $^31P$  magnetic resonance spectroscopy and 2) respirometry of fiber bundles from vastus lateralis biopsies. Quadriceps function was assessed by isokinetic dynamometry and physical function by the short physical performance battery (SPPB) and stair climb test. **Results:** Daily PA energy expenditure was significantly lower in OS, compared to YA and OA groups. Despite fitness being higher in YA compared to OA and OS, mitochondrial respiration, ATPMax, P/O ratio and exercise efficiency were similar in YA and OA groups and were significantly lower in OS. P/O ratio was correlated with exercise efficiency. Time to complete the stair climb and repeated chair stand tests was significantly greater for OS. Interestingly, ATPMax was related to muscle contractile performance and physical function. **Conclusion:** Older adults who maintain a high amount of physical activity have better mitochondrial capacity, similar to highly active younger adults, and this is related to their better muscle quality, exercise efficiency and physical performance. This suggests that mitochondria could be an important therapeutic target for sedentary aging associated conditions including sarcopenia, dynapenia and loss of physical function.

**P127- EFFECTS OF EXERCISING ON A VIBRATORY PLATFORM ON OLDER ADULTS? VASTUS LATERALIS ACTIVITY AND KNEE EXTENSION POWER: A RANDOMIZED PILOT STUDY.** Daniel Borges<sup>1,2</sup>, Lidiane Correia<sup>1</sup>, Karinna Costa<sup>1</sup>, Rafael Cavalcanti<sup>1</sup>, Samara Alencar<sup>1</sup>, Edgar Ramos Vieira<sup>2</sup>, Jamilson Brasileiro<sup>1</sup> ((1) *Department of Physiotherapy, Federal University of Rio Grande do Norte, Laboratório de Análise da Performance Neuromuscular (LAPERN), Campus Universitário, Lagoa Nova, Natal, RN, Brazil;* (2) *Department of Physical Therapy, Nicole Wertheim College of Nursing and Health Sciences, Florida International University, (FIU), Miami, FL, USA*)

**Backgrounds:** Age-related muscle performance decline affects function and contributes to frailty and disability in older adults. Exercising on a vibratory platform may potentiate the effects, but further evaluation is needed. **Objectives:** To analyze the effects of exercising on a vibratory platform on older adults» vastus lateralis activation and knee extension power. **Methods:** Twenty one sedentary older adults (mean age:  $68\pm 2$  years; BMI:  $26\pm 3$  Kg/m<sup>2</sup>) were randomized into exercise programs on a platform vibrating at 40Hz with peak-to-peak amplitude of 4 mm (experimental group,  $n=10$ ), or not vibrating but with vibration sound (sham/placebo group,  $n=11$ ). Exercise sessions were held twice a week for 8 weeks and consisted of 4 repetitions of 1.5-minute long isometric squats at 40 degrees of knee flexion with rest intervals of 1 minute. Evaluations were completed at baseline, 4 weeks and 8 weeks and consisted of isokinetic knee extensions at 60°/s, and the surface electromyographic activity of the vastus lateralis muscle was recorded during the assessments. A mixed ANOVA was used to test differences within and between groups with the significance level set at 5%. **Results:** Both groups had a significant increase ( $F=15$ ,  $P<0.001$ ) in knee extension power from baseline to weeks 4 (experimental=21%; sham=22%) and 8 (experimental=22%; sham=21%) without differences between groups or between weeks 4 and 8. There was a significant increase ( $F=12$ ,  $P=0.001$ ) in the vastus lateralis activity at week 4 (experimental=35%; sham=31%) for both groups without differences between groups. **Conclusion:** The exercise resulted in increased power and muscle activation, but the vibration did not affect the results.

**P128- GREATER MUSCLE LOADING DURING MAXIMAL ECCENTRIC-CONCENTRIC EXERCISE TRAINING DOES NOT PRODUCE GREATER MUSCLE HYPERTROPHY THAN MAXIMAL CONCENTRIC EXERCISE TRAINING IN RESISTANCE TRAINED VOLUNTEERS.** Tariq Taylor, Joanne Mallinson, Dumitru Constantin-Teodosiu, Rudi Billeter-Clark, Martino Franchi, Marco Narici, Sara Brown, Dorothee Auer, Paul Greenhaff (*University of Nottingham, School of Life Sciences, Medical School, Nottingham Nottinghamshire United Kingdom*)

**Background:** High-load eccentric exercise training reputedly produces greater muscle hypertrophy than concentric training, presumably from the greater loading and/or inflammation achieved by the former. **Objectives:** We quantified the temporal effect of combined maximal voluntary eccentric and concentric exercise training on muscle cross-sectional area, volume and abundance of mRNAs compared with maximal voluntary concentric training. **Methods:** Eight resistance-trained males ( $25.9\pm 1.6$  years, BMI  $23.6\pm 0.9$ ) performed 3x30 maximal eccentric isokinetic knee extensions, interspersed with 2x30 maximal concentric knee extensions (90°/s 3x/week) for 84 days using one limb (ECC+CON), and 5x30 maximal concentric contractions (CON) with the contralateral limb (same contraction speed and frequency). Mid-thigh muscle CSA and thigh

muscle volume (50 CSAs) were determined at baseline, and day (d) 7, 28 and 84 using 3T MRI. Resting vastus lateralis biopsies were obtained at baseline, on d1, and a minimum of 72 hours from the previous exercise session on d7, d28 and d84 for mRNA abundance measurement (RT-PCR micro-fluidic cards). Data are mean±SEM. **Results:** Total work done during training was greater in ECC+CON than CON at each week (data not shown) and over 84 days (16.8±2.3%; p<0.001). Muscle CSA increased from baseline in both limbs at d28 (CON 4.3±0.9%, p<0.05; ECC+CON 4.0±0.67%, p<0.05) and d84 (CON 3.9±0.8%, p<0.05; ECC+CON 4.0±1.1%, p<0.05). Similarly, thigh muscle volume increased from baseline at d28 (CON 3.1±0.8%, p<0.05; ECC+CON 3.1±0.4%, p<0.05) and d84 (CON 3.8±0.8%, p<0.01; ECC+CON 3.4±0.7%, p<0.05). However, there was no difference between limbs in muscle CSA or thigh volume at any time-point. Change in muscle mRNA abundance from baseline was overall greater in ECC+CON than CON at d1 and d7, with a number of cellular functions (including inflammation and morphology) identified as being altered. However, change in mRNA abundance from baseline and between CON and ECC+CON waned by d28 and thereafter. **Conclusion:** Muscle mRNA responses to resistance-exercise training are transitory. Compared to maximal CON training, maximal ECC+CON exercise produces greater mRNA abundance changes over the initial week of training and greater muscle loading throughout. This is not however associated with greater hypertrophy, supporting the suggestion from acute studies that muscle protein synthesis is maximal at workloads of ~80% 1 repetition max.

**P129- EFFECTS OF A DIETARY RESTRICTION AND EXERCISE PROGRAM ON CENTRAL ADIPOSITY IN OLDER WOMEN WITH OBESITY.** Luria Melo de Lima Scher<sup>1,2,3</sup>, Christy Karabetian<sup>1</sup>, Tood M. Manini<sup>1</sup>, Donovan J. Lott<sup>1</sup>, Michael G. Perri<sup>1</sup>, Stephen D. Anton<sup>1,4</sup> ((1) Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA; (2) University of State of Bahia, Brazil; (3) University of Pernambuco, Brazil; (4) Department of Clinical and Health Psychology, University of Florida, Gainesville, FL, USA)

**Background:** Obese older adults are at risk for sarcopenia (loss of muscle mass and function), and the combination of muscle loss and fat gain during aging can increase the risk of frailty and functional decline in older adults. **Objectives:** To investigate the effect of dietary restriction combined with a structured exercise program on subcutaneous adipose tissue (SAT) and visceral adipose tissue (VAT) in moderately functioning post-menopausal older women with obesity. **Methods:** Twenty-five post-menopausal, sedentary women (age range=64.0±6.2 years), with mild to moderate functional limitations (measured using Short Physical Performance Battery-SPPB; scores 4/10) were randomly assigned to a dietary restriction plus exercise group (DR+E; n=12) or health education control (HEC; n=13) group for a 24 week period. Participants in the HEC received weekly lectures relevant to aging. Participants in the DR+E were instructed to reduce their calorie intake by 750 kcal/day, which was designed to produce a weight reduction of 7-10% from baseline body weight. The exercise component of this intervention consisted of center-based aerobic, lower body resistance, and flexibility training three times per week. Magnetic resonance imaging was used to measure both SAT and VAT. Physical function was measured using the short physical performance battery (SPPB) and the 400 meter walk test. Analysis of covariance was conducted to examine changes from baseline to 24 weeks in volume with age, race, baseline SAT and VAT used as covariates. Pearson product-moment correlation coefficients were calculated to measure the relationships between changes in body weight, central adiposity, and physical function outcomes. **Results:** Compared

to participants assigned to HEC, participants in the DR+E group had a significantly greater reduction in both SAT (-2970.6±1345.1 cm<sup>3</sup> vs. 1096.6±1406.9 cm<sup>3</sup>, p=0.05) and VAT (-1057.4±347.0 cm<sup>3</sup> vs. 199.9±378.2 cm<sup>3</sup>; p<0.05). Changes in SAT were strongly related to reductions in body weight (r =-0.57, p<0.01). Changes in SAT and VAT were not, however, significantly associated with changes in physical function. **Conclusion:** The DR+E intervention produced significant reductions in both SAT and VAT in moderately functioning, post-menopausal women with obesity. These findings are an important step in discovering strategies to reduce central adiposity in older women with obesity.

**P130- HIGH RESOLUTION METABOLOMIC PROFILING OF AEROBIC EXERCISE EFFECTS IN CHRONIC STROKE SURVIVORS.** Monica C. Serra<sup>1</sup>, Charlene E. Hafer-Macko<sup>2</sup>, Carolyn Jonas Accardi<sup>3</sup>, Chunyu Ma<sup>3</sup>, ViLinh Tran<sup>3</sup>, Dean P. Jones<sup>3</sup>, Alice S. Ryan<sup>2</sup> ((1) Atlanta VA Center of Excellence for Visual and Neurocognitive Rehabilitation, Birmingham/Atlanta VA Geriatric Research Education and Clinical Center (GRECC), and the Division of General Medicine and Geriatrics, Emory University School of Medicine, Atlanta, GA, USA; (2) Baltimore VA GRECC, VA Maryland Exercise and Robotics Center of Excellence, and University of Maryland School of Medicine, Baltimore, MD, USA; (3) Clinical Biomarkers Laboratory, Division of Pulmonary, Allergy, and Critical Care Medicine, Emory University School of Medicine, Atlanta, GA, USA)

**Background:** Recent studies have demonstrated a benefit of aerobic exercise on cardiovascular and metabolic risk factors in chronic stroke survivors. However, a better understanding of the effects of exercise on the metabolic response to exercise is needed to optimally impact stroke management. **Objectives:** The purpose of this study was to evaluate plasma metabolomic profiles before and after six months of treadmill rehabilitation in chronic stroke survivors with hemiparesis. **Methods:** Seventeen chronic (>6 months post incident) stroke survivors (age: 62±1 years, BMI: 31±1 kg/m<sup>2</sup>, mean±SEM) underwent six months of progressive, moderate intensity treadmill training. Peak exercise tests were used to examine improvements in aerobic capacity (VO<sub>2</sub>peak). Heparinized plasma samples were collected following 12 hours of fasting before and after the intervention. Samples were analyzed using high-performance liquid chromatography coupled to ultra-high resolution mass spectrometry (LC-MS), detecting 10,623 m/z features. Linear models for microarray data (LIMMA) and partial least squares-discriminant based differential (PLSDA) expression analysis was performed to determine metabolic changes between time points and Mummichog for network analysis to identify metabolomics pathway enrichment associated with exercise intervention. **Results:** Following the intervention, VO<sub>2</sub>peak increase 11% (pre vs. post: 19.9±1.3 vs. 22.1±1.5 ml/kg/min; P<0.05). Differential expression analysis identified 276 significant features metabolic markers between pre- and post-exercise (LIMMA, P<0.05). Pathway enrichment analysis of differentially expressed metabolites (PLSDA, VIP>1.5) results showed significant enrichment in 12 pathways spanning a range of metabolic processes, including fatty acid (i.e., butanoate, glycerophospholipid, and linoleate), amino acid (i.e., glutamate, aspartate, arginine, and tyrosine), and metabolism. **Conclusion:** These preliminary data show aerobic exercise related metabolic changes are induced by six months aerobic exercise training in chronic stroke survivors. Future studies will evaluate changes in metabolomic profiles in relation to reductions in cardiometabolic risk after exercise rehabilitation.

**P131- PROGRAM PREFERENCES AND (DIS)INCENTIVES OF OLDER PEOPLE TO PARTICIPATE IN NUTRITIONAL AND PHYSICAL EXERCISE PROGRAMS.** Lenore Dedeyne<sup>1</sup>, Louise Dewinter<sup>1</sup>, Aniko Lovik<sup>2</sup>, Sabine Verschuere<sup>3</sup>, Jos Tournoy<sup>1,4</sup>, Evelien Gielen<sup>1,4</sup> ((1) KU Leuven, University of Leuven, Department of Chronic Diseases, Metabolism and Ageing, Leuven, Belgium; (2) KU Leuven, University of Leuven, Department of L-BioStat, Leuven, Belgium; (3) KU Leuven, University of Leuven, Department of Rehabilitation Sciences, Leuven, Belgium; (4) UZ Leuven, Department of Geriatric Medicine, Leuven, Belgium)

**Background:** Recently, a growing number of studies in older people has been examining beneficial effects of non-pharmacological interventions, such as physical exercise (PE) and nutritional supplementation, to target age-related syndromes such as sarcopenia and frailty and their consequences. However, it is reported that the recruitment of older people is challenging, and that their adherence to interventions is low. **Objectives:** The aim of this study in older adults (65 years) is (1) to evaluate the interpersonal, intrapersonal and community (dis)incentives towards participation in a hypothetical PE or nutritional program and; (2) to determine the preferred program formats of a PE (location) and nutritional program (intake form and timing) and to compare these in participants with or without frailty and with or without a risk of sarcopenia. **Methods:** A questionnaire was developed and filled in by 115 community-dwelling older adults after content (n = 7 experts) and face validation (n = 8 older adults). We assessed (1) the agreement with a statement (a statement with which > 70% of the participants agrees or strongly agrees is considered as a common statement); (2) concepts of motivation by an exploratory factor analysis and; (3) program preferences by nonparametric Wilcoxon or Friedman's Analysis of variance (ANOVA) and post-hoc Wilcoxon signed rank tests. **Results:** Intrapersonal motivators (e.g., health benefits) were the most common motivators to participate in a PE or nutritional program. Identified concepts to participate in a PE intervention were intrinsic health beliefs, fear of falling or injuries, influence of significant others and environment and (para)medical encouragement (Cronbach alpha 0.75; 72% variance explained). Intrinsic health beliefs, influence of significant others and (para) medical encouragement were identified as concepts that motivates older people to participate in a nutritional intervention (Cronbach alpha 0.77; 78% variance explained). No favorability of exercise location was identified, however older people preferred a protein supplement in tablet form compared to liquid or powder form and in a pulsed timing compared with a spread intake. **Conclusion:** Program preferences of older people towards nutritional interventions need to be taken into account in future clinical trials and implementation programs to increase recruitment and adherence to interventions.

**P132- IN CO-MORBID OLDER INDIVIDUALS, HIGH-INTENSITY INTERVAL TRAINING (HIIT) INDUCED IMPROVEMENTS IN CARDIORESPIRATORY FITNESS ARE NOT ASSOCIATED WITH GAINS IN MUSCLE MASS.** James EM Blackwell<sup>1,2</sup>, Catherine L Boereboom<sup>1,2</sup>, Philip JJ Herrod<sup>1,2</sup>, Jon N Lund<sup>1,2</sup>, John P Williams<sup>1,2</sup>, Bethan E Phillips<sup>1</sup> ((1) MRC-ARUK Centre for Musculoskeletal Ageing, University of Nottingham, UK; (2) Division of Surgery and Anaesthetics, Royal Derby Hospital, UK)

**Background:** Declines in cardiorespiratory fitness (CRF) and muscle mass with advancing age are both associated with increased morbidity and mortality per se, as well as in the peri-operative period. Given the increasing number of older individuals presenting for surgery, and the time constraints often imposed on the preoperative

period (e.g., for cancer), high intensity interval training (HIIT), which has been shown to induce meaningful increases in CRF and muscle mass in 4-weeks, may be a promising surgical «prehabilitation» tool. However, whether a 4-week HIIT programme, well-tolerated by healthy older individuals, can elicit improvements in CRF and muscle mass in older comorbid individuals; those most likely to present for major intra-abdominal surgery is not known. **Objectives:** The objectives of this study were: i) to determine the efficacy of a 4-week HIIT programme for improving CRF and whole-body lean mass (LM) in older co-morbid individuals, and ii) to explore the relationship between improvements in CRF and LM. **Methods:** Twenty-six (16 male: 10 female) independent community dwelling volunteers, aged >75 (82±0.6) years with chronic co-morbid conditions (ASA grade >1) undertook 12 sessions of HIIT over 4-weeks. Cardiopulmonary exercise testing (CPET) was used to assess CRF, with dual-energy x-ray absorptiometry (DXA) scanning to quantify LM. **Results:** Anaerobic threshold (AT), VO<sub>2</sub> peak and LM all significantly increased following the HIIT programme (AT: 12.6±0.5 vs. 14.1±0.6 ml/kg/min, p=0.0001; VO<sub>2</sub> peak: 22.0±1.2 vs. 23.7±1.3 ml/kg/min, p=0.008; muscle mass: 47.3±1.4 vs. 47.8±1.3 kg, p=0.04). There was no relationship between improvements in CRF and gains in LM (AT: R<sup>2</sup>=0.011, p=0.99; VO<sub>2</sub> peak: R<sup>2</sup>=<0.0001, p=0.61). No adverse events were reported during HIIT, with volunteers reporting high levels of acceptability and enjoyment. **Conclusion:** Our well-tolerated, time-efficient HIIT programme can improve both CRF and LM in older co-morbid individuals, in a time-frame acceptable for surgical 'prehabilitation'. Improvements in CRF are not linked to LM gains, suggesting that central (e.g., cardiac) and/ or muscle intracellular adaptation drive HIIT-induced CRF improvements. These findings preclude the option to use changes in LM to predict CRF improvements in this co-morbid population.

## EPIDEMIOLOGY

**P137- A PROSPECTIVE COHORT STUDY ON THE HEALTH, SOCIAL AND FINANCIAL EFFECTS OF CARE-GIVING AMONG CAREGIVERS OF ELDERLY STROKE PATIENTS IN THE FIRST POST-STROKE YEAR IN A MULTI-ETHNIC ASIAN COUNTRY.** Vanda Ho<sup>1</sup>, Shilpa Tyagi<sup>2</sup>, Peck-Hoon Ong<sup>2</sup>, Helen Hoeng<sup>3</sup>, Song-Iee Hong<sup>4</sup>, David B. Matchar<sup>5,6</sup>, Nan Luo<sup>2</sup>, Joanne Yoong<sup>2</sup>, Angelique Chan<sup>5,7</sup>, Eric A. Finkelstein<sup>5,8</sup>, Kim En Lee<sup>9,10</sup>, N. Venkatasubramanian<sup>11</sup>, Edward Menon<sup>12</sup>, Kin Ming Chan<sup>13</sup>, Deidre De Silva<sup>14</sup>, Philip Yap<sup>15</sup>, Boon Yeow Tan<sup>16</sup>, Effie Chew<sup>17</sup>, Sherry H. Young<sup>18</sup>, Yee Sien Ng<sup>19</sup>, Tian Ming Tu<sup>20</sup>, Lay Hoon Ang<sup>21</sup>, Keng Hee Kong<sup>22</sup>, Young Do Kyung<sup>23</sup>, Emily Guo<sup>17</sup>, Rajinder Singh<sup>20</sup>, Reshma A. Merchant<sup>24</sup>, Hui Meng Chang<sup>20</sup>, Tseng Tsai Yeo<sup>25</sup>, Ning Chou<sup>25</sup>, Angela Cheong<sup>2</sup>, Gerald Choon-Huat Koh<sup>2</sup> ((1) Internal Medicine, National University Hospital, Singapore; (2) Saw Swee Hock School of Public Health, National University of Singapore, Singapore; (3) Physical Medicine and Rehabilitation Service, Durham VA Medical Centre, USA; (4) Department of Social Welfare, Dongguk University, South Korea; (5) Program in Health Services and Systems Research, Duke-NUS Graduate Medical School, Singapore; (6) Department of Medicine (General Internal Medicine), Duke University Medical Center, Durham, NC, USA; (7) Department of Sociology, National University of Singapore, Singapore; (8) Duke Global Health Institute, Duke University, Durham, NC, USA; (9) Yong Loo Lin School of Medicine, National University of Singapore; (10) Duke-NUS Graduate Medical School Singapore; (11) Raffles Neuroscience Centre, Raffles Hospital, Singapore; (12) St. Andrew's Community Hospital, Singapore; (13) Mount Alvernia Hospital, Singapore; (14) Department of Neurology, Singapore General Hospital, Singapore; (15) Geriatric Centre, Khoo Teck Puat Hospital,

Singapore; (16) St. Luke's Hospital, Singapore; (17) Department of Rehabilitation Medicine, National University Hospital, Singapore; (18) Department of Rehabilitation Medicine, Changi General Hospital, Singapore; (19) Department of Rehabilitation Medicine, Singapore General Hospital, Singapore; (20) National Neuroscience Institute, Neurology, Singapore; (21) Geriatric Medicine, Khoo Teck Puat Hospital, Singapore; (22) Department of Rehabilitation Medicine, Tan Tock Seng Hospital, Singapore; (23) Department of Health Policy and Management, Seoul National University College of Medicine, Seoul, South Korea; (24) Department of Medicine, Yong Loo Lin School of Medicine, National University of Singapore; (25) Department of Neurosurgery, National University Hospital, Singapore)

**Backgrounds:** Stroke survivors inherit disability associated dependency, requiring both formal and informal care to assist on physical, emotional and social fronts. In an Asian setting, often a family member takes on the responsibility of caring for a stroke patient while still adapting to this new role. Consequently, there is high prevalence of caregiver stress. This multi-factorial stress can adversely impact both patient and caregiver outcomes. However, there is limited literature on the longitudinal mapping of caregiving effects on the patient-outcomes. **Objectives:** Our study aims to prospectively study the health, social and financial effects of caregiving among caregivers of stroke patients in the first-year post-stroke. **Methods:** With a prospective study design, eligible patients and their caregivers were recruited from all public tertiary hospitals in Singapore. Adapting aspects of Pearlin's caregiver stress process model, we devised a framework for data collection including questions related to socio-demographic profile of dyads, caregiving experience, associated caregiver burden, role strains, social support, healthcare service utilization, financial information and outcomes. Participants were interviewed face-to-face at baseline, 3-month and 12-month time points and via telephone at 6 and 9 months. **Results:** The current results pertain to the baseline description of our participants. 638 stroke patients with a mean age of 62.7 years were studied. 421 (66.0%) were male. Most suffered from an ischaemic stroke (87.9%) of mild severity (56.9%) on National Institute of Health Stroke Scale (NIHSS). 383 caregivers were interviewed. Half of the caregivers were spouses (50%), were predominantly female (71.0%), with a mean age of 47.5 years. 73.9% were married, and 20.4% were never-married. 46.5% were in full time employment, with most having an education up to high-school (39.7%) or college-equivalent (26.4) level. 80.1% were first time caregivers to a patient with stroke. **Conclusion:** Adopting a multi-disciplinary approach, this study provides a comprehensive account of both patient and caregiver factors for detailed analysis of caregiver strain development and its consequences. The study will provide useful information to aid in planning future relevant interventions and contribute towards policy recommendations by providing cost estimates and evaluate informal caregiving.

**P138- THREE-YEAR ADVERSE HEALTH CONSEQUENCES OF SARCOPENIA IN COMMUNITY-DWELLING OLDER ADULTS: RESULTS FROM THE SARCOPHAGE COHORT STUDY.** Médéa Locquet, Charlotte Beudart, Jean Petermans, Jean-Yves Reginster, Olivier Bruyère (Department of Public Health, Epidemiology and Health Economics, University of Liège, Belgium; Geriatrics Department, CHU of Liège, Belgium)

**Background:** Sarcopenia is now considered as a real public health burden, mainly because of its association with falls, fractures, physical disabilities, hospitalizations, loss of independence, and ultimately death. Previous prospective studies assessed the consequences

of sarcopenia, but a limited number only extensively focused on fractures, falls, hospitalizations and institutionalizations. **Objectives:** To better characterize adverse outcomes of sarcopenia (i.e., falls, fractures, physical disabilities, hospitalizations, institutionalizations and death) observed, over a 3-year follow up, in a cohort of community-dwelling older adults. **Methods:** The ongoing SarcoPhAge (for Sarcopenia and Physical Impairment with advancing Age) project, initiated in 2013, includes 534 community-dwelling adults aged 65 and aims at identifying health consequences of sarcopenia. Sarcopenia is defined according to the European Working Group on Sarcopenia in Older People algorithm. To collect information, a health professional collects at each yearly visit, data on falls, fractures and hospitalizations. Moreover, for participants who are not able to attend the annual follow-up, these data are recorded by a phone call given to either participants themselves, or to their relatives. Information about physical disabilities (e.g. capacity to walk...), institutionalization (including the date of onset) or death (including the date of the event) are collected. When survival data are available (i.e., falls, hospitalizations, institutionalizations and death), we applied the Cox proportional hazards model to determine if sarcopenia is associated with these adverse outcome. If survival data are not available, (i.e., fracture and physical disabilities), we used the multivariable linear regression model. Both models were adjusted for covariates known to significantly impact muscle health, including age, sex, BMI, number of co-morbidities, number of co-prescriptions, nutritional status, and cognitive status. **Results:** 534 subjects were recruited in this prospective cohort (73.5±6.2 years, 60.5 % of women), with 73 subjects (13.7%) diagnosed as sarcopenic. After 3 years of follow-up, 33 participants were lost to follow-up. Data on physical disability, institutionalization and death are therefore available for 501 subjects. Sarcopenic individuals are significantly older, have lower BMI and more comorbidities, take more medications and have a reduced nutritional and cognitive status compared to non-sarcopenic individuals (all p<0.01). A higher number of death occurred, during the 3 years of follow-up in individuals diagnosed with baseline sarcopenia compared to those who were not (16.2% vs 4.6%, p<0.001). The probability of death within 3 years when presenting a sarcopenia shows a 3-fold increase compared to non-sarcopenic subjects (adjusted HR=2.93, 95% CI: 1.17-7.35, p=0.03). 112 participants reported physically disabilities over the 3 years (22.4%). However, sarcopenia is not significantly associated with the occurrence of disabilities (29.4% vs 21.9%, p=0.13). 10 institutionalizations were reported (2.0%) with no significant increase in sarcopenic subjects (2.9% vs 1.9%, p=0.55). Data on falls, fractures and hospitalizations, information, collected at yearly visits, are available in a sample of 260 subjects. 101 individuals experienced at least one fall during the 3 years of follow-up (38.8%). Sarcopenic subjects were not significantly more affected (37.5% vs 39.0%, p=0.89). Similar findings are reported for incident fractures (8.3 vs 11.4%, p=0.64) and for incident hospitalizations (62.5% vs 44.9%, p=0.10). However, we observe a longer duration of hospital stay in sarcopenic subjects (10.4±3.5 days vs mean 5.5±0.6 days, p=0.01). When adjusted for covariates, the results remain similar (=0.21, p-value=0.03). **Conclusion:** After 3 years, sarcopenia at baseline is associated with an increased risk of mortality and with longer hospitalizations. However, no differences were observed for falls, fractures, physical disabilities and institutionalizations in our community-dwelling population. Our cohort will be followed-up for another two-year time to provide further information on the long-term consequences of sarcopenia.

**P139- SARCOPENIA AND DYNAPENIC OBESITY INCREASE MORTALITY AMONG BRAZILIAN OLDER ADULTS: A 15 YEAR FOLLOW UP OF THE SABE STUDY.** Jair Licio Ferreira Santos<sup>1</sup>, Yeda Aparecida de Oliveira Duarte<sup>2</sup>, Tiago da Silva Alexandre<sup>3</sup>, Clarissa de Lacerda Nazario<sup>4</sup>, Jorge Avelino Bento<sup>5</sup> (1) *Faculdade de Medicina de Ribeirão Preto -USP, Brazil;* (2) *Escola de Enfermagem, USP, Brazil;* (3) *Centro de Ciências Biológica e da Saúde, UFSCAR, Brazil;* (4) *Estudo SABE, FSP-USP, Brazil;* (5) *Estudo SABE, FSP-USP, Brazil;*

**Background:** Dynapenia and Sarcopenic obesity has been linked to frailty in older adults. There are few prospective studies evaluating the effect of frailty, central obesity, low muscle strength and sarcopeny on mortality. **Objectives:** To investigate whether dynapenia, abdominal obesity and Body Mass Index increase mortality among Brazilian older adults over a 15 year period. **Methods:** Data came from the Health, Well-being and Aging Study (SABE), a study that began in 2000 with a sample of the population aged 60 &+, in the city of Sao Paulo. After baseline, follow-up occurred every five years. A waist circumference > 102cm(men) or > 88cm(women) was taken as abdominal obesity. Dynapenia was assessed by a hand-held dynamometer and defined by cut-off points < 26 kg(men) and < 16 kg (women). Dynapenic abdominal obesity was defined by the two variables: normal, only abdominal obesity, only Dynapenia and Dynapenia with abdominal obesity. Body mass index(BMI) followed the WHO classification: underweight(BMI<18.5 kg/m<sup>2</sup>), normal(BMI 18.5 kg/m<sup>2</sup> and < 25kg/ m<sup>2</sup>), overweight(BMI 25 kg/m<sup>2</sup> and < 30kg/m<sup>2</sup>) obesity(BMI 30kg/m<sup>2</sup>). Co-variables included age, sex, income, schooling, marital status. Mortality rates were calculated by sex and compared using Cox test. A Poisson regression was adjusted by sex, with deaths as outcome. **Results:** Underweights showed the highest mortality rates per 1000 person-years: 108 (women) 119(men); normal BMI resulted in 36(women) and 68(men). For dynapenic obesity the higher values were in Dynapenia(67 for women, 109 men) and Dynapenic obesity(72 for women, 94 for men). Normal class showed 28(women) and 47(men). Poisson regression presented Incidence Rate Ratios (IRR) when compared to normal as follows: for females: 1.35(Abdominal Obesity), 1.35(Dynapenia), 1.67(Dynapenic Obesity). For males: 1.37(Abdominal Obesity), 1.84(Dynapenia), 1.67(Dynapenic Obesity). BMI showed significant result for underweight women. (IRR = 1.72) and for Overweight and obese men. In this case however, de IRR showed a protection factor: 0.76 and 0.73. **Conclusion:** Dynapenia and abdominal obesity are important risk factors for mortality. This finding highlights the importance of evaluating them in the assessment of mortality risk. For this purpose BMI index alone can lead to unfair predictions of survival.

**P140- FRAILTY AND DIABETES AMONG MEXICAN AMERICAN OLDER ADULTS.** Bret T. Howrey<sup>1</sup>, Soham Al Snih<sup>2</sup>, Kyriakos S. Markides<sup>3</sup>, Kenneth J. Ottenbacher<sup>2</sup> ((1) *Department of Family Medicine, University of Texas Medical Branch, Galveston, TX, USA;* (2) *Division of Rehabilitation Sciences, University of Texas Medical Branch, Galveston, TX, USA;* (3) *Department of Preventive Medicine & Community Health, University of Texas Medical Branch, Galveston, TX, USA)*

**Background:** Progressive physical frailty in older adults is associated with increased risk of falls, disability, institutionalization and mortality. Although associations between diabetes and frailty have been observed, the impact of diabetes on frailty in older Hispanics is largely unexplored. **Objectives:** To examine the association of diabetes on the odds of frailty among older Mexican Americans. **Methods:** Using data from the Hispanic Established Population for

the Epidemiological Study of the Elderly (HEPESE) from 1995 until 2012, frailty was assessed by slow gait, weak hand grip strength, exhaustion, and unexplained weight loss (n=1327). **Results:** Logistic regression showed a large magnitude of effect of diabetes on the odds of frailty (OR 1.47, 95% CI 1.14-1.90). Other contributors to frailty included arthritis, heart attack, and hip fracture. Positive and negative affect had significant and opposing associations. Ordinal logit models assessed the odds of frail compared to non-frail and pre-frail. In these models, diabetes was associated with a 32% increase in the odds of a higher level of frailty. **Conclusion:** Diabetes is a significant contributor to increased frailty in older Mexican Americans. Interventions to reduce frailty rates should focus on mitigating the effects of diabetes and shifting away from negative and towards positive affect.

**P141- PATIENT'S ENGAGEMENT IN THE IDENTIFICATION OF CRITICAL OUTCOMES IN SARCOPENIA.** Charlotte Beaudart<sup>1,2</sup>, Olivier Bruyère<sup>1,2</sup>, Jean-Yves Reginster<sup>1,2</sup>, Jurgen Bauer<sup>3</sup>, Cyrus Cooper<sup>4,5</sup>, Alfonso Cruz Jentoft<sup>6</sup>, Francesco Landi<sup>7</sup>, Médéa Locquet<sup>1,2</sup>, Stefania Maggi<sup>8</sup>, René Rizzoli<sup>9</sup>, Yves Rolland<sup>10</sup>, Nieves Vaquero<sup>6</sup>, Mickael Hiligsmann<sup>11</sup> ((1) *Department of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium;* (2) *WHO Collaborating Centre for Public Health Aspects of Musculo-Skeletal Health and Aging;* (3) *Center for Geriatric Medicine, University of Heidelberg, Germany;* (4) *MRC Lifecourse Epidemiology Unit, University of Southampton, Southampton, England, UK;* (5) *NIHR Musculoskeletal Biomedical Research Unit, University of Oxford, Oxford, UK;* (6) *Servicio de Geriatria, Hospital Universitario Ramón y Cajal (IRYCIS), Madrid, Spain;* (7) *Department of Geriatrics, Neurosciences and Orthopedics, Catholic University of the Sacred Heart Rome, Milano, Italy;* (8) *National Research Council, Neuroscience Institute, Arging Branch, Via Giustiniani, 2, 35128 Padua, Italy;* (9) *Service of Bone Diseases, Faculty of Medicine, Geneva University Hospitals, Geneva, Switzerland;* (10) *Gérontopôle of Toulouse, University of Toulouse III, CHU Purpan, Toulouse, France;* (11) *Department of Health Services Research, CAPHRI Care and Public Health Research Institute, Maastricht University, Maastricht, The Netherlands)*

**Background:** Sarcopenia, defined by a progressive loss of muscle mass and function, has been showed to be associated with several individual and public health outcomes. Identifying hard clinical outcomes of patients with sarcopenia is an important step in designing valid and useful clinical trials and outcome studies. **Objectives:** This study aims therefore first to identify which outcomes are important for patients with sarcopenia and second to assess the most importance ones. **Methods:** The identification and prioritization of outcomes for patients with sarcopenia was conducted following a 4-step process: 1) a literature review to generate an initial list of outcomes of sarcopenia; 2) an expert consultation (n=11) to restructure initial outcomes and validate them; 3) three focus groups with participants suffering from sarcopenia (2 in Belgium, 1 in Spain) to validate these outcomes, to generate additional ones and to rank the most important outcomes; 4) an expert meeting (n=11), to identify of the 5 most important outcomes of sarcopenia based on the results of the focus group. **Results:** In the first step, the initial list of outcomes comprised 6 different outcomes: mortality, functional decline, hospitalisation, falls, fracture and length of hospitalisation. With the second step, the list was extended to 9 outcomes including mortality, hospitalisation, falls, fractures, institutionalisation, quality of life, difficulties in self-care, difficulties in moving and difficulties in domestic duties. In the third step, the focus groups with sarcopenic subjects (n=19, 6 men and 13 women, mean age 78 years) identified a large number

of additional outcomes such as fatigue, affected morale, physical and mental slowness, loss of balance, fear of walking, etc; and each patient ranked the five most important ones. Based on the ranking of all the outcomes during the focus groups, experts agreed on the 5 most important outcomes: 'quality of life', 'mobility', 'domestic activities', 'fatigue' and 'falls'. **Conclusion:** This study identified and prioritized important outcomes for sarcopenia. The five important outcomes will be used in a discrete-choice experiment to further elicit the relative importance of these outcomes in a larger group of patients and experts.

**P142- DYNAMIC APPROACH OF THE FRAILTY STATUS IN NURSING HOMES: THE SENIOR COHORT.** F. Buckinx<sup>1</sup>, A. Charles<sup>1</sup>, T. Brunois<sup>1</sup>, C. Lenaerts<sup>1</sup>, J-Y. Reginster<sup>1</sup>, J. Petermans<sup>2</sup>, O. Bruyère<sup>1</sup> ((1) *Department of Public Health, Epidemiology and health Economics, University of Liège, Belgium. WHO Collaborating Centre for Public Health Aspects of Musculoskeletal Health and Ageing;* (2) *Geriatrics Department, CHU of Liège, Belgium*)

**Background:** Frailty appears as a transitional state in the dynamic and reversible process leading an individual from an age related «physiological» health state to the state of dependence. Few longitudinal data on the dynamic of frailty exist all together and more specifically in Belgian nursing homes. **Objectives:** This study aimed to assess frailty transitions over 1-year of follow-up among nursing home residents. **Methods:** This is an analysis of the 1-year follow-up of the SENIOR cohort (Sample of Elderly Nursing home Individuals: an Observational Research). All participants included in this cohort were classified into frail, pre-frail or robust according to the Fried's criteria (i.e. weight loss, weakness, exhaustion, slow gait, low physical activity level) at baseline (T0) and after a 12-month follow-up period (T12). Frailty transitions from T0 to T12 were assessed. **Results:** Among the 662 residents included in the SENIOR cohort (83.2 ± 8.99 years, 73.1% of women), 359 were included in the present analysis (i.e. 90 residents died, 2 nursing homes refused to continue the study (58 residents), 91 residents refused to be assessed at T12, 20 moved away from the nursing home, 41 were physically or cognitively unable to perform the various assessments at T12 and 3 have incomplete data). Among people with complete evaluations, respectively 75 (20.9%), 225 (62.6%) and 59 (16.4%) residents were classified frail, pre-frail and robust at baseline. At T12, these categories counted respectively 121 (33.7%; +12.8% from T0), 184 (51.2%; -11.4%) and 54 (15.1%; -1.3%) residents. Between T0 and T12, 69 (19.2%) became frail and 45 (12.5%) became pre-frail. More surprisingly, 31 (8.5%) subjects became robust although they were frail or pre-frail at baseline. **Conclusion:** Frailty is a dynamic process with transitions in both directions: worsening and improvement are observed, even within such a short period, among nursing home residents..

**P143- SENSORY IMPAIRMENT AND DEPENDENCY, A PROSPECTIVE STUDY AMONG FRENCH ELDERLY WOMEN: RESULTS FROM THE E3N COHORT STUDY.** Nathalie Bouscaren<sup>1,2,3</sup>, Laureen Dartois<sup>1,2,3</sup>, Marie-Noël Vercambre<sup>4</sup>, Marie-Christine Boutron-Ruault<sup>1,2,3</sup> ((1) *INSERM U1018, Center for Research in Epidemiology and Population Health, Villejuif, France;* (2) *University Paris-Saclay, University Paris-Sud, Villejuif, France;* (3) *Gustave Roussy, Villejuif, France;* (4) *MGEN Foundation for Public Health, Paris, France*)

**Background:** The majority of older adults express the wish to live at home as long as possible, making any measure to promote their independence crucial. Physical activity and diet are common target to do so. However, sensory impairments, especially visual and hearing disabilities are also reported to impact physical and social

health, which in turn may influence dependency. **Objectives:** We aimed at examining the longitudinal association between hearing and visual disabilities and the risk of dependency. **Methods:** Residual sensory impairments were self-reported in 2006. Visual disability was defined as difficulty to read a newspaper and/or to recognize someone being four-meter away despite glasses or contact lenses if needed, and hearing disability as the difficulty to hear and understand a conversation in a noisy environment despite hearing aids if equipped. Dependency was assessed using a self-filled Instrumental Activities of Daily Living scale both in 2006 and in 2010. Participants who were unable to perform at least one of the eight IADL were considered as dependent. **Results:** We included 4,010 independently functioning older French women in 2006 and aged on average 78 years; 588 (14.7%) became dependent between 2006 and 2010. Among these women, 18.5% were mostly dependent regarding cognitive items, 61.6% for physical items, and 19.9% were dependent for both physical and cognitive items. Among the 4,010 participants, in 2006, 107 (2.7%) reported visual disability, and 2,091 (52.14%) reported hearing disability. No interaction effect between visual and hearing disabilities was detected. In separate multivariate models, women reporting visual disability in 2006 had greater odds of becoming dependent in 2010 compared to women with no such disability (OR: 2.05, 95%CI: 1.31, 3.21). When compared to women with no hearing disability, those with hearing disability were also more likely to become dependent during follow-up (OR: 1.19, 95%CI: [1.00; 1.43]). **Conclusion:** In a population of older women, visual disability was strongly associated with subsequent risk of dependency. Hearing disability was also associated with dependency but in a lesser extent. Reducing visual and hearing disabilities as much as possible using adapted devices may contribute to maintain an independent life in elderly people.

**P144- FRAILTY INCREASES THE INCIDENCE OF MORTALITY IN ELDERLY PATIENTS WITH CARDIOVASCULAR DISEASES.** Sheila Ingham, Fabiola Martin, Jairo Borges, Antônio Carlos Carvalho (*Federal University of Sao Paulo, Sao Paulo, Brazil*)

**Background:** Introduction: Cardiovascular diseases increase the incidence of Frailty, which is associated with disability, falls and hospitalization in the elderly from the dwelling community. However, the interaction between frailty and cardiovascular diseases in regard to the incidence of death is still unclear in outpatients. **Objective:** to evaluate the association of the Frailty status with the incidence of mortality in the elderly at the 6-month follow-up. **Methods:** Longitudinal analysis from SARCOS study, an epidemiological study of SARcopenia and Osteoporosis in regard to vulnerable outcomes, frailty and mortality in older outpatient with cardiovascular diseases. Frailty was diagnosed by the Fried 's criteria, i.e. weakness, low walking speed, exhaustion, low energy expenditure (adapted) and loss of 5% of the weight of the previous year. Cardiovascular diseases (heart failure, previous myocardial infarction, hypertension, atrial fibrillation and peripheral arterial disease), previous stroke and other chronic diseases were evaluated. Mortality was assessed at 6 and 12 months after the initial evaluation by telephone call and verified by receipt of death certificate. Of the 342 patients started the follow-up, 57.2% of whom were women and 169 were evaluated at 6 months of follow up. Significant variables were analyzed in binary logistic regression in SPSS 17. **Results:** Frailty occurred in 19% (65) and 57% (195) were pre-frailty at baseline. Frailty patients were significantly older (80.49 ± 8.1, p = 0.016) and used more medications (p = 0.003) than other groups. Mortality rate at 6 months was 3% (5), of which 80% (4) were Frailty (p = 0.005) and 20% (1) pre frailty. In the logistic regression analysis for 6-month

mortality, adjusted for age, cardiovascular diseases and female gender, Frailty presented In the logistic regression analysis, Frailty was shown to be a strong predictor of death at 6 months, OR 15 (1.37-174.63;  $p = 0.026$ ) compared to the robust ones, whereas among CVDs, heart failure presented increased risk in 4 times ( $p = 0.061$ ). In the interaction model between Frailty and CVDs, there were no significant differences in Frailty in relation to the risk of death. **Conclusion:** Frailty is an important risk factor for early death in outpatients, independent of and superior to the most frequent chronic cardiovascular diseases that affect this population. Frailty syndrome does not show synergy with chronic cardiovascular diseases, in relation to the risk of death.

**P145- ASSOCIATIONS BETWEEN DOMESTIC VIOLENCE THROUGH LIFE AND FRAILITY: CROSS-SECTIONAL ANALYSIS FROM IMIAS STUDY.** CS Gomes<sup>1</sup>, M Zunzunegui<sup>2</sup>, C Pirkle Catherine<sup>3</sup>, DT Guedes<sup>1</sup>, FS Juliana<sup>1</sup>, P Hwang Phoebe<sup>3</sup>, R Guerra<sup>1</sup> ((1) *Departament of Physiotherapy, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil;* (2) *Centre de recherche du Centre Hospitalière de l'Université de Montréal, Montréal, Canada;* (3) *The Office of Public Health Studies, University of Hawaii at Monoa, Honolulu, Hawaii, USA*)

**Backgrounds:** Frailty has long been an important research topic in geriatric medicine and if it is a consequence of cumulative decline in multiple physiological systems, clues to its etiology might come from studying the determinants of frailty decades before its onset. According to research in life-course epidemiology, violent experiences can lead to hidden physical alterations inside the body; alterations that may have adverse effects on life-long health **Objectives:** To estimate the prevalence of frailty in older adults in the IMIAS population, to examine associations between lifelong domestic violence and frailty and possible pathways to explain these associations. **Methods:** Cross-sectional study with a random sampling of 2002 men and women in the IMIAS Study (International Mobility in Aging Study), aged between 65-74 years old living in five cities from Tirana (Albania), Natal (Brazil), Kingston and Saint-Hyacinthe (Canada) and Manizales (Colombia). Domestic physical and psychological violence by family and intimate partner was assessed by the Hurt, Insult, Threaten and Scream (HITS) scale. Fried's phenotype was adopted to define frailty. Logistic regressions were fitted to estimate between frailty and lifelong violence. Mediation analyses using the method of Preacher and Hayes was used to examine potential health pathways. **Results:** Frailty prevalence varies across cities, being lowest in Saint-Hyacinthe and Kingston and highest in Natal women. Women had higher prevalence in Tirana and Natal. Adjusting for age, sex, education and research city, those reporting childhood physical abuse (CPA) had higher odds of frailty (OR=1.68; 95%CI: 1.01;2.78); those ever exposed to psychological violence by the intimate partner had also higher odds of frailty (OR= 2.07; 95%CI: 1.37;3.12). CPA effect on frailty was totally mediated by chronic conditions and depressive symptoms. Effects of psychological violence by intimate partner were partially mediated by chronic conditions and depressive symptoms. **Conclusion:** Childhood physical abuse and psychological violence during adulthood leave marks on the life trajectory conducive to adverse health outcomes and frailty in old age.

**P146- SEEKING FOR EXPLANATIONS FOR FRAILITY INCIDENCE: THE INTERNATIONAL MOBILITY IN AGING STUDY - IMIAS.** C Gomes<sup>1</sup>, R Guerra<sup>1</sup>, YY Wu<sup>2</sup>, FS Juliana<sup>1</sup>, C Pirkle<sup>2</sup> ((1) *Departament of Physiotherapy, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil;* (2) *The Office of Public Health Studies, University of Hawaii at Monoa, Honolulu, Hawaii, USA*)

**Background:** Prevalence and incidence rates of frailty vary widely depending on the place and population subgroup, even when applying identical definitions of the syndrome. The reasons for this variability may be since methodological assessments aspects to social and economic influences on frailty phenotype. **Objectives:** This study aims to examine social and economic factors as predictors of frailty over 2 years of follow up in IMIAS population. **Methods:** This is an analysis using data from the baseline (2012) and 2 years of follow up (2014) of the IMIAS Study a population-based longitudinal study conducted in four countries (Brazil, Colombia, Albania and Canada). Frailty was defined according to the Fried's phenotype and Poisson regression models with robust standard errors were performed to estimate the unadjusted relative risks of becoming pre-frail or frail. **Results:** Our sample was composed by 2002 subjects at the baseline; two years later 1724 subjects were followed representing a retention rate of 85.9%. Transitions in the frailty status between the two assessment points were observed, 366 (21.2 %) participants migrated to a worse stage of frailty while 319(18.5%) migrated to a better stage. After statistical adjustment (participant age, sex and study site), insufficient income (RR 1.40; 95%IC 1.00-1.96) and have a partner support (RR 0.80; 95%IC 0.64-1.01) remained as predictors of incident frailty status. **Conclusion:** Notably, transitions among the frailty status were observed even in a short range of time, in addition, sociodemographic factors were predictors of incident frailty.

**P147- LONGITUDINAL ASSOCIATIONS BETWEEN ABDOMINAL OBESITY AND MOBILITY DISABILITY IN OLDER ADULTS: 4-YEARS FOLLOW UP OF THE INTERNATIONAL MOBILITY AGING STUDY.** FS Juliana<sup>1</sup>, MV Zunzunegui<sup>2</sup>, C Gomes<sup>1</sup>, R Guerra<sup>1</sup> ((1) *Departament of Physiotherapy, Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil.* (2) *Centre de recherche du Centre Hospitalière de l'Université de Montréal, Montréal, Canada*)

**Background:** Longitudinal studies have shown the predictive value of abdominal obesity (AO) for disability in older adults. However, these studies did not verify if this association remained even controlling for other known important confounders. **Objectives:** To explore the longitudinal relationship between abdominal obesity and mobility disability controlling for physical performance measures and depression. **Methods:** In the International Mobility Aging Study (IMIAS) Study, 1608 older adults aged 64-74 years old were followed for four years. Mobility disability was defined as reporting difficulty in walking 400 m or climbing stairs. Activities of daily living (ADL) disability was based on any self-reported difficulty in five mobility-related ADLs. Abdominal obesity was defined as waist circumference 88cm for women or 102 cm for men. Four meters gait speed, handgrip strength and depressive symptoms (CES-D) were assessed. Generalized Estimating Equations (GEE) and multinomial regressions were used to estimate associations between disability and abdominal obesity. **Results:** The longitudinal associations between mobility disability and abdominal obesity remained significant even when adjusted by depressive symptoms, handgrip strength, gait speed, age sex, education and research site. Those participants with abdominal obesity had higher mobility disability four years risk than those

without abdominal obesity (OR=1.47, 95% CI 1.01-2.15). Abdominal obesity was not significantly associated with ADL disability (OR: 1.40, 95% CI 0.90-2.18). Results were similar when multinomial regression was used, taking mortality in account. **Conclusion:** The longitudinal associations between mobility disability and abdominal obesity remained significant even when adjusted by depressive symptoms, handgrip strength, gait speed, age sex, education and research site. Those participants with abdominal obesity had higher mobility disability four years risk than those without abdominal obesity (OR=1.47, 95% CI 1.01-2.15). Abdominal obesity was not significantly associated with ADL disability (OR: 1.40, 95% CI 0.90-2.18). Results were similar when multinomial regression was used, taking mortality in account.

#### **P148- GENETIC DETERMINANTS OF HEALTHY AGEING.**

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**Background:** Healthspan is a time of life when one is considered to be healthy in general, free from serious diseases. Despite the fact that life expectancy has increased over the past century in the world, years of healthy life has not improved as such and may have even decreased slightly during last decades. **Objectives:** As healthspan has a strong genetic component, we performed a genome-wide association study and a meta-analysis in participants of the Finrisk study (Finland), the Cohort of Swedish Men (COSM), and the Estonian Genome Center of the University of Tartu (EGCUT). **Methods:** We defined healthy cases as over 75 years old individuals free from serious diseases. As controls we determined persons deceased under 75 years of age and those being over 75 years old unhealthy survivors diagnosed with (at least one of following condition) cardiovascular disease, stroke including intracerebral haemorrhage, heart failure, major adverse cardiovascular event, diabetes, dementia, cancers (skin cancer were excluded), chronic obstructive pulmonary disease, asthma, rheumatism, Crohn's disease, malabsorption or kidney failure. We collected together 1323 healthy cases and 10590 controls from three studies (Finrisk, COSM and EGCUT). **Results:** We found that a locus including the TRRAP gene, having histone acetyltransferase activity, in chromosome 7 was genome-wide significantly associated with healthy ageing ( $p=3.8 \times 10^{-08}$ ). TRRAP may affect in the development of several types of cancer. Another locus close to a genome-wide significant level was found to be in close vicinity of SREK1 in chromosome 5 ( $p=1.1 \times 10^{-07}$ ). SREK1 modulates alternative splicing by modulating the activity of other splicing factors. **Conclusion:** Our goal is to further confirm these findings in other available cohorts with European descent. These results offer a good starting point to model and understand longevity and healthy life.

#### **P149- PRE-OPERATIVE TOTAL FAT MASS, SKELETAL MUSCLE DENSITY AND OVERALL MORTALITY IN EARLY-STAGE COLORECTAL CANCER.**

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**Background:** Previous studies suggest that low muscle mass may increase mortality rates in various cancers. However, earlier studies from our group suggested that not low skeletal muscle mass, but low skeletal muscle density would potentially increase mortality risk in early stage (stage I-III) colorectal cancer (CRC) patients. **Objectives:** As skeletal muscle density is determined by the amount of fat in the muscle cells, we were interested to find out whether total fat mass would modify the association between muscle density and overall mortality. Additionally, we sought to assess the association between total fat mass and overall mortality. **Methods:** Total fat mass and skeletal muscle density were assessed among 1,349 early-stage CRC patients, diagnosed between 2006-2015, using pre-operative computed tomography (CT) scans. Cox proportional hazard models adjusted for age, gender and stage of disease were used to evaluate the association between total fat mass, skeletal muscle density, their combination and overall mortality. In the combined analysis, we created categories for muscle density (normal or low based on our previously defined cut-offs, with low being  $<36.2$ HU for men and  $<31.7$ HU for women with a BMI below 25, and  $<31.8$ HU for men and  $<30.6$ HU for women with a BMI above 25), and total fat mass (normal or high, with high being the upper tertile of fat mass). **Results:** The median follow-up time was 38 months (range, 0 - 108 months). Total fat mass was not associated with overall mortality (lowest vs highest tertile of fat mass: adjusted HR 0.97 (95%CI 0.74-1.27)). In the combined analysis, low skeletal muscle density was associated with a higher risk of dying irrespective of the amount of fat mass: HR for low density normal fat vs normal density normal fat 1.79 (95%CI 1.32-2.41), HR for low density high fat vs normal density normal fat 1.59 (95%CI 1.15-2.21), HR for low density high fat vs normal density normal fat 0.95 (95%CI 0.61-1.49). **Conclusion:** In early-stage CRC patients, total fat mass was not associated with mortality. Low skeletal muscle density was significantly associated with higher mortality, but this was not modified by total fat mass.

#### **P150- VALIDITY OF PHYSICAL PERFORMANCE TESTS IN SCREENING SARCOPENIA IN LOW-INCOME MIDDLE-AGED AND OLDER WOMEN FROM NORTHEAST BRAZIL.**

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**Background:** Identifying simple methods for screening sarcopenia is a challenge for researchers and practitioners. This is particularly important for low-income settings, where physical impairments initiate earlier during the aging process and where resources are limited. Handgrip strength and gait speed are physical performance tests widely used to classify sarcopenia among older adults, however little is known about their validity for middle-aged populations. Knee extension strength seems to be a useful method to evaluate

muscle strength among middle-aged and older populations, but studies associating this with sarcopenia are scarce. **Objectives:** Evaluate the ability of simple physical performance tests in identifying sarcopenia in middle-aged and older women from a low-income setting. **Methods:** This is a cross-sectional study of 568 middle-aged (40-59 years) and older women (60 years) recruited from the community in Northeast Brazil. The criteria for sarcopenia was relative skeletal muscle mass index values less than the lowest 20% for each group (middle-aged: 6.07 kg/m<sup>2</sup>; older adults: 5.51 kg/m<sup>2</sup>), using bioelectrical impedance analysis. Physical performance measures were handgrip strength, knee extension strength, and gait speed. Receiver operating characteristics was performed to calculate the area under the curve (AUC) and the cut-off point of each physical performance test that had better discriminated the sarcopenic from the non-sarcopenic participants. **Results:** For the middle-aged group, a cutoff point of 26.33Kgf in handgrip strength and 22.07Kgf in knee extension strength presented moderated sensitivity (71.6% and 72.5%, respectively) and specificity (59.4% and 56.0%, respectively) in identifying sarcopenia (AUC=0.68, and 0.64, respectively). For the older group, a cutoff point of 0.88m/s in gait speed and of 22.67Kgf in the handgrip strength had good sensitivity (77.8% and 81.6%, respectively) and moderate specificity (51.4% and 64.5%, respectively) in screening sarcopenia (AUC=0.64, and 0.74, respectively). The discriminatory capacity of gait speed for the middle-aged women and of knee extension strength for the older women was very low. **Conclusion:** Muscle strength measures are useful for screening sarcopenia among middle-aged women, while only the handgrip strength and gait speed tests are useful for the older adults. These measures can help practitioners to identify sarcopenia in low-income women and to address proper interventions for each group.

**P151- ASSOCIATION OF TOOTH LOSS WITH INCIDENT FUNCTIONAL DISABILITY IN AN ELDERLY JAPANESE POPULATION: A PROPENSITY SCORE MATCHED COHORT STUDY.** Takamasa Komiyama<sup>1</sup>, Takashi Ohi<sup>1,2</sup>, Kosei Endo<sup>1</sup>, Takako Hiratsuka<sup>1</sup>, Akito Tsuboi<sup>3</sup>, Yasutake Tomata<sup>4</sup>, Fumiya Tanji<sup>4</sup>, Ichiro Tsuji<sup>4</sup>, Makoto Watanabe<sup>5</sup>, Yoshinori Hattori<sup>1</sup> ((1) Division of Aging and Geriatric Dentistry, Graduate School of Dentistry, Tohoku University; (2) Japanese Red Cross Ishinomaki Hospital; (3) Department of Community Medical Supports, Tohoku Medical Megabank Organization, Tohoku University; (4) Division of Epidemiology, Department of Health Informatics and Public Health, School of Public Health, Graduate School of Medicine, Tohoku University; (5) Department of Social Welfare, Faculty of General Welfare, Tohoku Fukushi University)

**Background:** Oral health is well known not only to play an important role in oral function, but also to be an essential component of general health. A growing number of prospective cohort studies have shown that poor oral health status, particularly tooth loss, is associated with frailty and functional disability. However, there are few studies in which confounding factors are well adjusted. **Objectives:** To examine whether tooth loss affects incident functional disability in elderly Japanese individuals using propensity score-matched analysis, which can reduce bias due to confounders. **Methods:** This prospective cohort study was conducted targeting community-dwelling healthy older adults aged 70 years (N = 838) in Tsurugaya district, a suburban area of Sendai in northern Japan. The outcome measurement was incident functional disability, defined as first certification of long-term care insurance in Japan. This is determined on the basis of a strictly established uniform nationwide standard. During a median follow-up of 12.9 years (interquartile range 4.8-12.9 years), information on long-term care insurance

certification was obtained from the Sendai Municipal Authority. The number of remaining teeth was evaluated by professional clinical oral examination. A propensity score-matched analysis was performed for adjustment of the following confounders: age, sex, body mass index, medical history (stroke, hypertension and myocardial infarction), smoking, alcohol consumption, duration of education, depressive symptoms, cognitive impairment, physical functioning, and social supports. **Results:** During follow-up of 6,870 person-years, 518 participants experienced functional disability. Propensity-score matching created 301 pairs of successfully matched participants with 20 or more teeth to those with less than 20 teeth. Cumulative incidence rate of functional disability showed a significant difference between the number of teeth in the propensity-matched groups. Cox regression analysis demonstrated that participants with less than 20 teeth had a significantly greater risk for incident functional disability than those with 20 or more teeth (Hazard ratio = 1.34; 95% Confidence interval = 1.03-1.74). **Conclusion:** As a result of propensity score-matched analysis, tooth loss was associated with greater risk of functional disability in community-dwelling elderly Japanese individuals.

**P152- INTERACTION OF MOBILITY LIMITATION WITH CARDIOVASCULAR AND NEUROPSYCHIATRIC DISEASES IN OLDER PEOPLE: IMPACT ON MORTALITY.** Davide L Vetrano<sup>1,2</sup>, Debora Rizzuto<sup>1</sup>, Amaia Calderón-Larrañaga<sup>1</sup>, Graziano Onder<sup>2</sup>, Anna-Karin Welmer<sup>1,3,4</sup>, Roberto Bernabei<sup>2</sup>, Alessandra Marengoni<sup>1,5</sup>, Laura Fratiglioni<sup>1,4</sup> ((1) Aging Research Center, Department of Neurobiology, Health Care Sciences and Society, Karolinska Institutet and Stockholm University, Stockholm, Sweden; (2) Dept. of Geriatrics, Catholic University of Rome, 00168 Rome, Italy; (3) Karolinska University Hospital, 11776 Stockholm, Sweden; (4) Stockholm Gerontology Research Center, 11330 Stockholm, Sweden; (5) Department of Clinical and Experimental Sciences, University of Brescia, 25121 Brescia, Italy)

**Background:** Chronic diseases and functional impairment are major health determinants in older adults. However, the effect of their co-occurrence on mortality has been rarely studied. **Objectives:** To investigate the impact on mortality of multiple cardiovascular (CV) and neuropsychiatric (NP) diseases, with or without mobility limitation (a global measure of biological aging), in older adults. **Methods:** We studied 3061 community-dwelling people 60+ years participating in the Swedish National study of Aging and Care in Kungsholmen (SNAC-K). The number of CV and NP diseases was categorized as 0, 1 or 2+. Mobility limitation was defined as having a walking speed <0.8 m/s. Cox regression models were used to test the association (hazard ratio, HR) of different combinations of diseases and walking speed with mortality rate at 3 and 5 years. Participants with 0 CV or NP diseases without mobility limitation were the reference group. **Results:** After 3 years, in fully adjusted models, an increasing number of CV diseases (HR 1.82 for 0 diseases to 5.88 for 2+ diseases; p<0.01 for all) and NP diseases (HR 2.92 for 0 diseases to 3.19 for 2+ diseases; p<0.01 for all) was associated with higher mortality rate in participants with mobility limitation, as compared with the reference group. A marginal or non-significant association was found between both CV and NP diseases and mortality in those without mobility limitation. Consistent results were obtained for mortality at 5 years, but more evident for CV diseases. **Conclusion:** The presence of mobility limitation changes the prognosis of CV and NP diseases in older adults. An increasing number of CV and NP diseases leads to higher mortality rate only in participants with slow walking speed.

**P153- FRAILTY TRANSITIONS IN OLDER ADULTS WITH HIV: A ONE-YEAR PROSPECTIVE FOLLOW-UP STUDY.** Tom Levett, Nicole Hrouda, Juliet Wright (*Brighton and Sussex Medical School, Brighton, UK*)

**Background:** HIV-positive cohorts are ageing globally. In the last decade, the UK has seen a doubling of older (aged over 50) HIV service users. Frailty represents a state of vulnerability to minor stressors that renders one at risk of adverse outcomes. Frailty has been demonstrated in HIV-positive individuals at higher prevalence than negative cohorts but prospective data is lacking. **Objectives:** To examine frailty trajectories after one year in older adults with HIV, describing transitions in frailty and associated factors. **Methods:** 253 HIV-positive adults aged >50 were recruited from five HIV-services across Sussex, UK. Of these, 223 (88%) attended year one follow-up. At both time points, frailty was assessed by modified frailty phenotype comprising five criteria: low physical activity, exhaustion, unintentional weight loss, weak grip and slow walk. Present criteria were summed giving a score (0-5) categorizing participants as robust (0), pre-frail (1-2) or frail (3-5). Transitions between frailty states and scores from baseline were examined alongside sociodemographic, clinical and functional data. **Results:** At baseline, 48 (19.0%) participants were frail with 111 (43.9%) pre-frail and 94 (37.1%) robust. Of the 223 retained at one year, 66 (29.6%) transitioned, with 29 (13%) and 37 (16.6%) moving to higher and lower frailty states respectively. Using the frailty score (range 0-5), 97 (43.5%) demonstrated a change with 52 (23.3%) returning with higher score (more frail) and 45 (20.2%) lower score (less frail). Those with increasing score (propensity to frailty), described lesser education ( $p=0.041$ ), being out of work ( $p=0.016$ ), greater number of comorbidities ( $p=0.009$ ) and medications used ( $p=0.004$ ), greater mood symptoms using Hospital Anxiety and Depression Scale ( $p=0.033$ ), and lower physical activity ( $p=0.021$ ) at baseline. We found no statistically significant association between measured baseline factors and lowering of frailty score at year one. No HIV factors were associated with transition in either direction. **Conclusion:** Over a one-year period, frailty was dynamic in terms of state and absolute score in this cohort of HIV-positive older adults. Increasing frailty was associated with non-HIV factors of comorbidity, mood and lower physical activity. These may represent triggers and warrant further evaluation alongside factors that could be targets for reversion in frailty status.

**P154- NORMATIVE DATA FOR ISOMETRIC STRENGTH OF 8 DIFFERENT MUSCLE GROUPS AND THEIR USEFULNESS AS A PREDICTOR OF LOSS OF AUTONOMY AMONG PHYSICALLY ACTIVE NURSING HOME RESIDENTS: THE SENIOR COHORT.** F. Buckinx<sup>1</sup>, J-L. Croisier<sup>1,2</sup>, A. Charles<sup>1</sup>, J. Petermans<sup>1,3</sup>, J-Y. Reginster<sup>1</sup>, X. Rygaert<sup>1</sup>, O. Bruyère<sup>1</sup> ((1) *Department of Public Health, Epidemiology and Health Economics, University of Liège, Belgium. WHO Collaborating Center for Public Health Aspects of Musculoskeletal Health and Ageing, Belgium;* (2) *Department of Sport Sciences, University of Liège, Belgium;* (3) *Department of Geriatrics, CHU of Liège, Belgium*)

**Background:** Muscle strength, which can now be assessed using portable hand-held dynamometers, is the most important predictor of independence [1]. However very useful, these devices still have drawbacks, particularly the absence of large-sample normative isometric data, especially for lower extremity muscle groups and for a specific population such as nursing home residents. **Objectives:** This study sought to provide normative values for isometric strength of 8 different muscle groups among nursing home residents and to

investigate their predictive value for the decline of autonomy. The main purpose of this study was to determine the average monthly cost of drugs consumption among nursing home residents according to their frailty status. **Methods:** This is an analysis of the 1-year follow-up of the SENIOR cohort (Sample of Elderly Nursing home Individuals: an Observational Research). At baseline, the isometric muscle strength of nursing home residents has been assessed for 8 different muscle groups (knee flexors and extensors, hip abductors and extensors, ankle flexors and extensors, elbow flexors and extensors), using a wireless digital hand-held dynamometer, the microFET2 device. The cut-off threshold for low muscle strength was defined as the lower quartile of isometric strength per kg of body mass. The outcome was the 1-year loss of autonomy, which was defined as a decrease of 1 point on the ADL scale between baseline and 12-month follow-up. Logistic regressions were carried out to assess the predictive value of isometric muscle strength for the loss of autonomy. **Results:** A total of 204 subjects ( $83.2 \pm 8.99$  years and 72.5% of women) from the SENIOR cohort were included in this analysis. Threshold values of isometric strength were respectively 0.94, 1.07, 0.77, 0.88, 0.78, 0.79, 0.99 and 0.71 N/kg for knee flexors and extensors, ankle flexors and extensors, hip abductors and extensors, elbow flexors and extensors. After adjustment on age and sex, the cut-off values for knee extensor ( $p=0.04$ ) and for ankle extensors ( $p=0.03$ ) were significantly predictive of loss of autonomy. **Conclusion:** This study presents reference values for isometric strength of 8 different muscle groups among physically active nursing home residents derived from a prospective study. The cut-off value can be used in clinical practice to contribute to the identification of patients at increased risk of loss of autonomy. 1. Rantanen, T., et al., *Aging Clin Exp Res*, 2002.

**P155- NATIONAL ESTIMATES OF FRAILTY PREVALENCE AMONG KIDNEY TRANSPLANT RECIPIENTS IN THE UNITED STATES.** Alvin G. Thomas<sup>1</sup>, Ashton A. Shaffer<sup>1,2</sup>, Hao Ying<sup>1</sup>, Silas P. Norman<sup>3</sup>, Jeremy Walston<sup>1</sup>, Dorry L. Segev<sup>1,2</sup>, Mara McAdams-DeMarco<sup>1,2</sup> ((1) *Hopkins University, Baltimore, MD, USA;* (2) *University of Michigan, Ann Arbor, MI, USA*)

**Background:** Frailty, a measure of physiologic reserve, increases the risk of delayed graft function, longer length of stay, early hospital readmission, immunosuppression intolerance, and mortality among kidney transplant (KT) recipients. Despite its clinical importance in predicting KT outcomes, there are no national estimates of the prevalence or geographic distribution of frailty among US KT recipients. **Objectives:** To estimate the national prevalence of frailty at the time of kidney transplantation. **Methods:** Frailty (Fried phenotype) was prospectively measured in 1,065 KT recipients (12/2008-12/2016) in our multi-center cohort. Using SRTR data on 126,376 KT recipients, we projected the prevalence of frailty and intermediate frailty using predictive mean matching to multiply impute frailty scores, accounting for recipient, donor, transplant, and post-transplant factors. **Results:** In our multi-center cohort, the prevalence of frailty and intermediate frailty were 18.4% and 30.0%, respectively, among deceased-donor KT (DDKT) recipients and 14.5% and 28.1%, respectively, among living-donor KT (LDKT) recipients. Projected nationally, the prevalence of frailty and intermediate frailty were 18.0% (95% CI: 14.7-21.3%) and 29.9% (95% CI: 27.5-32.2%), respectively, among DDKT recipients and 12.5% (95% CI: 10.8-14.3%) and 28.4% (95% CI: 23.8-33.0%), respectively, among LDKT recipients. Frailty prevalence varied by geography ( $p<0.001$ ) and by age ( $p<0.001$ ). **Conclusion:** We project that nearly 20% of KTs 2008-2016 were performed with frail recipients; however, these recipients and their providers were likely not aware of their higher risk for

adverse post-KT outcomes. Given its prevalence, transplant programs should consider assessing frailty during KT evaluation to improve informed consent and identify candidates for pre-KT interventions.

**P156- IMPACT OF THE MUSCULAR MASS EVALUATION PERFORMED THROUGH DXA AND CALF CIRCUMFERENCE IN THE FREQUENCY OF SARCOPENIA IN ELDERLY WOMEN.** Letícia Mazocco<sup>1</sup>, Carla Helena Augustin Schwanke<sup>2</sup>, Maria Cristina Gonzalez<sup>3</sup>, Valéria Baccharin Ianiski<sup>4</sup>, Raquel Seibel<sup>5</sup>, Jamile Ceolin<sup>6</sup>, Patrícia Chagas<sup>7</sup> ((1) *doctoral student, Graduate Program in Biomedical Gerontology, Institute of Geriatrics and Gerontology (IGG), Pontifical Catholic University of Rio Grande do Sul (PUCRS)*; (2) *Graduate Program in Biomedical Gerontology, Institute of Geriatrics and Gerontology (IGG), Pontifical Catholic University of Rio Grande do Sul (PUCRS)*; (3) *Postgraduate Program in Health and Behavior at the University Catholic the Pelotas (UCPEL)*; (4) *master degree student, Graduate Program in Biomedical Gerontology, Institute of Geriatrics and Gerontology (IGG), Pontifical Catholic University of Rio Grande do Sul (PUCRS)*; (5) *doctoral student, Graduate Program in Biomedical Gerontology, Institute of Geriatrics and Gerontology (IGG), Pontifical Catholic University of Rio Grande do Sul (PUCRS)*; (6) *master degree student, Graduate Program in Biomedical Gerontology, Institute of Geriatrics and Gerontology (IGG), Pontifical Catholic University of Rio Grande do Sul (PUCRS)*; (7) *Postgraduate Program in Gerontology at the University Federal of Santa Maria (UFSM)*)

**Background:** There is a great variation in the prevalence of sarcopenia in the literature, due to the different methods used to evaluate muscle mass. The European Working Group on Sarcopenia in Older People (EWGSOP) proposes different methods to evaluate the muscle mass for diagnose sarcopenia. **Objectives:** The aims of the study were to evaluate the frequency of sarcopenia using two different methods for assessing muscle mass in a sample of elderly women, and the correlation between muscle mass index and calf circumference. **Methods:** A cross-sectional study was performed with 205 elderly women (60 years or older) submitted to bone densitometry in the Southern Brazilian region. Sarcopenia was diagnosed according to EWGSOP recommendations, combining the evaluation of muscle mass, strength, and muscular performance. Muscle mass was assessed by two different methods and their cut point were according to a previous study in a similar Brazilian population: (1) by Dual-Energy X-Ray Absorptiometry (DXA) and muscle mass index value <5.62 kg/m<sup>2</sup> were considered 'low muscle mass'; (2) using calf circumference and value <33cm were considered inadequate. Hand strength was assessed by dynamometer and value <20 kg were considered 'low muscle strength' and the physical performance was assessed by 4 m walking speed test and the value <0.8 m/s were considered 'loss of physical performance'. **Results:** The mean age of the sample was 67.3±5.9 years (60-88 years). The majority was caucasian (71.2%), physically active (76.6%), with 4 to 8 years of schooling (47.3%), with partner (61.5%) and retired (92.2%). The frequency of sarcopenia was 2.4% using DXA and 8.3% using calf circumference. Moderate correlation was observed between muscle mass index and calf circumference ( $r=0.515$ ;  $P<0.001$ ). **Conclusion:** The frequency of sarcopenia differs among the methods of muscle mass assessment and is higher using calf circumference.

**P157- IDENTIFYING SARCOPENIA AMONG MEN LIVING IN LONG-TERM CARE COMMUNITIES.** Mary P. Kotlarczyk<sup>1</sup>, Subashan Perera<sup>1,2</sup>, Susan L. Greenspan<sup>1,3</sup> ((1) *Department of Medicine, Division of Geriatric Medicine, USA*, (2) *Department of Biostatistics, USA*; (3) *Department of Medicine, Division of Endocrinology and Metabolism, University of Pittsburgh, Pittsburgh, PA, USA*)

**Background:** Prevalence estimates of sarcopenia vary widely depending on the population of interest and the diagnostic criteria employed. Few studies in the United States have examined sarcopenia in the long-term care (LTC) population, although it represents a high-risk cohort. Sarcopenia among women in LTC is as high as 33%, but there is a little agreement among three consensus panel diagnostic criteria about which women have sarcopenia. **Objectives:** Determine the prevalence of sarcopenia among older men in LTC and assess the degree of overlap among three sets of consensus diagnostic criteria. **Methods:** We conducted a cross-sectional secondary analysis of baseline data from men screened for an osteoporosis clinical trial. Participants were evaluated using dual x-ray absorptiometry (DXA) to assess muscle mass, dynamometry to measure hand grip strength, and 4-meter walk to evaluate usual gait speed. Sarcopenia was defined by three sets of consensus panel guidelines the European Working Group on Sarcopenia in Older People (EWGSOP), the Foundation for the National Institutes of Health Sarcopenia Project (FNIH) conservative cut-points, and FNIH intermediate cut-points. **Results:** Fifty two men (age 83.9 ± 7.2, mean ± SD) were included in the analysis. Sarcopenia prevalence was the lowest at 3.8% (2/52) by FNIH intermediate cut-points. Four participants (7.7%) had sarcopenia using FNIH conservative cut-points. The most participants with sarcopenia, 13.5% (7/52), were identified using the EWGSOP criteria. The three consensus guidelines agreed on only one participant with sarcopenia. **Conclusion:** Sarcopenia is prevalent among men in LTC, but to a lesser extent than in women. Current consensus panel recommendations lack agreement for diagnosing sarcopenia in both men and women living in LTC. Further research is needed to identify clinically relevant and consistent criteria for identification of sarcopenia among LTC residents in order to properly target management strategies.

**P158- EMPIRICAL CRITERIA FOR THE DEFINITION OF LOW MUSCLE MASS AND STRENGTH FROM THE CANADIAN LONGITUDINAL STUDY ON AGING.** Anne-Julie Tessier<sup>1,2</sup>, Simon S. Wing<sup>2,3</sup>, Elham Rahme<sup>2,3</sup>, José A. Morais<sup>1,2,3</sup>, Stéphanie Chevalier<sup>1,2,3</sup> ((1) *School of Human Nutrition, McGill University, Montréal, QC, Canada*; (2) *Research Institute of the McGill University Health Centre, Montréal, QC, Canada*; (3) *Department of medicine, McGill University, Montréal, QC, Canada*)

**Background:** Aging is associated with sarcopenia, i.e., low muscle mass and strength. No diagnostic criteria are currently derived from the Canadian population. **Objectives:** To identify cut-points of low appendicular lean mass (ALM) and low strength as predictors of impaired physical performance in a large Canadian cohort. **Methods:** Cross-sectional analyses were conducted on baseline data from 4,725 and 4,363 free-living men and women (65-86 y, 96.8% Caucasian) of the Canadian Longitudinal Study on Aging (CLSA) comprehensive cohort. Physical performance was evaluated from gait speed, timed-up-and-go, chair rise, and balance tests; a score was created using weighted factor analysis, computed for all participants and adjusted for BMI. Strength was measured by handgrip dynamometry. ALM was measured by dual-energy x-ray absorptiometry and ALM index

(ALMI; kg/m<sup>2</sup>) was calculated. Classification and regression trees analyses were performed to determine optimal sex-specific cut-points of (1) low strength to predict impaired physical performance (score < 1.5 SD below the mean), and of (2) low ALMI to predict low strength. **Results:** Mean ( $\pm$ SD) handgrip strength was 39.8 $\pm$ 8.4 and 23.9 $\pm$ 5.1 kg in men and women; ALMI was 8.57 $\pm$ 1.02 and 6.74 $\pm$ 0.98 kg/m<sup>2</sup>. Correlations between physical performance score, strength, and ALMI were modest ( $r$  0.327, all  $p$ <0.01). We identified <33.1 kg and <20.4 kg as cut-points to define low handgrip strength in men and women respectively, corresponding to 21.5 % and 24.1 % prevalences. Low ALMI cut-points were <7.76 kg/m<sup>2</sup> in men and <5.72 kg/m<sup>2</sup> in women; prevalence of 21.7 % and 13.7 %. Overall, 8.3 % of men and 5.5 % of women had both low strength and ALMI; 1.9% and 1.1% also had impaired physical performance. Participants with a low ALMI were older and had lower fat mass and BMI than those with a normal index. **Conclusion:** The proposed function-derived cut-points established from the largest Canadian cohort should be used to guide the identification of low strength and lean mass in older Canadians and in individuals of similar ethnic background. The modest agreement between low strength and ALMI denote potential distinct health implications justifying considering both components separately. Longitudinal and external validation of these cut-points is warranted.

**P159- LACK OF AGREEMENT AMONG DIFFERENT CRITERIA TO IDENTIFY SARCOPENIC INDIVIDUALS: COMPARISON IN THE CANADIAN LONGITUDINAL STUDY ON AGING.** Anne-Julie Tessier<sup>1,2</sup>, Simon S. Wing<sup>2,3</sup>, Elham Rahme<sup>2,3</sup>, José A. Morais<sup>1,2,3</sup>, Stéphanie Chevalier<sup>1,2,3</sup> ((1) School of Human Nutrition, McGill University, Montréal, QC, Canada; (2) Research Institute of the McGill University Health Centre, Montréal, QC, Canada; (3) Department of medicine, McGill University, Montréal, QC, Canada)

**Background:** Numerous cut-points to define low lean mass and strength, i.e. sarcopenia, exist. While the majority were not defined based on a performance endpoint (e.g. European Working Group on Sarcopenia in Older People (EWGSOP)), the Foundation for the National Institutes of Health (FNIH) chose an empirical approach based on gait speed. Similarly, we derived low lean mass and strength of sarcopenia cut-points predicting impaired physical performance, in a Canadian population. **Objectives:** To compare the prevalence and agreement of low lean mass and strength among our new cut-points, in the large contemporary Canadian Longitudinal Study on Aging (CLSA; 2008-2013). **Methods:** Cross-sectional baseline data from well-functioning adults (4,725 men, 4,363 women, 96.8% Caucasians) aged 65-86 y, were analysed. Appendicular lean mass index (ALMI) was measured by dual-energy x-ray absorptiometry (DXA) and divided by height squared. 95% CI for difference in proportions were used to compare prevalence. Positive and negative percent agreement (PPA and NPA) were calculated. **Results:** Using Canadian-specific cut-points, low ALMI (<7.76kg/m<sup>2</sup> in men, <5.72kg/m<sup>2</sup> in women) prevalence was 21.7% and 13.7%, in the CLSA. Applying the ALMI criteria advocated by the EWGSOP and the ALM/BMI cut-points elaborated by the FNIH to our sample, lower prevalence were found compared to our criteria, in men and women (8.1% and 10.0%, and 12.3% and 8.0%). These prevalences were also lower compared to those reported in their original cohorts. PPA for low lean mass was 20.3-100% and NPA, 80.0-100%; the FNIH cut-points were the least congruous with our criteria. From our criteria, 8.3 and 5.5% of men and women had both low lean mass and strength (<33.1kg in men, <20.4kg in women). Applying the EWGSOP and the FNIH criteria to our cohort resulted in lower prevalences of the combined conditions, in both men and women. While PPA with the EWGSOP criteria were

100%, PPA with the FNIH was 49.2% in men and 26.9% in women. NPA were all >90%. **Conclusion:** The use of distinct indices of ALM prevents the concordant identification of individuals with low lean mass and sarcopenia. The differences in observed prevalence obtained by applying cut-points derived from international populations support the need for population and ethnic-specific cut-points.

## NUTRITION INTERVENTION

**P162- IMPROVEMENTS IN PHYSICAL FUNCTION AFTER CONCURRENT EXERCISE TRAINING IN OLDER ADULTS ARE AUGMENTED BY A HIGH PROTEIN DIET INTERVENTION TARGETING LEUCINE-RICH MEALS.** Michelle Hone<sup>1</sup>, James F. Timmons<sup>2</sup>, Karl E. Cogan<sup>1</sup>, Orlaith Duffy<sup>3</sup>, John C. Murphy<sup>3</sup>, Brendan Egan<sup>1,2</sup> ((1) School of Health and Human Performance, Dublin City University, Ireland; (2) School of Public Health, Physiotherapy, and Sport Science, University College Dublin, Ireland; (3) Medfit Proactive Healthcare, Ireland)

**Background:** Most nutrition interventions targeting muscle mass and function in older adults utilise powdered protein or oral nutrition solutions. Few studies have employed food-based nutrition interventions to support exercise training. The amino acid leucine plays a key role in the stimulation of muscle protein synthesis by ingested protein as does an even distribution of protein throughout the day, but these strategies are underexplored in older adults. **Objectives:** To determine if a food-based nutrition strategy targeting the equivalent of 3 g of leucine per main meal augments exercise training-mediated effects on lean body mass (LBM) and physical function in older adults. **Methods:** Participants [(n=56; M/F, 28/28; age, 69.3 $\pm$ 4.0 y; BMI, 26.6 $\pm$ 3.7 kg/m<sup>2</sup>] were randomly assigned to Nutrition (NUT), Exercise (EX), and Exercise and Nutrition (EX+NUT) for a 12 week intervention. Exercise consisted of 3x24 min of concurrent aerobic and resistance exercise per week. The nutrition intervention provided meal plans and weekly engagement targeting leucine-rich meals at breakfast, lunch and dinner. Body composition (DXA), dietary intake (three day diet record), and physical function (test battery including Short Physical Performance Battery, chest and leg press strength, and aerobic fitness) were assessed before and after the intervention. **Results:** Daily protein intake increased in NUT (0.99 $\pm$ 0.34 vs. 1.43 $\pm$ 0.39 g/kg body mass,  $p$ <0.05) and EX+NUT (0.90 $\pm$ 0.20 vs. 1.57 $\pm$ 0.49 g/kg body mass,  $p$ <0.05), but not EX (1.14 $\pm$ 0.35 vs. 1.05 $\pm$ 0.28 g/kg body mass). Body mass increased by ~1% in both EX+NUT and NUT (both  $p$ <0.05), but this was in the form of LBM (1.1 $\pm$ 1.7%,  $p$ <0.05) and leg LBM (1.6 $\pm$ 2.6%,  $p$ <0.05) in EX+NUT, and fat mass (3.3 $\pm$ 5.5%,  $p$ <0.05) in NUT. Several measures of strength, physical function and aerobic fitness were improved to a similar extent in both EX and EX+NUT groups, but leg strength improved to a greater extent ( $p$ <0.05) in EX+NUT (33.4 $\pm$ 37.7%) compared to EX (12.8 $\pm$ 16.6%). **Conclusion:** Concurrent aerobic and resistance exercise training improves aerobic fitness, strength and physical function in older adults, but supporting this with a leucine-rich, high protein diet provides a more effective strategy to increase lean body mass and strength in this population. Acknowledgement: Supported by Irish Research Council grants EBPPG/2014/39 and EPSPG/2014/91.

**P163- VITAMIN D SUPPLEMENTATION IS ASSOCIATED WITH A REDUCTION IN SELF-REPORTED FALLS AMONG OLDER ADULTS - D-SAFE FEASIBILITY STUDY.** Madison Goetze<sup>1</sup>, Robert. T. Mankowski<sup>1</sup>, Christiaan Leeuwenburgh<sup>1</sup>, Marco Pahor<sup>1</sup>, Stephen D. Anton<sup>1,2</sup> ((1) *Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA;* (2) *Department of Clinical and Health Psychology, University of Florida, Gainesville, FL, USA*)

**Background:** Vitamin D deficiency is a prevalent and underestimated health condition in older adults that can contribute to the development of frailty and sarcopenia. Low levels of vitamin D have been associated with impaired physical function and increased fall risk in older adults. **Objectives:** The aims of this pilot study were to test the feasibility of recruiting older adults with low vitamin D levels and a recent fall history into a clinical trial to examine the effects of vitamin D supplementation on reported falls and change in physical function. **Methods:** Twenty-five older adults (mean age = 75.7±4.9 years) participated in this trial. Participants were recruited through direct mailings targeted at individuals aged 70 years and older with a recent fall history (two or more falls in the past six months). Other eligibility criteria included low vitamin D levels (< 30 ng/mL) and slow gait speed (< 1.2 meters/sec). In accordance with the Institute of Medicine's guidelines, participants received 800 IU of vitamin D per day for six months. The Falls History Questionnaire was used to assess frequency of falls at screening, baseline, and three and six-month follow-up visits. Functional outcomes and vitamin D levels were assessed at baseline and post-treatment (month-6). **Results:** Compared to baseline, participants reported significantly fewer falls following the six-month intervention (3.5 vs. 0.33 falls over six-month period;  $p < 0.05$ ). Additionally, levels of vitamin D in the blood rose significantly in participants after supplementation from an average of 23.25 ng/mL to 29.12 ng/mL, ( $= 6.25$  ng/mL;  $p < 0.001$ ). The increase in blood levels of Vitamin D, however, were not correlated with the observed reductions in falls. Performance on measures of physical function did not improve from baseline to month-6. **Conclusion:** Recruitment of older adults with low vitamin D levels and a recent fall history is feasible but requires substantial recruitment resources. Vitamin D supplementation may help reduce the frequency of falls in older adults with low vitamin D levels and a recent fall history.

**P164- SCREENING OF SARCOPENIA IN A CARDIOLOGY HOSPITAL - DISTINGUISHING FUNCTIONAL CAPABILITY OF MUSCULAR WEAKNESS AND ITS CONSEQUENCES.** Patricia Amante de Oliveira, Aline Santos Monteiro, Cristiane Kovacs, Karina Gama dos Santos, Isabela Cardoso Pimentel Mota, Tatiana Magalhães de Almeida, Amanda Guerra de Moraes Rego Sousa, Daniel Magnoni (*Nutrition Department, Instituto Dante Pazzanese de Cardiologia, São Paulo, Brazil*)

**Background:** The increased interest in sarcopenia is clearly seen by the number of publications in the last few years compared to previously. It is known that sarcopenia leads to functional impairment with increased risk of falls, but studies have demonstrated its relationship with cardiac function. Patients with heart failure associated with sarcopenia have impaired endothelial function, according to a recent publication for example. Age-related changes in body composition are common and consequential but still, body composition is rarely evaluated in routine heart failure care. Once patients' exercise capacity is directly connected to their skeletal muscle mass and quality of life, it should be a concern. We created the sarcopenia ambulatory at the Dante Pazzanese Institute of Cardiology in order to diagnose patients with sarcopenia and improve their

functional capability, exercise capacity, quality of life, hospitalizations and survival. We adopted the SARC-F questionnaire as screening tool, which is useful for impaired physical function in elderly CVD patients and its association with the calf circumference (CC) measurement significantly improved its sarcopenia screening ability. **Objectives:** To identify the presence of sarcopenia in patients with cardiovascular diseases without specific complaints of muscular weakness. **Methods:** All the elderly patients referred to the nutrition of this specifically cardiology hospital were evaluated with SARC-CalF as a screening for sarcopenia. **Results:** From August to November 2017, 218 patients aged > 60 years were evaluated. 10 patients presented SARC-CalF > 11, that is, 4.6% of the elderly referred to the nutrition sector. The sample consisted of 6 women and 4 men, mean age 76 years and BMI of 25 kg/m<sup>2</sup> on average and only 3 patients reported some type of physical activity. Although 5 patients have lost weight in the last months, none were referred for this reason to nutrition, but for dietary guidance of dyslipidemia or hypertension. The median CC was 31.9, below normal for both sexes. **Conclusion:** Preliminary data shows that our sample matches the incidence rate of sarcopenia in the elderly described worldwide of about 5%. This leads us to believe that patients with cardiovascular diseases may have sarcopenia beyond the limiting symptoms of the disease, being able to be underdiagnosed and, therefore, have their treatment neglected, impairing their functionality and increasing the health costs.

**P165- THE EFFECTS OF VITAMIN D SUPPLEMENTATION ON SKELETAL MUSCLE FUNCTION AND FATIGUE IN SEDENTARY AND PHYSICALLY ACTIVE MICE.** Danielle A Debruin<sup>1,2</sup>, Emma Rybalka<sup>1,2</sup>, Craig Goodman<sup>1,2</sup>, Alan Hayes<sup>1,2,3</sup> ((1) *Institute of Sport, Exercise & Active Living (ISEAL), College of Health & Biomedicine, Victoria University, Melbourne, Australia;* (2) *Australian Institute for Musculoskeletal Science (AIMSS), Western Health, Melbourne, Australia;* (3) *Department of Medicine - Western Health, Melbourne Medical School, The University of Melbourne, Melbourne, Australia*)

**Background:** muscle strength and fatigue resistance, high bolus dose VitD supplementation has been linked with increased risk of falls, possibly through decreased muscle strength. **Objectives:** The aims of this study were to investigate the effect of supraphysiological vitamin D supplementation on body composition, voluntary running performance and skeletal muscle function and fatigue in sedentary and physically active mice. **Methods:** Four week old C57Bl/10 mice ( $n=32$ ) were separated into a normal VitD (1500 IU/kg diet) and a high VitD (20,000 IU/kg diet) group. Each dietary group was further separated into sedentary and exercise-enriched (voluntary access to running wheel) intervention groups for 8 weeks. After the VitD and exercise enrichment period, in vivo body composition (EchoMRI) and Promethion metabolic cage analysis was conducted before the excision of muscles for ex vivo contractile analysis. **Results:** No differences in running performance were observed between the unsupplemented and supplemented exercised groups. High VitD supplementation decreased force production in the slow-twitch soleus (SOL) muscles of sedentary mice ( $p < 0.01$ ), however exercise attenuated this effect by 48%. Eight weeks of exercise did not improve fatigue resistance of the extensor digitorum longus (EDL) or SOL muscles in unsupplemented mice, likely due to low levels of activation in these muscles. Despite this, fatigability was improved in EDL ( $p < 0.01$ ) and even more so in the SOL ( $p < 0.001$ ) in the exercised animals that also received the high VitD diet. **Conclusion:** Increasing VitD levels above normal does not improve voluntary exercise performance. Decreased postural muscle force with high VitD may contribute to the increased risk of falls observed in some studies. Interestingly, when supplementation was

combined with exercise, force production was effectively restored, and fatigue resistance improved. This suggests that regular exercise may modulate the effects of VitD on skeletal muscle, and be recommended with high VitD supplementation.

## **NUTRITION AND AGING**

**P166- INFLUENCE OF QUALITY OF NUTRITION ON HEALTH OF THE ELDERLY WORKERS.** Nataliia Prokopenko (*Institute of Gerontology of National Academy of Medical Sciences, Kiev, Ukraine*)

**Background:** Almost every second the citizen of Ukraine after retiring has the will to active work and retraining. Although only one in five is actually working. Deterioration of health and the age-related disability are the main objective reasons for the termination of employment in the production of the elderly people. A wide range of preventive measures is necessary for prevention of premature aging and prolongation of active longevity. Nutrition refers to these measures. **Objectives:** The study deals with the identification of reliable links between actual nutrition and physical health of older workers. **Methods:** 28 men and 42 women at age 50-59 and 60-69 years underwent physiological and psychophysiological examination in the production conditions. On the basis of the measured parameters, the functional reserves of the organism were calculated. The actual nutrition was studied by the method of daily reproduction. **Results:** Most respondents (78.3 %) had a low level of functional reserves (FR). However, the rate of FR was significantly higher in men at the age 60-69 years as compared with men at 50-59 years. The calories content of the food was below of the recommended standards in all of the under study groups (except of men at the age 60-69 years). The author showed the statistically significant correlation of the calories content of the food with the rate of muscle, cardiovascular activity, respiratory function, and visual-motor reaction, as well as with the rate of cumulative FR. Ratio the proteins: fats: carbohydrates does not correspond to the optimum ratio in any one group of respondents. The lack of the calories content of the food, the reducing of the amount of protein in the diet and the increase of the fatty components of food conduce to imbalance in the nutrition. **Conclusion:** The study identified essential lack of vitamins, some minerals and amino acids on background of the deficit of the calories content of the food. All this conduces to premature aging and reduces the potential of respondents for the continuation of work in retirement, and reduces the prospect of use the potential of elderly people in the conditions of the modern labour market.

**P167- EFFECT OF CREATINE SUPPLEMENTATION DOSING STRATEGIES ON AGING MUSCLE PERFORMANCE.** Darren G. Candow, Jennifer Chami (*Faculty of Kinesiology and Health Studies, University of Regina, Canada*)

**Background:** Creatine supplementation, independent of exercise, may have beneficial effects on aging muscle. **Objectives:** However, the optimal dosage of creatine needed to achieve these benefits is unclear. **Methods:** Using a double-blind, repeated measures design, aging adults were randomized to one of three groups: Creatine-Low (CR-L; n=11; 58.8 ± 5.9 yrs, 170.9 ± 10.5 cm, 82.3 ± 16.1 kg; 0.1g kg-1 creatine + 0.3g/kg-1 of placebo [corn-starch maltodextrin]), Creatine-High (CR-H; n=11; 59.3 ± 3.2 yrs, 170.8 ± 8.7 cm, 82.6 ± 16.8 kg; 0.3g kg-1 creatine + 0.1g/kg-1 of placebo), or Placebo (PLA; n=11; 57.3 ± 4.6 yrs, 170.9 ± 11.3 cm, 84.1 ± 11.4 kg; 0.4g/kg-1 of placebo) for 10 consecutive days. Prior to and following supplementation, muscle strength (1-RM leg press & chest press),

muscle endurance (maximal number of repetitions performed at 80% baseline 1-RM for leg press and 70% baseline 1-RM for chest press), and tasks of functionality (walking speed, balance, hand grip strength) were assessed. **Results:** There was a time main effect (p < 0.05) for muscle strength (Leg press: CR-L pre 145.2 ± 47.7 kg, post 151.6 ± 44.9 kg; CR-H pre 161.5 ± 55.75 kg, post 169.2 ± 59.2 kg; PLA pre 163.7 ± 51.5 kg, post 178.2 ± 65.2 kg; Chest press: CR-L pre 54.5 ± 27.9 kg, post 56.8 ± 29.9 kg; CR-H pre 57.0 ± 26.2 kg, post 58.7 ± 27.9 kg; PLA pre 55.1 ± 26.9 kg, post 58.4 ± 29.4 kg) and endurance (Leg press: CR-L pre 24.2 ± 11.6 reps, post 29.1 ± 16.9 reps; CR-H pre 17.1 ± 6.1 reps, post 21.0 ± 7.2 reps; PLA pre 23.8 ± 9.7 reps, post 29.5 ± 11.9 reps; Chest press: CR-L pre 18.0 ± 5.0 reps, post 20.0 ± 7.1 reps; CR-H pre 15.6 ± 2.7 reps, post 18.9 ± 2.7 reps; PLA pre 20.4 ± 6.2 reps, post 21.5 ± 5.4 reps) with no other differences. **Conclusion:** Short-term creatine supplementation has no effect on aging muscle performance.

**P168- COMPONENTS OF THE MEDITERRANEAN DIET AND MORTALITY AMONG OLDER WOMEN WITH FRAILTY.** Oleg Zaslavsky<sup>1</sup>, Shira Zelber-Sagi<sup>2</sup>, James M. Shikany<sup>3</sup>, Tonya Orchard<sup>4</sup>, Robert Wallace<sup>5</sup>, Linda Snetselaar<sup>5</sup>, Lesley Tinker<sup>6</sup> ((1) *School of Nursing, University of Washington, Seattle, WA, USA;* (2) *Faculty of Health Science and Social Welfare, University of Haifa, Israel;* (3) *Division of Preventive Medicine, University of Alabama, Birmingham, AL, USA;* (4) *College of Education and Human Ecology, Ohio State University, Columbus, OH, USA;* (5) *College of Public Health, University of Iowa, Iowa City, IA, USA;* (6) *Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA, USA*)

**Background:** Although mounting evidence exists that in older populations Mediterranean Diet (Med) is beneficial in terms of reducing the risk of morbidity and mortality, questions still exist about specific components that comprise the Med that might account for this reduction in health risks. **Objectives:** In this study, we focused specifically on components within the Med to evaluate their association with all-cause mortality in older women with frailty. **Methods:** A sample of women aged 65-84 years with complete frailty and dietary data (N=10,431) was obtained from the Women's Health Initiative Observational Study. Frailty was assessed with modified Fried's criteria. Dietary data were collected by food frequency questionnaire. The alternative Mediterranean Diet (aMed) Index was used to assess adherence to a Mediterranean dietary pattern according to consumptions of the following components: (1) fruit, (2) vegetables, (3) nuts, (4) legumes, (5) whole grains, (6) fish, (7) ratio of monounsaturated to saturated fat, (8) red and processed meats, and (9) alcohol. **Results:** Over a mean follow-up of 12.4 years (range 3-21.0), 3,259 (31.2%) deaths occurred. Crude death rates demonstrated a decrease in mortality with higher intake of individual Med components. However, in the mutually adjusted models the majority of the Med components on their own were not significantly associated with mortality. Exceptions were vegetables, nuts and whole grains. A higher intake of vegetables, nuts and whole grains were associated with a significantly decreased hazard of mortality, by 8% (p=0.04), 13% (p<0.001) and 16% (p<0.001) respectively. Subgroup analyses by chronic morbidity or smoking status or excluding women with early death did not substantially change these findings. **Conclusion:** Our results highlighted Med components which are linked to better health in older women with frailty. These findings, however, are also relevant to general older and frail population because of a well-documented inadequate consumption of dietary fiber, whole grains, and vegetables. Although our study is prospective and allows temporal inference, clinical trials addressing causal relationship and implementation of

nutritional recommendations are needed.

**P169- OSTEOPOROSIS, ACTIVE DAILY LIVING SKILLS, AND DIETARY PATTERNS OF CONGREGATE MEAL PARTICIPANTS.** Fatma G. Huffman<sup>1</sup>, Joan A. Vaccaro<sup>1</sup>, Gustavo G. Zarini<sup>1</sup>, Edgar R. Vieira<sup>2</sup> ((1) Department of Dietetics and Nutrition, Florida International University, Miami, FL, USA; (2) Department of Physical Therapy, Florida International University, Miami, FL, USA)

**Background:** Osteoporosis is a major public health concern for the aging population. Adequate nutrition is essential for the prevention and delayed debilitation of osteoporosis. Nutrition education and providing health screenings and exercise at congregate meal site could potentially prevent osteoporosis or delay its complications. **Objectives:** The purpose of this study was to assess differences in diet and physical function and their relationship to osteoporosis status among Congregate Meal participants. **Methods:** This study is a cross-sectional analysis of data from the 2015 Tenth Annual National Survey of Older American Act Participants (NSOAAP). The data are available to the public and the research protocol was approved by the Office of Management and Budget and all participants signed an Informed Consent Form. A two-staged stratified selection of 312 out of 628 Area Agencies on Aging (AAoA) was conducted and described in at <https://agid.acl.gov/DataFiles/>. The population included 901 adults ages 60 years and older who completed the 2015 NSOAAP Congregate Meals survey. The final sample size was N=888 with data available for osteoporosis diagnosis (absent/present). All analysis (frequencies, cross-tabulations and logistic regression) was performed with the Statistical Package for the Social Sciences (SPSS) version 24, with the module for complex sample analysis. **Results:** Attendees were 60 years and over, two-thirds female, and three-quarters non-Hispanic White. Approximately 60% were not currently married and 20% were diagnosed with osteoporosis. Only 31.9% with osteoporosis as compared to 51.1% without osteoporosis reported a good quality of life ( $p = .004$ ). Higher percent of persons with osteoporosis reported that their physical health limited moderate activities, stair climbing, and shopping. Regardless of osteoporosis status, attendees had inadequate macronutrient intake, consuming under the recommended servings of dairy, meat, grains, and fruits/vegetables. Males consumed more grain and desserts compared to females. Approximately 12% attended nutrition education, 36% exercise classes, and 37% had health screenings on site. **Conclusion:** Participants at congregate meals with and without osteoporosis are at risk for frailty complications due to inadequate nutrition. Strategies to increase nutrition education, health screening, and exercise programs and participation on the sites are justified.

**P170- A META-ANALYSIS OF THE EFFECT OF DIETARY OMEGA-3 FATTY ACID SUPPLEMENTATION ON WALKING SPEED AND INFLAMMATORY MARKERS IN OLDER HEALTHY ADULTS.** Joanne Stocks<sup>1,2,3</sup>, Ana M Valdes<sup>1,2,3</sup> ((1) NIHR Nottingham BRC, UK; (2) Arthritis Research UK Pain Centre, University of Nottingham, UK; (3) Division of Rheumatology, Orthopaedics and Dermatology, School of Medicine, University of Nottingham, UK)

**Background:** Frailty is a complex phenomenon, highly correlated with a reduction in mobility along with the progressive loss of skeletal muscle strength, mass and function. Dietary supplementation of omega-3 polyunsaturated fatty acids (PUFAs), eicosapentaenoic acid and docosahexaenoic acid have shown to have a beneficial effect on skeletal muscle mass and strength. PUFAs are of particular interest in the context of frailty, given their well-known anti-inflammatory

role and the consensus of an inflammatory contribution to frailty, with differences in the levels of pro-inflammatory cytokines between frail and non-frail elderly having been reported. **Objectives:** To examine the effect of dietary omega-3 PUFA supplementation on frailty traits and associated biomarkers in medically stable older adults. **Methods:** A meta-analysis of randomised controlled trials studying omega-3 PUFA supplementation in older, medically stable people, published up to October 2017 was carried out in 5 databases. The results were pooled using a random-effects meta-analysis with standardised mean differences. This study has been registered with PROSPERO (registration number CRD42017080240). **Results:** 13 studies met the inclusion/exclusion criteria but not all frailty traits or associated biomarkers were measured in all studies. In 4 studies that analysed 236 patients, omega-3 fatty acid supplementation was associated with a significant improvement in walking speed with a pooled effect size of 0.28 (95% CI, 0.00, 0.55;  $P = 0.05$ ). A significant lowering effect was observed for C-reactive protein (CRP) levels in 5 trials of 310 patients, with a pooled effect size of -0.62 (95% CI, -1.14, -0.10;  $P = 0.02$ ). The pooled effect sizes for the inflammatory cytokines TNF (5 trials;  $n=168$ ), was -0.36 (95% CI, -1.09, 0.36;  $P=0.33$ ), and for IL-6 (5 trials;  $n= 187$ ), was -0.08 (95% CI, -0.62, 0.47;  $P=0.78$ ) and were not found to be significant. **Conclusion:** These results suggest that dietary omega-3 supplementation may have a beneficial effect on medically stable older people by improving walking speed and reducing some markers of systemic chronic inflammation.

**P171- ASSOCIATION BETWEEN DIETARY NUTRIENT INTAKE AND SARCOPENIA: THE SARCOPHAGE COHORT STUDY.** Charlotte Beaudart<sup>1,2</sup>, Médéa Locquet<sup>1,2</sup>, Mathilde Touvier<sup>3</sup>, Jean-Yves Reginster<sup>1,2</sup>, Olivier Bruyère<sup>1,2</sup> ((1) Department of Public Health, Epidemiology and Health Economics, University of Liège, Liège, Belgium; (2) WHO Collaborating Centre for Public Health Aspects of Musculo-Skeletal Health and Aging; (3) Equipe de Recherche en Epidémiologie Nutritionnelle (EREN, UMR U1153 Inserm / U1125 Inra / Cnam / Universités Paris 5, 7 et 13, Centre de Recherche en Epidémiologie et Statistiques Sorbonne Paris Cité (CRESS))

**Background:** Aging could be associated with physiological anorexia, decreased caloric intake, malnutrition, and weight loss, which can lead to a decline in muscle mass and muscle function, characterised under the term sarcopenia. It has been suggested that a balanced nutrition intake may be useful in preventing or even reversing sarcopenia. **Objectives:** To describe associations between dietary nutrient intake and sarcopenia. **Methods:** Subjects were recruited from the SarcoPhAge study population, a Belgian cohort of community-dwelling subjects aged 65 years or older. Sarcopenia was diagnosed according to the criteria of the European Working Group on Sarcopenia in Older People. A Food Frequency Questionnaire (FFQ), developed in our Research Unit, using a 1-month recall period, was administered to the participants that were seen for a second-year follow-up. Two sets of meal pictures were displayed to estimate the portion of food daily consumed per participants. The Nutritional Belgian Recommendations of 2016 were used: i.e. adequate intake (AI) and estimated average requirement (EAR). For micronutrients, the prevalence of insufficient intake was estimated as the proportion of subjects whose intake was below the EAR. When possible, recommendations adapted to populations older than 60 years were used; otherwise, recommendations for adults (+18 years) were used. **Results:** 331 subjects (mean age of  $74.8 \pm 5.9$  years, 58.9% of women) had complete data and were included in this study. Among them, 51 were diagnosed sarcopenic (prevalence of 15.4%). FFQ analyses revealed that sarcopenic subjects had a

lower total energy intake compared to non sarcopenic (1596.1 kcal/d versus 1820 kcal/d,  $p=0.008$ , adjusted on age and sex). Sarcopenic subjects consumed significantly lower amount of macro-nutriments (proteins, lipids and saturated fatty acids, adjusted  $p$ -values  $<0.05$ ) and micro-nutriments (sodium, potassium, magnesium, phosphorus, iron, calcium and vitamins (D-A-E-C-K), all adjusted  $p$ -values  $<0.05$ ) compared to non-sarcopenic. For the whole population, whatever the sarcopenic status, the prevalence of insufficient intake was 55.3% for vitamin C, 40.5% for vitamin E, 30.2% for calcium, 16.6% for proteins and 16.3% for vitamin A and potassium. Prevalence of insufficiency was lower than 10% for vitamin K, iron, sodium, magnesium and phosphorus. For macronutrients, 93.7% of the population was below the Nutritional Belgian Recommendations for carbohydrates and 74% for saturated fatty acids. Significantly higher prevalence of insufficiency (consumption below EAR) was found for sarcopenic subjects compared to non-sarcopenic for vitamin E and C, iron, calcium, potassium and magnesium. The prevalence of sarcopenic subjects who were also below the Nutritional Belgian Recommendations for one macronutrient, proteins, was significantly higher compared to non-sarcopenic subjects. **Conclusion:** Sarcopenic subjects seem to consume significantly lower amount of many micro- and macro-nutriments compared to non-sarcopenic subjects. A poorly balanced diet is therefore suggested to be associated with sarcopenia and poor musculoskeletal health.

**P172- SOCIAL MEDIA - A POSSIBILITY TO IMPROVE THE DISSEMINATION IN PROMISS: A PILOT STUDY.** Ellen Freiberger<sup>1</sup>, Michael Talaska<sup>1</sup>, Javier Ganzarain<sup>2</sup>, Marjolein Visser<sup>3</sup> ((1) Institute for Biomedicine of Aging (FAU Erlangen-Nürnberg), Nürnberg, Germany; (2) AGE Platform Europe 168 Avenue de Tervueren, Brussels, Belgium; (3) Vrije Universiteit Amsterdam, Amsterdam, the Netherlands)

**Background:** The European 'PROMISS' project (Prevention Of Malnutrition In Senior Subjects in the EU) from the VU University Amsterdam in The Netherlands, which is financed by the EU, tries to prevent malnutrition in community-dwelling older persons all over Europe. Thereby, PROMISS will contribute to improve active and healthy ageing, and prevent frailty. One of the reasons for malnutrition might be the lack of information that the seniors have. Therefore, it is most important to share and disseminate the information of the project to improve senior nutritional behavior. On this ground, the question of effective use of social media for dissemination purpose is omnipresent. **Objectives:** One of the main objectives of the dissemination work package of PROMISS is to integrate social media into dissemination activities. For better understanding of the social media we want to investigate in a pilot study the influence of social media based on quantified data from the 'Twitter Analytics'-tool. Twitter Analytics offers the opportunity to gain data from every single tweet or even from the audience and can be analyzed precisely. **Methods:** The dissemination work package of PROMISS is developing strategies to investigate e.g. 'Engagement-Rate' or 'Impressions' data of the Twitter analytic tool. Also data on 'Retweet-Rate' will be used on the information of shared tweets. Using this data provides the possibility for increasing the effectiveness of tweets. **Results:** Based on existing expertise we defined three parameters as our Key-Performance-Indicators (KPI) «Engagement-Rate», «Retweet-Rate» and «Followers». Maximizing these values will increase the number of interested persons. Twitter-analytics will collect the data for the KPI's so they can be compared over time. Besides, we will analyze the effect that different tweets have on the audience and the influence of the audience on our KPI's. Data on our three KPI will be analyzed based on the EUNAAPA Tweets and will be presented at the conference as

an example. **Conclusion:** Twitter analytics provides valuable data to strengthen the project presence in social media. This will increase the dissemination of the project and reaching out to a greater number of interested persons.

**P173- DIETARY SUPPLEMENTATION WITH CURCUMIN AND OLEUROPEIN MODULATES MUSCLE QUALITY DURING AGING.** Claire Boutr<sup>1</sup>, Elise Cazaubon<sup>1</sup>, Olivier Rizzo<sup>2</sup>, Jacques Vuichoud<sup>1</sup>, Andreas Rytz<sup>1</sup>, Marie-Noëlle Horcajada<sup>1</sup>, Jérôme Feige<sup>2</sup>, Sonia Karaz<sup>2</sup>, Denis Breuillé<sup>1</sup> ((1) Nestlé Research Center, Lausanne, Switzerland; (2) Nestlé Institute of Health Science, Lausanne, Switzerland)

**Background:** Sarcopenia is defined as a syndrome characterized by an age-related loss of skeletal muscle mass and functionality. One of the causes for this decline is the change in the quality of the muscle (fibers size and number). Skeletal muscle contraction time, strength and resistance to fatigue, highly depend on the fiber type distribution and the degree of expression of the different myosin-heavy chain isoforms in the muscle. **Objectives:** The objective of this study was to determine the effects of polyphenols, curcumin and oleuropein, known for their wide range of physiological effects, on muscle quality in aging preclinical model and the association with muscle mass. **Methods:** Thirty 20 months-old rats received a complete diet supplemented with either curcumin (CUR,  $n=10$ ) or oleuropein (OLE,  $n=9$ ) for 3 months. A control group (CON,  $n=11$ ) received cellulose instead of polyphenols. Fiber type was analyzed in tibialis anterior muscle by immunofluorescence staining and microscopy. Exact Wilcoxon test associated with Hodges-Lehmann to estimate the difference between groups and Kolmogorov-Smirnov test to assess the difference of the distribution have been performed for statistical analysis. **Results:** CUR and OLE groups exhibited higher muscle mass and higher fiber crosssectional area than CON group. There was a higher percentage of large fibers area between 2100 and 2800 $\mu\text{m}^2$  in the CUR compared to CON ( $P<0.04$ ). The distribution of cumulative cells area of muscle fiber was significantly lower in the OLE group compared to CON ( $P<0.001$ ). Finally, analysis of fiber types revealed that the proportion of MHC2A fibers, was increased in the OLE compared to CON ( $P<0.05$ ). Type 2B fiber distribution was also affected by OLE supplementation with a higher amount of small ( $<700\mu\text{m}^2$ ) fibers area ( $P<0.02$ ) and lower amount of fibers area between 2100 and 3500 $\mu\text{m}^2$  ( $P<0.05$ ). **Conclusion:** Dietary polyphenols supplementation can influence the quality of the muscle and could be a solution to tackle one of the causes of age related muscle decline. Further studies are needed to confirm the results obtained..

**P174- RISK FACTORS ASSOCIATED WITH SARCOPENIC OBESITY IN ELDERLY RESIDENTS IN THE NORTH OF THE R.J.: FIBRA III STUDY.** Glaucia Campos<sup>1,2</sup>, Virgílio Garcia<sup>2</sup>, Maria Angélica<sup>2</sup>, Claudia Lopez<sup>1</sup>, Roberto Lourenço<sup>2</sup> ((1) Instituto de Medicina Social- Universidade do Estado do Rio de Janeiro (UERJ) - RJ - Brasil; (2) Laboratório de Envelhecimento Humano- Geronlab - UERJ - RJ - Brasil)

**Introduction:** Sarcopenic obesity has been prominent in the scientific field mainly due to its negative outcomes in the health and damage to the quality of life of the elderly. **Objectives:** To verify the possible association of sarcopenic obesity with dependence on the basic activities of daily living, falls and demographic variables. **Methods** This is a sectional study called FIBRA III - RJ (Fragility in Brazilian Elderly) conducted with 402 elderly individuals, over 65 years old, of both sexes, and living in the Northern Zone of Rio

de Janeiro between the period of 2012 to 2013. They were submitted to the home interview, for evaluation of socioeconomic variables, demographic, and performed functional and morbidity evaluation. Anthropometric data were also collected. Based on the European Work Group on Sarcopenia in Older People, three criteria for the diagnosis of Sarcopenia were selected: muscle mass, muscle strength and walking speed. Muscle mass was estimated using the Baumgartner equation and defined as reduced in those of the first quintile. To evaluate the gait velocity, the elderly walked the distance of 4.6 meters, the evaluation of the palmar grip strength through the Jamar dynamometer and to evaluate the basic activities of daily living was used on the Katz scale. For the diagnosis of obesity, the individuals were classified according to the cutoff points recommended by the Pan American Health Organization - BMI > 30 kg / m<sup>2</sup>. Single frequencies and analyzes were calculated on SPSS 19 with their 95% confidence intervals. **Results:** A total of 402 elderly people, predominantly female (70.4%), were evaluated. The prevalence of sarcopenic obesity was 4.5% and in the bivariate analysis a risk of 2.76 (CI = 0.59-12.7) for sarcopenic obesity was observed in the elderly who had falls, have a dependence on basic activities of daily life (OR = 4.21-CI = 1.55-11.46), statistically significant. **Conclusion:** The proportion of sarcopenic obesity is similar to national and international studies. There was a positive association between sarcopenic obesity and dependence for basic activities of daily living, falls, female sex, and among the elderly who were between 75 and 84 years of age.

**P175- EVALUATION OF NUTRITIONAL RISK THROUGH MINI-NUTRITION SCREENING AND THE PAYETTE SCALE IN A GERIATRIC POPULATION.** Blanca González<sup>1,2</sup>, Patricia Guerrero<sup>1,2</sup>, Daniel Gámez<sup>1</sup>, Sagrario Nuñez<sup>1</sup>, Xochitl Ortiz<sup>3</sup>, Carolina Vargas<sup>1</sup>, Daniela Mendoza<sup>1</sup>, Abraham Treviño<sup>1</sup>, Patricia Ancer<sup>2</sup>, Ricardo Salinas<sup>1</sup> ((1) *Servicio de Geriatria del Hospital Universitario 'Dr. José Eleuterio González' UANL, Mexico;* (2) *Consulta de Nutrición del Hospital Universitario 'Dr. José Eleuterio González' UANL, Mexico;* (3) *Facultad de Psicología, UANL, Mexico*)

**Background:** The aging process cause alterations in body composition, organ functions, adequate energy intake and ability to obtain food. The most significant objective of nutrition in aging, in biological terms, is to maintain the structure and function of the organism, because there is no growth or development of tissues at this stage of life. The risk of malnutrition in Mexico in the geriatric population is very high and an increase is expected in the coming years. Therefore, a careful evaluation of the nutritional status should be carried out routinely in clinical practice. **Objectives:** The aim of this study is to evaluate the nutritional risk through nutritional Mini-Screening test and the Payette scale in a geriatric population. **Methods:** This is a observational and descriptive study from outpatients of the Geriatric Unit in the University Hospital in Monterrey México from 2014 to 2017, 760 patient over 50 years old were included. During nutritional assesment Mini-Nutritional Screening test (MN) and Payette Scale were carried out. A statistical analysis was carried out using SPSS 22 version and Pearson correlation was performed for analysys of variables, and Anova test for association between the groups. **Results:** 760 patients were evaluated, 530 (70%) females and 230 (30%) males, 441 (58%) were on severe nutritional risk based on MN 225 (29%) in moderate risk and 124 (16%) were at not risk. Based on Payette Scale (n: 758) was reported on severe nutritional risk: 105 in severe risk (13.8%), 323 (42%) moderate and 330 (43%) low or not risk of malnutrition. A positive correlation was observed between Mini Nutritional Screening Test and Payette Scale (r: .36, p: <.001). **Conclusion:** There is a

statistically significant association between the use of Mini nutritional Screening test and Payette Scale with a positive correlation (at higher nutritional risk per MN greater nutritional risk per Payette). This study recommends its implementation as a screening within the nutritional assessment of the patient.

**P176- BIOELECTRICAL IMPEDANCE ANALYSIS AND RISK OF MALNUTRITION IN OLDER ADULTS OF THE COMMUNITY.** Núñez Sagrario<sup>1</sup>, Gámez Daniel<sup>1</sup>, González Blanca<sup>1,2</sup>, Vargas Carolina<sup>1</sup>, Salinas Ricardo<sup>1</sup> ((1) *Servicio de Geriatria del Hospital Universitario 'Dr. José Eleuterio González', UANL, Mexico;* (2) *Consulta de Nutrición del Hospital Universitario 'Dr. José Eleuterio González' UANL, Mexico*)

**Background:** Elderly people are at risk of malnutrition due to numerous coexisting factors with an increased risk of hospitalization, morbidity and mortality. The use of validated nutritional screening tools becomes crucial during the clinical assessment in primary care. **Objectives:** The aim of this study is to evaluate the risk of malnutrition in elderly people through Mini Nutritional Screening Tests and the Payette Scale with its association of the muscle mass index by bioelectrical impedance analysis (BIA). **Methods:** Observational study from November 2016 to October 2017 of 119 elderly patients, 65 years and older, from a Geriatric Unit of the University Hospital in Monterrey Mexico. A Mini Nutritional screening test and a Payette Scale were carried out and bioelectrical parameters of resistance and reactance, with standard tetra polar analysis by bioelectrical impedance analysis (BIA) for the measurement of the Muscle Mass Index. Qualitative variables were represented by frequencies and percentages and were evaluated with the Xi square test. For quantitative variables, mean and standard deviation were used and analyzed using t-student for independent groups and a Pearson Correlation. All data was analyzed using SPSS version 24. **Results:** After the Mini Nutritional Screening Test (MN) data was analyzed, we observed that 37.0% of the females and 25.9% of the males had a high risk of malnutrition (MN>6), 41.3% of the females and 22.2% of the males had a moderate risk (MN 3-5), and 21.7% females and 51.9% males had low or no risk (MN 0-2). The Payette Scale reported that 9.8% of the females and 7.4% of the males had a high risk (6-13), 38.0% of the females and 22.2% of the males had a moderate risk (3-5), and 52.2% of the females and 70.4% of the males had low or no risk of Malnutrition. A negative correlation was reported among patients with low MMI (female 6.42kg/m<sup>2</sup> and male 8.87kg/m<sup>2</sup>; EWGSOP Consensus) and MN in all groups, with higher statistical significance in the female group with a moderate risk (p= 0.009). **Conclusion:** A routine assessment of nutritional status combined with the use nutritional tools such as Mini Nutritional and Payette scores are useful for recognizing patients at risk of malnutrition. Assessing muscle mass using BIA as a nutritional marker allows for an integral evaluation at an accessible cost..

**P177- MUSCLE MASS INDEX, GRIP STRENGTH AND NUTRITIONAL STATUS DURING HOSPITALIZATION OF ACUTE HIP FRACTURE.** Guerra Javier<sup>1</sup>, Gamez Daniel<sup>2</sup>, González Blanca<sup>2,3</sup>, Ortiz Xóchitl<sup>4</sup>, Salinas Ricardo<sup>2</sup>, Peña Victor<sup>1</sup> ((1) *Servicio de Ortopedia y Traumatología del Hospital Universitario 'Dr. José Eleuterio González' UANL, Mexico;* (2) *Servicio de Geriatria del Hospital Universitario 'Dr. José Eleuterio González' UANL, Mexico;* (3) *Consulta de Nutrición del Hospital Universitario 'Dr. José Eleuterio González' UANL, Mexico;* (4) *Facultad de Psicología, UANL, Mexico*)

**Background:** Sarcopenia is a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength that occurs with advancing age. The diagnosis is made with the documentation of low muscle mass plus low muscle strength or low physical performance. The prevalence is reported as 10-50% in people older than 80 years. **Objectives:** The aim of the study is to determine the prevalence of sarcopenia in patient with acute hip fracture and nutritional status at admission and comparing pre-surgery status. **Methods:** 61 elderly patients with the diagnosis of acute hip fracture (<5 days) hospitalized between 29 July 2016 and 2 August 2017 were included. A clinical assessment was carried out during the first 48 hours after hospitalization (serum albumin, Grip strength and Muscle Mass Index). Grip Strength was measured using the dominant hand with a Takei TKK5401 Dynamometer and following the Southampton protocol and the muscle mass index was calculated with BIA device (Quantum IV) and the Janssen's formula. A second assessment was carried out later, 48 hours before surgery. **Results:** Demographic analysis shows: mean age of 80.15 years, 21% males and 79% females. During admission we found the following: 77% malnutrition based on albumin level (3.2 g/dl), 49.1% Sarcopenia based on low MMI (MMI <8.87 kg/m<sup>2</sup> in men and <6.42 kg/m<sup>2</sup> in women) and low GS (GS <30 kg in men and <20kg in women). Statistical difference was observed between initial Grip Strength (11.40 ±5.55) and secondary assessment (9.45 ±6.29) (t=2.32, p=0.026). No statistical significance was report on weight, BMI and MMI between both assessments (mean of 14 ± 6.7 days). **Conclusion:** The present study found that the frequency of sarcopenia was 49.1%, 77% with malnutrition in acute hip fracture patients, a higher prevalence compared with general population. Muscle and weight loss was not detected, although grip strength loss (sarcopenia) was found during hospitalization. This may indicate that grip strength measurements obviate the need for muscle mass.

**P178- EVALUATION OF SWALLOWING IN PATIENTS WITH HEART FAILURE.** Raquel Gama Fernandes<sup>1</sup>, Tatiana Magalhães de Almeida<sup>1</sup>, Marcela Dinalli Gomes Barbosa<sup>1</sup>, Patricia Amante de Oliveira Soares<sup>2</sup>, Carlos Daniel Magnoni<sup>2</sup>, Elizabete Silva Santos<sup>3</sup>, Amanda Guerra de Moraes Rego Sousa<sup>3</sup> ((1) *Speech Therapy Department, Dante Pazzanese Institute, Sao Paulo, Brazil;* (2) *Nutrition Department, Dante Pazzanese Institute, Sao Paulo, Brazil;* (3) *Dante Pazzanese Institute, Sao Paulo*)

**Background:** Fatigue is usually a symptom that may be present in patients with heart failure (HF), which can result in decreased physical activity, leading to decreased muscle mass. Dyspnea another symptom, which is also common in HF, can lead to an increase in energy expenditure. Reduced muscle mass as well as dyspnea are known as risk factors for dysphagia. Reduction of muscle mass in this population may not only be associated with heart disease but also with advancing age, since HF is common in the elderly population. **Objectives:** To evaluate the phonoarticular organs (OFAs) and the swallowing of patients with HF profile B and C admitted to a cardiology hospital.

**Methods:** The study was approved by Research Ethics Committee (CEP) under the n° 53481116.2.0000.5462. We included adult patients with HF diagnosis, excluding patients with previous dysphagia, neurological sequels, head and neck cancer and Chronic Obstructive Pulmonary Disease (COPD). Patients were selected after admission in the period from April 2016 to August 2017. The swallowing evaluation was performed at the bedside by the speech therapy team, composed of OFA and functional evaluation of swallowing, being classified as functional swallowing or mild oropharyngeal dysphagia, moderate or severe. Subsequently performed statistical analysis, Logistic Regression Test. **Results:** Evaluated 33 patients, 13 (39.4%) of the patients presented dysphagia, of which 5 (38.5%) were mild and related to changes in the OFA strength and 8 (61.5%) were moderate, related to incoordination between breathing and swallowing with signs of laryngotracheal aspiration. The elderly patients presented Odes Rate OR = 1,048 more chances of dysphagia, with p = 0,106 according to statistical analysis. **Conclusion:** Patients with HF are at risk of dysphagia, dyspnea due to incoordination between breathing and swallowing, besides a reduction in the force of OFAs, be related to disease or aging of the musculature involved in swallowing.

**P179- PREVALENCE OF OBESITY, SARCOPENIA AND OSTEOPOROSIS IN A GROUP OF OLDER MEXICAN WOMEN.** Maria Consuelo Velazquez-Alva, Maria Esther Irigoyen-Camacho, Lazarevich Irina and Marco Zepeda (*Health care department, metropolitan autonomous University. Mexico city, Mexico*)

**Background:** Obesity, sarcopenia and osteoporosis have been recognized as clinical conditions that particularly favor the development of adverse results in older adults due to age-related redistribution of fat and its infiltration into bone and muscle. Osteoporosis and bone fractures in elderly rise the risk of sarcopenia, which, through decreased mobility, increases the risk of more falls and fractures, generating a vicious cycle. Obesity, increased adiposity and is also a cause of pro-inflammatory cytokines and other endocrine factors that impaired bone and muscle. **Objectives:** The aim of this study was to evaluate the prevalence of obesity, sarcopenia and osteoporosis in a group of community-dwelling old women living in the south of Mexico City. **Methods:** This was a cross-sectional study. Sarcopenia was defined according to the consensus definition of the EWGSOP using the following cutoff point: 5.45 kg/m<sup>2</sup> determined by Dual X-ray Energy Absorciometry (DXA) to estimate skeletal muscle mass, 0.8 m/ s for the gait speed and 20 kg for the grip strength. Osteopenia was identified with a T-score between <1.1 to <2.5 D.E in total lumbar spine and / or femoral neck and osteoporosis with a T-score -2.5 SD in the same regions. For Obesity we used the result of % body fat determined by DXA and also obtained the body mass index (BMI) according to the criteria proposed by the WHO. **Results:** 185 women were studied with an average age of 71.8 (± 6.6) years (range: 65 to 89 years old). The prevalence of obesity was of 60.0%; 44.0% of women presented osteoporosis and the prevalence of sarcopenia was 8.0%. **Conclusion:** The prevalence of sarcopenia in this population of active older women was low, however; the prevalence of both obesity and osteoporosis were higher. Elderly women who suffer from these clinical entities may benefit from combined strategies to improve diet habits, oral nutritional supplements and physical activity/resistance exercise programs. Such recommendations could be promoted as part of public health agendas.

**P180- SARCOPENIC OBESITY AND METABOLIC SYNDROME IN ELDERLY OUTPATIENTS: IS THERE AN ASSOCIATION?** Renata Borba de Amorim Oliveira<sup>1</sup>, Juliana de Carvalho Lima<sup>2</sup>, Marcio José de Medeiros<sup>3</sup>, Vanessa Gomes Luiz da Costa<sup>4</sup> ((1) Adjunct Professor, Nutrition Program, UFRJ campus Macaé, RJ, Brazil; (2) Bachelor in Nutrition, Nutrition Program, UFRJ campus Macaé, RJ, Brazil; (3) Adjunct Professor, Engineering Program, UFRJ campus Macaé, RJ, Brazil; (4) Specialist, Bachelor in Physiotherapist, Program of Integral Attention to Elderly Health, SEMUSA / PMM, RJ, Brazil)

**Background:** Sarcopenic Obesity (SO) is a subclinical inflammatory condition characterized by changes in body composition. Obesity (increased body fat) and sarcopenia (decrease in skeletal muscle mass) are frequent findings in the elderly population, and it has already been attributed to the influence in the development of Metabolic Syndrome (MS). Although some studies point to SO influence on MS, this association is still not well established in the literature. **Objectives:** The present study aimed to verify the association between SO and risk factors for MS in the elderly. **Methods:** Sixty-four elders of both sexes, participants of physiotherapy groups of a public health service were evaluated. Data were collected regarding the risk factors for the development of MS such as: alcohol consumption, smoking, physical activity (International Physical Activity Questionnaire), family risk antecedents; history of current illness; diagnostic criteria for MS (fasting glycemia, HDL-C, triglycerides, blood pressure); anthropometric data (weight and height, waist circumference) and body composition evaluation by a whole body (WB) bioelectrical impedance analysis (BIA) to measure the percentage of body fat and estimate the lean mass. **Results:** From the body fat percentage, a diagnosis of obesity was made. Sarcopenia was established through an equation to obtain skeletal muscle mass (from the lean mass values obtained by the BIA), muscle strength (manual grip strength using the hydraulic dynamometer) and physical performance (Short Battery for Physical Performance). The most prevalent risk factors were physical inactivity (68.8%), family history of Systemic Arterial Hypertension (SAH) (76.6%) and Diabetes Mellitus (DM) (65.6%), occurrence of SAH (89.1%), Obesity (87.5%) and Dyslipidemia (76.6%). Waist circumference was above ideal values for both sexes (98.3 cm ± 14) in women and (103.2 cm ± 10) in men; high blood pressure (94.6%) in women and (68.8%) in males outside the appropriate parameters. There was no statistically significant association between OS and SM ( $p > 0.9$ ). **Conclusion:** In this study it was possible to conclude that the development of MS may be associated with other risk factors presented in this population or the multiplicity of diagnostic criteria for SO determination may have been responsible for the weak association between OS and MS.

**P181- RISK OF DYSPHAGIA AND NUTRITIONAL STATUS OF POST-STROKE OLDERS.** Renata Borba de Amorim Oliveira<sup>1</sup>, Ludmila da Silva Pinheiro<sup>2</sup>, Alessandra Arnaud de Queiroz Mattoso<sup>3</sup>, Elizabeth Teixeira Lins<sup>4</sup>, Benizia Soares Pessanha<sup>5</sup> ((1) Adjunct Professor, Nutrition Program, UFRJ campus Macaé, RJ, Brazil; (2) Graduate Student in Nutrition, Nutrition Program, UFRJ campus Macaé, RJ, Brazil; (3) Specialist, Bachelor in Speech Therapy, Home Care Program, SEMUSA/PMM, RJ, Brazil; (4) Specialist, Bachelor in Nutrition, Home Care Program, SEMUSA/PMM, RJ, Brazil; (5) Specialist, Bachelor in Social Service, Home Care Program, SEMUSA/PMM, RJ, Brazil)

**Backgrounds:** Stroke has become one of the main causes of death and hospital admissions in Brazil, affecting mainly elderly population. Most of them present some physical, emotional or cognitive deficit, needing assistance to better perform activities of daily living. Dysphagia is an example of a frequent disorder in post-stroke individuals and may directly contribute to malnutrition. **Objectives:** To evaluate risk of dysphagia and nutritional status of elderly people affected by stroke from a home care service and to associate sequels with nutritional parameters. **Methods** This is a cross-sectional, descriptive and quantitative study, with the post-stroke elderly population of both sexes, assisted by a government home care service. Signs and symptoms of the risk of dysphagia were evaluated using the Questionnaire for Dysphagia Screening, developed by OHKUMA et al. (2002) and adapted to portuguese by CHAVES et al. (2011). Nutritional status was classified according to BMI and nutritional screening was performed through the Mini Nutritional Assessment short form (MNA-SF). The association between nutritional status, risk of dysphagia, stroke sequels and time of diagnosis were investigated through Pearson's chi-square test using SPSS statistical package, version 21.0. **Results:** A total of 41 post-stroke patients were included in the study. Regarding BMI, 61% of the elderly were classified as underweight, 21.9% eutrophic. According to the MNA-SF, 41.5% presented risk of malnutrition, 36.6% malnourished. The most frequent stroke sequels presented were hemiparesis (43.9%) and hemiplegia (51.2%), with a statistically significant association within hemiparesis and BMI underweight ( $p = 0,021$ ), MNA risk of malnutrition ( $p = 0,024$ ), MNA malnutrition ( $p = 0,000$ ); hemiplegia and BMI underweight ( $p = 0,019$ ) and MNA malnutrition ( $p = 0,001$ ). Although there was a considerable number of signs and symptoms of risk of dysphagia, there was no statistically significant association with nutritional parameters. **Conclusion:** Early identification and monitoring sequels, nutritional and dysphagia risk of these patients allows the development of more appropriate intervention actions.

## **ANIMAL MODELS**

**P185- SKELETAL MUSCLE EXTRACELLULAR MATRIX (ECM) ADAPTATION AFTER CHRONIC STRETCHING EXERCISE IN AGED FEMALE RATS.** Hilana Rickli Fiuza Martins<sup>1</sup>, Kátia Janine Veiga Massenz<sup>2</sup>, Nayara Bertoncini<sup>3</sup>, Talita Campos<sup>3</sup>, Anna Raquel Silveira Gomes<sup>4</sup>, Talita Gianello Gnoato Zotz<sup>5</sup> ((1) PhD student of Physical Education Department, Federal University of Paraná, Curitiba, Paraná, Brazil; (2) Master student of Physical Education Department, Federal University of Paraná, Curitiba, Paraná, Brazil; (3) Physiotherapy student, Physiotherapy Department, Federal University of Paraná, Curitiba, Paraná, Brazil; (4) Physiotherapy Department, Masters and Doctorate Programs in Physical Education, Federal University of Paraná, Curitiba, Paraná, Brazil; (5) Physiotherapy Department, Federal University of Paraná, Curitiba, Paraná, Brazil)

**Background:** Extracellular matrix (ECM) turnover contributes to the reorganization of the connective tissue necessary for skeletal muscle plasticity. Aged muscles are characterized by an increase in collagen levels and a decrease in collagen turnover with an accumulation of collagen cross-links which can reduce joint range of motion. ECM collagens is regulated by the TGF- $\beta$ /Smad pathway, which can be activated by mechanical signals such as stretching exercise. However, the adaptations of extracellular matrix in response to a chronic stretching protocol, performed for 3 weeks, in aged rats, are still unclear. **Objectives:** The aim of the present study was to verify the effects of stretching in the soleus muscle histomorphology of aged female rats. **Methods:** Fourteen 26-month old female rats were divided into two groups: Stretching (SG, n = 7, 321 $\pm$ 32g) and control (CG, n = 7, 335 $\pm$ 39g). The stretching protocol consisted of 4 repetitions of 1 minute with 30 seconds interval between each repetition. Stretching was performed on the left soleus muscle, through an apparatus composed by a load cell to detect the force applied during the stretching, 3 times a week, for 3 weeks. The control group was also anesthetized and placed on the apparatus, without stretching, 3 times a week, for 3 weeks. Twenty four hours after last session, the rats were anesthetized and the left soleus muscle was removed. Immunohistochemistry for quantification of type I Collagen and TGF $\beta$ -1 was performed. **Results:** The stretching group (SG) showed less type I collagen (0.07 $\pm$  0.09% vs 0.48 $\pm$ 0.75%, p = 0.05, Kruskal-Wallis) and more TGF-1 (5.91 $\pm$ 10.36% vs 3.89 $\pm$  7.37%, p=0.04, Kruskal-wallis) percentage of immunostain per soleus muscle fiber area than the control group. **Conclusion:** Chronic stretching on the aged soleus muscle of female rats promoted an antifibrotic action by decreasing collagen I content probably mediated by TGF-/Smad pathway. It is suggested molecular analysis of signaling pathway extracellular matrix for better comprehension about stretching effects in the skeletal muscle plasticity.

**P186- ALPHA-MELANOCYTE STIMULATING HORMONE MODULATES THE CENTRAL ACYL GHRELIN-INDUCED STIMULATION OF FEEDING AND COLONIC SECRETION.** Hsien-Hao Huang<sup>1</sup>, Chih-Yen Chen<sup>2,3</sup> ((1) Division of Emergency Department; (2) Gastroenterology and Hepatology, Taipei Veterans General Hospital, and Faculty of Medicine; (3) National Yang-Ming University School of Medicine, Taipei, Taiwan)

**Background:** Cachexia is characterized by weight loss, fat and muscle tissue wasting, psychological distress and a low quality of life. As melanocortin receptors (MCRs) have been reported to be hyperactive in cancer cachexia, and plasma levels of acyl ghrelin have been shown to be compensatory but insufficiently increased in tumor-bearing rats compared to paired-fed controls. **Objectives:** The interplays between acyl ghrelin and MCRs may provide a new therapeutic avenue for ameliorating anorexia and constipation during human negative energy balance conditions. **Methods:** We examined the effects of -melanocyte stimulating hormone (-MSH) and acyl ghrelin on food intake, colonic motility, and secretion in conscious rats with a chronic implant of intracerebroventricular (ICV) catheters. **Results:** ICV injection of O-n-octanoylated ghrelin (0.1 nmol/rat) significantly increased the cumulative food intake up to 1h (P < 0.001), 2h (P < 0.01), 4h (P < 0.001), and 8h (P < 0.01), accelerated colonic transit time (P < 0.05), increased fecal pellet output (P < 0.01), total fecal weight (P < 0.01) and fecal dried solid weight (P < 0.05). Pre-treatment with ICV injection of -MSH (1.0 nmol/rat) attenuated the acyl ghrelin-induced hyperphagic effect at 1, 2, 4, and 8h (P < 0.05), fecal pellet output (P < 0.05), total fecal weight (P < 0.01) and fecal dried solid weight (P < 0.05). Pre-treatment with ICV injection of -MSH (2.0 nmol/rat) attenuated the acyl ghrelin-induced hyperphagic

effect at 1h (P < 0.001), 2h (P < 0.05), 4h (P < 0.05), 8h (P < 0.01) and 12h (P < 0.01), fecal pellet output (P < 0.05), total fecal weight (P < 0.01) and had the trend to decrease the fecal dried solid weight (P = 0.071). However, -MSH (1.0 and 2.0 nmol/rat) did not attenuate the acyl ghrelin-stimulated accelerated colonic transit time. **Conclusion:** -MSH is involved in central acyl ghrelin-elicited feeding, fecal pellet output and fecal weight. -MSH did not restore central acyl ghrelin-induced accelerated CTT, but attenuated the increase in fecal pellet output and total fecal weight. These results suggested that central acyl ghrelin-induced enhancement of distal colonic motility and colonic secretion is, at least partly, mediated by MCRs in the brain.

## OSTEOPOROSIS AND FRAILITY

### **P187- OSTEOPOROSIS, SELF-RATED HEALTH, AND ACTIVITY OF DAILY LIVING SKILLS OF OLDER ADULTS ATTENDING CONGREGATE MEAL SITES.**

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**Background:** Osteoporosis is common among older adults and it affects health and in many ways. However, little is known about osteoporosis' health effects and impacts in socioeconomically disadvantaged older adults attending congregate meal sites. **Objectives:** To assess self-rated health (SRH) and activity of daily living skills (ADLs) in older adults with osteoporosis that attend congregate meal sites. **Methods:** We analyzed data from the 2015 Tenth Annual National Survey of Older American Act Participants that were conducted at congregate meal sites. Participants were asked about their socio-demographics, food and satisfaction, health, functionality, and social life. The population included 901 people 60 years, and 888 had data on osteoporosis diagnosis and were included in the analysis. SRH was based on the question: in the past 12 months how would you rate your health? Difficulty with ADLs was assessed by affirmative responses to questions concerning dressing, shopping, cooking, cleaning, and other physical activities. Osteoporosis was assessed based on an affirmative response to a physician's diagnosis. Analysis was performed with SPSS, v. 24, using the module for complex sample analysis. Characteristics were compared using chi square and models of osteoporosis impact on SRH and ADLs were calculated using logistic regression. **Results:** Twenty percent of the participants had osteoporosis, and it was more frequent among women (25.3% vs. 10.1%, P=0.020). Adjusting for age, gender, race/ethnicity, and food security, those with fair to poor SRH had twice the odds of osteoporosis (OR: 2.24, 95%CI: 1.16-4.30). Osteoporosis interfered with several ADLs including shopping or visiting doctors (P=0.018); climbing stairs (P=0.037), light housework (P=0.004), and moderate activities (P=0.026). The ability to do activities such as dressing and eating were not significantly different between those with and without osteoporosis. Age-group, race/ethnicity, and education level were not significantly associated with osteoporosis. **Conclusion:** Osteoporosis was common among older adults attending congregate meal sites, especially among women. People with osteoporosis had twice the odds of rating their health as fair to poor than those without osteoporosis, and it significantly affected their ability to go shopping or visit doctors, climb stairs, do even light house work and moderate effort activities.

**P188- MUTUAL ASSOCIATIONS AMONG FRAILTY, SARCOPENIA AND OSTEOPOROSIS: FOUR-YEAR OBSERVATIONS BETWEEN THE SECOND AND THIRD ROAD STUDY SURVEYS.** Noriko Yoshimura<sup>1</sup>, Shigeyuki Muraki<sup>1</sup>, Hiroyuki Oka<sup>2</sup>, Toshiko Iidaka<sup>1</sup>, Rie Kodama<sup>3</sup>, Chiaki Horii<sup>3</sup>, Hiroshi Kawaguchi<sup>4</sup>, Kozo Nakamura<sup>5</sup>, Toru Akune<sup>5</sup>, Sakae Tanaka<sup>3</sup>  
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**Objectives:** To clarify the prevalence of frailty, and mutual associations among frailty, sarcopenia (SP), and osteoporosis (OP). **Methods:** The second survey of the Research on Osteoarthritis/Osteoporosis Against Disability (ROAD) study 'a large-scale population-based cohort study' was conducted between 2008 and 2010. Among 1,099 participants of the second survey of the ROAD study, 1,083 subjects (aged 60 years, 372 men, 711 women) completed the all examinations of frailty, SP and OP. Frailty was defined using the Fried's definition with following five variables: unintentional weight loss, self-reported exhaustion, low physical activity, weakness (grip strength, < 26 kg in men and < 18 kg in women), and slowness (slow walking speed, usual gait speed was 0.8 m/s). Those with three or more of the five factors were judged to be frailty. The third survey was conducted between 2012 and 2013; 767 of the 1,083 individuals who were enrolled from the second survey (70.8%, 253 men, 514 women) had completed assessments identical to those in the second survey. SP was defined as per the algorithm of the Asian Working Group for Sarcopenia, whereas OP was defined based on the World Health Organization criteria. **Results:** The prevalence of frailty in the second survey was found to be 5.6% (men, 3.8%; women, 6.6%). Among individuals of frailty, 44.3% (men, 57.1%; women, 40.4%) were diagnosed as SP, and 50.8% (men, 21.4%; women, 59.6%) diagnosed as OP at the lumbar spine L2-4 and/or the femoral neck. The cumulative annual incidence of frailty was 1.2%/yr (men, 0.8%/yr; women, 1.3%/yr). After adjustment for confounding factors, a logistic regression analysis using the occurrence of frailty as the objective variable and the presence of OP as the explanatory variable indicated that the presence of OP was significantly associated with the occurrence of frailty in the near future (odds ratio (OR), 3.24; 95% confidence interval (CI), 1.38-7.63; p<0.01). Again, the logistic regression revealed occurrence of frailty significantly increased according to the number of OP and SP present (OR vs. neither OP nor SP: OP or SP, 2.50; OP and SP, 5.80). **Conclusion:** This prospective study suggests that OP and SP prevention may be useful in reducing future frailty risk.

**P189- WALKING STEPS CORRELATED WITH BONE MINERAL DENSITY AT THE FEMORAL NECK INDEPENDENTLY OF MUSCLE FUNCTION IN POSTMENOPAUSAL JAPANESE WOMEN.** Jun Kitagawa<sup>1</sup>, Takahiro Tachiki<sup>2</sup>, Masayuki Iki<sup>2</sup>, Junko Tamaki<sup>3</sup>, Katsuyasu Kouda<sup>3</sup>, Yuho Sato<sup>4</sup>, Etsuko Kajita<sup>5</sup>, Naonobu Takahira<sup>1</sup>, Sadanobu Kagamimori<sup>6</sup>, JPOS Study Group<sup>2</sup> (1) Graduate School of Medical Science, Kitasato University, Kanagawa, Japan; (2) Department of Public Health, Kinki University Faculty of

Medicine, Osaka, Japan; (3) Department of Hygiene and Public Health, Osaka Medical College, Osaka, Japan; (4) Department of Human Life, Jin-ai University, Fukui, Japan; (5) Department of Nursing, Nagoya University Graduate School of Medicine, Aichi, Japan; (6) University of Toyama, Toyama, Japan)

**Background:** The maintenance of physical activity in the later decades of life may impede age-related bone loss. The number of steps walked, as measured by a pedometer, has been used as a physical activity assessment by The National Nutrition Survey in Japan. Steps/day was positively associated with hip bone mineral density (BMD) in older community dwelling Australian individuals<sup>1</sup>. Previous studies<sup>2,3</sup> reported that not only physical activity, but also muscle function, such as grip strength, was linked to BMD. **Objectives:** The purpose of this cross-sectional study was to investigate whether walking steps correlate with femoral neck BMD (FN-BMD) independently of muscle function in postmenopausal Japanese women. **Methods:** This study was part of the Japanese Population-based Osteoporosis (JPOS) cohort study<sup>4</sup> conducted in 2015 and 2016. Subjects were 333 postmenopausal women (mean 66.8±7.9 years). No subject exhibited abnormal bone metabolism. FN-BMD was measured by dual X-ray absorptiometry (QDR4500A, Hologic, USA). Muscle function was assessed by measuring grip strength (kg) and maximal gate speed (m/sec: a 10-m course). Steps/day was measured using a triaxial accelerometer (EW-NK52, Panasonic Electric Works Co., Japan). Subjects were instructed to wear the accelerometer during their waking hours for 7 consecutive days. **Results:** The mean number of steps/day was 5,834±3,040. A significant decrease was observed in steps/day with age (r=-0.30, p<0.001). FN-BMD negatively correlated with years since menopause (r=-0.35, p<0.001) and age (r=-0.33, p<0.001). FN-BMD was positively associated with body mass index (BMI) (r=0.30, p<0.001). Grip strength (r=0.26, p<0.001) and walking steps (r=0.15, p<0.01) positively correlated with FN-BMD. In stepwise multiple regression analyses, walking steps, grip strength, and maximal gate speed correlated with FN-BMD after adjustments for years since menopause and BMI. **Conclusion:** Walking steps correlated with FN-BMD independently of muscle function in postmenopausal Japanese women. The maintenance of daily walking activity and muscle function may be effective for preserving bone health in postmenopausal women. References: 1) Foley S et al. Osteoporos Int. 21:1809-1816, 2010. 2) Marin RV et al. J Clin Densitom. 13:96-101, 2010. 3) Sirola J et al. Osteoporos Int. 16:1841-1848, 2005. 4) Iki M et al. Int J Epidemiol. 44: 405-414, 2015.

## **BIOMARKERS AND IMAGING**

**P190- RISK FACTORS OF SARCOPENIA IN UKRAINIAN POSTMENOPAUSAL WOMEN.** Vladyslav Povoroznyuk, Nataliia Dzerovych, Roksolana Povoroznyuk (D.F. Chebotarev Institute of gerontology NAMS Ukraine, Kyiv, Ukraine)

**Background:** Sarcopenia is a geriatric syndrome characterized by an age-related reduction in muscle mass, strength and performance. There are many underlying causes of age-related skeletal muscle mass loss. Recent studies attest to a strong connection of dietary peculiarities and body composition of elderly people (Cruz-Jentoft A. J. et al., 2010; Morley J. E. et al., 2010; Budul S.L., 2015). In this context, protein with its prominent dietary status gains an especial standing as far as the older population's health is concerned. There has also been a number of studies examining associations among skeletal muscles and vitamin D, as well as androgens and growth hormone (Di Monaco M., 2011; Cruz-Jentoft A. J., 2010; Buehring B., Binkley N., 2013; Yuki A. et al., 2015; Cangussu L.M., 2015). **Objectives:**

The aim of the study was to study the risk factors (dietary protein intake, vitamin D, growth hormone (GH), total and free testosterone level (TT, FT)) of sarcopenia in Ukrainian postmenopausal women. **Methods:** To evaluate the connection between appendicular lean mass (ALM) and dietary protein intake we have examined 63 women aged 52-89 yrs (mean age 68.46±9.26 yrs). For the purpose of studying the correlation between skeletal muscles and vitamin D level 87 healthy women aged 45-83 yrs were examined (mean age 66.29±8.35 yrs). To study the correlation between skeletal muscles and GH, TT, FT level, 42 healthy women aged 60-86 yrs (mean age 70.62±6.97 yrs) were examined. To assess the dietary habits of women, we used a three-day sampling method. Lean mass was evaluated using Dual X-ray absorptiometry (Prodigy, USA). Strength of skeletal muscle was evaluated using springy carpal dynamometer, the functional capacity of skeletal muscle by «four-meter» test. To determine the level of 25(OH)D, GH, TT and FT electrochemiluminescent method was used. **Results:** Women of 80-89 yrs consuming less than 1.0 grams of protein per 1 kg of body weight accounted for more than a half of their group (57.1%). Significant correlations among dietary protein, aminoacids and ALM index values ( $p<0.01$ ) were determined. We determined a significant correlation between parameters of lean mass ( $p=0.05$ ) and vitamin D level; skeletal muscle functionality ( $p=0.04$ ) and vitamin D level. Significant correlation between ALM and level of GH (60-74 yrs:  $r=0.36$ ; 60-89 yrs:  $r=0.31$ ), between strength of skeletal muscle and level of TT (75-89 yrs:  $r=0.55$ ; 60-89 yrs:  $r=0.32$ ), FT (75-89 yrs:  $r=0.31$ ), GH (75-89 yrs:  $r=0.35$ ; 60-89 yrs:  $r=0.32$ ); between function of skeletal muscle and level of TT (75-89 yrs:  $r=0.46$ ), FT (75-89 yrs:  $r=0.48$ ) was found. **Conclusion:** Significant correlation between parameters of lean mass, skeletal muscle strength, functionality and dietary protein intake, vitamin D, GH, TT and FT level was determined in the Ukrainian postmenopausal women.

**P191- INFLUENCE OF GRIP STRENGTH, PHYSICAL ACTIVITY, AND DIETARY PROTEIN INTAKE ON MUSCLE STRENGTH AND CROSS-SECTIONAL AREA IN MIDDLE AGED-WOMEN.** Christopher J Kotarsky<sup>1</sup>, Kara A. Stone<sup>1</sup>, Rachel Iverson<sup>1</sup>, Wonwoo Byun<sup>2</sup>, Kyle J Hackney<sup>1</sup>, and Sherri N Stastny<sup>1</sup> ((1) North Dakota State University, Fargo, ND, USA; (2) University of Utah, Salt Lake City, UT, USA)

**Background:** An unfortunate aspect of aging is the progressive loss of muscle mass and strength. Protein intake (PI) and physical activity (PA) play an important role in attenuating these losses. However, the Recommended Dietary Allowance (RDA) for protein (0.8 g/kg/d) may not be enough to aid this process. Suggestions for a level of 1.0-1.5 g/kg/d may increase muscle maintenance with aging. **Objectives:** To evaluate the association between PA and dietary PI on muscle strength and cross-sectional area (CSA) in middle-aged women. **Methods:** Fifty women (53.1±5.4 years) completed the study. Subjects' rectus femoris CSA (RCSA) was analyzed using panoramic ultrasound. Strength was tested using a Biodex dynamometer, expressed as knee flexor (KFPT) and extensor (KEPT) peak torque, grip strength (HGS), and 30-second sit-to-stand (SS). Moderate-to-vigorous PA (MVPA) was assessed over seven days with an accelerometer. PI and its percentage of total calories (PP) were analyzed from three-day food diaries. Pearson Product Correlations (PPC) assessed the relationship between HGS and KFPT, KEPT, and RCSA, and PP and KFPT, KEPT, and RCSA. Stepwise regression was used to predict KFPT, KEPT, and RCSA from HGS, PI, SS, and MVPA. **Results:** A moderate, positive relationship was observed between HGS and KFPT ( $r=0.598$ ,  $p<0.001$ ), KEPT ( $r=0.516$ ,  $p<0.001$ ), and RCSA ( $r=0.508$ ,  $p<0.001$ ). A low, positive relationship was observed between PP and KFPT ( $r=0.364$ ,  $p=0.009$ ) and KEPT ( $r=0.358$ ,  $p=0.011$ ). A significant regression equation was

created for KFPT ( $F(1,48)=26.688$ ,  $p<0.001$ ), with a  $R^2$  of 0.357, KEPT ( $F(1,48)=17.382$ ,  $p<0.001$ ), with a  $R^2$  of 0.266, and RCSA ( $F(1,48)=16.682$ ,  $p=0.045$ ), with a  $R^2$  of 0.258 from HGS. Subjects' predicted KFPT and KEPT is equal to  $4.758+1.871(\text{HGS})$  Nm and  $30.701+2.635(\text{HGS})$  Nm, respectfully, when HGS is measured in kilograms. Subjects' predicted RCSA is equal to  $1.084+0.185(\text{HGS})$  cm<sup>2</sup> when HGS is measured in kilograms. **Conclusion:** HGS significantly predicted KFPT, KEPT, and RCSA in middle-aged women, and explained 36%, 27%, and 26% of the variability in these models respectfully. While PP was correlated with KFPT and KEPT, and PI was higher ( $1.24\pm0.35$  g/kg/d) than the RDA, these variables were not selected as significant predictors for any model.

**P192- CHANGES IN PLASMA LEVELS OF NITROTYROSINE AND MONOCYTE CHEMOATTRACTANT PROTEIN-1 LEVELS AFTER ETANERCEPT THERAPY IN RHEUMATOID ARTHRITIS.** C Chen (*National Yang-Ming University School of Medicine, Taipei, Taiwan*)

**Backgrounds:** Rheumatoid arthritis (RA) is a chronic inflammatory disease that damages the synovial joints. RA patients often show anorexic and cachectic. Biological therapy with anti-tumor necrosis factor (TNF)- has been proven effective as a treatment for RA. Oxidative stress increases the production of superoxide and nitric oxide, in turn, leading to the formation of pro-oxidant peroxynitrite. Raised levels of nitrotyrosine have been reported in the plasma of patients with RA. On the other hand, monocyte chemoattractant protein-1 [MCP-1, or chemokine (C-C motif) ligand 2 (CCL2)] is implicated in pathogenesis of several diseases characterized by monocytic infiltrates, such as RA and atherosclerosis. The impact of etanercept therapy on plasma nitrotyrosine and MCP-1 level in RA patients still remains unknown. **Objectives:** To investigate the effects of etanercept therapy on the plasma nitrotyrosine and MCP-1 levels. **Methods:** Total 40 RA patients fulfilling the ACR/EULAR criteria, with failure of disease control by traditional DMARDs were enrolled prospectively. Plasma nitrotyrosine and MCP-1 was checked prior to etanercept injection, 3 months, and 1 year after treatment by enzyme immuno-assays methods. Another 15 age-matched RA patients who did not receive any biologics were included as control group, and the plasma nitrotyrosine and MCP-1 were collected at enrollment and 1 year later. **Results:** After 1 year follow-up, there was a significant decrease in blood nitrotyrosine level after treatment of etanercept in the 3rd month ( $p < 0.001$ ), and this trend lasted to 1 year ( $p<0.001$ ). The control group did not manifest the decrease of nitrotyrosine ( $p=0.296$ ). On the other hands, a significant increase of serum MCP-1 level after etanercept treatment was noted in the 3rd month of follow-up ( $p=0.001$ ), and this trend lasted to 1 year ( $p<0.001$ ). The trend did not appear in the control group ( $p=0.317$ ) as well. None of these patient experienced major side effects or mortality during this period. **Conclusion:** Serum nitrotyrosine level decreased significantly after etanercept injection in RA as early as 3 months. Serum MCP-1 level increased 3 month after treatment with etanercept. The mechanism of two biomarkers fluctuations need more investigations to clarify.

**P193- SCREENING TOOL FOR SARCOPENIA IN OLDER PEOPLE: A BIOSPECTROSCOPIC APPROACH.** Ricardo Oliveira Guerra<sup>3</sup>, Leomir Aires Silva de Lima<sup>1</sup>, Daniele Sirineu Pereira<sup>2</sup>, Juliana Fernandes de Souza Barbosa<sup>3</sup>, Aline do Nascimento Falcão Freire<sup>3</sup>, Kássio Michell Gomes de Lima<sup>1</sup> ((1) Institute of Chemistry, Biological Chemistry and Chemometrics, Federal University of Rio Grande do Norte, Natal, RN-Brazil; (2) Physical Therapy Department, Federal University of Alfnas, Alfnas, MG, Brazil; (3) Department of Physiotherapy, Federal University of Rio

Grande do Norte, Natal, RN-Brazil)

**Background:** Sarcopenia is considered a new geriatric syndrome. In order to diagnose sarcopenia, it is necessary to measure muscle mass, strength and physical function. The gold standard measures of muscle mass are expensive and are problematic to access in clinical settings, mainly in primary care where fast, easy and low cost diagnosis methods are necessary for decreasing the economic burden on the health system. The biospectroscopic approach is a recent method that uses a little amount of blood plasma and is capable of screening cervical cancer in the early stages. We hypothesized that use of this new method could be a possible way of improving sarcopenia diagnosis in primary care. **Objectives:** To assess the use of Attenuated total reflection Fourier transform-infrared (ATR-FTIR) spectroscopy with discriminant analysis as a screening method of sarcopenia from the blood plasma of community dwelling older adults. **Objectives:** To assess the use of Attenuated total reflection Fourier transform-infrared (ATR-FTIR) spectroscopy with discriminant analysis as a screening method of sarcopenia from the blood plasma of community dwelling older adults. **Methods:** This study used data from an epidemiological study that included 521 community dwelling older adult users (aged 60 years or more) of primary care health services in Minas Gerais, Brazil. Sarcopenia was assessed following the algorithm proposed by the European Working Group on Sarcopenia in Older People (EWGSOP), where data of gait speed, handgrip strength and muscle mass were collected. Older adults with sarcopenia were paired with those without sarcopenia by gender and age. ATR-FTIR spectroscopy with discriminant analysis (PCA-LDA, SPA-LDA and GA-LDA models) were employed to distinguish non-sarcopenic (n=80) and sarcopenic (n=79) individuals. **Results:** Computational modeling showed that the biochemical changes that split the sample into sarcopenic and non-sarcopenic individuals were those associated to the protein vibrational band (combination of Amide I and II polypeptide bands). Sensitivity and specificity values demonstrated that the use of the biological fingerprint region was able to distinct sarcopenic individuals from controls for PCA-LDA, SPA-LDA and GA-LDA models. **Conclusion:** The ATR-FTIR biospectroscopic approach was able to distinguish older adults with sarcopenia. Our findings present great clinical relevance for more studies using this new approach, since the gold standards for sarcopenia diagnosis are expensive and are mainly difficult to access in developing countries.

#### **P194- A NEW CT BASED APPROACH TO DETERMINE MUSCLE AND ADIPOSE TISSUE OF PARASPINAL MUSCLE.**

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**Background:** Paraspinal muscle properties are associated with back pain, structural abnormalities of the lumbar spine and perhaps even vertebral fracture. However, it is still unknown, whether fat infiltration or muscle volume are parameters that are more relevant. **Objectives:** To develop and validate a precise anatomy orientated approach for segmentation and determination of fat infiltration of paraspinal muscle. **Methods:** Due to low soft tissue contrast, it is difficult to segment the paraspinal muscle in CT images with high accuracy. Therefore, a global VOI and coronal, diagonal and sagittal clipping planes were defined to facilitate a segmentation that captured about 80-90% of the paraspinal muscle at the expense of the outer parts. The clipping planes were determined automatically based

on a 3D segmentation, a vertebral coordinate system (VCS) and a number of landmarks such as the ends of the transverse processes, the center of the VCS and the width of the vertebral body. The resulting segmentation was compared with a manual segmentation of an expert radiologist, which served as gold standard. Voxels containing pure fat and were separated from muscle tissue by a threshold obtained from subcutaneous adipose tissue, which served as reference for pure fat. Based on the CT value, muscle tissue was further divided into 5 compartments. A low muscle density indicated a higher portion of fat, while with increasing density the ratio of muscle to fat increases. A muscle density > 25 HU was defined as pure muscle. Automated and manual segmentation were compared in 13 elderly subjects with vertebral fractures. Analysis was applied to CT scans obtained before vertebroplasty. For each dataset 3 slices were compared. **Results:** The correlation of relative % volume of pure fat and muscle between the automated and the manual segmentation was very high ( $r_2 > 0.97$ , SEE <). Intra and interoperator reanalysis precision errors were below 2%. As expected the automated segmentation underestimated muscle volume. There was a moderate correlation of  $r_2 = 0.79$  in muscle cross sectional area. **Conclusion:** The new approach for segmentation of paraspinal muscle showed excellent precision, which is highly important in longitudinal studies. The compromise on muscle volume accuracy is justified as % fat and muscle volume obtained from the automated approach correlated extremely high with the gold standard technique. Thus the method provides an excellent basis for further re-search in the field of vertebral fractures.

#### **P195- OMIC SIGNATURES IN RISK OF FRAILTY - A META-ANALYSIS OF NESTED CASE-CONTROL STUDIES FROM THE FRAILOMIC INITIATIVE.**

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**Background:** Population ageing is a major challenge to society. Frailty, a syndrome that is strongly associated to dependency, falls, and mortality, is the only phenotype of aging for which validated interventions for prevention and recovery exists. **Objectives:** To identify candidate OMIC markers of frailty risk in four nested case-control studies. **Methods:** Longitudinal study in 1182 participants (four nested case controls samples from the Toledo Study of Healthy Aging (robust = 178 / prefrail = 184), the 3 City Bordeaux Study (111/269), the AMI cohort (157/79), and the InChianti cohort (106/98). From the biobanks of these studies urine, plasma, whole blood, and serum to measure more than 40.000 'omics' (genomic, transcriptomic, proteomic and metabolomic) markers were analyzed in highly specialized laboratories. We considered all individuals where the progression was either no change or changing robust to pre+frail, robust to frail, pre+frail to frail. All analysis were adjusted for age, sex, and major clinical markers of frailty. We used permuted p-values to identify candidate biomarkers in this discovery phase and looked for validation in the other 3 cohorts. An OMIC marker was considered validated if the association test was nominally significant at  $p < 0.05$  in at least one of the 4 heterogeneous cohorts. **Results:** Five of risk markers tested as candidates for the risk of frailty were validated internally by at least one other cohort. We report the random effect meta-analytic OR considering the heterogeneous

nature of the exploratory cohorts. Vitamin D (p discovery < 0.001, ORMETA= 0.99, 95%-CI: 0.72 - 1.36), rs6657616 (discovery p = 0.003, ORMETA =1.03, 95%-CI = 0.64 - 1.66), proBNP (discovery p = 0.0212, ORMETA = 1.26, 95%-CI 1.04 - 1.54), Lutein/Zeaxanthin (Discovery p = 0.04, ORMETA = 0.85, 95%-CI=0.66 - 1.10), and alpha carotene (discovery p=0.048, ORMETA =0.80, 95%-CI = 0.58 - 1.08) were selected according to the above criteria. Meta-analysis revealed heterogeneity across cohorts. **Conclusion:** ProBNP is a promising risk factor of incident frailty. 4 other OMIC factors can be considered promising candidates. External validation in other longitudinal samples is required given the heterogeneous results as evidence by mostly non-significant random effect results from meta-analysis.

**P196- BIOIMPEDANCE IN HEART FAILURE: SYSTEMATIC REVIEW OF CURRENT EVIDENCE.** Eric Carelli<sup>1</sup>, Melissa Bendayan<sup>2,3</sup>, Alexandrine O'Brand<sup>3</sup>, Louis Mullie<sup>1</sup>, Jonathan Afilalo<sup>2,3,4</sup> ((1) *Department of Medicine, McGill University, Montreal, Quebec, Canada;* (2) *Division of Experimental Medicine, McGill University, Montreal, Quebec, Canada;* (3) *Centre for Clinical Epidemiology, Jewish General Hospital, Lady Davis Institute for Medical Research, Montreal, Quebec, Canada;* (4) *Division of Cardiology, Jewish General Hospital, McGill University, Montreal, Quebec, Canada*)

**Background:** Bioelectrical impedance analysis (BIA) is a non-invasive method used to determine body composition. Given its ability to rapidly estimate parameters such as body water and fat-free mass, BIA has been evaluated as a potential diagnostic and prognostic tool in patients suffering from acute and chronic forms of heart failure (HF). **Objectives:** While numerous studies have been published, we sought to comprehensively review these diverse studies to inform clinical practice. **Methods:** A systematic review was performed, searching MEDLINE and EMBASE from inception to 2017 for original studies of BIA in adult patients with known or suspected HF. Studies were required to have examined at least one of the following outcome measures to be included: mortality, HF hospitalization, HF diagnosis, physical functioning, and frailty. Two independent observers screened search results using the Rayyan platform (<https://rayyan.qcri.org/>), and extracted data from those that met the inclusion criteria. **Results:** Thirty-four studies were included, comprising a total population of 6,778 patients. BIA was used to measure phase angle (10 studies), reactance (10 studies), resistance (9 studies), body water distribution (9 studies), and fat-free mass (2 studies). Among studies that examined the prognostic value of BIA, phase angle was found to be predictive of mortality in 4 studies, and body water distribution was found to be predictive of mortality or rehospitalisation in 8 studies. Among studies that examined the diagnostic value of BIA, reactance, resistance, and body water distribution were found to be effective in distinguishing between HF and non-HF related dyspnea in 6 studies, whereas these parameters and phase angle were found to be effective in ascertaining the response to diuretics in 10 studies. Moreover, BIA was associated with markers of frailty; notably fat-free mass with quadriceps strength, and phase angle with handgrip strength. **Conclusion:** The use of BIA in patients with HF is supported by a significant body of evidence that has demonstrated the diagnostic and prognostic value of this tool. Phase angle and body water distribution are promising parameters to predict mortality and determine fluid status before and after treatment. Further research is warranted to test the impact of BIA-guided therapy in HF.

**P197- SEMI-AUTOMATED SEGMENTATION OF PSOAS MUSCLE AREA IN OLDER ADULTS UNDERGOING AORTIC VALVE REPLACEMENT.** Wayne Lok Ok Choo<sup>1</sup>, Samuel Mamane<sup>2</sup>, Louis Mullie<sup>2</sup>, Matthew Ades<sup>3</sup>, Amanda Trnkus<sup>1</sup>, Jose Morais<sup>4</sup>, Giuseppe Martucci<sup>5</sup>, Nicolo Piazza<sup>5</sup>, Jonathan Afilalo<sup>5</sup> ((1) *Centre for Clinical Epidemiology, Lady Davis Institute, Jewish General Hospital, McGill University, Montreal, QC, Canada;* (2) *Department of Medicine, McGill University, Montreal, QC, Canada;* (3) *Faculty of Medicine, McGill University, QC, Montreal, Canada;* (4) *Division of Geriatric Medicine, McGill University, Montreal, QC, Canada;* (5) *Division of Cardiology, McGill University, Montreal, QC, Canada*)

**Introduction:** Psoas muscle area (PMA) has emerged as a surrogate marker for sarcopenia and a risk factor for adverse outcomes in older adults undergoing transcatheter aortic valve replacement (TAVR). To promote the clinical adoption of this marker in the evaluation of TAVR candidates, we developed the CoreSlicer web-based software to facilitate measurement in a semi-automated fashion. **Objectives:** To compare semi-automated vs. manual measurements of PMA, and determine which is more closely correlated with physical frailty and mortality following TAVR. **Methods:** A prospective multicenter cohort of older adults 70 years old undergoing TAVR was enrolled between 2012-2017. Using pre-procedural clinical CT scans, PMA was measured semi-automatically by image segmentation using CoreSlicer (PMA-C), and manually (PMA-M) by planimetry of muscle contours using Osirix MD. Muscle performance was measured using the short performance physical battery (SPPB) and handgrip strength. Outcomes of interest were all-cause mortality at 1 year and hospital length of stay. Multivariable regression models were adjusted for age, sex, body surface area, and the Society of Thoracic Surgeons risk score. **Results:** The cohort consisted of 420 TAVR patients that had available CT scans with a mean age of 83.4 ± 5.7 years. PMA-C was 21.7 ± 4.4 cm<sup>2</sup> in males and 15.0 ± 3.6 cm<sup>2</sup> in females, which was on average 1.1 cm<sup>2</sup> smaller than PMA-M, with the 95% limits of agreements being -4.2 to +1.9 cm<sup>2</sup>. PMA-C was more closely correlated than PMA-M with the SPPB (Spearman's R 0.25 vs. 0.23, P=0.04) and equally correlated with handgrip strength (Spearman's R 0.53 vs. 0.53, P=0.22). PMA-C was more predictive of post-procedural length of stay (adjusted beta per cm<sup>2</sup> -0.33 [95% CI -0.56 to -0.10] vs. -0.21 [95% CI -0.43 to 0.02]) and equally predictive of 1-year mortality (adjusted odds ratio per cm<sup>2</sup> 0.92 [95% CI 0.85 to 0.99] vs. 0.92 [95% CI 0.85 to 0.99]). **Conclusion:** Measurement of PMA using our semi-automated CoreSlicer software is an accessible and effective method to assess sarcopenia and incrementally predict risk of adverse outcomes in older adults undergoing TAVR.

**P199- COGNITIVE AND PSYCHOSOCIAL FACTORS ASSOCIATED WITH REDUCED MUSCLE MASS, STRENGTH, AND FUNCTION IN RESIDENTIAL CARE APARTMENT COMPLEX RESIDENTS.** Murad H. Taani<sup>1</sup>, Ellen Siglinsky<sup>2</sup>, Christine R. Kovach<sup>1</sup>, Bjoern Buehring<sup>3</sup> ((1) *College of Nursing, University of Wisconsin-Milwaukee, USA;* (2) *Osteoporosis Clinical Research Program, University of Wisconsin - Madison, USA;* (3) *Division of Geriatrics and Gerontology/Osteoporosis Clinical Research Program, University of Wisconsin - Madison, USA*)

**Background:** The loss of muscle mass, strength, and function is a major source of disability in older adults. However, limited data are available about muscle outcomes (muscle mass, strength, and function) among older adults living in Residential Care Apartment Complexes (RCACs) and the relationship between cognitive and psychosocial factors and muscle outcomes. **Objectives:** To describe

the muscle mass, strength, and function of older adults living in RCACs and explore the association between self-efficacy for exercise, depressive symptoms, social support and muscle outcomes. **Methods:** This secondary analysis used baseline data collected for a randomized crossover-design study to investigate the effectiveness of semi-recumbent vibration exercise on muscle outcomes in older adults. Thirty-one older adults were recruited from one RCAC in the Midwestern United States. Whole-body skeletal muscle mass index (SMI) was measured by bioelectrical impedance spectroscopy. Short Physical Performance Battery test (SPPB), Timed Up and Go test (TUG), Jumping Mechanography were used to assess muscle function. Grip strength was measured by a Jamar® hand dynamometer. Self-efficacy for exercise, depressive symptoms, and social support were measured by the Self-efficacy for Exercise Scale, Geriatric Depression Scale, and the Lubben Social Network Scale, respectively. **Results:** RCAC residents had lower SMI, grip strength, total SPPB score, gait speed, chair rise time, TUG score, and weight-corrected jump power compared to values obtained in previous research. Men had significantly higher SMI, grip strength, and weight-corrected jump power than women ( $p = .021$ ,  $<.001$ , and  $.034$ , respectively). The findings showed a trend for individuals with high self-efficacy, without depressive symptoms, and with strong social support to present greater SMI, grip strength and muscle function. **Conclusion:** The findings of this study warrant further investigation of an intervention aimed at maintaining or improving the muscle outcomes of RCAC residents. While the findings should be replicated with other samples, this study may provide a new understanding about the muscle outcomes and the relationship between self-efficacy for exercise, depressive symptoms, social support and muscle outcomes..

**P200- ASSOCIATION BETWEEN FRAX AND SARCOPENIA IN COMMUNITY-DWELLING ELDERLY IN JAPAN.** Noboru Ide, Tomokazu Furuya, Soshi Ideta, Yoshihisa Miyazaki, Kenji Fuzii, Taisaku Syouzaki, Nobuya Yamashita (*Kurotsuchi Fukuoka Kasuga Rehabilitation Clinic, Kasuga Fukuoka, Japan*)

**Background:** Osteoporosis and sarcopenia are common among the elderly and associated with morbidity and mortality significantly. The combined osteoporosis and sarcopenia could increase negative health outcomes and healthcare costs. It is important to identify early the condition of osteoporosis and sarcopenia for prevention and treatment. The Fracture Risk Assessment Tool (FRAX) has been most widely used as the clinical screening tool. In contrast, there is no appropriate clinical screening tool for sarcopenia. It has been reported that osteoporosis is closely associated with Sarcopenia. However, the relationship between FRAX and sarcopenia is still unclear. **Objectives:** The aim of this study is to clarify the relationship between FRAX and sarcopenia, or components of sarcopenia in community-dwelling elderly in Japan. **Methods:** This study recruited 148 community-dwelling elderly Japanese people aged 65-94 years. All participants were measured for muscle mass by using bioelectrical impedance analysis, usual gait speed and handgrip strength. The diagnosis of sarcopenia was made according to Asia Working Group for Sarcopenia. We used the Japanese FRAX without Bone Mineral Density. Participants were divided into two groups according to FRAX score Japan Osteoporosis society recommend: FRAX  $\geq 15\%$  and FRAX  $< 15\%$ . Logistic regression analysis was used to examine the association between FRAX and sarcopenia and the association between FRAX and components of sarcopenia. **Results:** In the present study, 13.3% of men and 70% of women were more than 15% in FRAX. Eight point nine percent of men and 14.6% of women were classified as sarcopenia. No association was found between FRAX and sarcopenia (Odds ratio (OR) = 1.31, 95% confidence interval

(CI) = 0.50-3.48,  $p = 0.58$ ). No association was also found between FRAX and muscle mass (OR = 0.87, 95% CI = 0.47-1.63,  $p = 0.67$ ). However, handgrip strength was associated with FRAX significantly, (unadjusted OR = 0.88, 95% CI = 0.81-0.95,  $p = 0.0018$ ). The association between gait speed and FRAX was marginal (unadjusted OR = 0.26, 95% CI = 0.06-1.09,  $p = 0.065$ ). After adjustment for age and sex, the relationship became non-significant. **Conclusion:** Although sarcopenia was not associated with FRAX, the handgrip strength were associated with FRAX..

**P201- THE MORTALITY DETERMINANTS OF SARCOPENIA, MMSE AND COMORBIDITIES IN HOSPITALIZED GERIATRIC PATIENTS.** Scott Lamers<sup>1</sup>, Robin Degerickx<sup>1</sup>, Stany Perkisas<sup>2</sup> ((1) *School of Medicine, University of Antwerp, Antwerp, Belgium*; (2) *University Centre for Geriatrics, ZNA (Ziekenhuis Netwerk Antwerpen), Belgium*)

**Background:** Sarcopenia is the age-related loss of skeletal muscle mass, muscle strength and physical performance. It is known to be associated with an increased risk for several adverse outcomes such as frailty, hospitalization, disability and mortality. **Objectives:** This retrospective cohort study sought to determine the influence of muscle mass, muscle strength, physical performance, nutritional status, Mini-Mental State Examination (MMSE) scores and two specific comorbidities - heart failure and orthopedic surgery - on the four years mortality risk of hospitalized geriatric patients. **Methods:** All patients hospitalized at the geriatric department of the Saint-Elisabeth hospital in Antwerp (Belgium) from 01/08/2012 until 31/01/2013 were included. No patients were excluded. A total of 302 subjects were obtained. During hospitalization of the included geriatric patients, the determinants of sarcopenia were measured. The MMSE and nutritional status were surveyed by using a questionnaire. The muscle mass was measured by a computed tomography (CT) scan of both upper legs. The muscle strength was obtained by measuring the handgrip strength using a Jamar dynamometer. The physical performance was measured by performing the Short Physical Performance Battery (SPPB). The nutritional risk status was surveyed by using the Mini-Nutritional Assessment - Short Form (MNA-SF). The comorbidities were obtained later through research of medical records. **Results:** The variables gender (HR = 0.609; 95% CI 0.442 0.838), nutritional status (HR = 2.953; 95% CI 1.924 4.531), muscle mass (HR = 0.443; 95% CI 0.251 0.780), muscle strength (HR = 0.215; CI 95% 0.079 0.587), physical performance (HR = 0.407; 95% CI 0.237 0.702), MMSE (HR = 0.955; 95% CI 0.933 0.978) and heart failure (HR = 1.440; 95% CI 1.022 2.029) have been shown to be significant in determining the 4 years mortality risk in hospitalized geriatric patients. Age and orthopedic surgery had no significant relation with mortality. **Conclusion:** The determinants which have the greatest prognostic value in predicting the four years mortality risk were gender, nutritional status and physical performance.

**P202- MUSCLE MASS AND INTRAMUSCULAR ADIPOSE TISSUE AS PREDICTORS OF 4-YEAR MORTALITY RISK.** Perkisas Stany<sup>1,2,3</sup>, Scott Lamers<sup>2</sup>, Robin Degerickx<sup>2</sup>, Anne-Marie De Cock<sup>2</sup>, Vandewoude Maurits<sup>1,2</sup> ((1) *ZNA (ZiekenhuisNetwerk Antwerpen) / Departement Geriatrie, Universiteit Antwerpen, Belgium*; (2) *Departement Geneeskunde, Universiteit Antwerpen, Belgium*; (3) *Belgian Ageing Muscle Society, Belgium*)

**Background:** Sarcopenia is the age-related loss of skeletal muscle mass, muscle strength and physical performance. It is known to be associated with an increased risk for several adverse outcomes such as frailty, hospitalization, disability and mortality. Besides

the quantity of the muscle mass, the quality is also important. This is measured, among others, by the intramuscular adipose tissue. **Objectives:** Looking into the predictive effect of muscle mass and the intramuscular adipose tissue of an acute hospitalized geriatric population on their 4-year mortality rate. **Methods:** Between 01/08/2012-30/11/2012, acute hospitalized geriatric patients in the saint-Elisabeth hospital (Antwerp, Belgium) were screened for muscle mass and intramuscular adipose tissue (IMAT). These were measured by a computed tomography scan of both upper legs. Muscle mass and IMAT were discerned by Hounsfield units. Both the muscle mass and the IMAT were divided in three groups to increase comparability. Four years after the initial admission, mortality rates were obtained in this cohort by telephone contact with either the patient or caregiver. **Results:** Of 139 patients, follow-up data was obtained. Mean follow-up was 949 days (range 2-1494 days). There is a negative relation between mortality and muscle mass (men  $p=0.004$ ; women  $p=0.031$ ). There is a positive relation between mortality and the intramuscular adipose issue for men ( $p=0.019$ ) but not for women ( $p=0.309$ ). Survival data for muscle mass groups (highest to lowest) was 68.8%, 63.0% and 39.3% for men; 41.7%, 22.7% and 16.7% for women. Survival data for IMAT (highest to lowest) was 40.0%, 65.2% and 51.1% for men; 28.6%, 23.8% and 47.6% for women. **Conclusion:** In this cohort, there is a negative relation between mortality and muscle mass. There is a positive relation between mortality and IMAT for men, but not for women. Muscle mass and its quality in the form of IMAT could perhaps be used as a predictor of mortality.

**P203- BONE MINERAL DENSITY, SPINAL MICRO-ARCHITECTURE (TBS DATA) AND BODY COMPOSITION IN THE OLDER UKRAINIAN WOMEN WITH VERTEBRAL FRAGILITY FRACTURES.** Vladyslav Povoroznyuk, Nataliia Dzerovych (D.F. Chebotarev Institute of gerontology NAMS Ukraine, Kyiv, Ukraine)

**Background:** Osteoporosis and sarcopenia are the most frequent musculoskeletal disorders affecting older people. Fracture incidence as well as the number of fractures increase due to the population's ageing. Recent studies show that a low skeletal muscle mass is associated with the poor structural bone parameters and impaired balance of the elderly people. **Objectives:** The aim of this study is to evaluate the bone mineral density (BMD), trabecular bone score (TBS) and body composition in women taking into account the presence of vertebral fragility fractures (VFF). **Methods:** We've examined 171 women aged 65-89 years (mean age 73.12±0.39 yrs; mean height 1.58±0.004 m; mean weight 72.54±0.99 kg). The patients were divided into the groups depending on the VFF presence: A no VFF (n=105; mean age 72.70±0.54 yrs; mean height 1.58±0.006 m; mean weight 74.43±1.33 kg), B present VFF (n=66; mean age 73.79±0.55 yrs; mean height 1.58±0.008 m; mean weight 69.53±1.37 kg). Total body, lumbar spine, femoral neck, forearm BMD, lateral vertebral assessment, trabecular bone score (L1-L4), lean and masses were measured by DXA densitometer (Prodigy, GE). Appendicular skeletal mass (ASM) was measured at all the four limbs with DXA. We've also calculated the appendicular skeletal mass index (ASMI) according to the formula  $ASM/height^2$  (kg/m<sup>2</sup>). **Results:** We have found the following parameters to be significantly lower in women with the VFF compared to women having no VFF: BMD of total body (A 0.859±0.01 g/cm<sup>2</sup>, B 0.764±0.02 g/cm<sup>2</sup>;  $p<0.05$ ), spine (A 1.038±0.02 g/cm<sup>2</sup>, B 0.927±0.03 g/cm<sup>2</sup>;  $p<0.05$ ), femoral neck (A 0.787±0.01 g/cm<sup>2</sup>, B 0.711±0.01 g/cm<sup>2</sup>;  $p<0.05$ ), 33% forearm (A 0.690±0.01 g/cm<sup>2</sup>, B 0.600±0.01 g/cm<sup>2</sup>;  $p<0.05$ ), TBS (A 1.171±0.01, B 1.116±0.02;  $p<0.05$ ), whole-body fat mass (A 30736.87±939.92 g, B 25877.45±966.90 g;  $p<0.05$ ), whole-body lean

mass (A 41202.44±498.18 g, B 39440.77±594.78 g;  $p<0.05$ ), ASM (A 16.47±0.22 kg, B 15.81±0.22 kg;  $p<0.05$ ) and ASMI (A 6.59±0.07 kg/m<sup>2</sup>, B 6.34±0.09 kg/m<sup>2</sup>;  $p<0.05$ ). The frequency of presarcopenia was 2% in women with no VFF and 14% - in women with the VFF. **Conclusion:** Women with the VFF have the BMD, TBS, lean and fat masses data significantly lower in comparison to women with no VFF.

**P204- POTENTIAL FACTORS INVOLVED IN DELAYED OSTEOPOROTIC FRACTURE HEALING IN THE PRESENCE OF SARCOPENIA: INTERVENTIONAL STUDY OF THE EFFICACY OF LOW-MAGNITUDE HIGH-FREQUENCY VIBRATION.** Ning Zhang, Kwok-sui Leung, Simon Kwoon-ho Chow, Wing-hoi Cheung (Department of Orthopaedics and Traumatology, Faculty of Medicine, the Chinese University of Hong Kong, Hong Kong)

**Background:** Sarcopenia is a geriatric syndrome characterized by loss of muscle mass and muscle function, and its prevalence is very high in osteoporotic fractured patients<sup>1</sup>. We have validated the senescence-accelerated mouse prone 8 (SAMP8) as an animal model of osteoporosis co-existing with sarcopenia and found that delayed osteoporotic fracture healing was associated with the presence of sarcopenia<sup>2</sup>. Low-Magnitude-High-Frequency Vibration (LMHFV) could enhance the osteoporotic fracture healing in the presence of sarcopenia based on our previous study<sup>3</sup>. However, the mechanism is unknown in this process. **Objectives:** The objective of this study was to investigate potential involvement of BMP-2 and TNF- $\alpha$  in this process. **Methods:** Closed fracture was created at the right femur of 32-week-old SAMP8 and its control SAMR1. The fractured mice were randomized to control (SAMP8 n=5 and SAMR1 n=5) or LMHFV (SAMP8-V n=5 and SAMR1-V n=5) groups. The mice in control groups received no treatment; LMHFV groups were given daily LMHFV treatment (35Hz, 0.3g) 20min/day and 5 days/week at day 1 postoperatively. Immunohistochemistry of BMP-2 and TNF- $\alpha$  at callus were performed at week 2, 4 and 6 post-fracture. One-way ANOVA was used at significance considered at  $p<0.05$ . **Results:** At week 2 post-fracture, BMP-2 expression was higher in SAMR1, SAMP8-V and SAMR1-V groups compared with SAMP8 group respectively. While at week 4 and 6 post-fracture, low expression BMP-2 were detected without difference among groups. Furthermore, the expression of TNF- $\alpha$  in the callus at week 2 post-fracture could be detected and showed no difference among groups. Very low expression of TNF- $\alpha$  were observed at week 4 and 6 post-fracture without significant difference. **Conclusion:** The results from this study suggested that the BMP-2 pathway might be compromised in sarcopenia thus negatively influencing osteoporotic fracture healing. BMP-2 was a potential factor involved in osteoporotic fracture healing in the presence of sarcopenia and LMHFV could enhance osteoporotic fracture healing through regulating the BMP-2 pathway. Meanwhile, TNF- $\alpha$  seemed not a key mediator during this process. Acknowledgements: OTC Research Grant (Ref. No. 2014-WHKS) References: (1) Chen, J Am Med Dir Assoc. 2014. (2) Zhang, Exp Gerontol. 2017. (3) Zhang, ORS Annual Meeting Poster2221. 2017..

**P205- GENDER-SPECIFIC RISK FACTORS FOR SARCOPENIA PROGRESSION IN COMMUNITY-DWELLING OLDER ADULTS.** Tay Laura<sup>1</sup>, Leung Bernard<sup>2</sup>, Noor Hafizah<sup>3,4</sup>, Yeo Audrey<sup>3</sup>, Yew Suzanne<sup>3</sup>, Ding Yew Yoong<sup>3,5</sup>, Lim Wee Shiong<sup>3,5</sup> ((1) Department of General Medicine (Geriatric Medicine), Sengkang General Hospital, Singapore; (2) Department of Rheumatology, Allergy and Immunology, Tan Tock Seng Hospital, Singapore; (3) Institute of Geriatrics and Active Ageing, Tan Tock Seng Hospital, Singapore; (4) Department of Continuing and Community Care, Tan

Tock Seng Hospital, Singapore; (5) Department of Geriatric Medicine, Tan Tock Seng Hospital, Singapore)

**Background:** Sarcopenia is a precursor for frailty, with consequent risk of disability. Gender discordance in sarcopenia prevalence and accelerated skeletal muscle mass loss in men that could not be merely attributed to their larger initial muscle mass has been observed. **Objectives:** We examine gender-specific clinical and blood biomarkers predictive of sarcopenia progression in community-dwelling older adults. **Methods:** In this longitudinal study of older adults (>50 years), diagnosis of non-sarcopenia, pre-sarcopenia or sarcopenia was assigned at baseline and 2-year, using European Working Group on Sarcopenia in Older People algorithm, but employing Asian cut-offs for muscle mass (dual-energy X-ray absorptiometry), grip strength and gait speed. Participants were classified as sarcopenia progressors if they progressed from non-sarcopenia or pre-sarcopenia states, or remained sarcopenic at year-2. Co-morbidities, mood, cognition, nutrition (Mini-Nutritional Assessment), physical activity, functional and physical performance were assessed at each visit. Blood biomarkers included full-blood count, metabolic profile and Vitamin D, and serial measurements of insulin-like growth factor-1 (IGF-1), interleukin-6 (IL-6), tumour necrosis factor-alpha receptor-1 (TNF-R1) and myostatin. We performed logistic regression to identify independent predictors of sarcopenia progression. **Results:** One-hundred-eighty-one (90.5%) participants (59 males, 122 females) completed follow-up. 27 (42.9%) males and 59 (43.1%) females had sarcopenia progression. Decline in muscle mass was significantly greater in sarcopenia progressors in both gender ( $p < 0.001$ ). Amongst men, muscle mass decline correlated with rising IL-6 ( $r = -0.30$ ,  $p = 0.02$ ) and myostatin ( $r = -0.27$ ,  $p = 0.04$ ). Male sarcopenic progressors were more likely to have underlying malignancy ( $p = 0.02$ ), lower baseline physical activity ( $p = 0.02$ ), and higher serum myostatin at baseline [30.53 (23.50-34.50) vs 23.5 (21.0-29.6),  $p = 0.02$ ] and follow-up ( $p = 0.01$ ). Amongst women, incremental IL-6 correlated with decline in muscle mass ( $r = -0.28$ ,  $p < 0.01$ ). Diabetes mellitus ( $p = 0.04$ ), higher baseline neutrophils [3.53 (1.12) vs 3.11 (0.98),  $p = 0.03$ ], and malnutrition at follow-up ( $p = 0.02$ ) were more frequently observed in female sarcopenic progressors. Adjusting for age and ethnicity, baseline myostatin significantly increased risk for sarcopenia progression in men [OR=1.10 (1.01-1.21),  $p = 0.03$ ], while malnutrition increased risk of sarcopenia progression in women [OR=4.12 (1.28-13.27),  $p = 0.02$ ]. **Conclusion:** Our findings support gender-specific mechanisms for sarcopenia progression. Therapies that block myostatin signaling may be relevant in older men, whilst greater attention to nutrition will be warranted in women.

**P206- AGING, SEVERE SARCOPENIA WITH METABOLIC SYNDROME IN HOME CARE.** Yvonne Suzy Handajani<sup>1</sup>, Yuda Turana<sup>2</sup>, Nelly Tina Wijaja<sup>3</sup> ((1) Department of Public Health & Nutrition, Faculty of Medicine, Atma Jaya Catholic University of Indonesia, Jl. Pluit Raya No.2 North Jakarta, Jakarta, Indonesia; (2) Department of Neurology, Faculty of Medicine, Atma Jaya Catholic University of Indonesia, Jl. Pluit Raya No. 2, North Jakarta, Jakarta, Indonesia; (3) Center of Health Research, Faculty of Medicine, Atma Jaya Catholic University of Indonesia, Jl. Pluit Raya No.2, North, Jakarta, Indonesia)

**Background:** The metabolic syndrome is a cluster of the most dangerous heart attack risk factors: diabetes and raised fasting plasma: glucose, abdominal obesity, high cholesterol, and high blood pressure. An estimated 1.5 million people die from metabolic syndrome disease and are expected to be ranked 7th as the cause of death in the world, recruiting WHO by 2030 3. **Objectives:** To determine the relationship

between the metabolic syndrome and sarcopenia and to determine what was the greatest affects to sarcopenia. **Methods:** This was a cross-sectional study of 161 older peoples aged > 60 years who were recruited from home care in West Jakarta, Indonesia. Abdominal circumference, blood pressure, fasting blood glucose, HDL, and triglycerides were taken and categorized based on the NCEP ATP III criteria to define metabolic syndrome among the subjects. Sarcopenia was measured by means of bioimpedanceanalysis (BIA), handgrip dynamometer, and timed get up and go test (TGUG). Chi Square and multinomial logistic regression tests were used to find relations between the metabolic syndrome and sarcopenia and what was the greatest affects to sarcopenia. **Results:** The percentages of peoples with non-sarcopenia ,mild sarcopenia, and severe sarcopenia were 34.2%, 37.2%, and 28.6% respectively. According the data analysis, it showed a significant association between severe sarcopenia with metabolic syndrome after adjusting for confounding factors ( $p = 0.014$ ; OR=2.9; 95% CI :1.23-6.68), mild and severe sarcopenia with abdominal obesity ( $p = 0.011$ ; OR=0.21;95%CI:0.06-0.70) and ( $p = 0.05$ ; OR=0.29;95% CI:0.09-0.99), severe sarcopenia with hypertension ( $p = 0.02$ ; OR=4.19; 95% CI: 1.25-14.05), and severe sarcopenia with hyperglycemia ( $p = 0.02$ ; OR=0.37;95% CI: 0.16-0.85). However, there's no significant association between sarcopenia with atherogenic dyslipidemia ( $p > 0.05$ ). **Conclusion:** Older peoples living in home care who experienced sarcopenia were 65.8% which were categorized as mild sarcopenia and severe sarcopenia. Older peoples with metabolic syndrome as well as hypertension more likely to have severe sarcopenia 2.9 times and 4.2 times than non-sarcopenia. Futhermore older peoples without hyperglycemia as protective factor for severe sarcopenia and the same thing happened on older peoples without abdominal obesity as protective factors for mild and severe sarcopenia. The greatest affect to sarcopenia was hypertension.

**P207- A HIGH SCORE ON THE SARC-F SCREENING QUESTIONNAIRE FOR SARCOPENIA IS ASSOCIATED WITH LOWER QUALITY OF LIFE IN PATIENTS ATTENDING HIGH RISK FOOT CLINIC.** Irina Churilov<sup>1</sup>, Leonid Churilov<sup>2</sup>, Michelle Proctor<sup>1</sup>, Anna Galligan<sup>1</sup>, David Murphy<sup>1</sup>, Mark Westcott<sup>1</sup>, Richard J MacIsaac<sup>1</sup>, Elif I Ekinci<sup>3</sup> ((1) St Vincent's Hospital Melbourne Australia; (2) Florey Institute of Neuroscience and Mental Health, Melbourne, Australia; (3) (The University of Melbourne, Australia)

**Background:** High Risk Foot Clinic (HRFC) patients have foot ulceration secondary to neuropathy and vascular disease, commonly associated with diabetes and poorer quality of life. A positive SARC-F test (score 4 or above) is predictive of sarcopenia, which is also associated with poorer quality of life. The prevalence of being SARC-F positive and its association with quality of life in HRFC population is unknown. **Objectives:** To investigate whether increased risk of sarcopenia in HRFC population is associated with further reduction in quality of life. **Methods:** A prospective cross-sectional study of High Risk Foot multidisciplinary ambulatory clinic patients at metropolitan tertiary referral hospital (Melbourne, Australia) over the period of Feb-Oct 2017. Demographics, comorbidities, SARC-F and EQ-5D-3L questionnaires, and hand grip strength were collected. The association between SARC-F status and the EQ visual analogue scale (EQ VAS), as well as 5 individual EQ dimensions were investigated using van Elteren test (stratified by gender due to its demonstrated independent association with quality of life). **Results:** Over the period of 8 months, 95 new patients attended the clinic. 71/95 (75%) completed the questionnaires, with no selection bias on demographic and clinical characteristics identified. 84/95 (88%) patients had diabetes. In patients with completed questionnaires,

38/71 (54%) were SARC-F positive. No significant difference between SARC-F positive and negative patients were identified in age [SARC-F negative - median 67 (IQR 58-73), SARC-F positive - median 70 (IQR 59-81)] or diabetes status (SARC-F negative - 88% diabetes, SARC-F positive - 92% diabetes). SARC-F positive patients had a statistically significantly lower EQ VAS [mean 5.24 (SD 2.01); median 5 (IQR 4-6.5)] compared to SARC-F negative patients [6.58 (SD 1.83); 7 (IQR 5.5-7.5)], van Elteren  $p=0.002$ . SARC-F positive patients demonstrated consistent and statistically significantly higher EQ-5D-3L scores on mobility, personal care and usual activities, but not on anxiety and depression and pain and discomfort. **Conclusion:** About half of HRFC patients are SARC-F positive and exhibit lower quality of life as measured by EQ-5D-3L compared to SARC-F negative patients. This population may benefit from routine testing for sarcopenia. Further studies are needed to investigate the association between sarcopenia and quality of life in diabetic population.

**P208- ALTERED EXPRESSION OF H19/MIR-675 AND REGULATION OF SMAD1/5 EXPRESSION IN SKELETAL MUSCLE IS ASSOCIATED WITH LOW MUSCLE MASS IN COMMUNITY-DWELLING OLDER ADULTS: FINDINGS FROM THE HERTFORDSHIRE SARCOPENIA STUDY (HSS).** E Antoun<sup>1</sup>, E Migliavacca<sup>2</sup>, E Garratt<sup>1</sup>, SJ Barton<sup>3</sup>, P Titcombe<sup>3</sup>, L Westbury<sup>3</sup>, A Charpagne<sup>2</sup>, A Baczynska<sup>4</sup>, R Dodds<sup>4</sup>, HC Roberts<sup>4,5</sup>, AA Sayer<sup>4,6,7</sup>, S Shaw<sup>3</sup>, A Sheppard<sup>8</sup>, C McFarlane<sup>9</sup>, N Karnani<sup>10</sup>, P Descombes<sup>2</sup>, C Cooper<sup>1,3</sup>, KM Godfrey<sup>1,3,5</sup>, JN Feige<sup>2</sup>, HP Patel<sup>1,3,4,5</sup>, KA Lillycrop<sup>1,11</sup> and the EpiGen-MEMOSA Study Groupd ((1)Human Development and Health Academic Unit, Faculty of Medicine, University of Southampton, UK; (2) Nestle Institute of Health Sciences, Lausanne, Switzerland; (3) MRC Lifecourse Epidemiology Unit, University of Southampton; (4) Academic Geriatric Medicine, Faculty of Medicine, University of Southampton; (5) NIHR Southampton Biomedical Research Centre, University of Southampton & University Hospital Southampton NHS Foundation Trust, UK; (6) AGE Research Group, Institute of Neuroscience, Newcastle University, UK; (7) NIHR Newcastle Biomedical Research Centre; Newcastle University and Newcastle upon Tyne Hospitals NHS Foundation Trust; (8) Liggins Institute, University of Auckland, Auckland, New Zealand; (9) James Cook University, Australia; (10) Singapore Institute for Clinical Sciences, Singapore; (11) Biological Sciences, University of Southampton, UK)

**Background:** Sarcopenia is the age-related loss of muscle mass, strength and function, with an estimated prevalence between 3-30% worldwide. Sarcopenia is associated with a number of adverse outcomes including frailty, disability, diabetes and osteoporosis. However, the molecular pathways altered during muscle ageing and how they contribute to sarcopenia are poorly understood. **Objectives:** To identify molecular pathways that may be altered during ageing that contribute to the loss of muscle mass. **Methods:** RNAseq was carried out on muscle biopsies of the vastus lateralis from 40 healthy older Caucasian men from the Hertfordshire Sarcopenia Study (HSS), aged 68-76 years. We analysed changes in the muscle transcriptome with respect to appendicular lean mass index (ALM/ht2). The association between the expression of H19 and ALM/Ht2 was validated using qRT-PCR and replicated in muscle biopsies from 109 independent male and female participants recruited into an extension of the Hertfordshire Sarcopenia Study (HSSe). qRT-PCR was carried out to examine the expression of miR-675-3p/5p and SMAD1/5. Western blot analysis was used to determine SMAD1/5 protein expression. siRNA-mediated H19 knockdown was carried out in cultured myoblasts from HSSe participants followed by quantification of SMAD1/5 mRNA and protein levels. **Results:** RNAseq analysis

showed altered expression of H19 with respect to ALM/ht2. Consistent with the RNAseq data, qRT-PCR showed an inverse association between H19 expression and ALM/ht2 ( $p=0.0002$ ) in the combined HSS and HSSe dataset. Exon 1 of H19 encodes the microRNAs miR-675-5p/3p; miR-675-5p expression was negatively associated with ALM/ht2 ( $p=0.005$ ), while miR-675-3p showed a weak negative association ( $p=0.089$ ). miR-675-5p/3p expression positively correlated with H19 expression ( $p=0.017$  and  $p=0.028$ , respectively). Consistent with mouse data showing negative regulation of SMAD1 and 5 expression by miR-675-5p and 3p, expression miR-675-3p and -5p in the human muscle biopsies were negatively associated with SMAD1/5 mRNA (and protein expression (all  $p < 0.05$ ). To determine a causal role for H19 in mediating the effects on SMAD1 and 5 expression, primary myoblasts were transfected with siRNAs directed against H19. siRNA-mediated knockdown of H19 increased SMAD1 ( $p=0.002$ ) and SMAD5 ( $p=0.006$ ) protein expression and this was rescued by over expression of miR-675-5p/3p ( $p=0.008$  and  $p=0.032$  respectively). **Conclusion:** Increased expression of H19 and miR-675-5p/3p, is associated with low muscle mass. miR-675-5p/3p have previously been shown to regulate SMAD1/5 expression in mice, which in turn promote hypertrophy and protect against atrophy in postnatal muscle. Here we show that SMAD1/5 expression is regulated by miR-675-5p/3p in human muscle. These data suggests that increased expression of H19 and its miRNA effectors contributes to the inhibition of SMAD1/5 expression, leading to reduced hypertrophy, increased atrophy and loss of muscle mass in older people.

**P209- BODY MASS INDEX RECOMMENDATIONS AND SARCOPENIA STATUS IN HOSPITALIZED OLDER ADULTS.** Rachel R. Deer, Katie A. O'Brien, Shawn Goodlett, Leyla Akhverdiyeva, Elena Volpi (University of Texas Medical Branch, Galveston TX, USA)

**Background:** According to the World Health Organization (WHO), a Body Mass Index (BMI) range of 18.5-24.9 kg/m<sup>2</sup> is associated with the lowest risk of morbidity and mortality for all adults. However, studies have consistently found that a higher BMI range of 24.0-30.9 kg/m<sup>2</sup> is more protective against all-cause mortality for adults over the age of 65. Older adults are susceptible to sarcopenia, a condition defined as progressive loss of muscle mass and function. Sarcopenia is associated with increased falls and fractures, increased risk of hospitalization, poor clinical outcomes, and an increased risk of death. **Objectives:** Studies on sarcopenia prevalence and the clinical association of BMI in hospitalized patients in the United States are lacking. Thus, the objective of this study was to determine if in older adults a higher BMI range (24.0-30.9 kg/m<sup>2</sup>) is more protective against sarcopenia than the WHO-recommended BMI (18.5-24.9 kg/m<sup>2</sup>). **Methods:** This study was performed in patients 65 years and older hospitalized at the University of Texas Medical Branch. Testing included an enrollment interview, physical function tests (hand grip, gait speed) and body composition measurements (DXA scan, height, weight). The European Working Group for Sarcopenia in Older People (EWGSOP) algorithm was used to determine prevalence of sarcopenia. **Results:** Subjects (n=152) were on average 76.7 years old, 68% female, 86% white. Their average length of stay was 3.43 days. Prevalence of sarcopenia was 24.3% with no difference in prevalence between genders. The majority (62%) of those with sarcopenia were within the WHO-recommended range. Average BMI for those with sarcopenia was 23.4 kg/m<sup>2</sup>; for those without sarcopenia BMI was significantly higher 30 kg/m<sup>2</sup>. Participants within our hypothesized optimal BMI range (24.0-30.9 kg/m<sup>2</sup>) had a significantly lower prevalence of sarcopenia than those within the WHO-recommended BMI range ( $P < .001$ ). **Conclusion:**

A higher BMI range than currently recommended by the WHO may be more protective against sarcopenia in adults 65 and older. The adoption of a higher BMI range for older adults vs. younger adults by major health organizations may be indicated in order to decrease all-cause mortality and rates of sarcopenia in older adults.

**P210- FACTORS ASSOCIATED WITH LOW MUSCLE MASS INDEX IN AGING.** R Naveira Miguel Ramos Luiz, Andreoni Solanged (Department of Preventive Medicine, Federal University of São Paulo - UNIFESP, Sao Paulo, Brazil)

**Background:** Frailty Population aging is a global phenomenon, characterized by a continuous process of modifications of the physiological systems, among them, the musculoskeletal system. **Objectives:** to analyze the influence of demographic, social factors, health conditions, lifestyle and functional capacity with low muscle mass index (IMM) in aging. **Methods:** a cross - sectional study was carried out with data from 563 non - obese elderly individuals belonging to the 1st stage of the EPIDOSO Project in the period 1991-1992. The skeletal muscle mass index (low or normal) was obtained through anthropometric data and a predictive equation. We investigated the associations of IMM with variables: gender, age, ethnicity, marital status, schooling, physical activity level, medical history, cognitive deficit, falls in the last 12 months and functional capacity through regression models multiple logistics with a hierarchical approach. **Results:** 39,4% were male and 60,6% female, with a mean age of 74,32 years (SD=6,17 years). Significant associations with low muscle mass index were found in the final model only with the age range of 75 to 79 years (ORaj=4,88; 95%CI: 2,22; 10,71), 80 to 84 years (ORaj=8,25; 95%CI: 3,45; 19,72) and 85 years or more (ORaj=7,94; 95%CI: 3,12; 10,23). **Conclusion:** advanced age, mainly above 75 years, was an important factor in the regulation of the variable muscle mass index..

**P211- SEVERITY OF SARCOPENIA IS ASSOCIATED WITH POSTURAL BALANCE AND RISK OF FALLS IN COMMUNITY-DWELLING OLDER WOMEN.** André Bonadias Gadelha<sup>1</sup>, Silvia Gonçalves Ricci Neri<sup>1</sup>, Ricardo Jacó de Oliveira<sup>1</sup>, Martim Bottaro<sup>1</sup>, Ana Cristina de David<sup>1</sup>, Baruch Vainshelboim<sup>2</sup>, Ricardo Moreno Lima<sup>1</sup> ((1) Faculty of Physical Education, University of Brasília, Brasília, Distrito Federal, Brazil; (2) Master of Cancer Care Program, School of Health Sciences, Saint Francis University, Loretto, PA, USA)

**Background:** Falls represent the leading cause of accidental deaths in the elderly. Sarcopenia is a geriatric syndrome defined as the loss of muscle mass and strength. However, the association between falls and sarcopenia is still unclear. **Objectives:** To investigate the association between different stages of sarcopenia and postural balance, risk of falls, and fear of falling in community-dwelling older women. **Methods:** 196 women (68.6 ± 6.5 years) underwent body composition (DXA), muscle strength (isokinetic), and functional (TUG) assessments. Sarcopenia was classified according to European Working Group on Sarcopenia in Older People. Center of pressure (CoP) sway, risk and fear of falling were assessed through force platform, QuickScreen, and Falls Efficacy Scale, respectively. ANOVA models and chi-squared were used to compare groups. **Results:** The prevalence of nonsarcopenia, presarcopenia, sarcopenia, and severe sarcopenia were 67.3%, 14.3%, 9.2%, and 9.2%, respectively. Severe sarcopenic subjects presented higher risk of falling when compared to the other stages (p<.01). Regarding CoP sway, both mean speed and mediolateral range were significantly higher in severe sarcopenia when compared to both nonsarcopenia and presarcopenia (p<.05). Fear of falling was higher in all sarcopenia stages when compared to nonsarcopenic individuals (p<.05).

**Conclusion:** Sarcopenia negatively affects balance, and both risk and fear of falling in community-dwelling older women. Moreover, this study provides evidence that sarcopenia severity is further associated to reduced balance and imposes an even greater risk of falls in the elderly.

**P212- ASSESSING SARCOPENIA RISK USING ESTABLISHED METRICS IN OBESE, MIDDLE-AGED AND OLDER APPALACHIAN MALES.** Allison Morris<sup>1</sup>, Margaret Drazba<sup>1</sup>, Matthew J Delmonico<sup>2</sup>, Melissa Ventura Marra<sup>1</sup> ((1) Division of Animal and Nutritional Sciences, West Virginia University, Morgantown, West Virginia, USA; (2) Department of Kinesiology, University of Rhode Island, Kingston, Rhode Island)

**Background:** Low muscle mass can be used to assess sarcopenia risk, the age-related reduction of muscle mass, strength and function. However, multiple metrics for low muscle mass are available. Further, limited research is available regarding the application of these metrics to obese populations. **Objectives:** To assess sarcopenia risk in a middle-aged and older, obese males using established metrics for low muscle mass. **Methods:** Participants (n=55) were 40-70-year-old, obese men (BMI= 36.55 ± 5.77 kg/m<sup>2</sup>; age= 59.6 ± 7.6 years) participating in a 12-week weight-loss trial. Baseline measures of whole-body and appendicular skeletal muscle mass (SMM and ASM, respectively) were estimated by multi-frequency, segmental bioelectrical impedance analysis (MF-BIA). Risk for sarcopenia was assessed by comparison to sex-specific metrics for low muscle mass. Cut-points for BMI and height adjusted ASM were < 0.789 and < 7.26kg/m<sup>2</sup>, respectively. Cut-points based on skeletal muscle index percent (SMI %) were > 37% (normal), 31-37% (class I) and < 31% (class II sarcopenia). Classification for height-adjusted SMM was also used. **Results:** Mean SMM and ASM were 34.49 ± 5.54 kg and 18.56 ± 3.69 kg, respectively. Mean ASMBMI was 0.51 ± 0.06 and ASMht was 5.92 ± 1.03 kg/m<sup>2</sup>. Proportion of the sample with low muscle mass was 100% and 94.5% by ASMBMI and ASMht, respectively. Mean SMI % was 30.30 ± 2.43%. Based on SMI %, none of the sample had normal values; 38.2% were classified as class I and 61.8% as class II sarcopenia. Mean SMMht was 11.01 ± 1.49 kg/m<sup>2</sup>. Using the SMMht classification, 54.5% had normal muscle mass and 45.5% were classified moderately sarcopenic. **Conclusion:** Different indices for low muscle mass provided varying prevalence's of sarcopenia risk in middle-aged and older, obese males. While BIA has been suggested to assess sarcopenia in clinical practice, cutoff values for clinical care should consider potential variation between MF-BIA machines. Further research is needed to determine product-specific values across MF-BIA devices

**P213- PREVALENCE OF SARCOPENIA IN AGING: A PUBLIC HEALTH PROBLEM.** M Naveira, LR Ramos, S Andreoni (Department of Preventive Medicine of the Federal University of São Paulo)

**Background:** Irving Rosenberg created the term sarcopenia in 1989 to describe the severe loss of muscle mass in aging. It is considered to be responsible for high levels of dependence and physical incapacity. **Objectives:** The purpose of this investigation is to review the prevalence studies of sarcopenia and discuss their implication from the point of view of public health. **Methods:** We performed a scientific literature review through the electronic databases of National Library of Medicine (MEDLINE) and Latin American and Caribbean Center on Health Sciences Information (LILACS) including publications with estimates of sarcopenia calculate through measurement of skeletal muscle mass and muscle

strength and/or motor performance. Data was later classified according to year, region or country, author, characteristics of the studied population. **Results:** The prevalence of sarcopenia adjusted by age and sex varied between 7 to 69%, depending on the method used to measure the muscle mass, cut-offs and criteria. **Conclusion:** The information presented highlights the relevance of the challenge, demanding attention from health professionals in prevention, early diagnosis and future research.

**P214- DESIGN AND VALIDATION OF A SOFTWARE FOR THE DIAGNOSTIC OF SARCOPENIA IN COMMUNITY-DWELLING CHILEAN ELDERS.** Lydia Lera, Barbara Angel, Carlos Márquez, Rodrigo Saguez, Cecilia Albala (*Institute of Nutrition and Food Technology (INTA) - University of Chile, Santiago, Chile*)

**Background:** To design and validate a software for mobiles (Apps for Android and IOS) and computers, based on a previously validated diagnostic algorithm for sarcopenia in Older Chileans, according to an adapted version of the European Working Group on Sarcopenia in Older People (EWGSOP). **Methods:** Follow-up of 429 community-dwelling people 60y and older beneficiaries of the public health centers (mean±SD: 68.2±4.9 years), from HTSMayor cohort designed to study sarcopenia. The software was designed according an adapted version of the algorithm of EWGSOP. The software estimates the appendicular muscle mass (ASM) using an anthropometric prediction equation or DXA measurements with Chilean cut-off points. The beta test of the software was done. The criterion-related and predictive validation of the diagnostic algorithm was performed comparing physical performance tests, functional limitations (one activity of daily living and/or two instrumental activity of daily living) and falls in the follow-up in non-sarcopenic and sarcopenic subjects in baseline. **Results:** After 2078.42 person's years of follow-up (median follow-up 4.82 years), 37 new cases of sarcopenia were identified (incidence density rate=1.78 per 100 persons/years). ASM estimated with the prediction equation showed high sensitivity and specificity compared with DXA measurements, yielding a concordance of 0.933. The diagnostic algorithm of sarcopenia considered in the software with the prediction equation showed a high sensitivity (84.6%) and specificity (87.8%) when compared with DXA. Non-sarcopenic subjects have better physical performance than sarcopenic adults with both methods. Similar results were observed in falls (10.6% vs. 17.7%) and functional limitations (19.5% vs. 30.9%). In the beta testing of 108 older adults, the measurements and results were done in 9-10 minutes. The software showed the different stages of sarcopenia: non-sarcopenia, presarcopenia, sarcopenia or severe sarcopenia. **Conclusion:** We obtained a validated software for the diagnostic of sarcopenia in Chilean Elders that can be used in a mobile or a computer with good sensibility and specificity, thus allowing the development of programs for the prevention, delay or reversion of this syndrome. Funded by FONDEF Grant IT15I10053.

**P215- PREVALENCE OF SARCOPENIA WITH A BIPOLAR IMPEDANCIOMETER AT A CARDIAC REHABILITATION CENTER IN BOGOTÁ, COLOMBIA.** Luz Karime Alvis, Juan Carlos Galvis, Orlando José Angulo (*Department of Physical Activity and Sports Medicine, Hospital Infantil Universitario de San José, Fundación Universitaria de Ciencias de la Salud, Bogotá, Colombia*)

**Background:** Sarcopenia is associated to an increased risk of morbidity and mortality, especially in the elderly and patients with cardiovascular disease. Currently, the prevalence of sarcopenia in Colombian patients undergoing cardiac rehabilitation is unknown. **Objectives:** To determine the prevalence of sarcopenia in a group of

patients undergoing cardiac rehabilitation in a Colombian hospital. **Methods:** 10 month cross-sectional study in the cardiac rehabilitation and cardiovascular prevention program in the Department of Physical Activity and Sports Medicine at the Hospital Universitario Infantil de San José, in Bogotá, Colombia. Convenience sampling was conducted to recruit patients aged 40 years or older who were undergoing cardiac rehabilitation or cardiovascular prevention sessions at least once a week, and who were capable of providing written informed consent. Patients were excluded if they had the following medical conditions: neurological disorders; neoplastic diseases; amputations or functional limitations in their extremities; the presence of feeding tubes, colostomies, implantable pacemakers or cardiac defibrillator devices; physical dependence on a family member. To calculate the prevalence of sarcopenia, skeletal muscle mass was measured with a bipolar impedanciometer (<10.76kg/m<sup>2</sup> for men; <6,76kg/m<sup>2</sup> for women); strength was measured with handgrip dynamometry (<30kg for men, <20kg for women), and physical performance was evaluated with gait speed (<0.8m/s, for both sexes). **Results:** 128 patients were recruited (78 men), with a median age of 64.5 years (IQR 57-72). Low skeletal muscle mass was more prevalent in men (n=16, 20%) than in women (n=1, 2%). The prevalence of presarcopenia, sarcopenia and severe sarcopenia was 0%, 2%, and 0% for women and 8.97%, 10.26%, and 1.28% for men, respectively. When stratified by age, sarcopenia diagnosis was more prevalent among patients aged 60 to 79 years. The most prevalent pathologies associated with cardiac rehabilitation patients were myocardial infarction; angioplasty and stent placement; and myocardial revascularization. **Conclusion:** The prevalence of presarcopenia, sarcopenia and severe sarcopenia for all patients was 13.3%, which was more prevalent in men and in patients aged 60 to 79 years. We recommend that the clinical syndrome of sarcopenia must be assessed and treated in all patients who assist cardiac rehabilitation programs in Colombia.

**P216- LIPID ACCUMULATION PRODUCT IS INVERSELY ASSOCIATED WITH SKELETAL MUSCLE INDEX INDICATING INCREASED CARDIOMETABOLIC RISK IN SARCOPENIC WOMEN.** Eleonora Poggiogalle<sup>1,2</sup>, Aldo Rosano<sup>3</sup>, Dario Boschiero<sup>4</sup>, Eric Ravussin<sup>2</sup> ((1) *Sapienza University, Department of Experimental Medicine, Rome, Italy*; (2) *Pennington Biomedical Research Center, Baton Rouge, LA, USA*; (3) *National Institute of Health, Rome, Italy*; (4) *BIOTEKNA Co., Venice, Italy*)

**Background:** The skeletal muscle is the major target tissue of insulin action. The increase of Insulin resistance in obesity may be responsible for the development of sarcopenia through the interference on protein anabolism leading to the decrease of lean body mass. In turn, the deterioration of the lean compartment worsens insulin resistance, favoring the phenotype of sarcopenic obesity. Beside the well-known detrimental effects of sarcopenia in terms of physical functionality, its metabolic consequences have been poorly explored. **Objectives:** The aim of our study was to investigate the association between the Lipid Accumulation Product (LAP), as a marker of cardio-metabolic risk, and the Skeletal Muscle Index (SMI) in women from young age to the elderly. **Methods:** Study participants were enrolled among female outpatients- aged 18 and older- referring to GP ambulatory units across Italy. Body composition was assessed through a BIA-ACC dual frequency analyzer (Biotekna srl. Venice, Italy). BIA-ACC device is characterized by a dual frequency bioimpedance analyzer. Skeletal muscle mass (SMM) and body fat were estimated. The SMI was calculated as SMM normalized to body weight and expressed as percentage. The LAP was calculated as: (waist circumference in cm - 58)\* triglyceride in mmol/L. Study population was divided in different age classes, as follows: 18-24 years, 25-34

years, 35-49 years, and 50 years and older. In addition, quartiles of SMI were calculated. **Results:** A total of 15312 women were included, age:  $38 \pm 1$  years, BMI:  $33.9 \pm 0.4$  kg/m<sup>2</sup>. In the age class 35-49 years, women in the highest SMI quartile exhibited the lowest levels of LAP ( $p=0.04$ ). Similarly, LAP values were significantly lower in women in the highest quartiles (third and fourth quartiles) of SMI compared to their counterparts in the lowest quartile (all  $p$  values  $< 0.03$ ). Multiple linear regression analysis revealed a significant negative association between LAP and SMI in the age classes 35-49 years and +50 years (all  $p$  values  $< 0.05$ ) after adjustment for body fat and high-sensitivity C-Reactive Protein levels. **Conclusion:** After the third decade we found a significant inverse association between SMI and LAP. Our results suggest that the decline in lean body mass occurring with aging confers increased cardio-metabolic risk independently of excess adiposity and inflammation in middle-aged and elderly women..

**P217- ASSOCIATION BETWEEN SARCOPENIA AND OSTEOPOROSIS IN COMMUNITY DWELLING ELDERLY PATIENTS.** Melissa Hughes<sup>1</sup>, Ricardo Salinas<sup>1</sup>, Gladys Garza<sup>1</sup>, Xochitl Ortiz<sup>2</sup> ((1) Geriatric Unit, University Hospital Dr. Jose Eleuterio Gonzalez UANL, Monterrey, NL, Mexico; (2) Faculty of Psychology UANL, NL, Mexico)

**Background:** A progressive decline in bone mineral density, muscle mass and strength are key features of the ageing process. They predispose older individuals to disability, falls, fractures and frailty and are a major and increasing clinical public health burden. **Objectives:** This study aimed to determine if there is an association between sarcopenia and osteoporosis, its prevalence and the role of contributing factors such as physical performance and frailty status. **Methods:** This is a descriptive and observational study. Subjects were invited for assessment including dual-energy X-ray absorptiometry, from which whole body composition, appendicular lean mass index, spine and hip bone mass density (BMD) and t score were determined. Geriatric clinimetry was performed including physical performance tests (Short Physical Performance Battery, SPPB), frailty index, grip strength and anthropometric measurements. Sarcopenia was defined by the consensus of the European Working Group on Sarcopenia in Older People (EWGSOP) (IMMEA  $< 7.26$  kg/m<sup>2</sup> in men and 5.67 in women, plus low muscle function and strength adjusted to BMI). Pearson correlation was used to determine the association between osteoporosis and sarcopenia. **Results:** 101 patients with a mean age of 69.8 years ( $SD \pm 7.49$ ) were included in the analysis, 89 women and 12 men. 25.7% were presarcopenic, 16.8% mild and 5% severe sarcopenic according to EWGSOP criteria. A positive association was found between sarcopenia and osteoporosis of the spine ( $r=0.45$ ,  $p < .0001$ ) and the hip ( $r=0.35$ ,  $p < .0001$ ); among the contributing factors a positive association was found between sarcopenia and frailty ( $r=0.35$ ,  $p < .001$ ). **Conclusion:** Sarcopenia is associated with osteoporosis in elderly mexican population. Exploring the relationship between muscle and bone may help in the development of interventions that will benefit musculoskeletal function, reducing adverse clinical outcomes such as falls and fractures.

**P218- DYNAPENIC-OBESITY AS A RISK FACTOR FOR FALLS IN OLDER WOMEN.** Júlia de Moraes Elias, Juscélia Cristina Pereira, Silvia Gonçalves Ricci Neri, André Bonadias Gadelha, Ricardo M. Lima (Faculty of Physical Education, University of Brasília, Brasília, Distrito Federal, Brazil)

**Background:** Dynapenia (low muscle strength) and obesity are associated with negative outcomes in older people. The combination of these conditions is termed Dynapenic-Obesity (DO), and has

been recently examined as a major cause of frailty in the elderly. Although the relationship between DO and physical function has been documented, its association with falls-related phenotypes needs to be further understood. **Objectives:** To investigate the association between DO, risk of falls, dynamic balance, and fear of falls in older women. It was also aimed to verify if DO was more strictly related to the outcomes than either dynapenia and obesity alone. **Methods:** A total of 219 elderly women ( $68.03 \pm 6.21$  years) underwent waist circumference (WC) measurement and had handgrip strength assessed at the dominant arm using a hydraulic dynamometer (JAMAR). Risk of falls was evaluated using the QuickScreen Clinical Falls Risk Assessment while the Timed up and go (TUG) test was conducted as a measure of dynamic balance. Fear of falling was evaluated by the Falls Efficiency Scale - International (FES-I). Dynapenia was classified using the lower tertile of handgrip strength as cutoff value (20.67 kgf), while obesity was considered as a waist circumference  $> 88$ cm. Dynapenic-Obesity was combination of both criteria. Thus, volunteers were divided into 4 groups: Normal; Dynapenic; Obese; and Dynapenic-Obese. ANOVA, Kruskal-Wallis, chi-squared were used for comparisons, with significance level set at  $p < 0.05$ . **Results:** DO was associated with greater probability of falls ( $p < 0.001$ ), reflecting decreased sit to stand performance ( $p=0.001$ ), reaction time ( $p < 0.001$ ), peripheral sensation ( $p=0.047$ ) and postural balance ( $p=0.043$ ). Time to complete the TUG test was significantly higher in DO group compared to all remaining groups ( $p < 0.001$ ). Also, significant differences between groups was observed for the FES-I score ( $p < 0.05$ ), with DO ( $30.31 \pm 7.89$ ) and Obese ( $27.76 \pm 7.37$ ) women showing increased fear of falling than Normal ( $23.23 \pm 5.50$ ) and Dynapenic ( $26.61 \pm 8.33$ ) groups. **Conclusion:** These results provide support for the notion that DO has negative clinical implications in older women. In particular, Dynapenic-Obesity was associated with reduced dynamic balance and increased both risk and fear of falls. Of note, these relationships were stronger than obesity or dynapenia alone..

**P219- HAND GRIP STRENGTH AND SARCOPENIA IN ADVANCED SYSTOLIC HEART FAILURE PATIENTS RECEIVING LEFT VENTRICULAR ASSIST DEVICES.** Amanda R Vest<sup>1</sup>, Corinne Pellows<sup>1</sup>, Nathan Yuen<sup>1</sup>, Angelo DeNofrio<sup>1</sup>, Alexandra Coston<sup>1</sup>, Edward Saltzman<sup>2</sup> ((1) Tufts Medical Center, Boston, MA, USA; (2) Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA, USA)

**Background:** Systolic heart failure (HF) is chronic disease that causes reductions in functional capacity and increased mortality. Sarcopenia, the age-related loss of skeletal muscle mass and strength, is accelerated in chronic conditions such as HF. The prevalence of sarcopenia in systolic HF and its impact on quality of life and outcomes are currently poorly defined. **Objectives:** We sought to define the prevalence of sarcopenia amongst advanced HF patients receiving a surgical left ventricular assist device (LVAD) for mechanical circulatory support. **Methods:** LVAD recipients were studied within 21 days before or after LVAD implantation. We measured grip strength in the dominant hand on three occasions and recorded the mean. Subjects completed the Simplified Nutritional Appetite Questionnaire (SNAQ, higher score indicates lower appetite) and 3 days of food recall with mean 24-hour caloric intake calculation. Lean mass was measured by dual X-ray absorptiometry (DXA, Hologic, Bedford, MA; Discovery A; v12.6.2.3; appendicular lean mass, ALM, recorded and indexed to height<sup>2</sup>). The correlation between hand grip strength and SNAQ score, 24-hour caloric intake, age, BMI, ALM and hospital length of stay (LOS) after LVAD implantation were examined with Spearman correlation coefficients. We determined the prevalence of sarcopenia according to hand grip

strength (males <26kg, females <16kg) and ALM criteria (males <19.75kg or <7.23 kg/m<sup>2</sup>, females <15.02kg or <5.67 kg/m<sup>2</sup>). **Results:** Twelve advanced systolic HF subjects (10 male, 2 female) were recruited, with mean age 59 years and body mass index (BMI) 28.0 kg/m<sup>2</sup>. Mean handgrip strength was 36 +/-11kg for males and 19 +/-8kg for females. Handgrip strength was negatively correlated with SNAQ score ( $r=-0.57$ ,  $p=0.05$ ) and positively correlated with 24-hour caloric intake ( $r=0.61$ ,  $p=0.04$ ). Handgrip strength did not correlate with age, BMI, ALM or hospital LOS. Three subjects were sarcopenic based on handgrip strength, 1 subject met absolute ALM criteria and 6 met ALM/height<sup>2</sup> criteria for sarcopenia. Seven subjects met at least one sarcopenia criteria. **Conclusion:** Fifty-eight percent of advanced systolic HF patients met handgrip or ALM sarcopenia criteria at LVAD implantation. Greater handgrip strength was associated with a greater appetite (lower SNAQ score) and a greater 24-hour caloric intake.

## LATE BREAKING NEWS

### PHYSICAL FRAILTY AND AGE-RELATED BODY COMPOSITION MODIFICATIONS

**P22- ASSOCIATION BETWEEN DYNAPENIA AND SUBSEQUENT SERIOUS FALL INJURIES IN OLDER ADULTS.** Anoop Balachandran<sup>1</sup>, Boya Lin<sup>1</sup>, Thomas M. Gill<sup>2</sup>, Jack M. Guralnik<sup>3</sup>, Abby C King<sup>4</sup>, Fang-Chi Hsu<sup>5</sup>, Anne B. Newman<sup>6</sup>, Mary M. McDermott<sup>7</sup>, Roger A. Fielding<sup>8</sup>, Todd Manini<sup>1</sup> ((1) Department of Aging and Geriatric Research, University of Florida, Gainesville, FL, USA; (2) Department of Medicine, Yale School of Medicine, New Haven, CT, USA; (3) Department of Epidemiology and Public Health, University of Maryland School of Medicine, Baltimore, MD, USA; (4) Departments of Health Research & Policy and Medicine, Stanford School of Medicine, Stanford, CA, USA; (5) Department of Biostatistical Sciences, Division of Public Health Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA; (6) Department of Epidemiology, University of Pittsburgh, Pittsburgh, PA, USA; (7) Departments of Medicine and Preventive Medicine, Northwestern University, Feinberg School of Medicine, Chicago, IL, USA; (8) Nutrition, Exercise Physiology, and Sarcopenia Laboratory, Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA, USA)

**Background:** Dynapenia (muscle weakness) is associated with low physical function and a variety of health outcomes in older adults. Its association with serious fall injuries is less clear; some studies demonstrate a clear association while others demonstrate no association. Fall events quantified according to physical activity exposure (e.g. steps per day) is an alternative method that considers ambulation time for estimating fall risk. **Objectives:** To evaluate the association between dynapenia and serious fall injuries expressed two ways: fall time-to-event rate (e.g. falls per 1000 person-days) and the FARE (Falls Risk by Exposure) defined as falls per 1000 steps. **Methods:** Maximal grip strength and accelerometer derived steps per day were assessed in the Lifestyle Interventions and Independence for Elders (LIFE) study (1424 older adults aged 70 to 89 years). Serious fall injuries, defined as a fall that resulted in a clinical, non-vertebral fracture or that led to a hospital admission for another serious injury, were adjudicated and assessed over 2.6 years. Dynapenia was defined according to the FNIH criteria: grip strength <32 kg in males and <26 in women. FARE was calculated with the most recent measurement of steps/day (e.g. 6, 12 and 24 months) prior to a fall event or censoring.

**Results:** Fifty-four percent of participants were classified with dynapenia. Dynapenic participants were slightly older (79.9 vs 77.3 y) and had a similar distribution of men and women compared to non-dynapenic older adults. The rate of serious fall injuries were twice as likely in dynapenic (10.9%) compared to non-dynapenic (4.9%) older adults. Using Cox regression analysis, adjusted for demographics, intervention arm and fall-related risk factors, dynapenic participants had a higher risk of serious fall injuries (hazard ratio (HR), 1.78, 95% confidence interval (CI): 1.17-2.71). FARE analysis showed similar results (HR, 1.96, 95% CI: 1.28-3.09). **Conclusion:** Dynapenia is associated with an increase in serious fall injuries. Expressing fall events by physical activity exposure showed similar results to traditional event-time approaches.

**P23- MYOFASCIAL FORCE TRANSMISSION AND MUSCLE WEAKNESS IN OLD AGE.** Marco Narici, Robert Csapo, Usha Sinha, Shantanu Sinha (University of Padova, Italy)

**Background:** Sarcopenia, the age-related loss of muscle mass, affects >50% of the population aged 75 yrs and over and is a main cause of impaired physical performance and reduced mobility. Amongst the several factors contributing to sarcopenia neuroendocrine changes are regarded as primary drivers of this condition (1) and responsible for alpha-motoneuron- and neuromuscular junction (NMJ) degeneration as well as muscle fibre denervation which, also fuelled by mitochondrial dysfunction and oxidative damage, leads to loss of motor units and muscle weakness. One of the major functional characteristics of sarcopenia is the disproportionate loss of muscle strength: at the age of 80 yrs, the loss of muscle strength is about 4-fold greater than that of muscle size (2). This intrinsic muscle weakness, also known as a deterioration in 'muscle quality', has traditionally been attributed to changes in muscle fibre type composition, a decrease in fibre specific tension, reduced excitation-contraction coupling and reduced neural drive. However, new evidence suggests that this disproportionate loss of force also arises from changes in the extracellular matrix (ECM) and of associated proteins, leading to a decrease in lateral force transmission (3,4), which in young muscle normally contributes to >50% of muscle force output (5). Indeed, as recently reported for rat muscle, lateral force transmission is reduced by up to 44% in old animals (6). **Objectives:** Direct measurements of lateral force transmission involve highly invasive surgical procedures (tenotomies and myotomies), precluding human studies. Hence the objective of this pilot in-vivo study was to test the hypothesis that MR imaging-based indices derived from strain rate (SR) tensor maps reflect lateral force transmission (7). **Methods:** SR tensors were derived from velocity encoded magnetic resonance phase-contrast images in nine young (28 years) and eight senior (78 years) women. **Results:** The central finding of this study was that the angle enclosed by the SR along the fibre (indicative of the principal axis of muscle shortening) and the muscle fibre axis was significantly smaller in older women (proximal: -19.2%, central: -17.6%). Under the assumption that the SR-fibre angle would be 0° if force was solely transmitted along the fibre, this finding indicates lower lateral transmission of force in older compared to younger women. **Conclusion:** These observations seem consistent with the hypothesis, and with observations in animal muscle, that a reduction in lateral force transmission may contribute to the intrinsic muscle weakness of older human muscle. References: 1. Moore AZ et al. J Am Geriatr Soc 62:230-236, 2014. 2. Narici MV, Maffulli N. Br Med Bull. 2010;95:139-59. 3. Lieber RL, Ward SR. AmJ Physiol Cell Physiol 305: C241-C252, 2013. 4. Zhang C, Gao Y. J Biomech. 2014, 47:944-8. 5. Huijing PA et al. The Journal of Experimental Biology 201, 682-691 (1998) 6. Ramaswamy et al. J Physiol 2011; 589:

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**P24- BODY PROFILE AND FUNCTIONAL CAPACITY IN HEALTHY FREE LIVING WOMEN OF THE CITY OF CÓRDOBA, ARGENTINA.** AV Asaduroglu, J Cosianzi, VB Sobh, S Rossel S; RH Gallerano (Cordoba, Argentina))

**Background:** Older adults are a vulnerable population group growing rapidly, especially women, who predominate in number and longevity. To maintain independence and autonomy at an advanced age is relevant. The body and functional physical and cognitive changes with aging are reason of intense research. The purpose is to detect areas of deficiency and its possible causes, and to intervene in the favorable modulation of both changes, in order to preserve the function so that people can stay as long as possible in the community. **Objectives:** To analyze the relationships between body profile and functional capacity in healthy free living women of the city of Córdoba accordance with the age. **Methods:** 178 healthy older women 60 years free living were evaluated attending centers of retirees and day homes in the city of Córdoba. We evaluated body profile from: skeletal muscle mass index, relative body adiposity 'dual X-ray absorptiometry- and muscle strength 'dynamometry-. Categories: normal, sarcopenic, obesity, sarcopenic obesity. Functional capacity= physical function and cognitive function: Categories: independent; partial dependence, dependent. Instruments: Lunar Prodigy Densitometer and Smedley dynamometer, Lawton and Brody and Minimental Examination of Folstein scales. **Results:** Among the main findings, it was observed a predominance of older women with sarcopenic obesity and obesity. The majority of older women were functionally independent. Cognitive decline doubled to functional limitations as a cause of partial dependence. Consider the strength in the definition of sarcopenia, determined that frequency will increase from 2.25% to 50% regardless of the presence or not of high relative body fat. The dynapenia proved to be a key factor in classifying women as sarcopenic; it was the most notable decline and the only one that was associated with functional capacity. Partial dependence of the older women increased with age and was double to 70-79 years and 4 times more frequent in the 80 years with respect to 60-69 years. Only 5.56 percent of partially dependent women had low skeletal muscle mass index (SMMI). Aging per se does not seem to determine a decrease of appendicular skeletal muscle mass in healthy elderly, therefore a low SMMI is not necessarily associated with a decrease in functional capacity. The ratio of prevalence of dependency in the obese sarcopenic elderly women with respect to the only obese was 2.12 (95% CI; 1.04 - 4.33) **Conclusion:** In this group the dynapenia was responsible for the observed sarcopenia, not low mass. Many of the key concepts around the study of health, body and function in older adults are controversial. These discrepancies still has not been solved satisfactorily, which represents a limitation to assess the true extent of the problem by interfering with the possibility of comparing the scientific information. This study makes an original contribution, to provide a methodology, provide data derived from its application, as well as the possibility to be used in similar studies.

**FRAILITY IN CLINICAL PRACTICE AND PUBLIC HEALTH**

**P77- COMPARISON OF FRAILITY CRITERIA ITEMS (FRIED PHENOTYPE AND FRAIL SCALE) IN ELDERLY PATIENTS ADMITTED INTO HIGH RISK CLINICAL SETTING; FRAILCLINIC PROJECT\***. M Checa, JA Carnicero, M. Oviedo, A. Pardo, J. Gonzales, T. Guevara, N. Fernández, L. Rodríguez-Mañas (Fundación de Investigación Biomédica- Hospital Universitario Getafe, Madrid, Spain)

**Background:** Frailty syndrome is compound by the alteration of several domains. However, these domains affected could be different depending on the characteristics of the patients in high risk clinical setting. It would be interesting to know if there are differences in the items affected between all these patients. **Objectives:** 1) To assess the most common frailty criteria affected (by Fried phenotype and FRAIL scale) in frail patients admitted in 4 clinical settings; Emergency Room(ER), Cardiology(CA), Urgent Surgery(US) and Elective Surgery(ES). 2) To assess the differences in the domains affected between the settings compared. **Methods:** We assessed the positive items for frailty of Fried and FRAIL scale in four clinical settings; for each setting, descriptive statistics for continuous mean (mean+SD) and categorical (% variables) were calculated. We evaluated if there is any difference in the affected domains among the clinical settings; for each criteria, prevalence between settings were compared using Chi-square test (P<0.0083); FRAILCLINIC project data. **Results:** A total of 572 subjects were evaluated from 3 countries and 5 hospitals (147 from ER, 176 from US, 132 from ES and 117 from CA). The mean age 83.31(Std 5), 54% were men. In Fried criteria the most prevalent item observed was weakness (93.94%), followed by exhaustion (87.26%). The less common item was slowness (27.27%). In FRAIL scale, fatigue was the most frequent symptom (86.29%), and the less common illness (17.49%). No clear differences between settings were observed. The concordance in the items altered between settings were: In Fried, the highest concordance was observed between ER-ES and ER-US with 3 domains coinciding (p<0.008). The rest of settings showed no clinical significance. In FRAIL scale ER-CA and ES-US showed no concordance in the domains affected. The rest of settings presented concordance in the 5 domains affected. **Conclusion:** - Exhaustion was in general the most common domain altered in both tools. Weakness was the most prevalent in Fried. - The highest differences were observed between Surgery (elective and urgent) and Emergency Room and Cardiology.

**P78- FRAILITY AND MALNUTRITION IN FALLERS.** Marta Neira, Estefania Arias, Rafael Bielza, Jorge Francisco Gómez Cerezo (Hospital Infanta Sofía, Universidad Europea de Madrid, Madrid, Spain)

**Background:** Falls are a main geriatric problem in elderly, not only because its prevalence but also because their consequences. They are the expression of a variety of elderly syndromes like gait disorders, polimedication, sensory impairments, cardiovascular problems or cognitive impairment among others but recently frailty, and malnutrition have been proposed as main responsible. **Objectives:** The study describes prevalence of frailty and malnutrition among elders with falls. **Methods:** It is an observational study in patients aged 65 years and older who had fallen down in the last 12 months. Assessment included: medical history, medications, geriatric evaluation, nutritional, physical performance, muscular strength and bioimpedance evaluation. Nutritional screening was made by using long version of Mini Nutritional Assessment (MNA). Anthropometric

measurements were: body mass index (BMI) being cut-off points 22 and 30 kg/m<sup>2</sup> calf, mid-upper arm circumference and calf circumference and being cut-off points 21 cm and 31 cm, respectively. Fat Free Mass was assessed with bio-electrical impedance analysis with TANITTA BC-601 and the then calculated Fat Free Mass Index (FFMI) Kg/m<sup>2</sup>. Muscle mass strength was assessed by hand grip strength using a standard adjustable handle dynamometer (KERN & SOHN GmbH Balingen) and measurements <20 Kg in women and <30 Kg in men were considered cut-off points. Additional information was serum 25-hydroxyvitamin D levels that were measured by competitive enzyme immunoassay technique (ADVIA Centaur, Siemens Healthcare Diagnostics). The diagnosis of Frailty was made by using Fried criteria and ESPEN consensus statement was used to define malnutrition. **Results:** Mean age of the 100 subjects was 84.4±5.7 years and 70 were women. Mini-Nutritional-Assessment was 24 in 75.5%. 76.7% of patients had gait speed < 0.8 m/sec and 92.8% had hand grip strength below cut-off point (<20 Kg in women and <30Kg in men). Frailty diagnosis was made in 68.0% of patients, being gait speed, physical activity and low muscle strength the most common altered items. Malnutrition was present in 37.0% of patients. **Conclusion:** Falls are multifactorial but frailty and malnutrition are highly present so it is mandatory to include their assessment in falls evaluation.

**P79- IMPLEMENTATION OF AN INTEGRATED HEALTHY AGING CLINIC TO INVESTIGATE FRAILITY, SARCOPENIA, AND LOCOMOTIVE SYNDROME IN A CLINICAL SETTING.** Yasumoto Matsui, Hidenori Arai, Tsuyoshi Watanabe, Shosuke Satake, Kazuyoshi Senda, Izumi Kondo, Kaori Kinoshita, Naoki Ito, Sarui Morita Sabre, Atsushi Harada (*National Center for Geriatrics and Gerontology, Japan*)

**Background:** Although treatment of frailty, sarcopenia, and locomotive syndrome is essential for prevention of disability, an approach to assessment has not been completely established and thus is not widely used in clinical practice. Locomotive syndrome is a unique concept proposed by the Japanese Orthopedic Association in 2007, focusing on mobility function. Our hospital recently opened an Integrated Healthy Aging Clinic [The Locomo-Frail Center in Japanese], to implement a novel diagnostic system for comprehensive evaluation of frailty and sarcopenia in older patients, through multidepartmental and multidisciplinary cooperation. **Objectives:** We introduce the assessment system and report the preliminary results. **Methods:** Subjects were 200 patients (69 men and 131 women; mean age: 77.3 [60-94 years]). In addition to questionnaires concerning basic attributes (age, sex, education, family etc.), the clinic assessed higher cognitive function, sociability, frailty, locomotive syndrome, comorbidities, medications, nutrition, spinal radiography, bone density scanning, thigh CT, body composition, and blood biochemical profile. Motor function was assessed using grip strength, the timed up and go test, short physical performance battery (including gait speed, balance, chair stand, and total scores), one-leg standing time, two locomotive syndrome tests, ankle dorsiflexion angle, etc.). **Results:** Based on the AWGS criteria, 57 patients (28.5%) had sarcopenia, 58 (29.0%) had presarcopenia, and 85 (42.5%) did not. In addition, 66 (33.0%) were frail, 106 (53.0%) were prefrail, and 28 (14.0%) were robust. Moreover, 152 (76.0%) had locomotive syndrome level 2, 39 (19.5%) had level 1, and 9 (4.5%) did not satisfy the criteria. Combinations of impairments were also identified. Among those with frailty, 97.0% also had locomotive syndrome level 2, while 42.1% with locomotive syndrome level 2 were considered frail. Among those with sarcopenia, 91.2% also had locomotive syndrome level 2, while 34.2% with locomotive syndrome level 2 also had sarcopenia.

Among those diagnosed with frailty, 57.6% also had sarcopenia, while 66.7% of those with sarcopenia were considered frail. Those meeting criteria for all three conditions accounted for 19.0% of all participants. **Conclusion:** In most cases, locomotive syndrome was combined with the other two, suggesting that patients diagnosed with locomotive syndrome may have early frailty. Mobility functions are thought to decline earlier.

**P80- IMPORTANCE OF FRAILITY RECOGNITION AND IDENTIFICATION IN THE GERIATRIC PATIENT POPULATION: KNOWLEDGE FOR FUTURE ADVANCED PRACTICE NURSES.** Kristina Fortes (*School of Nursing, California State University Fullerton, Fullerton, CA USA*)

**Background:** Frailty identification, diagnosis and treatment suffers from a lack of provider consensus on the exact pathophysiological nature of the syndrome. With the increase of advanced practice nurses caring for the geriatric patient population in health care settings today, it is vital to educate our future providers into this complex syndrome and the interdisciplinary approach needed in developing an effective plan of care. **Objectives:** Improve identification, diagnosis and treatment for the elderly frail patient. Educate on the benefit of an interdisciplinary approach to frailty management. Improve self-efficacy in future advanced practice nurses in caring for frail individuals. **Methods:** A quantitative pilot study using a quasi-experimental approach to evaluate knowledge and ability to recognize/treat frailty syndrome by advanced nurse practitioner students. Methodology included demographic question and pre/post-study surveys to evaluate knowledge gained from the educational intervention. Frailty Knowledge Instrument, developed by this writer, utilized ten patient interaction/clinical management statements to rate corresponding levels of confidence from one, indicating need for basic further instruction to four, indicative that they are confident to perform independently. The second pre-post survey was the Self-Efficacy Scale (1982) with permission for use granted by researcher/developer Dr. Mark Sherer. Informed consent was received. Participants initially completed a pre-intervention survey of the questionnaires listed above. Then, participants completed four education intervention modules on frailty identification, definition, assessment tools and Inter-professional treatment modalities for patients. After completion of the modules, participants repeated the above instruments post intervention. **Results:** Final study population was N=75. Demographic data in terms of ethnicity, level of highest education, etc. were analyzed using descriptive statistics. Frailty knowledge and Self-efficacy on pre and post-surveys were analyzed using Paired t-test method. Frailty Knowledge paired t-tests yielded the following sample results: t= -5.109, df=74, p<0.001. Similar findings for Self Efficacy survey: t= -2.786, df = 74, p< 0.007 were achieved. **Conclusion:** Study results showed statistical significance. One limitation included lack of similar studies present in the literature to compare with. Findings support the need for continued research on the benefit of education to a wider net of healthcare providers in developing an interdisciplinary plan of care for their frail/sarcopenic patients.

## **FUNCTIONAL ASSESSMENT**

**P101- HANDGRIP STRENGTH AND FUNCTIONAL CLASS HOW PROGNOSTIC FACTORS IN OLDER PATIENTS WITH HEART FAILURE IN COLOMBIA. FORCE 2 STUDY.** Amaury Alexis Amarís-Vergara<sup>1,3</sup>, Miguel Enrique Ochoa<sup>2</sup>, Betsy Viviana Rodríguez Hernández<sup>3</sup>, Maria Alejandra Rodríguez Flórez<sup>3</sup>, Carlos Alberto Velandia-Carrillo<sup>1,3</sup>, Miguel Oswaldo Cadena-Sanabria<sup>1,3,4</sup> ((1) *Department of Geriatrics and Internal Medicine, Clínica*

FOSCAL, Bucaramanga, Colombia; (2) Grupo de Investigaciones Clínicas, UNAB; (3) Universidad Autónoma de Bucaramanga, UNAB; (4) Universidad Industrial de Santander (UIS))

**Background:** The handgrip strength is a measure of skeletal muscle function. There is a correlation between the progression of heart failure (HF) and its decrease. **Objectives:** To determine the rate of hospitalization and death in relation to basal handgrip strength, NYHA functional class and ejection fraction in older patients with heart failure. **Methods:** cohort study, prospective, patients with a diagnosis of HF of the FORCE study in 2015, who were followed at 18 months. Grip strength was evaluated by JAMAR dynamometer. Grip strength less for 28 kg/f in men and 18 kg/f in women was considered low. The anthropometric, sociodemographic characteristics of the patients were evaluated taking into account the age, body mass index, etiology of the HF, functional class by NYHA, and medications were recorded. An analysis categorized by grip strength and low grip strength was performed, stratifying by retesting for continuous variables and Chi-square; For the categorical groups, a Kaplan-Meier survival analysis was performed with variable mortality dependent at 18 months. The clinical and sociodemographic characteristics associated with mortality were evaluated by means of a Cox regression. **Results:** of 120 patients included in the FORCE study in 2015, 95 patients were reached in 2017. 17 patients died for a mortality of 17.8%. The remaining 78 patients were followed up for 18 months. The frequency of hospitalization was 78%. In the bivariate analysis, a higher mortality risk was found in patients with low grip strength RR 2.9 IC 95% (1.11 - 7.59). This behavior was also observed in patients belonging to NYHA group III and IV in whom, at lower grip strength, there was greater risk RR 2.42 IC 95% (1.07 - 5.45). In the multivariate model, only a significant association was found for the functional class globally with respect to mortality, with an HR 2.63 IC 95% (1.4 - 4.94), being more significant in men. Regarding hospitalization, the mean grip strength was lower in hospitalized women vs those who did not present the outcome (18kg / f vs 22kg / f p.0261). **Conclusion:** In patients with HF, there is a correlation between NYHA functional class and grip strength with mortality and hospitalization. Handgrip strength measurement can increase the characterization of patients with advanced HF.

**P102- AGILITY VERSUS MUSCLE STRENGTH AND MASS IN THE PREDICTION OF PHYSICAL FUNCTIONING IN COMMUNITY-DWELLING OLDER MEN AND WOMEN.** Alex Lima<sup>1</sup>, Myrian Faber<sup>2</sup>, Élvio Rúbio Gouveia<sup>3</sup>, Fátima Baptista<sup>4</sup> ((1) Laboratory of Biosciences of the Human Movement - LABIMH/UFRJ/Brasil, Curso de Educação Física, Universidade do Estado do Amazonas, UEA, Brasil; (2) Curso de Educação Física, Universidade do Estado do Amazonas, UEA, Brasil; (3) Madeira-ITI, LARSYS and University of Madeira, Portugal; (4) Exercise and Health Laboratory, CIPER, Faculdade de Motricidade Humana, Universidade de Lisboa, Portugal)

**Background:** Skeletal muscle mass and function (physical performance and muscle strength) are the main determinants of sarcopenia, a condition correlated with physical disability, poor quality of life and death. The importance of these determinants for physical disability may however be different from that assumed in the identification of sarcopenia. **Objectives:** To determine the relative importance of physical performance, muscle strength and muscle mass in predicting the physical functioning of elderly people with a predominantly moderate and high physical functioning. **Methods:** The sample consisted of 188 elderly (101 men) 69.97 ± 7.53 years. The physical performance was assessed by the agility test 8-Foot and

Go Up and muscle strength was evaluated by the handgrip (HG). Muscle mass was estimated from perimeters and skinfolds of the arm, thigh, and leg and physical functioning was determined by the Composite Physical Function questionnaire. It was also calculated the body mass index (BMI) and the muscle mass index (MMI) by dividing body mass and muscle mass by the square of the height in meters. Statistical analysis was performed through linear regression by setpwise separately for men and women having physical functioning as dependent variable and the agility, muscle strength (with and without adjustment for BMI), and IMM as independent variables. **Results:** The analyzes in which muscle strength adjusted for body size (HG/BMI) was used revealed associations of physical functioning with agility (women: = -0.425, p <0.001, adjR2 = 19.6%, men: (P <0.001, adjR2 = 13.7%) and with muscle strength (women: = 0.223, p <0.021, adjR2 = 4.1%, men: = 0.261, p <0.006, adjR2 = 6.7%). In the analyzes in which muscle strength was not adjusted it were observed associations of physical functioning with the agility (women: = -0.403, p <0.001, adjR2 = 19.6%; men: = -0.196 p <0.034, adjR2 = 2.6%), with the muscle strength (women: = 0.245 p <0.012, adjR2 = 2.5%; men: = 0.307, p <0.001, adjR2 = 22%), and with the MMI (men : = 0.216, p <0.003, adjR2 = 5.9%). **Conclusion:** Muscle strength and mass accounts for about one-third of the variability of physical functioning only in men and when there is no adjustment for the body size. When this adjustment is considered, agility proved to be the best predictor of physical functioning in both genders.

**P103- CORRELATES OF MUSCLE STRENGTH IN COMMUNITY-DWELLING OLDER ADULTS FROM AMAZONAS, BRAZIL WOMEN.** Élvio Rúbio Gouveia<sup>1</sup>, Alex Lima<sup>2</sup>, Andreas Ilh<sup>3</sup>, Bruna Gouveia<sup>4</sup>, Myrian Faber<sup>5</sup>, Duarte Freitas<sup>6</sup>, Adilson Marques<sup>7</sup>, Matthias Kliegel<sup>3</sup>, Fátima Baptista<sup>8</sup> ((1) Laboratório de Biociência do Movimento Humano - LABIMH, UFRJ, Brasil, Curso de Educação Física, Universidade do Estado do Amazonas, UEA, Brasil; (2) Madeira-ITI, LARSYS and University of Madeira, Portugal; (3) Department of Psychology, Center for the Interdisciplinary Study of Gerontology and Vulnerability, University of Geneva, Geneva, Switzerland; (4) Madeira-ITI - LARSYS; Health Administration Institute, Secretary of Health of the Autonomous Region of Madeira, ESESJCluny, Funchal, Portugal; (5) Curso de Educação Física, Universidade do Estado do Amazonas, UEA, Brasil; (6) Department of Physical Education and Sport, Universidade de Madeira, Funchal, Portugal; (7) Centro Interdisciplinar de Estudo da Performance Humana, Faculdade de Motricidade Humana, Universidade de Lisboa, Lisboa, Portugal; (8) Exercise and Health Laboratory, CIPER, Faculdade de Motricidade Humana, Universidade de Lisboa, Portugal)

**Background:** Muscle strength (MS) is a critical component of physical function in old age. Body composition and behavioural patterns have been considered important predictors affecting the age-associated declines in MS in older people. **Objectives:** The main purposes of this study were: (1) to analyse the relation between MS, body composition and behaviour patterns, and (2) to investigate if the strength of these associations holds after adjustments for sex, age, and other key correlates. **Methods:** The sample comprised 441 community-dwelling older adults from Borba and Tonantins municipalities, Brazil (204 men and 237 women). Mean age was 70.5 years (SD = 9.3). MS was determined by physical functional tests from the Senior Fitness Test battery, namely, arm curl test (upper body strength) and chair stand test (lower body strength). Physical activity (PA) and nutritional status were assessed by the Modified Baecke Questionnaire and the Mini Nutritional Assessment, respectively. The percentage of body fat was estimated using the formulas proposed by

Williams et al. (1992). Total lean mass was obtained by the subtraction of body fat mass to body weight. **Results:** MS was positively related to body lean, nutritional status and physical activity (.12 r .25; p .05). Age did affect the relationship between PA and MS, as well as sex did affect the relationship between body fat and MS. Hierarchical multiple regression analyses showed that the relation of MS to age, body lean, PA and nutritional status remained significant when controlling for all other investigated correlates (.11 .24; p < .05). **Conclusion:** MS was positively related to body lean, PA and nutritional status, and negatively related to age. PA for the oldest age group, and body fat for women, were identified, as important factors to maintain MS. Specific intervention focused on maintain MS in older people, should consider these modifiable factors.

## CLINICAL TRIALS

**P111- THE REACHES STUDY: LESSONS LEARNED FROM CONDUCTING REMOTE ASSESSMENT WITHIN A NURSING HOME ENVIRONMENT.** Marie Mc Carthy<sup>1</sup>, Bill Byrom<sup>1</sup>, Brenda Reginatto<sup>2</sup>, Susie Donnelly<sup>2</sup>, Barry Greene<sup>3</sup>, J. Patrick Bewley<sup>4</sup>, Willie Muehlhausen<sup>1</sup>, Oisín Kearns<sup>2</sup> ((1). *ICON PLC, Dublin Ireland.* (2). *ARCH, Dublin, Ireland.* (3). *Kinesis Health Technologies, Dublin, Ireland.* (4). *EVO, Atlanta, Georgia, USA*)

**Background:** The REmote Assessment of Older People in a Care Home Setting (REACHES) study was an observational study to determine the feasibility and acceptability of conducting a clinical trial within a residential care home setting. This study evaluated the practicalities and burden of conducting longitudinal assessments using mobile and wearable technologies. It is hoped the lessons learned from this study will provide insights that will lead to the creation of low burden, patient centric trial. **Objectives:** To explore the technical feasibility of remote trial in a nursing home setting, 2) To explore the operational feasibility of remote trial in a care home setting, 3): To identify the burden of remote data collection on nursing home staff and residents **Methods:** 11 care home residents and 12 staff members were recruited. The following mobile and digital assessments were deployed: Age-related muscle loss questionnaire (Apple ResearchKit app), Timed up and go test (Kinesis QTUG), daily activity and heart rate (Garmin Vivosmart HR device), and analytics dashboard (EVO platform). Semi-structured interviews and observations were used to assess the use of the patient-reported outcome measure (PROM) and the burden, acceptability and practicalities of participation in the study. **Results:** All residents recruited provided informed consent to participate, independently (6) or by proxy (5). Technical feasibility findings included: Poor Wi-Fi connectivity in the care home; Residents' limited ability to interact with iPad based questionnaire, and activity tracker battery life and poor Bluetooth connectivity. Operational feasibility findings included: Disruption of care home staff workflows; Connectivity issues impacting the activity tracker data collection and the significant level of assistance needed during trial activities. **Conclusion:** Recent advances in connected health technologies mean that is now possible to collect clinical data outside traditional clinic environments. This has particular significance for patients with Sarcopenia and other diseases of aging where mobility issues can impact travel to the sites. However while the technology exists there are a number of practical issues that need to be considered in order for this 'place-shifting' approach to be successful.

## PHYSICAL EXERCISE

**P133- COMBINED EXERCISE TRAINING REDUCES INSULIN RESISTANCE AND CENTRAL ADIPOSITY IN OBESE ADOLESCENT.** Song-Young Park, Rebecca Cuthbert, Steven Scott, Elizabeth Pekas (*University of Nebraska at Omaha, Omaha, Nebraska*)

**Background:** Exercise training is recommended for maintaining health and reducing the risks of developing metabolic and cardiovascular pathologies. Combined resistance and aerobic exercise (CRAE) training has been utilized to decrease metabolic risk factors in obese adults. **Objectives:** To determine the effects of CRAE on obese adolescent females with hyperinsulinemia. **Methods:** Forty obese adolescent girls (age, 14.7±1 yrs; BMI, 30± 2) were randomly assigned to a 'no exercise?' (CON, n=20) or combined exercise group (EX, n=20). The EX group performed resistance and aerobic exercise for 12 weeks, 5 times per week. Exercise intensity was increased gradually, from 40 to 70% of heart rate reserve (HRR), every 4 weeks. The brachial-ankle pulse wave velocity (BaPWV), blood pressure (BP), heart rate (HR), blood leptin, adiponectin levels, and body composition were measured before and after the 12-week intervention. **Results:** CRAE reduced the body fat percentage, body weight, and waist circumference of the EX group (p < 0.05) compared to the CON group after 12 weeks of testing. EX maintained appropriate levels of blood leptin and adiponectin while their insulin, glucose, and insulin resistant parameters decreased compared to their baseline and the control group (p < 0.05). **Conclusion:** These data show that CRAE is a safe and useful therapeutic method to improve metabolic risk factors of obese adolescent females with hyperinsulinemia.

**P134- AORTIC BLOOD PRESSURE RESPONSES TO METABOREFLEX ACTIVATION ARE ATTENUATED IN OLDER ADULTS WITH DYNAPENIA.** Arturo Figueroa<sup>1</sup>, Alexei Wong<sup>2</sup>, Brandon Grubbs<sup>3</sup>, Lynn Panton<sup>4</sup>, Stephen Fischer<sup>1</sup>, Salvador J. Jaime<sup>5</sup> ((1) *Department of Kinesiology and Sport Management, Texas Tech University, Lubbock, TX, USA;* (2) *Department of Health and Human Performance, Marymount University, Arlington, VA, USA;* (3) *Department of Health and Human Performance, Middle Tennessee State University, Murfreesboro, TN, USA;* (4) *Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL, USA;* (5) *Department of Exercise and Sport Science, University of Wisconsin, La Crosse, WI, USA*)

**Background:** Sarcopenia is defined by the European group as the age-related loss of muscle mass and strength or exercise performance (gait speed). New evidence indicates that low muscle strength (dynapenia) is associated with hypertension, physical disability and all-cause mortality, independently from muscle mass. Peripheral blood pressure (BP) responses to metaboreflex activation (post-exercise muscle ischemia, PEMI) following low-intensity isometric handgrip exercise are exaggerated in older adults with elevated BP and hypertension and in postmenopausal women with low appendicular muscle mass. However, aortic BP is clinically more important than brachial BP because is a marker of left ventricular afterload. **Objectives:** The purpose of this study was to examine the impact of dynapenia on aortic BP responses to PEMI in older pre-frail and frail adults. We hypothesized that dynapenic older adults would exhibit increased BP responses to PEMI. **Methods:** Participants were categorized in dynapenic and non-dynapenic according to their handgrip strength (maximal voluntary contraction [MVC]: < 20 kg for women and < 30 kg for men). Brachial and aortic systolic BP (SBP), diastolic BP (DBP), and mean arterial pressure (MAP) were measured in older adults (age, 80±5 y) with dynapenia (n= 16) and

non-dynapenia (n= 9) at rest and during PEMI. Skeletal muscle mass index (SMI) and walking performance were measured using bioelectrical impedance analysis and the 8-ft walking test, respectively. **Results:** BP at rest, SMI, and walking performance were similar in both groups. Increases in aortic SBP (11±7 vs. 23±18 mmHg), DBP (6±6 vs. 14±12 mmHg), and MAP (8±5 vs. 17±14 mmHg) from rest to PEMI were lower in dynapenic compared to non-dynapenic adults. Aortic SBP ( $r=0.69$ ,  $P < 0.05$ ), DBP ( $r=0.77$ ,  $P < 0.05$ ), and MAP ( $r=0.76$ ,  $P < 0.05$ ) responses to PEMI were correlated with Short Physical Performance Battery walk scores, but not SMI, in non-dynapenic adults. **Conclusion:** Older adults with dynapenia exhibit blunted blood pressure responses to metaboreflex activation. In adults with normal strength, BP responses to metaboreflex activation positively influenced walking performance. Muscle mass may not play a main role in BP responses to muscle metaboreflex activation in pre-frail and frail older adults.

**P135- THE RISK OF SARCOPENIC OBESITY AND PHYSICAL FITNESS IN SPANISH ADULTS.** Raquel Aparicio Ugarriza, Raquel Pedrero-Chamizo, Gonzalo Palacios, Josep Antoni Tur, Marcela González-Gross (*ImFINE Research Group. Universidad Politecnica de Madrid, Spain*)

**Background:** High levels of physical fitness (PF) are related to better health status. Furthermore, ageing is associated with an increase and redistribution of body fat mass and decrease of muscle mass. The combination of both variables (high fat mass, FM and low total muscle mass, TMM) is called 'sarcopenic obesity (SO)'. **Objectives:** The main aim of this study was to investigate the risk of suffering SO considering the use of PF tests in Spanish 'apparently healthy' adults. **Methods:** 192 participants (39.6 % males) aged over 55 years from the PHYSMED study were included. PF was assessed by means of the Senior Fitness test and the Eurofit battery. Likewise, body composition (FM and TMM) was measured through dualenergy Xray absorptiometry. In order to classify our population, two groups were created following the criteria established by Davion et al.: normal FM and TMM and high FM and low TMM. Data was analyzed using ANOVA. Moreover, the risk of suffering SO according to their PF level was analyzed by binary logistic regression. **Results:** A total of 38.5% males and 37.7% females presented SO. Significant differences were found between groups in balance, leg strength, right leg and arm flexibility, agility, walking speed and aerobic endurance in males and aerobic endurance in females. Furthermore, PF tests which better predicted the risk of SO were: balance, leg strength, right leg flexibility, right arm flexibility, agility, walking speed in males; 95% CI [(0.9430.992), (0.6520.998), (0.9000.991), (1.4746.523), (1.0281.581)], all  $p < 0.05$ , except aerobic endurance (0.9770.993),  $p < 0.001$ , and aerobic endurance in females; 95% CI [(0.9890.999),  $p < 0.05$ ]. **Conclusion:** Around a third of the population presented SO. Moreover, these PF test could help to detect the risk of SO, concretely in males; however, further studies are needed in females. More exercise programs and interventions should be performed taking into account the results observed. Supported by Instituto Salud Carlos III (PI11/01791 & CB12/03/30038). ImFINE and NUCOX are members of the EXERNET network. Raquel Aparicio-Ugarriza is supported with a predoctoral grant from the Universidad Politécnica de Madrid.

**P136- HIGH-INTENSITY INTERVAL OR MODERATE-INTENSITY CONTINUOUS TRAINING TO IMPROVE PHYSICAL PERFORMANCE IN OBESE-OSTEOPENIC ELDERLY WOMEN.** P Noirez<sup>1,3,4</sup>, LP Carvalho<sup>4,5</sup>, MC Dulac<sup>2,4,5</sup>, G El Hajj Boutros<sup>3,4,5</sup>, V Marcangeli<sup>3,4,5</sup>, P Gaudreau<sup>6</sup>, G Gouspillou<sup>3,4,5</sup>, JA Morais<sup>7</sup>, M Aubertin-Leheudre<sup>3,4,5</sup> ((1) *University Paris Descartes,*

*IRMES EA7329, Paris, France; (2) Department of Biology; (3) Department of Physical Activity Sciences; (4) GRAPA, University of Quebec at Montreal, Montreal, Canada; (5) Centre de Recherche l'Institut Universitaire de Gériatrie de Montréal, Montreal, Canada; (6) Department of Medicine, Centre de Recherche du Centre hospitalier de l'Université de Montréal, University of Montreal, Montreal, Canada; (7) Geriatric Department, Mc-Gill University Hospital, Montreal, Canada)*

**Background:** Aging is associated with functional incapacities which lead to falls, loss of autonomy and mortality. Being obese and osteopenic seems to have worse health impact than one of this condition alone. Physical activity (aerobic training) is recognized to be an efficient strategy for health promotion. Lack of time has been raised as one of the main barriers to participation in exercise programs. High-Intensity Interval Training (HIIT) is a promising avenue to prevent these phenomena considering its high effectiveness and short duration. However, its efficiency in obese-osteopenic elderly remain unknown. **Objectives:** We aimed to compare the effect of HIIT and moderate-intensity continuous training (CONT) on physical performance in obese-osteopenic elderly women. **Methods:** Nineteen inactive (<10,000steps/d) elderly (67±3y), obese (fat mass: 43±6%) and osteopenic (BMD<-1 T-score) women were randomly divided into 2 groups and completed a 12 week exercise intervention: HIIT (n=9, elliptical device; cycle: 30 sec at 85% and 90 sec at 65% of maximal age-predicted heart rate; 3 x 30 min/week) and CONT (n=10, treadmill at 65-75% maximal age-predicted heart rate; 3x1h/week). Body composition (DXA: fat-free and fat masses), muscle function (leg power, handgrip strength) and functional capacities (4m and 6min -6MWT- walking test, chair and step tests) were measured pre and post-intervention.  $p < 0.05$  was considered significant. **Results:** HIIT improved significantly leg power (102±26 to 137±30Watt), step test (28±3 to 34±3), chair test (19±3 to 16±4s) and hip circumference (112±15 to 109±14cm) whereas CONT improved leg (12.6±2.8 to 11.7±2.6 kg) and appendicular fat (15.3±3 to 14.5±3.1kg) masses, and handgrip strength (21.6±4.4 to 24.2±5.4kg). Only 6MWT was increased in both groups (+16% in HIIT and +6% in CONT). **Conclusion:** With half fewer time, HIIT seems more promising to improve physical performance in inactive obese-osteopenic elderly women compared to CONT. Clinicians should consider HIIT as a strategy for health promotion. Further investigations with larger sample sizes are needed to confirm our pilot study.

## EPIDEMIOLOGY

**P160- ASSOCIATION BETWEEN GAIT SPEED WITH MORTALITY, CARDIOVASCULAR DISEASE AND CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS.** Nicola Veronese, Brendon Stubbs, Stefania Maggi, Matteo Cesari, Alberto Pilotto, Emanuele Cereda (*Consiglio Nazionale delle Ricerche, Padova, Italy*)

**Background:** The speed at which someone walks (gait speed) is an important indicator of their functional status. In this sense, slow gait speed may be associated with premature mortality, cardiovascular disease (CVD) and cancer, although a comprehensive meta-analysis is lacking. **Objectives:** In this systematic review and meta-analysis, we explored potential associations between gait speed and mortality, incident CVD and cancer. **Methods:** A systematic search in major databases was undertaken from inception until June 01st 2017 for prospective studies reporting data on gait speed and mortality, incident CVD and cancer. The adjusted hazard ratios (HRs) and 95% confidence intervals (CIs), based on the model with the maximum number of covariates for each study, were meta-analysed

with a random-effects model. **Results:** Among 5,426 papers, 37 (=41 cohorts) were eligible and followed-up a total of 96,929 participants (mean age 72.9 years; 55.2% women) for a median of 5.4 years. After adjusting for a median of 9 potential confounders and pooling data from 38 cohorts, each decrease of 0.1 m/s in gait speed was associated with a 13% increased risk of earlier mortality (n=38; HR=1.13; 95% CI: 1.10-1.16; I2=91%) and 11% increased risk of CVD (HR=1.11; 95%CI: 1.06-1.15; I2=76%), but no relationship with cancer was observed (HR=0.99; 95%CI: 0.96-1.02; I2=0%). **Conclusion:** Slow gait speed may be a predictor of mortality and CVD in older adults. Since gait speed is a quick and inexpensive measure to obtain our study suggests that it should be routinely used and may help identify people at risk of premature mortality and CVD.

**P161- EFFECT OF MULTIDOMAIN INTERVENTION, OMEGA-3 POLYUNSATURATED FATTY ACIDS SUPPLEMENTATION OR THEIR COMBINAISON ON COGNITIVE FUNCTION IN NON-DEMENTED OLDER ADULTS ACCORDING TO FRAIL STATUS: RESULTS FROM THE MAPT STUDY.** M Tabue-Teguo Maturin<sup>1,2,3</sup>, P Barreto de Souza<sup>3,4</sup>, C Cantet Christelle<sup>3,4</sup>, S Andrieu Sandrine<sup>3,4</sup>, N Simo Nadine<sup>5</sup>, B Fougère Bertrand<sup>3,4</sup>, JF Dartigues<sup>2</sup>, B Vellas Bruno<sup>3,4</sup> ((1) CHU de Pointe-à-Pitre, Université des Antilles, France; (2) INSERM UMR 1219, Equipe SEPIA, Université de Bordeaux, France; (3) Gérontopôle, CHU de Toulouse, France; (4) INSERM UMR 1027, Université Toulouse 3, France; (5) Pôle de Santé du Villeneuveois, Villeneuve/Lot, France)

**Background:** To our knowledge, no study has yet explored whether MI and Omega-3 Polyunsaturated Fatty Acids supplementation can modify the cognitive function on elderly according to frail status. **Objectives:** The aim of this study was to explore whether multidomain intervention (MI) and Omega-3 Polyunsaturated Fatty Acids supplementation can modify the cognitive function on elderly according to frail status. **Methods:** Data are from a secondary exploratory analysis of the Multidomain Alzheimer Preventive Trial (MAPT), a French community-dwellers aged 70 or over reporting subjective memory complaints, but free from clinical dementia. The multidomain intervention consisted of 2 hours group sessions focusing on three domains (cognitive stimulation, physical activity, and nutrition) and a preventive consultation (at baseline, 12 months, and 24 months). For Omega-3 Polyunsaturated Fatty Acids supplementation, participants took two capsules of either placebo or polyunsaturated fatty acids daily. Linear mixed-model repeated-measures analyses were used including baseline, 6, 12, 24 and 36-month follow-up data to assess between-group differences in the change in cognitive tests over 36 months. **Results:** The overall mean age of the MAPT study population was 75.25(±4.38). A significant differences in TMT-A were found for the effect of the multidomain intervention on the prefrail group compared to non-frail group. The MI and n3 PUFA program could not significantly have reduced cognitive function in a sample of pre-frailty elders. **Conclusion:** This population-based study in community-dwellers aged 70 years or over suggested that multidomain intervention and n3 PUFA supplementation have not significant effects on cognitive function change in frail older adults with memory complaints. Further studies with larger samples and stronger intervention are needed to confirm our results.

## **NUTRITION AND AGING**

**P182- NUTRITIONAL PROFILE OF ELDERLY WOMEN IN MANAUS- AM.** Joan Faber<sup>1</sup>, Myrian Faber<sup>2</sup>, Alex Barreto de Lima<sup>2</sup> ((1) General Surgery, Hospital and Emergency Room August 28, Manaus, Am- Brasil; (2) University of the State of Amazonas, Manaus, Am, Brasil)

**Background:** The bad nutrition that occurs in the elderly may be due to physiological changes of aging, the socio-economic conditions, diseases and the interaction between nutrients and drugs. The food served to the elderly should be mostly cooked or prepared to facilitate mastication. However, change is important because these types of food contain less vitamins, minerals and fiber. **Objectives:** Examine the association between body mass index (BMI), waist-to-hip ratio (WHR), waist circumference (WC) and the nutritional profile in two groups of elderly women relating it to their food habits. **Methods:** This work consisted of observation, interview and apply alimentary habits questionnaire, measurement of blood pressure and anthropometric variables in 108 old women divided into two groups. These are the anthropometric variables: body mass index, weight, index waist / hip featuring a quantitative field research. These variables were collected by graduate students of UNATI - UEA . We used electronic scale digital Corpus, tape-measure, digital pressure blood and a metallic portable stadiometer. The highest BMI, WHR, and WC quartiles and predefined BMI categories were analyzed as predictive variables. The alimentary consumption was registered 24-hour, for 3 days and each specific nutrient was statistical analyzed by Epi Info 7.1.5.0@ (2015). **Results:**The elderly woman presented in anthropometric variables, weight 63±16 e 61,1± 9,4; BMI = 30,3±10,5 e 28,3±4,0 and WHR= 0,91± 0,05 e 0,93± 0,08. The group?s nutritional profile was with prevalence?s of overweight (65, 8%), 87% for hypertension and unfed. **Conclusion:** The data found and compared to the guidelines to the Dietary Reference Intakes: Applications in Dietary Assessment (2000) and Dietary Reference Intakes for Energy, Carbohydrates, Fiber, Fat, Protein and Amino Acids (Macronutrients)(2002), revealed that the elderly woman studied in Manaus presented inadequate habitual diet and the majority presented overweight, high blood pressure, the ingestion of liquid less than the necessary and inadequate diary intake for Vitamins, Elements, Macronutrients and Electrolytes.

**P183- ASSOCIATION BETWEEN FRAILTY AND MICRONUTRIENTS INSUFFICIENCY IN JAPANESE OLDER OUTPATIENTS.** Kaori Kinoshita, Shosuke Satake, Yasumoto Matsui, and Hidenori Arai (*National Center for Geriatrics and Gerontology, Japan*)

**Background:** Several studies from western countries indicated that the low serum micronutrient concentrations predict frailty in older adults. Additionally, some studies suggested that the low intake of micronutrients is associated with frailty. However, the food culture is different from Japan, and it is not clear whether a similar relationship can be applicable in Japanese older adults. **Objectives:** We investigated whether or not frailty is associated with specific nutrient insufficiency in Japanese older outpatients. **Methods:** The study subjects were 130 non-demented outpatients aged 65 years who had been evaluated with a brief-type self-administered diet history questionnaire (BDHQ) and the mini nutritional assessment-short form (MNA®-SF). They were divided into two groups (frailty and non-frailty) based on the Japanese version of the Cardiovascular Health Study criteria. We excluded 6 patients who could not fill out the questionnaire. We analyzed the difference of nutrient intake between

two groups. Subsequently, we assessed their nutrient insufficiency based on 'Dietary Reference Intakes for Japanese', and we analyzed the association between frailty and each nutrient insufficiency by logistic regression analysis adjusted for age, sex, and BMI. **Results:** The mean age ( $\pm$ SD) was 79.6 $\pm$ 6.3 years (men, 36.3%) and 32 patients were classified as the frail group (25.8%). There were no significant differences in the MNA<sup>®</sup>-SF score (frailty, 11.4 $\pm$ 1.9 vs. non-frailty, 11.7 $\pm$ 1.7) or BMI (frailty, 22.5 $\pm$ 4.4 kg/m<sup>2</sup> vs. non-frailty, 21.5 $\pm$ 6.4 kg/m<sup>2</sup>) between the two groups. The consumption of fruits in the frail group was significantly lower than the non-frail group. The logistic regression analysis indicated a significant association between frailty and micronutrient insufficiencies with significant odds ratios, after adjusting for sex, age, and BMI [ORs (95%CI), Cu: 6.09 (1.58-23.50), Mn: 2.58 (1.07-6.24), VA: 2.57 (1.06-6.21)]. **Conclusion:** We found a significant association between frailty and an insufficient intake of several micronutrients with antioxidant effects in Japanese older adults. Further studies are needed to confirm this association in a larger cohort and with a longitudinal design.

#### **P184- NUTRITIONAL DEFICIENCIES IN AMAZONIAN ELDERLY.** M Faber (*University of State of Amazon, Manaus AM, Brazil*)

**Background:** Malnutrition occurring in the elderly may be due to physiological changes in aging, socioeconomic conditions, diseases and the interaction between nutrients and drugs. Health care involves not only adequate nutrition, but also the control and maintenance of biochemical indicators, as well as the regular practice of physical activities. **Objectives:** This cross-sectional study investigated the prevalence of nutritional deficiencies in amazonian elderly people. **Methods:** We collected data from 200 medical records of white and black elderly men and woman between the ages of 60 and 75, on randomly chosen. Biochemical blood tests, urine and stool tests and blood pressure analysis were examined as predictive variables. The alimentary consumption was registered for 3 days and each specific nutrient. We used a report generated by Stat soft (Statistica Version 10). **Results:** Was found overweight prevalence's 65. 8%, 87% hypertension, 48% intestinal parasitism; 45% high cholesterol, 47% anemic and 32% diabetics. The diet compared to the Dietary Reference Intakes showed deficiency to Vitamin B12, Acid Folic, Magnesium, Vitamin C and iron. **Conclusion:** The enteroparasites found are among other causes of anemia in the elderly studied. The most common causes of anemia in the elderly are chronic disease and iron deficiency. Iron deficiency alone accounts for almost half of the cases of anemia caused by nutritional deficiencies . In Europe and the USA, iron deficiency anemia occurs in approximately 4% to 5% of the elderly. Anemia is associated with lower muscle strength and physical performance in older persons.

#### **BIOMARKERS AND AGING**

#### **P198- PANORAMIC ULTRASOUND MUSCLE CROSS-SECTIONAL AREA NORMALIZED TO ECHO INTENSITY AS A MARKER FOR THE LOSS OF MUSCLE QUALITY WITH AGING.** Kyle J Hackney, Christopher J Kotarsky, Kara A Stone, Sherri N Stastny (*North Dakota State University, Fargo, ND, USA*)

**Background:** Aging is accompanied by progressive losses of skeletal muscle cross-sectional area (CSA) and strength with a corresponding increase in lipid infiltration. These alterations lead to metabolic perturbation and a decline in skeletal muscle quality. There are many established methods for examining muscle quality, including magnetic resonance imaging, computed tomography, and

dual energy x-ray absorptiometry. These methods, however, are expensive and often require participants to be exposed to ionizing radiation. Recently, panoramic ultrasound has been established as a low-cost alternative to assess muscle CSA. In parallel, echo intensity (EI), or increased reflection of the ultrasound beam, appears to be useful in identifying increased lipid or fibrous infiltration within a muscle. **Objectives:** This study determined if panoramic ultrasound muscle CSA normalized to EI could be a useful indicator of muscle quality and if it was associated with functional muscle strength. **Methods:** Fifty, middle-aged women were recruited, and each completed a panoramic ultrasound assessment of the right rectus femoris. Images were transferred to a personal computer, calibrated, and analyzed for CSA and EI. Participants also completed maximal isokinetic knee extension testing (60 deg ·sec<sup>-1</sup>). Following these assessments, subjects were subdivided into two groups based on self-reported age ranging from: 40-54 years (54 yr) or 55 to 65 years (55+ yr) for comparison of CSA, EI, and CSA normalized to EI (CSA/EI). Independent sample t-tests and a Pearson correlation were performed. An alpha level of P < 0.05 determined significance. **Results:** Rectus femoris CSA was significantly greater (7.94  $\pm$  2.19 vs. 6.48  $\pm$  1.88 cm<sup>2</sup>, P = 0.016) and EI significantly lower (89.79  $\pm$  13.81 vs. 100.37  $\pm$  16.93, P = 0.019) for ? 54 yr group compared to 55+ yr group. CSA/EI was also significantly greater (P = 0.005) in ? 54 yr group (0.09  $\pm$  0.04) compared to 55+ yr group (0.07  $\pm$  0.24). Rectus femoris CSA/EI was positively correlated with knee extensor torque relative to body weight (R = 0.36, P = 0.011). **Conclusion:** Panoramic muscle ultrasound CSA normalized to EI is associated with functional lower body strength and represents a novel marker of muscle quality in middle-aged women. Funded by the Beef Farmers and Ranchers.

#### **OSTEOPOROSIS AND SARCOPENIA**

#### **P220- FACTORS ASSOCIATED WITH LOW BONE MINERAL DENSITY AMONG WHITE WOMEN - SANTOS CITY, BRAZIL.** Miguel Naveira<sup>1</sup>, Paulo Frazão<sup>2</sup> ((1) *Universidade Federal de São Paulo / UNIFESP, Brazil;* (2) *niversidade de São Paulo / USP, Brazil*)

**Background:** In more developed regions, decreasing mortality and fertility and increasing life expectancy have resulted in aging of the population and increasing rates of chronic-degenerative diseases like osteoporosis. This bone metabolic disorder is characterized by loss of bone mass and disorganization of bone microarchitecture, which makes bones more fragile. It is an important cause of fractures, which create the need to use health services. Bone mass decreases with advancing age and more frequently affects women. For these reasons, interest in this problem has been growing. New products, medications and technologies are being developed and incorporated into medical care. Studies on factors associated with the occurrence of osteoporosis are also necessary for guiding preventive measures. **Objectives:** To analyze whether the factors causing low bone mineral density among elderly women are the same as those observed in other age groups. **Methods:** A cross-sectional study was carried out on the medical records of a random sample of 413 white women seen at an imaging diagnostics service in a city of Southern Brazil, in 2003. Femoral bone mineral densities with adjustment using T-scores were used. The following variables were investigated: age, body mass index, tobacco smoking, alcohol consumption, milk consumption, physical activity and hormone replacement therapy. Univariate and multivariate unconditional logistic regression were used. **Results:** In the sample, 52.5% were up to 59 years old and 47.5% were 60 or over. The mean bone mineral density was 0.867 g/cm<sup>2</sup> (SD=0.151) for the femoral neck. Significant age-adjusted values were obtained

for physical activity (adjusted OR=0.47; 95% CI: 0.23;0.97), body mass index greater than or equal to 30.0 kg/m<sup>2</sup> (adjusted OR=0.10; 95% CI: 0.05;0.21), alcohol consumption (adjusted OR=7.90; 95% CI: 2.17;28.75), low milk consumption (adjusted OR=3.29; 95% CI: 1.91;5.68) and hormone replacement (adjusted OR=0.44; 95% CI: 0.21;0.90). Among the elderly women, body mass, milk consumption and physical activity were independent protection factors. **Conclusion:** Advanced age, body mass, physical activity, milk and alcohol consumption were important factors in bone mass regulation. The influence of behavioral factors was maintained among the women of advanced aged, thus reinforcing the role of preventive measures in medical practice and public health promotion policies aimed at healthy aging.

**P221- SARCOPENIA IN ADULT RENAL TRANSPLANT RECIPIENTS: FREQUENCY AND RELATIONSHIP WITH AGE, GENDER, TYPE OF GRAFT DONOR, TIME FROM TRANSPLANTATION, TYPE OF IMMUNOSUPPRESSIVE DRUGS AND TIME ON DIALYSIS BEFORE TRANSPLANT.**

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**Background:** Sarcopenia is defined as progressive and generalized loss of muscle mass and function, being associated with poor outcome. There is evidence that renal transplant recipients (RTR) present reduced muscle mass. However, in RTR the prevalence of sarcopenia and the factors associated with this syndrome are not known. **Objectives:** To evaluate the frequency of sarcopenia

and its association with age, gender, type of graft donor, time from transplantation, type of immunosuppressive drugs and time on dialysis before transplant in young and middle-aged RTR. **Methods:** Cross-sectional study with adult RTR (18-64y) submitted to tx for at least 6 months. RTR undergoing dialysis, presenting AIDS, cancer and autoimmune diseases were excluded. Muscle mass was evaluated by the skeletal muscle mass index (SMI) with energy radiological absorptiometry (DXA). Muscle strength assessed by hand grip strength (HGS) and physical performance evaluated by usual gait speed (GS). Sarcopenia diagnosis: SMI <7.26kg/m<sup>2</sup> (men), <5.5 kg/m<sup>2</sup> (women) associated with HGS <30kg (men), <20kg (women) and/or GS <1m/s. Estimated glomerular filtration rate (eGFR) by CKD-EPI equation. Study approved by local Committee on Ethics. Statistical analyses: STATA12.0. **Results:** 186 RTR were evaluated (101 men), 47.5 ± 0.8 years old, 115.1 ± 6.6 months post-transplantation, eGFR = 55.8 ± 1.5 ml/min. Sarcopenia was present in 33 RTR (18%). Patients with sarcopenia (sarcopenia group; SG; n=33) compared to patients without this syndrome (non-sarcopenia group; NSG; n=153) presented similar (p ? 0.05) age: 47.6 ± 2.0 vs. 47.4 ± 0.9 years; frequency of male gender: 22 (67%) vs. 84 (55%); type of graft donor (deceased): 11 (33%) vs. 72 (47%) time from transplantation: 125.9 ± 17.1 vs. 112.8 ± 7.2 months; type of immunosuppressive drugs; time on dialysis before transplant: 40.6 ± 7.0 vs. 51.7 ± 4.1 months; and eGFR: 58.0 ± 3.9 vs. 54.5 ± 1.6 ml/min, respectively. The frequency of RTR aged 40-64y was similar in SC (79%, n=26) and NSG (80%, n=122). **Conclusion:** This study suggests that in young and middle-aged RTR sarcopenia is common and is not associated with age, gender, type of graft donor, time from transplantation, type of immunosuppressive drugs and time on dialysis before transplant.