SYMPOSIA

S1- WHAT WE HAVE LEARNED FROM LARGE CLINICAL TRIAL ON FRAILTY AND SARCOPENIA. R. Fielding[1], S. Bhasin[1], B. Vellas[2] *(1. Boston, USA; 2. Toulouse, France)*

Communication 1: *What we have learned from testosterone trials?* S. Bhasin (Boston, USA)

Communication 2: *Lessons learned from sarcopenia drug trials,* R. Fielding (Boston, USA)

Communication 3: *MAPT Trial: Mobility and cognitive endpoint,* B. Vellas (Toulouse, France)

S2- MUSCLE QUALITY IN SKELETAL MUSCLE FUNCTION DEFICIT AND OTHER AGING-RELATED MUSCLE DYSFUNCTIONS: THE NEED FOR STANDARDIZED ASSESSMENT. A.B. Newman *(Pittsburgh, USA)*

Background: Impaired mobility is often a precursor of functional decline, disability and loss of independence. Evidence now shows that not only changes in skeletal muscle mass, but other factors underpinning muscle quality play a role in the decline in skeletal muscle function and impaired mobility associated with aging. Changes in muscle quality may precede loss of muscle mass. To further characterize skeletal muscle function deficit, additional investigation and understanding of the factors behind changes in muscle quality are needed. Objectives: The purpose of this symposium is to provide a venue for basic science and clinical researchers and expert clinicians to discuss muscle quality in the context of skeletal muscle function deficit and other aging-related muscle dysfunctions; and, provide recommendations on a standardized assessment of muscle quality likely to facilitate the identification of older adults at risk for mobility disability and for whom interventions to improve muscle function would be beneficial. This symposium is designed for a 60-minute duration. Presenters will have a total of 45 to 50 minutes to speak. A moderator will have 10-15 minutes to lead a panel discussion with target pre-assembled questions and summarize final recommendations. Questions from the audience may be embedded in the discussion. Discussion: Will focus on the following specific content: 1) Brief introduction to frame the issue on what currently defines muscle quality. 2) Discussion on metabolic capacity and impact on mobility and other important activities of daily living. Potential inclusion as a criteria in an expanded definition of muscle quality. 3) Discussion on a standardized and consistent methodological approach, to assess muscle quality that is reliable and relatively easy to use in diverse clinical or community settings. 4) Identification of research gaps and potential ideas to address these gaps in support of future large prospective studies of interventions to improve muscle mass, strength, function, and quality. Conclusion: Will focus on proposing an expansion of the definition of muscle quality and providing a summary of recommendations for potential standardized assessment of muscle quality, and ideas to address research gaps in the field with an emphasis on potential clinical applicability.

Communication 1: *Framing the issue: What defines muscle quality? Metabolic capacity and impact on muscle quality,* T. Mannini[1], R. Correa-de-Araujo[2] (1. Gainsville, USA; 2. Bethesda, USA)

Communication 2: *The use of standard imaging measures of muscle quality: Effects of myosteatosis on muscle performance and metabolic status. Determinants of muscle quality: Functional approaches to muscle quality estimates,* I. Miljkovic[1], M.S. Fragala[2] (1. Pittsburgh, USA; 2. Madison, USA)

Communication 3: *Alternative Clinical Imaging Measures of Muscle Quality: Impact of Muscle Quality on Functional Performance and Sarcopenia Staging,* M.O. Harris-Love[1], B.W. Anthony[2] (1. Washington, USA; 2. Cambridge, USA)

S3- A MOUSE MODEL OF CHRONIC INFLAMMATION, SARCOPENIA AND PHENOTYPIC FRAILTY. J.D. Walston *(Baltimore, USA)*

Introduction: Chronic inflammation in older adults is strongly associated with adverse health outcomes including sarcopenia, frailty, disability, and early mortality. Although the molecular pathways that connect elevated inflammatory cytokines to these adverse outcomes are not well understood, evidence suggests that chronic exposure to inflammatory molecules such as interleukin 6 (IL-6) contributes to stem cell and mitochondrial dysfunction, tissue remodeling, and exacerbated chronic disease states. The IL-10tm mouse lacks the anti-inflammatory cytokine IL-10 and develops chronic low-grade inflammatory pathway activation with increasing age. That in turn has greatly facilitated the study of how chronic inflammation and aging together may influence sarcopenia, mitochondria, as well as multiple tissues, organs and physiological systems that contribute the vulnerability observed in frail organisms. To date, numerous publications have helped to 1) characterize inflammatory cytokines, activity related declines, and shortened life-span in this mouse model, 2) demonstrate how chronic inflammation influences IGF-1 over the lifespan of this mouse, 3) identify functional mitochondria changes related to mitophagy and energy production in the face of chronic inflammation, and 4) illustrate how chronic inflammation alters cardiac function in a manner very similar to human frailty. Although it is increasingly clear that chronic inflammation in aging contribute to both sarcopenia and frailty and alterations in many organ and physiological systems, few if any interventions have been developed and tested that target chronic inflammation and related molecular pathways. Objectives: The objective of this symposium is to first provide an overview of how the activation of chronic inflammatory pathways influence frailty and sarcopenia, and how the IL-10tm mouse has been utilized in the past to characterize the age and inflammation related changes in relevant phenotypes. The session will begin with an overview of the relevance of chronic inflammation in aging and related biology, an overview of prior important findings in the IL-10tm mouse model. This will be followed by individual presentations that detail age and inflammation related alterations in fat and adipokines, skeletal muscle, and cardiac myocytes. Comprehensive new data that will help the participant to understand the molecular connections between chronic inflammation and declines in skeletal muscle, cardiomyocytes, and fat tissue will be presented. Dr. Tyesha Burks will provide new insights into the molecular signaling that drives the development of muscle weakness in the face of chronic inflammation, and describe the efficacy of targeting the renin-angiotensin system to maintain skeletal muscle strength. Dr. Peter Abadir will describe the role of chronic inflammation in cardiomyocyte decline in this mouse model, how the angiotensin receptors type 1 and 2 and Nox signaling changes related to chronic inflammation may development of fibrosis and hypertrophy, and how blocking angiotensin receptors improves the cardiac phenotype observed in this mouse model. Finally, Dr. Reyhan Westbrook will present data that demonstrates an altered metabolic

phenotype in the older IL-10tm ko mice that includes lower metabolic rate and markedly altered fat tissue and adipokine signaling in the IL-10tm compared to age and gender matched C57Bl6 control mice. After attending this session participants will be able to understand influence of aging and chronic inflammation on organ and tissue changes, and understand the potential translational implications in the treatment of both sarcopenia and frailty. Discussion: Chronic inflammation likely drives many of the molecular changes observed in both frailty and skeletal muscle. Dr. Walston will lead a discussion of how these systems are integrated, and in total drive the phenotype of frailty and late-life vulnerability. Further discussion will center on the potential to intervene on relevant biological pathways in mouse models, and potentially translate this into human studies of frailty and sarcopenia. A discussion of the relevance to basic biological understanding of inflammation related changes and the potential clinical relevance of these findings will complete the session. Conclusion: Chronic inflammation is known to influence both sarcopenia and frailty. The IL-10tm ko mouse has been increasingly utilized as a mouse model that has facilitated the understanding of the biological intersection between inflammation and aging. Important molecular and physiological findings related to skeletal muscle, cardiac muscle, and fat tissues are detailed. In addition, the potential translational relevance of these findings, and potential novel treatment paradigms will be discussed.

Communication 1: *Age- and inflammation-related alterations in the renin angiotensin system mediate pathological changes in cardiomyocytes,* P. Abadir, T. Burks, R. Marx, L. Powell (Baltimore, USA)

Communication 2: *Skeletal muscle declines in the IL-10 KO mouse,* T.N. Burks, R. Marx, J.D. Walston (Baltimore, USA)

Communication 3: *The metabolic characterization of the interleukin-10tm1Cgn mouse,* R. Westbrook, C.N. Roy, H. Yang, P.P. Choudhury, Q.-L. Xue, R. de Cabo, J. Walston (Baltimore, USA)

S4- PHYSICAL FRAILTY AND SARCOPENIA: MAGNITUDE OF THE PROBLEM AND POSSIBLE SOLUTIONS. F. Landi[1], M. Cesari[2] *(1. Rome, Italy, 2. Toulouse, France)*

Backgrounds: Physical function decreases with ageing leading to a wide spectrum of negative outcomes in the elderly, such as mobility disability, falls, social isolation, reduced quality of life, dependency and institutionalisation. The age-related loss of physical performance often results from multiple clinical and subclinical conditions. In order to develop interventions against the disabling cascade in older persons, over the last decade special interest has been paid to the geriatric syndrome of frailty. Frailty has been defined as a «multidimensional syndrome characterized by decreased reserve and diminished resistance to stressors» in older persons. The clinical picture of frailty (especially when assessed using instruments particularly focused on the physical domain) presents substantial overlap with that of sarcopenia ("a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength with a risk of adverse outcomes such as physical disability, poor quality of life and death"). In other words, sarcopenia might be considered both as the biological substrate for the development of physical frailty as well as the pathway through which the negative health-related outcomes of frailty ensue. Methods: The relevance of the "Physical Frailty & Sarcopenia" (PF&S) condition needs to be established from its prevalence in the population. For the identification of clinical improvements, it is necessary that all of the components of the syndrome are measurable and quantifiable. The conceptualisation of the PF&S condition proposed by the SPRINTT ("Sarcopenia and Physical Frailty in Older People: Multicomponent Treatment Strategies") consortium is indeed based on objectively measurable parameters making it easily applicable in the clinical setting. The SPRINTT clinical trial represents the first attempt to 1) identify a precise subset of frail elderly with unmet medical needs, and 2) implement a multi-component intervention (MCI) aimed at preventing incident disability and major negative health-related events. Results: The prevalence of PF&S in a French elderly population will be presented based on data collected at the Frailty Day Hospital in Toulouse. The rationale for implementing intervention strategies based on exercise and nutrition will be discussed. Finally the design and initial recruitment data of the SPRINTT clinical trial will be presented. Conclusions: The conceptualization of PF&S based on objective parameters with definite biological substrate may allow overcoming the traditional resilience of the clinical arena to the implementation of frailty in the standard practice. The SPRINTT clinical trial will provide evidence of efficacy for a multidomain intervention primarily based on physical exercise and nutrition.

Communication 1: *Prevalence of Sarcopenia in frail older adults. Results from the Frailty Day Hospital,* G. Abellan van Kan, M. Cesari, S. Sourdet, B. Vellas (Toulouse, France)

Communication 2: *Physical activity to contrast physical frailty and sarcopenia,* M. Tosato, E. Marzetti, R. Calvani, A.M. Martone, E. Ortolani, F. Landi (Rome, Italy)

Communication 3: *Role of nutrition in physical frailty and sarcopenia,* R. Calvani, E. Marzetti, M. Tosato, A.M. Martone, E. Ortolani, F. Landi (Rome, Italy)

Communication 4: *SPRINTT clinical trial deployment,* E. Marzetti, R. Calvani, M. Tosato, A.M. Martone, E. Ortolani, F. Landi (Rome, Italy)

S5- MODELS OF CARE FOR FRAIL OLDER PEOPLE IN THE COMMUNITY. R. Visvanathan *(Adelaide, Australia)*

Like the majority of countries all over the world, Australia's population is ageing. Older Australians expect to live longer with quality lives and achieve Healthy Ageing. There are, however, common conditions associated with growing older that pose serious health risks, and about which researchers know too little in terms of screening and management. Frailty is such a condition and frailty is the focus of our recently funded National Health and Medical Research Council Centre of Research Excellence. Projecting to 2050, we estimate that almost 850,000 older Australians living in the community are likely to be frail, and by 2050, four million Australians aged 70 years and older will either be frail or at-risk of frailty. Community based models of care for the frail must be developed and translated if our health care system is to remain sustainable and adequately meet consumer needs and expectations.

Communication 1: *Frailty levels in residential aged care facilities measured with the Frailty Index and FRAIL-NH Scale,* O. Theou[1], E.C.K. Tan[2], J.S. Bell[2], T. Emery[3], L. Robson[3], J.E. Morley[4], K. Rockwood[5], R. Visvanathan[3] (1. Novia Scotia, Canada; 2. Melbourne, Australia; 3. Adelaïde, Australia; 4. Saint-Louis, USA; 5. Nova Scotia, Canada)

Background: As new models of community-based care are developed, residential aged care facilities increasingly cater for the

frailest sub-set of older people. Nevertheless, research on how best to manage and assess frailty in residential aged care is limited. The aim of this study was to assess levels of frailty in Australian residential aged care facilities using the Frailty Index and the newly developed FRAIL-NH scale. Additionally, the relationship between frailty and other health measures was examined. Methods: A cross-sectional study of permanent residents of six Australian residential aged care facilities was undertaken in 2014. Frailty was assessed using a 66-item Frailty Index and the FRAIL-NH scale. Other measures examined were: dementia diagnosis, level of care, resident satisfaction with care, nurse-reported resident quality of life, neuropsychiatric symptoms, and professional caregiver burden. Results: 383 participants aged 65 years and older (mean 87.5±6.2 years, 77.5% females, 77.8% born in Australia) were recruited. Based on the Frailty Index 60.8% of participants were categorized as frail, and 24.4% were categorized as most frail. Based on the FRAIL-NH 37.5% of participants were classified as frail and 35.9% as most frail. Females (Frailty Index 0.36±0.13, FRAIL-NH 4.9±4.1) were assessed as being frailer ($p<0.05$) than males (Frailty Index 0.31±0.12, FRAIL-NH 3.9±3.6) using both tools. Frailty Index levels were higher in those aged 95+ years (0.39±0.13) compared to those aged younger than 85 years (0.33±0.13; $p<0.01$), and among those born outside Australia (0.38±0.13) compared to those born in Australia (0.34±0.13; $p<0.05$). Both frailty tools were associated with all other health measures examined with the Frailty Index having stronger associations with all of these measures. Conclusion: Frailty can be measured in residential aged care facilities using the Frailty Index and FRAIL-NH scale. It was possible to grade frailty levels with the overall prevalence of frail and most frail participants ranging from 73% to 85% depending on the scale used. Both frailty tools were associated with most characteristics that would indicate higher care needs, with the Frailty Index showing a stronger association with these characteristics.

Communication 2: *Approaches to frailty treatment in frail and pre-frail community living older people,* S. Kurrle, I.D. Cameron, C. Sherrington, S. Lord (Sydney, Australia)

Background: A number of approaches for "treating" frailty are potentially feasible. These include direct interventions for the phenotypic characteristics of frailty, or more general approaches based on comprehensive geriatric evaluation and management and then targeted interventions based on health status, disabilities and other factors. This presentation reviews the approaches to "treatment" of frailty used in two randomized trials to ascertain whether a common approach can be applied both in frailty and pre-frailty. Methods: Two randomized trials have been conducted. Both applied interdisciplinary multifactorial interventions based on phenotypic characteristics using Cardiovascular Health Study criteria and comprehensive geriatric assessment. One study involved with frail community living older people (ACTRN12608000250336) and the other pre-frail older people (ACTRN12613000043730). A narrative review of the feasibility, implementation and operation of the studies is provided, together with analyses of adherence to the interventions. Results: High rates of retention in the studies were achieved. The studies demonstrated that multifactorial interdisciplinary interviews could be delivered with coordination from a key staff member (physical therapists). The components of the interventions were broadly similar although the pre-frail participants were able to participate in higher intensity exercise programs, had fewer unstable health conditions and require fewer community support services. Adherence to the interventions was limited in both groups. Conclusion: Implementation of frailty, and pre-frailty, "treatment" programs are feasible and will be associated with benefit if adequate levels of adherence are achieved.

Communication 3: *Towards a patient centred virtual orthogeriatric liaison service - lessons from a hip fracture outcomes study,* M. Chehade, T. Gill (Adelaïde, Australia)

Background: Hip fractures commonly affect the frail. Hip fractures often lead to a loss of independence, decreased mobility and a reduction in quality of life – those previously living independently in the community may suddenly need to transition to living arrangements providing them with higher levels of care. It has been demonstrated that half of hip fracture patients suffer from a permanent decline in mobility, with a subsequent decline in overall function. There are issues of follow-up and the ability to return for appointments, transport, access to services and communication in terms of potential language difficulties and lower levels of cognition. Services need to be "re-imaged" to ensure that appropriate follow up and support are provided. "Outreach" or "remote" clinics or virtual liaison services may be able to address these challenges and fill in service gaps. Methods: A prospective cohort study, of those admitted for treatment of fragility trochanteric hip fractures over a two year period (August 2011-July 2013, 423 participants), was designed to provide a more individualised model of post-discharge care which recognises pre-injury risk factors and inadequacies in follow-up in order to reduce complications. Data were collected relating to pre-injury status (mobility, balance, hip pain, activities of daily living, medication use, past medical history). A clinical follow up service completed post injury assessment forms by telephone at 6 weeks, 3, 6 and 12 months and examined similar issues to the pre-injury assessment and included an assessment of functional recovery and the occurrence of any post-discharge complications or concerns. A satisfaction survey was also conducted with 100 patients at six months to determine perceptions of logistical barriers to follow-up; confidence with, and convenience of, the service; preferences for follow-up care; and overall satisfaction. Results: A high follow up rate was achieved overall (99% at 12 months), with 86% satisfaction with the service. The results have also demonstrated that clinical outcomes are achieved and identified barriers to attending outpatient, hospital-based clinics. However these issues are different and vary according to the type of respondent, that is, patient, carer or residential care. These groups also had different needs in terms of community-based management, however there are challenges to linking in with associated services. Conclusion: Implementation of a remote virtual clinic allows improved community follow of older patients with limited mobility. The clinic provides opportunities to reduce burden on the patients, carers and hospital resources, integrate post-fracture care and can identify and target information/education gaps. Lessons from this work are being used in the design of the next phase, the development of an online based program. These include the transition of assessments into routine follow-up with clinical staff, the potential to create an «orthogeriatric» follow up service; patient centred/ integrated care and links to carers and health professional resources.

S6- KINETIC AND STATIC BIOMARKERS FOR CHANGING SKELETAL MUSCLE MASS AND FUNCTION: STABLE ISOTOPE RESEARCH COMES OF AGE. W. Evans *(Durham, USA)*

Communication 1: *Stable isotope research comes of age: 2H2O labeling and kinetic biomarkers as predictors of effects of disease and treatment,* M. Hellerstein (Berkeley, USA)

The use of stable isotopes has provided a means to assess kinetic changes in metabolism, however, until recently, methods for assessment have been limited. For example, the primed-constant

infusion of stable labeled amino acids provides only a brief (2 – 24 hrs) time period and must be carried out in a clinical setting. The use of 2H2O provides a non-invasive means of labeling amino acids, DNA, lipids and other compounds to assess the rates of protein synthesis, cellular proliferation, and de novo lipogenesis. We have recently applied a proteomic approach allowing the quantification of rate of synthesis of large numbers of muscle proteins of different ontologies, including mitochondrial, sarcoplasmic, myofibrillar, structural, and fibrotic.

Communication 2: *Rate of muscle protein synthesis as a biomarker for muscle wasting and anabolic response,* W. Evans (Durham, USA)

Sarcopenia and atrophy due to immobilization occurs largely as a result of decreased rate of muscle protein synthesis. New anabolic therapies that increase muscle mass and function increase the rate of muscle protein synthesis. The assessment of the fractional rate of muscle protein synthesis (FSR) can be measured over hours, days or weeks using 2H2O labeling of muscle proteins and is strongly associated with increased skeletal muscle mass after anabolic therapy. Muscle protein FSR can be assessed without a muscle biopsy using circulating proteins synthesized in muscle such a CK-M.

Communication 3: *Creatine dilution for the measurement of muscle mass in old men: Association with functional status in the MrOs trial,* P. Cawthon (San Francisco, USA)

The dilution of orally delivered D3-creatine can be measured using a single fasting urine sample. This allows the direct measurement of total body creatine and because ~98% of creatine in intramyocellular, muscle mass. We have employed this method in the ongoing MrOs trial and have dosed and collected usable urine sample from 1,320 men (80 – 100 yr) in this study. In addition to muscle mass by creatine dilution, DXA (whole body and appendicular), strength, functional capacity, and health outcomes have been measured. Here, we will provide an interim analysis of a subset (>500 subjects) with complete data set available.

S7- MUSCLE INDICES UNDERLYING FUNCTIONAL DECLINE IN AGING POPULATIONS. B. Beamer *(Baltimore, USA)*

Introduction: Decreased mobility function is currently a leading cause of long-term care admissions.1 While the cause of decreased mobility is multifactorial in nature, muscle changes associated with normal aging and compounded by comorbidities, poor nutrition and inactivity contribute to reduced function and the progression towards frailty. Older adults appear to be particularly susceptible to changes within muscles including altered muscle mass and quality2 leading to metabolic changes as well as decreased muscle strength, power, and balance and gait performance ultimately resulting in functional declines and frailty.2-4 Recent evidence suggests that not only are the nature of muscle changes important but also the location.5 Impairments of postural and locomotor muscles impact gait contributing to dysmobility.5-7 Other evidence suggests deficits in proximal hip muscles function are particularly harmful to mobility contributing to balance and gait dysfunction including altered step length, increased gait variability, and a higher risk for falls. 7,8 Identifying the specific muscle contributions to balance and mobility dysfunction in older adults is crucial in developing effective and innovative preventive and restorative treatment strategies. Objectives: This symposium will discuss both the common changes that occur in muscle structure and function across disease, and also detail unique changes that contribute to disability in specific disease states commonly found in older adults including obesity, stroke and peripheral arterial disease. We will also present recent evidence that suggests structural and functional changes in proximal hip musculature may be a critically important contributor to balance and mobility decline and increased fall risk. Finally, we will discuss novel and innovative rehabilitation treatment strategies aimed to improve muscle function and mobility in older adults who are at risk for functional decline and frailty. Discussion: As the population of older adults continues to increase, understanding the muscle changes that contribute to functional declines and frailty is critically important to developing novel and effective treatments to combat mobility disabilities. This symposium will increase the understanding of some of these changes and provide a discussion on novel ways to implement treatments to reduce fall risk and improve functional mobility. Conclusion: Development of treatments to improve the multitude of muscle changes that commonly occur with aging and disease specific states is necessary to avoid long-term care admissions and improve mobility outcomes with interventions. This symposium will target the muscle specific changes that occur in older people and common disease states to stimulate discussion and research in these areas. References : 1. Addison O, Young P, Inacio M, et al. Hip but not thigh intramuscular adipose tissue is associated with poor balance and increased temporal gait variability in older adults. Current aging science. 2014;7(2):137-143. 2. Addison O, Young P, Inacio M, et al. Hip but not thigh intramuscular adipose tissue is associated with poor balance and increased temporal gait variability in older adults. Current aging science. 2014;7(2):137-143. 3. Inacio M, Ryan A, Bair W, Prettyman M, Beamer B, Rogers M. Gluteal muscle composition differentiates fallers from non-fallers in community dwelling older adults. BMC Geriatr. 2014, March 25; 14:37. 4. Addison O, Marcus RL, Lastayo PC, Ryan AS. Intermuscular fat: a review of the consequences and causes. International journal of endocrinology. 2014;2014:309570. 5. Marcus RL, Addison O, Dibble LE, Foreman KB, Morrell G, Lastayo P. Intramuscular adipose tissue, sarcopenia, and mobility function in older individuals. Journal of aging research. 2012;2012:629637. 6. Delmonico MJ, Harris TB, Visser M, et al. Longitudinal study of muscle strength, quality, and adipose tissue infiltration. The American journal of clinical nutrition. Dec 2009;90(6):1579-1585. 7. Gaugler JE, Duval S, Anderson KA, Kane RL. Predicting nursing home admission in the U.S: a meta-analysis. BMC Geriatr. 2007;7:13. 8. Goodpaster BH, Park SW, Harris TB, et al. The loss of skeletal muscle strength, mass, and quality in older adults: the health, aging and body composition study. J Gerontol A Biol Sci Med Sci. Oct 2006;61(10):1059-1064. 9. Visser M, Kritchevsky SB, Goodpaster BH, et al. Leg muscle mass and composition in relation to lower extremity performance in men and women aged 70 to 79: the health, aging and body composition study. J Am Geriatr Soc. May 2002;50(5):897-904.

Communication 1: *Conditions of muscle disease related disablement,* A.S. Ryan (Baltimore, USA)

This presentation will focus on the skeletal muscle and functional changes that occur in obesity and conditions of disability (e.g. stroke and peripheral vascular disease) and the use of exercise training to alter metabolism, strength, and mobility. References: Ryan AS, Li G, Blumenthal JB, Ortmeyer HK. Aerobic exercise + weight loss decreases skeletal muscle myostatin expression and improves insulin sensitivity in older adults. Obesity. Jul 2013;21(7):1350-1356. Ryan AS, Ivey FM, Prior S, Li G, Hafer-Macko C. Skeletal muscle hypertrophy and muscle myostatin reduction after resistive

training in stroke survivors. Stroke 2011; 42(2):416-420. Ryan AS, Buscemi A, Forrester L, Hafer-Macko CE, Ivey FM. Atrophy and intramuscular fat in specific muscles of the thigh: associated weakness and hyperinsulinemia in stroke survivors. Neurorehabilitation and Neural Repair. Nov-Dec 2011;25(9):865-872.

Communication 2: *Specificity of muscle changes and risk of falls,* O. Addison (Baltimore, USA)

This communication will focus on specific postural and locomotor muscles that are important in dysmobility and fall risk. We will discuss recent findings that suggest alterations to proximal hip muscles, including the hip abductors and extensors, which contribute to balance and mobility changes ultimately leading to functional changes and increased fall risk. References: Addison O, Marcus RL, Lastayo PC, Ryan AS. Intermuscular fat: a review of the consequences and causes. International Journal of Endocrinology. 2014; 2014:309570. Inacio M, Ryan A, Bair W, Prettyman M, Beamer B, Rogers M. Gluteal muscle composition differentiates fallers from non-fallers in community dwelling older adults. BMC Geriatr. 2014;14:37. Addison O, Young P, Inacio M, et al. Hip but not thigh intramuscular adipose tissue is associated with poor balance and increased temporal gait variability in older adults. Current Aging Science. 2014;7(2):137-143. Marcus RL, Addison O, Dibble LE, Foreman KB, Morrell G, Lastayo P. Intramuscular adipose tissue, sarcopenia, and mobility function in older individuals. Journal of Aging Research. 2012; 2012:629637.

Communication 3: *Translating science into rehabilitation interventions,* M. Inacio (Baltimore, USA)

This communication will discuss novel treatment paradigms and approaches being used to combat the specific muscle and functional changes that occur in aging and multiple disease states. An emphasis will be placed on treatments that focus on enhancing balance, reducing fall risk and improving mobility by improving muscular activation and performance. References: Sanders OP, Savin DN, Creath RA, Rogers MW. Protective balance and startle responses to sudden freefall in standing humans. Neuroscience letters. Jan 23 2015;586:8-12. Mille ML, Johnson-Hilliard M, Martinez KM, Zhang Y, Edwards BJ, Rogers MW. One step, two steps, three steps more ... Directional vulnerability to falls in community-dwelling older people. J Gerontol A Biol Sci Med Sci. Dec 2013;68(12):1540-1548. Hilliard M, Martinez KM, Janssen I, Edwards B, Mille M-L, Zhang Y, Rogers MW. Lateral balance factors predict future falls in community living older adults. Arch Phys Med Rehabil. 2008;89:1708-13. Rogers MW, Hedman LD, Johnson ME, Martinez KM, Mille ML. Triggering of protective stepping for the control of human balance: age and contextual dependence. Brain research. Cognitive brain research. Apr 2003;16(2):192-198. Rogers MW, Johnson ME, Martinez KM, Mille ML, Hedman LD. Step training improves the speed of voluntary step initiation in aging. J Gerontol A Biol Sci Med Sci. Jan 2003;58(1):46-51.

S8- FRAILTY IN NURSING HOME: WHAT WE KNOW AND WHICH SOLUTIONS?

M. Aubertin-Leheudre *(Montréal, Canada)*

In Western countries, about 25% of the population is constituted by older persons, and 20% of these individuals lives in nursing home (NH). The number of people with functional declines as well as the number of individuals living in institutional settings are expected to rise in the next decades around the world. Nursing homes are supposed to deliver high quality and complex medical care. Overall, NH residents have different concomitant clinical issues, such as functional limitations, disabilities, cognitive impairment, multiple and interacting chronic diseases, polypharmacy. Since, residents in NH represent an extremely heterogeneous population in terms of clinical conditions, risk factors, and preserved homeostatic reserves. It is thus important to differentiate their health statuses by adopting instruments that are able to objectively capture the biological age of this too rarely studied (but increasing) population. In this context, the Frailty Index proposed by Rockwood and Mitniski represents a unique opportunity. Thus the first speaker will present the results from the use of the Frailty Index in the INCUR project (a prospective cohort study recruiting and following over 12 months 800 nursing home residents in France). In addition, it is important to note that 65% of health care costs are related to the elderly population. It has been recently reported that minor injuries can trigger worsening of physical function in 15-18% previously independent seniors up to 6 months post-injury and may mask an underlying and not yet undetected frailty status. Although some studies have investigated the burden of co-morbid diseases in older adults, few studies have quantified the risk of hospitalizations and emergency department (ED) visits according to the type of comorbidities in NH residents. Thus, the second speaker will present results of analyses aimed at exploring the relationships existing between the burden and associations of comorbidities with the total number of hospitalizations and ED admissions in a large sample of NH residents (IQUARE study). Finally, preliminary evidence suggests that exercise might produce beneficial effects when implemented as preventive and therapeutic intervention in older NH residents. Although about one-third of NH residents attends sessions of physical exercises, only 9% of all the residents can be considerate as sufficiently active. Such a high level of sedentariness might contribute to the aggravation of their physical functional status. Even if the presence of physical therapists can increase the rate of active elderly individuals, it is unfeasible for these healthcare professionals to meet the needs of all the possible beneficiaries among NH residents. Therefore, it has been proposed that programs of adapted physical activity (APA) developed with the use of gerontechnology could represent a novel and promising possibility for counteracting sedentariness and frailty. Thus, the third speaker will present the results of studies conducted for ascertain the feasibility and potential benefits of APA gerontechnology interventions in elderly individuals having experienced recent injuries and/or living in nursing home.

Communication 1: *Frailty index in nursing home - Results from the INCUR study,* M. Cesari (Toulouse, France)

Communication 2: *Impact of hospitalization on frailty in NH residents,* Y. Rolland (Toulouse, France)

Communication 3: *An adapted physical activity gerontechnology to prevent frailty in nursing home and following minor injury,* M. Aubertin-Leheudre (Montréal, Canada)

S9- SCREENING FOR FRAILTY AND SARCOPENIA.

J. Morley[1], B. Vellas[2] *(1. Saint Louis, USA; 2. Toulouse, France)*

Communication 1: *The Gerontopole experience,* B. Vellas (Toulouse, France)

Communication 2: *The rapid Geriatric assessment,* J. Morley (Saint Louis, USA)

Communication 3: *The Kihon index,* H. Arai (Kyoto, Japan)

S10- THE NIA AND FNIH INITIATIVES TO DEVELOP A CONSENSUS: DEFINITION OF SARCOPENIA. S. Bhasin, R. Fielding *(Boston, USA)*

Communication 1: *An Overview: Presentation of the larger goals of the initiative and its public health and regulatory importance,* S. Bhasin (Boston, USA)

Communication 2: *Generating cut-points using data from epidemiological studies and statistical considerations: Defining the specificity, sensitivity, predictive value of the cut-point,* T.G. Travison (Boston, USA)

Communication 3: *Application of the cut-points to clinical populations and RCT populations,* R. Fielding (Boston, USA)

Communication 4: *European initiative on cut-points to define sarcopenia,* F. Landi (Roma, Italy)

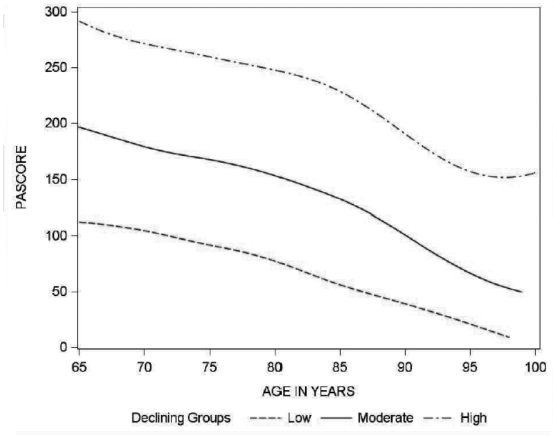
Communication 5: *Regulatory perspective: Presentation of regulatory view of this effort,* J. Sharretts (USA)

Oral Communications

OC1- CHANGES IN BODY COMPOSITION RELATIVE TO PHYSICAL ACTIVITY CHANGES IN OLDER MEN: THE MROS STUDY. D. Laddu[1], P. Cawthon[2], N. Parimi[2], A. Hoffman[1], E. Orwoll[3], I. Miljkovic[4], T.L. Dam[5], M. Stefanick[1] *(1. Stanford, USA; 2. San Francisco, USA; 3. Portland, USA; 4. Pittsburgh, USA; 5. New York, USA)*

Background Excess gains in adiposity and significant loss of lean mass may be risk factors for chronic disease in old age. The degree to which age-related changes in physical activity are associated with body composition decline in in older age is unknown. The purpose of this study was to assess patterns of change in physical activity as related to patterns of change in body composition in older community dwelling men over 6.9 years of follow-up. Methods Data from 5,964 men (mean age, 74 yrs), participating in the Osteoporotic Fractures in Men Study (MrOS) were included in the study. Self-reported physical activity (PA) assessed at baseline (Visit 1, V1), Visit 2 (V2; 5 years from baseline), and Visit 3 (V3; 6.9 years from V1) according to the Physical Activity Scale for the Elderly (PASE) (unitless, relative measure of physical activity). Body composition measurements, (i.e., weight, fat mass, appendicular lean mass) was assessed by scale and dual-energy x-ray absorptiometry (DXA) at study visits. Men with at least one measurement of PA were included in the analyses; whereas, only men with missing body composition values at all visits (n=30) were excluded from analyses. In all analyses, PA trajectories were used as the independent variable and body composition trajectories as the dependent variable. A descriptive analysis was performed using graphical methods to determine the association of physical activity patterns and body composition trajectory patterns. Specifically, group-based trajectory modeling was applied using TRAJ software in STATA to identify latent groups of individuals based on activity patterns. This method employed a semi-parametric mixture model to longitudinal data using the maximum likelihood method to determine the final model. The best fit model and number of trajectory groups for physical activity (PASE score), was determined using the Bayesian Information Criterion (2DBIC; criterion threshold = 410). Mean posterior probabilities were calculated to ensure internal reliability of the model, and in all models, an individual was assigned to a group based on his highest posterior group probability. The same model-fit criteria used to characterize physical activity trajectories were repeated to determine trajectories of each body composition variable, body weight, total fat mass and lean mass, over the 6.9 years follow up. Joint trajectory modeling was employed to examine trajectories in pairwise combinations of PA with each of the body composition variables (PA-weight, PA-fat mass, PA-lean mass) using similar model fit criteria. All models were repeated to stratify results by age to qualitatively examine the differences and similarities in patterns of change of these variables in the young-old (<73yrs) and older-old (≥73yrs). Results The group-based trajectory model identified three distinct activity groups (low-declining, moderate-declining and high-declining). The final models illustrated a decline in the PASE score for all three trajectory groups; however, the decline in activity patterns appear to remain constant among the high, moderate, and low activity groups over the 8-yr follow up (Figure 1). Declines in activity patterns appeared steeper in old-old versus young-old men. The final body composition models illustrated eight weight groups, five fat mass groups, and six lean mass groups, showing gradual declines in weight, stable (unchanged) levels of fat mass, and steep declines in lean mass across each body composition trajectory group, respectively. Joint trajectory modeling of PA and body composition variables illustrated varied decreases in weight, relatively stable fat mass and steep declines in lean mass patterns among all activity groups. Greater declines in weight and lean mass appeared to be among men in the moderate-declining group versus the low- and high-declining activity groups. Conclusion Physical activity levels, total body weight and lean mass patterns demonstrate declines with increasing age; whereas, fat mass appears to remain stable among men in low-, moderate-, and high-declining physical activity groups with age. These data suggest that the declines in weight and lean mass patterns may be attenuated with habitual physical activity during old age in elderly men.

Figure 1
Trajectories of Physical Activity with Age over 6.9 years of follow up



OC2- PSOAS MUSCLE AREA AND MUSCLE FAT INFILTRATION BEFORE AND AFTER ANTIRETROVIRAL THERAPY INITIATION IN HIV INFECTION. F. Masawi[1], S. Fiorillo[1], J.E. Lake[2], G.A. McComsey[3], T.T. Brown[4], A. Scherzinger[1], K.M. Erlandson[1] *(1. Aurora, USA; 2. Los Angeles, USA; 3. Cleveland, USA; 4. Baltimore, USA)*

Background: Physical function impairment and metabolic dysfunction occur commonly among HIV-infected compared to HIV-uninfected adults. Antiretroviral therapy (ART) initiation is associated with gain in both total body fat and lean body mass (estimate of

skeletal muscle mass) among HIV-infected adults, but little is known about the effects of ART and weight gain on the quality of the muscle (i.e., fat infiltration). In HIV-uninfected populations, fat infiltration of psoas or thigh skeletal muscle, as measured by CT scan Hounsfield units (HU), has been associated with physical function impairment and metabolic dysfunction. We hypothesized that ART initiation would be associated with greater fatty infiltration (lower attenuation) after 96 weeks of therapy, and may be a mechanism underlying physical function impairment and metabolic dysfunction. Methods: AIDS Clinical Trials Group study A5260s was a metabolic sub-study of a randomized ART initiation study (A5257) among ART-naïve participants. Sub-study participants had L4-L5 single-slice CT scans at baseline and week 96. Previously obtained scans were reanalyzed for psoas muscle attenuation by body-composition software with semi-automatic segmentation technique (Excelis Visual Information Systems, Boulder, CO). Differences in CT density (by HU) between adipose tissue and muscle estimated the amount of fat present in muscle, with lower HU indicating fat and higher HU indicating muscle. Psoas lean muscle area, intermuscular (psoas muscle with surrounding fat) and intramuscular (psoas muscle and fat within muscle only) density were the primary outcomes of interest. Regression models were used to determine associations between baseline psoas measures and covariates of age, gender, race/ethnicity, hepatitis C infection, smoking status, body mass index [BMI] and baseline CD4+ T-cell count; smoking was excluded in multivariate analyses as $p>0.15$ in univariate analyses. Multivariate models to estimate predictors of the change in psoas measures additionally included the CD4 count change over 96 weeks. Results: Baseline scans were available on 180 participants and paired week 96 scans on 120 participants. At baseline, participants were mostly male (89%) with a median age of 35 years (IQR 27-44); 39% were white non-Hispanic, 32% black-non Hispanic, and 24% Hispanic. The median BMI was 24.5 kg/m2 (IQR: 22.0-27.7) and CD4 count 344 cells/μL (IQR: 167-453). At baseline, median psoas lean area was 15.70 cm2 (IQR: 13.09-17.89); intermuscular density was 47.34 HU (IQR: 44.12-50.68) and intramuscular 53.81 HU (IQR: 51.92-56.27). In multivariate analyses, lower psoas area was associated with older age (0.094 cm2/yr, $p<0.0001$), female sex (6.77 cm2 , $p<0.0001$), Hispanic ethnicity (1.49 cm2, $p=0.018$), and lower BMI (0.27cm2 per kg/m2, $p<0.0001$); intermuscular density was associated with older age (0.26 HU lower/yr, $p<0.0001$), female sex (4.55 HU lower, $p=0.0022$), and Hispanic ethnicity (2.68 HU lower, $p=0.019$); lower intramuscular density was associated only with older age (0.13 HU/yr, $p<0.0001$). After 96 weeks of ART, psoas lean area increased by a mean of 0.3 cm2 (95% CI -0.04, 0.65; $p=0.09$), intermuscular HU decreased by 0.46 (95% CI -1.04, 0.12; $p=0.12$), and intramuscular density had minimal change (0.03 HU; 95% CI -0.43, 0.49; $p=0.89$). A greater increase in psoas lean area at week 96 was associated with black race (0.90 cm2), Hispanic ethnicity (0.94 cm2), and lower baseline CD4 count (0.07 cm2 /25 cells/μL; $p\leq0.033$). Race was the only significant predictor of changes in inter- and intramuscular HU: non-Hispanic whites had a significant decline in both measures compared to non-Hispanic blacks over 96 weeks (1.91 and 1.51 lower HU, respectively; $p\leq0.011$). Conclusions: Older age, female sex, and Hispanic ethnicity, but not HIV disease severity (CD4 count), were significant predictors of psoas muscle area and density prior to ART initiation. Although not statistically significant, ART initiation was associated with a trend towards increased psoas muscle mass and increased intermuscular fatty infiltration. Greater fatty infiltration (lower density) among whites following 96 weeks of ART suggests that this population may be an increased risk of metabolic and physical function impairment over time, in comparison to blacks. Inclusion of a measure of physical function in future research can confirm these findings..

OC3- BLOOD BASED BIOENERGETIC PROFILING REPORTS ON MUSCLE MITOCHONDRIAL FUNCTION AND IS ASSOCIATED WITH MULTIPLE MEASURES OF PHYSICAL ABILITY. D.J. Tyrrell, M. Bharadwaj, T.C. Register, A.J.A. Molina *(Winston-Salem, USA)*

Background: Blood based bioenergetic profiling strategies are recognized to have potential diagnostic and prognostic applications as reporters of systemic mitochondrial function. Compared to methodologies that utilize biopsied tissue, blood based approaches are minimally invasive, repeatable, and suitable for older adults, including those who are frail and/or ineligible for biopsy. Advancements in blood based bioenergetic profiling can also pave the way for large clinical trials focused on examining the role of mitochondria in age-related physical function decline. Our recent publications have reported that the respiratory capacity of peripheral blood mononuclear cells is associated with gait speed, Ex-SPPB (expanded short physical performance battery) score, knee extensor strength, grip strength, muscle quality, and inflammation in community dwelling older adults. While our studies and others support the utility of blood based bioenergetic profiling, evidence on the ability of blood cells to report on the bioenergetic capacity of tissues remain lacking. In order to address this gap in knowledge, we utilized vervet primates which provide us with expanded access to blood and tissues. Previous studies have shown that Vervet primates model human aging based on their susceptibility to numerous age related disorders such as metabolic and physical function decline. Methods: We selected a diverse cohort of vervet primates (ages 8yrs-24yrs) to examine the respirometric profiles of peripheral blood mononuclear cells, purified CD14+ cells, and platelets. Respirometric profiles of each cell population were compared to skeletal muscle (vastus lateralis) bioenergetic capacity measured by high resolution respirometry of permeabilized fiber bundles and the intrinsic electron transport chain function of mitochondria isolated from skeletal and cardiac muscles. Results: Key features of skeletal and cardiac muscle mitochondrial function were recapitulated across multiple circulating cell types. Among the relationships uncovered, the maximal respiratory capacity of CD14+ monocytes was significantly positively correlated with permeabilized skeletal muscle maximal oxidative phosphorylation capacity (OXPHOS) driven by substrates for complexes I and II together ($R=0.71$, $p=0.010$) and for complex I alone ($R=0.72$, $p=0.009$). Similarly, monocyte maximal respiratory capacity was also correlated with the FCCP-linked respiratory control ratio (RCR-F) of isolated skeletal muscle mitochondria ($R=0.70$, $p=0.017$). Furthermore, the maximal uncoupled respiration of platelets was significantly positively associated with complex I+II driven OXPHOS in permeabilized skeletal muscle fibers ($R=0.51$, $p=0.036$). Conclusion: Comprehensive assessments of mitochondrial function in non-human primates reveal that multiple features of muscle bioenergetics are recapitulated by circulating cells, particularly CD14+ monocytes. These results suggest that individual cell types and respirometric parameters likely have variable utility with regard to potential prognostic and diagnostic applications. We are currently utilizing state of the art Machine Learning approaches designed for high dimensional data analysis to address key questions that stem from this work, such as: 1) Which cell type and variable should be the focus of future studies? 2) Does the cell type/variable of interest differ based on the outcome of interest (e.g. age, disease status, prognosis)? 3) Can we identify patterns comprised of multiple variables and/or multiple cell types that are most closely related to age, physical function, and other outcomes of interest?

OC4- LOW LEAN MASS EXAGGERATES THE HEMODYNAMIC RESPONSES TO MUSCLE METABOREFLEX ACTIVATION IN POSTMENOPAUSAL WOMEN. A. Figueroa[1], S.J. Jaime[2], S.A. Johnson[3], S. Alvarez-Alvarado[2], J.C. Campbell[2], R.G. Feresin[4], M.L. Elam[5], B.H. Arjmandi[2] *(1. Tallahassee, USA; 2. Fort Collins, USA; 3. Little Rock, USA; 4. Pomona, USA)*

Background: The age-related loss in muscle mass is associated with arterial dysfunction measured as increased arterial stiffness (pulse wave velocity, PWV) and radial pressure wave reflection (augmentation index, AIx), especially in women. The exaggerated blood pressure (BP) and aortic AIx responses to metaboreflex activation (post-exercise muscle ischemia, PEMI) have been reported in older and hypertensive adults. The influence of low appendicular skeletal mass (ASM) index (ASMI) on vascular responses to PEMI is currently unknown. We hypothesized that postmenopausal women with low-ASMI would exhibit exaggerated vascular reactivity to PEMI compared to women with normal-ASMI. Methods: Brachial and aortic BP, heart rate (HR), radial AIx, and aortic AIx were measured in postmenopausal women with low-ASMI (n= 25) and normal-ASMI (n= 26) at rest and during PEMI following isometric handgrip at 30% maximal voluntary contraction. ASMI was calculated as ASM/height2 measured by dual-energy x-ray absorptiometry. Pressure waves and brachial-ankle PWV were measured by arterial tonometry and volume-plethysmography, respectively. Results: There were no significant differences in resting BP between the groups. Resting radial AIx, aortic AIx, and brachial-ankle PWV were higher in women with low-ASMI than normal-ASMI. Increases in aortic systolic BP during PEMI were greater in women with low-ASMI than normal-ASMI (Δ33±2 vs. Δ25±2 mmHg, P < 0. 05). Increases in aortic pulse pressure during PEMI were greater in women with low-ASMI than normal-ASMI (Δ18±2 vs. Δ9±1 mmHg, P < 0.05). Although radial AIx, aortic AIx, reflection time, and HR responses were similar in both groups, the increases in first (P1) and second (P2) systolic peaks of radial (ΔP1: 33±3 vs. 23±2 mmHg; ΔP2: 34±3 vs. 26±2 mmHg, P < 0.05) and aortic waves (ΔP1: 25±2 vs. 17±2 mmHg; ΔP2: 34±2 vs. 24±3 mmHg, P < 0.01) during PEMI were greater in women with low-ASMI than normal-ASMI. Conclusion: These findings indicate that low-ASMI influences an exaggerated BP and pressure wave reactivity to metaboreflex activation in non-obese postmenopausal women compared with obese women with normal-ASMI. The augmented vascular responses to the muscle metaboreflex may increase the risk for cardiovascular events in sedentary non-obese postmenopausal women with low-ASMI. Exercise training studies are needed to examine the impact of muscle mass gain on metaboreflex activity in older adults with sarcopenia.

OC5- SELF-REPORTED DIFFICULTY WITH PHYSICAL FUNCTION IS A SIGNIFICANT PREDICTOR OF FUTURE DECLINES IN COGNITIVE FUNCTION. M. Nakazawa, A. Fitri, J. Suhr, B.C. Clark *(Athens, USA)*

Background: Recent work suggests that slow gait speed and gait abnormalities are predictive of the development of dementia. The purpose of this study was to determine to what extent cognitive function and self-reported physical function influence each other over time, after controlling for baseline levels. We hypothesized that poor levels of self-reported physical function would be associated with significant reductions in cognitive function over time. Methods: We used data from the Health and Retirement Study (HRS), which is a longitudinal study of a representative sample of Americans over age 50. The HRS data set assesses individuals every two years for up to 20 years. Utilizing the HRS data, we calculated a total recall index (TRI) as a measure of cognitive function. The TRI was computed as the sum of the immediate and delayed word recall scores, and had a score range of 0-20, with a higher score reflecting greater cognitive function. We also calculated a physical function index (PFI) as a measure of physical function. The PFI was computed by summing the number of eight tasks participants self-reported difficulty performing (1. walking one block; 2. walking several blocks; 3. walking across the room; 4. climbing one flight of stairs; 5. climbing several flights of stairs; 6. getting up from a chair; 7. stooping or kneeling or crouching; and 8. pushing or pulling a large object). The PFI score range was between 0-8, with a lower score reflecting greater physical function. We applied bivariate latent change score (BLCS) modeling to the TRI and PFI data while covarying for survey cohort, gender, years of education, age, BMI, physical activity status (i.e., whether they reported performing vigorous physical activity > 3x/wk at baseline), and arthritis (i.e., whether they reported having osteoarthritis at baseline). Results: There was complete data on 4,889 older adults for this analysis (56% women, age at baseline=63.3±12.1, BMI at baseline=26.7±5.2, years of education at Baseline=12.1±3.5). At baseline, 28% of the subjects were classified as being physically active and 44% as having arthritis. The BLCS model indicated that higher PFI scores measured at one point were associated with greater reductions in TRI scores (ΔTRI=-1.33±0.03, p<0.001). Conversely, higher TRI scores were significantly associated with greater increases in the PFI scores (ΔPF = 0.03±0.01, p<0.001). The influence of the PFI scores on the later ΔTRI scores was greater than the reverse scenario (i.e., TRI influence on ΔPFI), as removing this path resulted a greater model deterioration, measured by changes in Akaike's Information Criterion (AIC) (ΔAIC=1,702 for removing PFI → ΔTRI; ΔAIC=27 for removing TRI→ ΔPFI). Conclusions: Self-reported difficulty with physical function is a significant predictor of future declines in cognitive function. These findings are consistent with the recently proposed Motoric Cognitive Risk Syndrome. We interpret these findings to suggest that physical activity may be a moderator of this relationship (i.e., reductions in physical function result in reductions in physical activity, which contributors to declines in cognitive function) or that neurodegenerative processes underlie reductions in both physical and cognitive function and that the motor system exhibits these impairments earlier than the cognitive system. Future work is needed to identify the determinants of this relationship.

OC6- DANCING IN OLD AGE AFFORD NEUROMUSCULAR PROTECTION. M. Narici[1], K. Rehfeld[2], N. Müller[2], D. Rankin[1], A. Hökelmann[2] *(1. Derby, United Kingdom; 2. Magdeburg, Germany)*

Introduction: Motor neuron degeneration, denervation, loss of structural and functional integrity of the neuromuscular junction (NMJ) and loss of motor units (MUs), markedly contribute to the age-related decline in muscle mass (sarcopenia) (Deschenes, 2011). Evidence of NMJ degeneration in sarcopenic individuals is now available from serum measurements of c-terminal peptide agrin fragment (CAF), a breakdown product of the heparan sulphate proteoglycan agrin, released after NMJ damage (Hettwer et al. 2013). Interestingly, aerobic exercise in senile rats seems to protect against denervation and NMJ degeneration (Valdez et al. 2010) and in humans, no decline in MUs has been found in muscles of master runners (Power et al. 2010). Objectives: The present study aimed to investigate whether an aerobic activity such as dancing could have neuroprotective effects when compared to conventional gym exercise training. Methods: Thirty-seven older individuals (aged 71.6±3.5 yr) were recruited (18 female and 19 male) and randomly assigned either to a Dance Group (DG, 9 female, 10 male) or to a

Gym Exercise Group (GEG, 9 female, 9 male). Both interventions took place twice a week, lasted 90 minutes each, for a period of six months. DG training consisted of Line, Jazz, Rock 'n' Roll, Latin-American and Square dances. GEG training consisted of endurance, strength-endurance and flexibility training. For both DG and GEG, each set of exercises/dances, lasted 20 minutes. Blood samples were collected before and after the intervention to measure CAF levels in serum using a commercially available Elisa kit (NTCAF ELISA, Neurotune AG, Schlieren, Switzerland). The data were compared to those of reference populations of older sarcopenic and young controls (Hettwer et al. 2013). Values are means ± S.D., compared by paired or unpaired Student's t-Test, as appropriate. Results: Since no significant differences were found between CAF values of male and female participants of both groups, values were pooled together. Pre-training, CAF values of the DG (202.9±66.3 pM) and GEG (228.5±70.5 pM) groups were respectively 1.9 and 2.2-fold higher than those of a young reference population (4) and were statistically not different from aged-matched elderly controls (214.1±118.2 pM)(3). However, after the 6-month intervention period, CAF levels decreased by 15% ($P<0.001$) in DG, (pre 202.6±66 pM post 172.1±50.2 pM) while no changes were found in the GEG (pre 228.5±70.5pM, post 219.7±60.0 pM, n.s.). Discussion and Conclusions: The present findings suggest a reduction of neuromuscular degeneration in older humans as a result of a six-month recreational dancing intervention. Instead, general fitness training based on strength, endurance and flexibility exercises does not seem to produce these benefits. It is not clear how dancing affords this protection but this could be due to a reduction of oxidative stress (Vasilaki & Jackson 2013), inflammation (Nicklas & Brinkley, 2009) and/or improved neurotrophin levels (Sakuma & Yamaguchi, 2011). References: Deschenes MR (2011). Curr Aging Sci 4, 209-220. Hettwer S et al. (2013). Exp Gerontol 48, 69-75. Valdez G et al. (2010). Proc Natl Acad Sci 107, 14863-14868. Power GA et al. (2010). Med Sci Sports Exerc 42,1644-1650. Vasilaki & Jackson (2013). Free Radic Biol Med 65, 317–323. Nicklas & Brinkley (2009) Exerc Sport Sci Rev. 37, 165-70. Sakuma& Yamaguchi (2011). J Biomed & Biotechnol 201, 1-12.

OC7- BIOACTIVE COLLAGEN PEPTIDES AS A NEW CONCEPT FOR THE TREATMENT OF SARCOPENIA – OVERVIEW OF THE CURRENT RESEARCH. S. Oesser *(Kiel, Germany)*

The positive impact of protein supplementation in combination with resistance training for muscle growth and muscle strength in elderly people is generally accepted. In a meta-analysis consisting 22 clinical studies it was demonstrated that protein supplementation significantly increases fat-free mass (FFM) and strength compared to placebo. In most of these studies whey or milk protein was used, as it is generally believed that the protein should be high in branched-chain amino acids. For this reason, not much attention was paid to collagen as a protein source for the treatment of sarcopenia, although collagen peptides have an excellent bioavailability and have demonstrated their ability to stimulate the connective tissue cell metabolism. In recent studies, the influence of specific orally administered collagen peptides for muscle mass and muscle function was investigated for the first time. In a double-blinded RCT, 60 men (with a mean age of 72) suffering from sarcopenia class I or II underwent a guided resistance training program three times a week, and were supplemented with a daily dosage of 15 g collagen peptides or placebo. After three months, the fat-free mass (FFM) and fat mass (FM) was measured by DXA scan (dual-energy X-ray absorptiometry) and the results were compared with the baseline measurements. In addition, muscle power as isokinetic quadriceps strength (IQS) and sensory motor control (SMC) was evaluated by a standardized one-leg stabilization test. The data revealed a significant improvement in body composition and muscle strength in all study participants, but in subjects that had received the specific collagen peptides, the positive effects were statistically significantly more pronounced than with placebo. FFM increased by 4.2 ± 2.3 kg, and FM decreased by -5.4 ± 3.2 kg after collagen peptide treatment in comparison to the placebo treatment (FFM 2.9 ± 1.8, FM -3.5 ± 2.2 kg). Moreover, the IQS increased by more than twofold after collagen peptide administration (16.5 ± 12.9 Nm vs. 7.3 ± 13.2 in the placebo group). The results clearly demonstrated the beneficial effect of collagen peptide supplementation for the treatment of sarcopenia in combination with resistance training in elderly men. In principle, this positive effect was confirmed in a second double-blinded RCT on 114 men with a mean age of 50 years. The study design was identical to the previous study and investigated the effect of daily supplementation of 15 g of specific collagen peptides in combination with resistance training over a period of three months. In addition, the effect of a whey protein supplement (15g/d) was evaluated in the study. The main criteria evaluated by the study were changes in FFM and FM after three months of collagen peptide treatment compared with placebo. As demonstrated in the previous study on elderly subjects, collagen peptide intake also had a positive impact on the body composition of the participants. Muscle mass increased statistically significantly ($p<0.05$) after collagen peptide supplementation compared with placebo. In the treatment group, the FFM gain was 86% higher and muscle power was 12% higher than in individuals who received the placebo. Moreover, the analysis of differences in fat mass revealed a statistically significant decrease ($p<0.05$) after collagen peptide supplementation compared with placebo. Evaluation of the DXA results showed a more pronounced fat loss of 1.5 kg in the treatment group compared to subjects who received the placebo. Interestingly, the effect of a collagen peptide supplementation seems to be more pronounced than a treatment with the same amount of whey protein, as indicated by the higher effect sizes for FFM increase and loss in FM in subjects who received the specific collagen peptides. The positive effect might be explained by the excellent bioavailability of the peptides, the high nitrogen content (higher than whey on a per gram basis), and the special amino acid profile. Collagen peptides are rich in arginine and glycine, both essential substrates for creatine synthesis, which is known to improve muscle mass and muscular function and can reduce signs of sarcopenia. Moreover, it was demonstrated that collagen peptides have a positive influence on microcirculation, which might improve tissue supply and thus promote muscle growth. In conclusion, the results of the current studies support the use of specific collagen peptides to improve gains in muscle mass and muscle strength following resistance exercise. Furthermore, it has been shown that the reduction in fat mass was also significantly higher in subjects who received collagen peptides. Therefore, due to the promising results on muscle mass and functional outcome measures, a collagen peptide supplementation seems to be an interesting option for the improvement of the body composition and the treatment of sarcopenia.

OC8- FRAILTY AND ITS EFFECT ON FUNCTIONAL RECOVERY AFTER HIP FRACTURE IN MEN AND WOMEN. J.M. Guralnik, Y. Huang, D. Orwig, W. Lu, A. Gruber-Baldini, M. Hochberg, J. Magaziner *(Baltimore, USA)*

Background: Physical frailty has been one of the important geriatric syndromes that predict subsequent adverse health outcomes. Based on Fried and colleagues' definition, frailty describes a syndrome of decreased resiliency and reserves, which is characterized by exhaustion, weight loss, weak grip strength, slow walking speed,

and low energy expenditure. Frailty is defined as having 3 or more of these criteria. Given the popularity of frailty concept, this paper addresses two questions associated with its internal and external definition validity in post hip fracture patients: how do this syndrome and its five phenotype variables develop longitudinally, and how do they predict mobility and functional recovery, in the year after hip fracture in men and women? Methods: Baltimore Hip Studies (BHS-7) is a longitudinal study with 339 male and female hip fracture patients age 65 or older. For the study of frailty and its five components, our analytic sample contains 327 people (165 women and 162 men) with available frailty measurements at month 2. The main variables of interest are frailty status and its components (weight (kg), best grip strength among six trials (three left and three right, in kg), walking speed, total calorie expenditure per week based on self-reported Yale questionnaire (kCal/week), exhaustion) as well as two functional outcomes: Short Physical Performance Battery (SPPB) score and a self-reported mobility recovery status, which is generated after combining multiple criteria. Most variables are available at months 0, 2, 6, and 12, except walking speed which is only available at months 2, 6, and 12. For mobility recovery and SPPB analyses, our analytic samples contain fewer people due to including variables with more missingness. Potential confounders include sex, time, race (white vs. non-white), education, comorbidity (Charlson comorbidity index at baseline), and BMI. Longitudinal analysis was carried out for this investigation, including marginal models estimated by GEE and random effect models. Data were analyzed using SAS version 9.1 software. Results: Out of 165 women and 162 men in our sample, 27.3% of women and 35.8% of men were frail at month 2. Men had significantly higher prevalence of frailty, unintentional weight loss (>10 lbs) in the prior year, weakness in grip strength, and lower energy expenditure than women at month 2. Longitudinally, frailty and its five measures recovered substantially over the post-fracture year. The risk of being frail significantly reduced after month 2. And, there were significant declines in being exhausted, as well as increases in walking speed and total activities after month 2. Importantly, male hip fracture patients had better recovery than females in grip strength and walking speed, but not in weekly total activities. On average over the 1st year of follow-up, women's grip strength decreased 0.145 kilograms (95% CI: [-0.283, -0.007]) more per month than men, and women's walking speed increased less than men in the last 6 months, after adjusting all other confounders. Women had significantly higher self-reported weekly total calorie expenditure than men overall across the 1st year, even though women's total activities dropped faster than men at month 2, after adjusting for confounders. However, for the summary frailty measure, no trajectory difference by sex was observed. Longitudinal evaluations of the predictive ability of frailty and its five components at month 2 on mobility status and SPPB score at later months were performed as a way of assessing the external validity of the frailty definition in post hip fracture patients. Frailty at month 2 as a summary measure (i.e. syndrome) was a good prognostic predictor of subsequent SPPB recovery over one year. On average over time, the population mean SPPB score in frail group is 1.57 unit (95% CI:[-2.116, -1.022]) less than the non-frail group, after adjusting for confounders. But, frailty is not a good prognostic factor for self-reported mobility recovery after confounding adjustment. Interestingly, three out of five frailty components at month 2, including grip strength, gait speed, and weekly energy expenditure, were highly significant prognostic factors (all with P values < 0.01) for both functional recovery measures over one year. Additionally, significant sex differences in longitudinal trajectories of the two functional recovery measures were found, after confounding adjustments. Conclusion: Even though significant sex differences in recovery are identified in various measurements (grip strength, gait speed, and weekly total activities), the current summary measure of frailty might not be sensitive enough to capture them. Additionally, grip strength, gait speed, and total weekly activities at month 2, are good prognostic factors for the functional recovery measures (self-reported mobility recovery status and SPPB score) longitudinally. Therefore, the global frailty indicator may be obscuring the different changes that are happening in its components when comparing men and women. In summary, for the functional recovery process of hip fracture patients, these three measures might be more sensible to use than a frailty summary measure for future studies and clinical applications.

OC9- EFFICIENCY OF ORAL SUPPLEMENTATION FOR MALNOURISHED NURSING HOME RESIDENTS: RESULTS OF THE PRESAGE STUDY. Y. Rolland, D. Seguy, C. Bonhomme, G. Abellan, S. Walrand, Y. Boirie, B. Vellas *(Toulouse, France)*

No abstract.

OC10- CHARACTERIZATION OF THE LEAN-FAT MASS ASSOCIATIONS IN AGE, SEX, AND RACIAL GROUPS AND THE DEVELOPMENT OF FAT-ADJUSTED MEASURES OF LOW LEAN MASS AND SARCOPENIA. D. Weber[2], J. Long[3], M.B. Leonard[3], B. Zemel[1], J.F. Baker[1] *(1. Philadelphia, USA; 2. Rochester, USA; 3. Stanford, USA)*

Background: Adiposity has been observed to be an important confounder of the associations between muscle loss and physical functioning. Previous studies have suggested that adjustments for adiposity may improve correlations between muscle mass estimates and physical functioning. The appendicular lean mass to body mass index (ALM-to-BMI) ratio is one such method developed to account for adiposity in the assessment of skeletal muscle mass loss. Our aims were to develop and employ a more comprehensive method of estimating appendicular lean mass adjusted for the confounding effects of adiposity that could be practically applied in clinical research and in clinical assessments. We also aimed to assess the performance of this method in an at-risk group. Methods: This study utilized adult whole-body DXA data from the National Health and Nutrition Examination Survey (NHANES). Age-, sex-, and race-specific standard deviation scores (Z-Scores) and T-Scores (compared to 25 year-olds) for appendicular lean mass index (ALMI, kg/m2) and fat mass index (FMI, kg/m2) were determined for all subjects using previously defined methods within NHANES. Correlations between estimates of appendicular lean mass index ALMI and FMI Z-Scores were assessed within age, sex, and race categories. Fat-adjusted ALMI Z-Scores (ALMIFMI) (relative to age) and ALMIFMI T-Scores (relative to a 25 year-old) were determined using residual methods based on observed associations within age, sex, and race strata. Sarcopenia was defined as a sex/race-specific T-Score <-2.0 (2nd percentile for 25 year-olds) and low lean mass for age was defined as an age, sex, and race-specific Z-Score <-1.0 (16th percentile). Correlation and agreement between unadjusted and fat-adjusted measures was assessed. Associations between ALMI Z-Scores (standard and fat-adjusted) and physical functioning as measured by the validated Health Assessment Questionnaire (HAQ) were assessed using multivariable linear regression adjusting for age, sex, and pain levels among patients with rheumatoid arthritis (RA) and compared to associations observed with the ALM-to-BMI ratio. Results: Positive associations between ALMI and FMI Z-Scores were observed and significant ($p<0.001$) in all age, sex, and race categories in the NHANES study. However, the impact of a unit greater FMI Z-score on ALMI Z-score was less in the elderly, among men, and among white subjects ($p<0.001$). In addition, the impact of a unit greater FMI Z-Score on ALMI

Z-Score was greater among individuals with greater FMI Z-Scores ($p < 0.001$). The correlation between ALMI and ALMIFMI Z-Scores was moderate [$R=0.68$, $p<0.001$]. Correlation between ALMI and ALMIFMI T-Scores was also moderate [$R= 0.72$, $p<0.001$]. There was only fair agreement between unadjusted and fat-adjusted estimates of sarcopenia and low lean for age [Kappa: 0.46, 0.52, respectively ($p<0.0001$)]. As expected, those with greater adiposity were more likely to be reclassified as sarcopenic or low lean for age using the fat adjusted methods. Elderly subjects were more likely to be re-classified as sarcopenic with fat-adjustment while young subjects were more likely to be re-classified as normal. Among the 84 patients with rheumatoid arthritis, ALMIFMI Z-Scores demonstrated stronger associations with disability as measured by HAQ [β: -0.16 (-0.30, -0.020) $p=0.03$] after adjustment compared to the ALMI Z-Scores [β: -0.0021 (-0.14, 0.14) $p=0.98$]. Fat-adjusted definitions of low lean mass for age more clearly identified those with greater functional impairment as measured by the HAQ [β: 0.33 (-0.0078, 0.67) $p=0.055$ v. β: 0.14 (-0.18, 0.46) $p=0.38$]. These associations were independent of FMI. A low ALM-to-BMI ratio was not associated with functional impairment independent of the FMI Z-Score [β: -0.042 (-1.04, 0.95) $p=0.93$]. Conclusions: Adjustment of ALMI for the confounding association with FMI impacts the definition of skeletal muscle deficits. The methods described here provide immediate and practical tools based on widely available national reference data for investigators to be able to incorporate and validate these measures in clinical studies. Fat-adjusted estimates of skeletal muscle mass deficits demonstrate stronger correlations with physical functioning that are independent of adiposity and therefore represent a potentially useful and important outcome measure.

OC11- THE VALIDITY AND RELIABILITY OF A HAND-HELD ULTRASOUND DEVICE TO MEASURE MUSCLE SIZE. W. Nijholt, H. Jager-Wittenaar, E.V.A. Gorter, J.S.M. Hobbelen, C.P. van der Schans *(Groningen, The Netherlands)*

Background: Loss of muscle mass and function, also known as sarcopenia, is associated with functional decline and disability. In particular loss of quadriceps muscles might lead to loss of mobility. Currently, simple and reliable methods to measure muscle size in clinical practice are lacking. In research settings Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) are considered to be the 'gold standard' for the assessment of muscles. Compared to these techniques, ultrasound imaging (US) might be an alternative, due to its mobile, relatively cheap and non-ionising nature. Nowadays, hand-held US devices are being introduced, but understanding about the validity and reliability of this device to measure muscle size is lacking. Therefore, the aim of this study is to investigate the validity and reliability of a hand-held ultrasound device to measure muscle size in healthy adults, as compared to a regular ultrasound device. Methods: 37 healthy participants (mean age=28.1, 25 female), were included in this study. The participants were tested three times: twice with a hand-held US to assess intra-rater reliability and once with a regular US to assess the validity of the hand-held US compared to regular US as the gold standard. The size of the m. rectus femoris (RF-CSA), expressed in cross- sectional area (RF-CSA), was measured using the trackball on the regular device and an automatic region of interest on the hand-held device. Furthermore, RF diameter was measured on both devices. Agreement between measurements was tested by intraclass correlation coefficient (ICC). Results: An ICC of .95 (95% CI: .90-.97) was found for the validity of hand-held US versus regular US for measuring RF-CSA. ICCs ranging from 0.95 (95% CI: .90-.97) to .98 (95 % CI: .96-.99) for measuring RF diameter were found for the validity and the intra-rater reliability respectively. Conclusion: A hand-held US device is as valid and as reliable as a regular device for measuring RF-CSA and RF diameter. Future research should clarify whether muscle size can be extrapolated to whole body muscle mass, and how US can contribute to assessment of sarcopenia.

OC12- POOR SATELLITE CELLS IMPAIR MUSCLE REGENERATION DURING OSTEOPOROSIS AND SARCOPENIA. E. Piccirilli, J. Baldi, M. Scimeca, E. Bonanno, E. Gasbarra, U. Tarantino *(Rome, Italy)*

Backgrounds: osteoporosis is one of the most common diseases of musculoskeletal system and it is strongly associated with sarcopenia and muscle fiber atrophy. Sarcopenia is characterized by an histological deterioration of muscle tissue and by an important functional impairment due to poor structure and performance in the elderly. Methods: in this study we analyzed vastus lateralis muscle biopsies (20 biopsies of osteoarthritic women who underwent a Total Hip Arthroplasty (THA) and 20 biopsies from osteoporotic women with a cervical femoral fragility fracture) in order to demonstrate that in osteoporotic patients the regenerative properties of muscle stem cells are related to the same factors that could influence poor bone resistance. In particular, thanks to immunohistochemistry, transmission electron microscopy and immuno-gold labeling we investigated the role BMP-2 in muscle stem cells activity. In addition, we set up an in vitro experiment on primary cell culture in order to strengthen both morphological and molecular data about relationship between BMP-2 expression and satellite cells activity. In particular, we selected satellite cultures of three osteoporotic patients, three osteoarthritic patients and three controls. Each satellite cells culture was characterized by immunohistochemical studies and transmission electron microscopy (TEM) analysis. Results: in patients with osteoporosis both immunohistochemistry and transmission electron microscopy allowed us to note a lower number of CD44 positive satellite muscle cells forming syncytium. Moreover, the expression of BMP-2 assessed by in situ molecular characterization trough immune-gold analysis both in the peri-nuclear area and in the fiber body of satellite cells syncytia suggest a very strict correlation between BMP-2 expression and muscle regeneration capability. Our immunohistochemical data clearly demonstrated the association between BMPs expressions and myotube formation. We observed a poor number of myotube close to areas with low BMP-2 expressions. Moreover, thank to TEM analysis, we note that satellite cell cultures of osteoporotic patients were often characterized by small rounded cells that do not form satellite cells syncytia. Conversely, cell cultures of both osteoarthritic and control groups showed several myotube with sarcomeric structure and satellite cells syncytia. Conclusion: all together our data suggest that degeneration observed in the skeletal muscle tissue of osteoporotic patients is characterized by low or absent expression of BMPs, loss of satellite cells and loss of their ability to differentiate in myotube. On a clinical point of view, the control of physiological BMP-2 balance between bone and muscle tissues may be considered as a potential pharmacological target in bone-muscle related pathology.

OC13- IMPACT OF A STRUCTURED PHYSICAL ACTIVITY PROGRAM AND NUTRITIONAL SUPPLEMENTATION ON REGIONAL BODY COMPOSITION: RESULTS FROM THE VITALITY, INDEPENDENCE, AND VIGOR IN THE ELDERLY 2 STUDY (VIVE2). R.A. Fielding[1], D.R. Kirn[1], A. Koochek[2], K.F. Reid[1], J.C. Laussen[1], T. Gustafsson[3], T. Cederholm[2] *(1. Boston, USA; 2. Uppsala, Sweden; 3. Stockholm, Sweden)*

Introduction: Several lines of evidence have suggested that nutritional supplementation can potentiate the increase in skeletal muscle protein synthesis following a single bout of exercise in both young and healthy older individuals. However, no studies have been conducted to determine whether these observed acute synergistic effects of exercise and nutrition can result in sustained increases in fat free mass, muscle mass and decrease fat accumulation, particularly among mobility-limited older adults. Methods: The VIVE2 study was designed to compare the effects of a 6-month oral nutrition supplement (NS; 150kcal, key nutrients: 20g whey protein, 800 IU vitamin D in 4 fl. oz. beverage given once per day) versus placebo (PL, 30kcal, non-nutritive) on physical activity mediated changes in 151 physical functioning mobility-limited older adults (Age ≥70, Short Physical Performance Battery score (SPPB) ≤9). Participants attended three group-based physical activity sessions per week, which involve aerobic, strength, flexibility, and balance exercises. NS or PL was consumed once daily. Results: Mean (Standard Deviation) age was 77 (5) and 78 (6) years in NS and PL respectively, and the mean (SD) SPPB scores at inclusion were 7.8 (1.3) and 8.0 (1.1). Six month change in total body lean mass (LM) and fat mass (FM) measured by Dual Energy X-Ray Absorptiometry did not differ significantly between groups. Thigh muscle cross sectional area assessed by computed tomography increased 2.9% (95% CI: 1.6%, 4.3%) in NS and 1.1% (0.2%, 1.9%) in Pl; the unadjusted difference was 1.7% (0.2%, 3.4%), but adjusted for baseline body composition and design effects this difference was statistically nonsignificant. Over six months, there was a significantly greater decrease in intramuscular fat in NS than PL; mean (CI) difference -0.40 (-0.69, -0.10) cm2. Conclusions: These data suggest that physical activity together with a protein-rich oral nutrition supplement may increase muscle mass and decrease regional fat accumulation in mobility-limited older adults.

OC14- BLOCKADE OF MYOSTATIN ACTIVATION SPECIFICALLY AND POTENTLY ENHANCES MUSCLE GROWTH IN VIVO. A. Donovan, J. Jackson, S. Wawersik, K. Long, D.Y. Lee, G. Carven, N.K. Mahanthappa, K. J. Turner, M. Pirruccello-Straub *(Cambridge, USA)*

Background: Myostatin, a member of the TGFβ family of growth factors, is a well-characterized negative regulator of muscle mass that is proteolytically activated from precursor forms by two separate cleavage steps. Following proteolytic cleavage, mature myostatin signals by binding to a complex of Type I and II cell surface receptors (Alk3/4 and ActRIIB) whose downstream signaling induces muscle atrophy. There is intense interest in myostatin as a target for the treatment of muscle wasting and a number of therapeutics targeting the ActRIIb signaling pathway are in early- to mid-stage clinical trials in muscle wasting conditions including sarcopenia, muscular dystrophies, cachexia, and hip replacement/hip fracture. To date, the primary clinical strategy has focused on blocking the interaction between the mature myostatin and the ActRIIB receptor. However, several therapeutic programs have recently been discontinued due to lack of specificity (leading to unacceptable toxicities) and/or efficacy. Because the myostatin is primarily held in a latent form in vivo, we aimed to determine whether blocking the activation of myostatin and inhibiting the production of the mature growth factor improves both specificity and efficacy. Methods: We developed human monoclonal antibodies that specifically block proteolytic activation of myostatin at different steps in the activation pathway. These antibodies do not impact the signaling of other members of the TGFβ family, most notably Activin A and GDF11. We assayed one of these antibodies, SRK-015, in murine models to evaluate the effects of myostatin processing in normal muscle physiology and under conditions that result in atrophy. Results: Treatment of healthy mice with SRK-015 promoted robust muscle growth. Importantly, SRK-015 also protected mice from corticosteroid-induced muscle atrophy and reduced atrophy experienced by hind- limb immobilization. A single dose of SRK-015 was sufficient to sustain muscle-enhancing activity over the course of eight weeks, reaching a greater magnitude of effect and duration of action compared to a clinical-stage myostatin-specific inhibitor that targets the mature growth factor. Assessment of serum and muscle samples from healthy animals and from those undergoing atrophy demonstrated an altered flux of precursor forms through the myostatin activation pathway, but no detectable changes in levels of mature growth factor. Conclusion: These results suggest that targeting the upstream steps of myostatin activation is an effective strategy for blocking myostatin signaling. Our results provide insights into the significance of myostatin processing in skeletal muscle homeostasis and the efficacy of blocking the activation of the growth factor from precursor forms. In contrast to the traditional method of targeting the fully matured growth factor domain, blockade of the activation of myostatin is a novel, and potentially more potent approach for the specific treatment of muscle atrophy.

OC15- FRAILTY AND COMPUTERIZED TOMOGRAPHY (CT) ASSESSED BODY COMPOSITION IN OLDER ADULTS WITH CANCER. G.R. Williams[1], A.M. Deal[1], H.B. Muss[1], H.K. Sanoff[1], M.S. Weinberg[1], S. Strulov Shachar[1,2] *(1. Chapel Hill, USA; 2. Haifa, Israel)*

Background: Given the wide use of computerized tomography (CT) imaging in routine oncologic care, this modality represents a nascent opportunity to assess muscle mass and attenuation [Martin et al. JCO 2013]. Whether these measurements of body composition aid in the identification of frail patients with cancer remains unknown. This study examines the association of single-slice CT assessed muscle measurements with a frailty index in a cohort of older adults with cancer. Methods: Using an institutional observational cancer cohort registry (NCT01137825), the Carolina Senior Registry (CSR), we identified all patients with available abdominal CT imaging within 60 days +/- baseline assessment. CSR was developed in 2009 as a registry that contains geriatric assessment (GA) data on older adults (65+) with cancer. Baseline GA variables were used to calculate a 32-item frailty index (range 0-1) based on the principles of deficit accumulation [Searle et al. BMC Geriatrics 2008] and categorized as robust (<0.2), pre-frail (0.2-0.35), and frail (>0.35). Cross-sectional skeletal muscle area and mean muscle attenuation were analyzed from CT scan L3 lumbar segments using automated radiological software [Chung et al. Medical Imaging 2009]. Skeletal muscle area and patient height (m2) were used to calculate skeletal muscle index (SMI) and mean muscle attenuation, measured in Hounsfield Units (HU), is represented as skeletal muscle density (SMD). Skeletal Muscle Integrated Density (SMID), a novel integrated skeletal muscle measurement, was created by multiplying SMI x SMD. Linear regression models, controlling for gender, and Pearson correlation coefficients were used to evaluate associations. Results: Of the 207 patients with available CTs, 186 were sufficient for body composition analysis, and 161 had adequate

GA data to calculate frailty index. The median age was 71 years, 57% female, 83% Caucasian, and 50% during treatment. Mean SMI 41.8 cm2/m2 (range 23-67), SMD 26.2 HU (range 3.9-47), and SMID 1103 Arbitrary Units (AU) (range 89-2760). Using the frailty index, 84 patients (52%) were robust, 44 patients (27%) pre-frail, and 33 patients (21%) were frail. After controlling for gender, significant differences were found between robust and frail patients for SMD (28.8 vs 23.0 HU, p<0.001) and SMID (1221 vs 921 AU, p<0.001), but not SMI (42.3 vs 39.7 cm2/m2, p=0.42). For each increasing category of frailty (robust to pre-frail, pre-frail to frail), the SMD decreased by 2.97 HU (p<0.001) and the SMID decreased by 134 AU (p<0.001). The Pearson correlation coefficient for SMD and SMID with the frailty index as a continuous variable was -0.33 and -0.32, respectively. Conclusions: Body composition components were significantly associated with a GA-based frailty index. Skeletal muscle attenuation (SMD), which reflects muscle lipid content, is more associated with frailty than muscle quantity (SMI) and may be helpful in identifying frail, at-risk older adults with cancer. An integrated measurement of both muscle quality and quantity (SMID) may be a valuable tool that combines these two important measurements that warrants further evaluation. Supported in part by the UNC Oncology Clinical Translational Research Training Program (NCI 5K12CA120780-07), the Breast Cancer Research Foundation (New York, NY), the University Cancer Research Fund at UNC, and the Clinical and Translational Science Award program of the National Center for Advancing Translational Sciences, National Institutes of Health (1UL1TR001111)..

OC16- FRAILTY AND HEALTH CARE UTILIZATION IN OLDER COMMUNITY DWELLING VETERANS. M. Zylberglait Lisigurski, Y. Bueno, C. Karanam, S. Akkineni, V. Cevallos, J.G. Ruiz *(Miami, USA)*

Background: Frailty is a clinical syndrome characterized by vulnerability, resulting from loss of physiological reserve across multiple systems. It is associated with increased disability, morbidity, and mortality. Frailty assessment using the established frailty phenotype or frailty index can be time-consuming and complicated and therefore unsuitable for primary care settings. The FRAIL Scale is a validated, simple and rapid 5-item questionnaire for screening of frailty in primary care settings. It categorizes patients into three groups: robust, pre-frail and frail. Identifying frailty in primary care settings may allow for targeted interventions that improve health care outcomes and thereby reduce health care utilization. The aim of our study is to determine the level of health care utilization (hospital admissions and emergency room visits) in those older Veterans with pre-frailty and frailty. Methods: Participants and Setting: Convenience sample of Veterans 65 years and older coming to the Miami VA Medical Center for outpatient visits. Patients in wheelchairs were excluded. Study design: Cross-sectional study with 8-month prospective follow-up for determination of health care utilization. Outcomes and Measures: We collected socio-demographic information (age, gender, race, and ethnicity) and administered the 5-item FRAIL Scale. We conducted chart reviews in the VA electronic health record (EHR) for information about weight, and number of illnesses. Frailty was diagnosed in patients with a score 3 or greater; a patient with a score of 1 or 2 was considered as pre-frail. Robust patients had a score of zero. Eight months later, we obtained information from the VA EHR regarding deaths, emergency room (ER) visits and hospital admissions. Data Analysis: We reported descriptive statistics and then compared demographic and health care utilization data between robust, pre-frail and frail groups. We used one-way ANOVA for parametric data and Chi-Square for non-parametric data comparisons. We performed logistic regression to ascertain the effect of frailty status on hospitalization and ER visits adjusted for age and Charlson co-morbidity index. Results: We assessed 288 older Veterans (99% male), African American n = 113 (38%), White n = 187 (62%); Hispanic n = 43 (14%) and non-Hispanic n = 257 (86%). The mean age was M = 74, SD = 8 years. The age distribution was as follows: 65 - 74 (62%), 75 - 84 (27%) and 85 years and older (11%). The mean Charlson score was M = 2, SD = 2, and mean BMI was M = 28, SD = 5; range 16 - 41). The frequency of robust, pre-frail and frail patients was 16% (n = 47), 56% (n = 160) and 28% (n = 81) respectively. The frequency of the 5 items of the questionnaire obtained include: fatigue, lack of resistance and reduced aerobic capacity were found in n = 147 (49%), n = 98 (33%) and n = 84 (28%) respectively. After chart review it was found, that n = 171 (59%) of the patients had more than 5 illnesses and n = 30 (11%) presented with weight loss of more than 5% in the last 6 months. During the 8 months of follow up n = 75 (26%) had at least one hospital admission, n = 102 (26%) had at least one ER visits and 12 patients (4%) died; n = 7 (58%) of deaths were pre-frail and n = 5 (42%) frail. Differences between robust, pre-frail and frail participants are presented in Table 1. In Table 2 we present a logistic regression to ascertain the effect of frailty status on hospitalization and emergency room visits unadjusted and also adjusted for age and comorbidities which show that compared to robust older adults, frail older adults have increased hospitalization and ER visits. Conclusion: Frailty is significantly associated with an increased frequency of hospital admissions and emergency room visits in a sample of community dwelling older Veterans. Identifying patients with frailty may allow for targeted interventions that improve health care outcomes and potentially reduce health care utilization.

Table 1
Participant Characteristics According to Baseline Frailty Status

	Robust (n = 47)	Pre Frail (n = 160)	Frail (n = 81)	p
Mean age (SD)	72 (7)	74 (7)	76 (9)	0.02
Age group, n (%)				0.19
65-74	32 (18)	102 (58)	43 (24)	
75-84	13 (16)	43 (53)	25 (31)	
>85	2 (6)	15 (50)	13 (43)	
Race, n (%)				0.57
White	27 (15)	104 (59)	46 (26)	
African American	20 (18)	55 (50)	35 (32)	
Ethnicity, n (%)				0.91
No Hispanic	39 (16)	137 (56)	69 (28)	
Hispanic	8 (20)	21 (52)	11 (28)	
Charlson Comorbidity Index, mean (SD)	1 (1)	2 (2)	3 (2)	<0.001
Mean BMI kg/m2 (SD)	26 (3)	28 (5)	29 (6)	0.09

Table 2
Health Care Utilization and Frailty Status

	> 1 Hospital Admissions			
Frailty Status	**Unadjusted**		**Adjusted***	
	Odds Ratio (95% CI)	**p**	**Odds Ratio (95% CI)**	**p**
Robust	1		1	
Pre - Frail	7.71 (1.79 – 22.26)	.006	2.81 (.91 – 8.74)	.07
Frail	14.18 (3.21 – 62.82)	<.001	4.72 (1.41 – 15.81)	.01
	> 1 ER Visits			
Frailty Status	**Unadjusted**		**Adjusted***	
	Odds Ratio (95% CI)	**p**	**Odds Ratio (95% CI)**	**p**
Robust	1		1	
Pre - Frail	2.95 (1.24 – 7.04)	.01	1.86 (.84 – 4.17)	.12
Frail	5.43 (2.16 – 13.63)	<.001	3.29 (1.35 – 7.99)	.008

* Adjusted for Age and Charlson comorbidity index

OC17- HIGHER UPDRS3-SCORE IS ASSOCIATED WITH EARLY STAGE SARCOPENIA. S.E. Hasmann[1,3], M. Drey[1,2], J.-P. Krenovsky[1], W. Maetzler[3] *(1. München, Germany; 2. Nürnberg, Germany; 3. Tuebingen, Germany)*

Background: Identifying prodromal markers for Parkinsons disease is one main topics oft current research. There is a great need for biomarkers in the prodromal phase of Parkinson´s disease because valid definitions of this phase, and it's progression would open entirely new opportunities for treatment and even prevention of neurodegeneration. Motor parameters seem to be particularly promising for this purpose as subtle motor changes in individuals at high risk for Parkinson´s disease may occur several years before clinical diagnosis can be made. Latest investigations have identified a relationship between a low number of motor neurons and sarcopenia (loss of muscle mass and function). Neurodegenerative aspects seem to play a role in both diseases. The association between prodromal markers of Parkinsons disease and the onset of sarcopenia is unknown. Method: 255 individuals were recruited out of the follow assessment of the Tübinger evaluation of Risk factors for Early detection of NeuroDegeneration (TREND, www.trend-studie.de) study. From these individuals muscle mass was calculated using Janssen's regression formula by applying Bioelectrical Impedance Analysis (BIA). Sarcopenia was defined as suggested from the EWGSOP. Cut-offs for muscle mass, gait speed and hand grip strength in this healthy and young cohort were chosen on the cohorts own worst tertile. Multiple linear regression analysis was used to identify influence of early markers of Parkinsons disease (UPDRS3 score, hyperechocenicity of the substantia nigra (SN+) and depression/hyposmia/REM sleep behavior disorder) on muscle mass. Results: The UPDRS3-score is significantly associated with early stage sarcopenia. The result remains still significant after adjustment for age, gender and physical activity. No association was shown for hyposmia, depression, REM-sleep disorder or SN+. Conclusion: The strong association of a higher UPDRS3-score ressembling a higher risk for Parkinson´s disease indicates a common pathway in the onset of both diseases. Assessment of Sarcopenia may have a particular value in gaining a broader understanding of the pathophysiology leading to immobility and loss of muscle mass in Parkinson patients. Therefore Sarcopenia assessment in Parkinson's disease including determination of the number of motor units and muscle histology should give more insight in the common pathway.

OC18- HIGH INTENSITY INTERVAL TRAINING (HIIT) INCREASES MUSCLE MASS, IMPROVES PHYSICAL PERFORMANCE, AND REDUCES FRAILTY IN AGED MICE. K.L. Seldeen, M. Leiker, B.R. Troen *(Buffalo, USA)*

Background: Sarcopenia and frailty are highly prevalent in older persons, increasing the risk of functional decline, disability and mortality. Sarcopenia, a condition marked by loss of muscle mass, increases with age and results in greater likelihood of falls, immobility and loss of independence. Strength training exercise is currently the only known intervention against sarcopenia, yet only 14% of individuals over the age of 65 routinely participate. Participation may increase by creating exercise modalities providing similar or improved benefit with less time commitment. Towards this goal we are investigating the benefits and mechanistic impacts of a novel high intensity interval training (HIIT) program administered to 24-month old male C57BL/6J mice (equivalent to a 65-70 year old human). Additionally, in order to explore the benefits of exercise as an intervention for frailty in clinical settings, we have created a new frailty assessment tool for aged mice. Methods: 24-month-old C57BL/6J mice were either sedentary or given three 10-minute uphill treadmill high intensity interval training sessions per week, featuring a mix of alternating fast walks and sprints, with increasing difficulty over the 4 month experimental period. Baseline and endpoint assessments of physical performance (rotarod, treadmill, grip force meter, open field activity and gait speed) were performed, as well as monitoring of body weight. Frailty assessment was performed using parameters that closely align to the Fried et al human physical frailty scale, including: weight loss (>10% weight loss in a two week period), grip strength (mouse grip strength meter), exhaustion (treadmill endurance test), slow gait speed (mouse gait speed test), and low activity (open field activity monitor). Similar to the human scale, mice that fell below cutoff on 3 or more parameters were considered frail, and those below cutoff on 1 or 2 parameters were identified as pre-frail. Cutoffs were below 1.5 times the standard deviation of the group mean. Following sacrifice, post-mortem analysis included muscle weight, muscle morphology (NADH fiber staining), mitochondrial biomass and complex IV activity, cerebellar protein carbonyl content, and ELISA serum biomarker analysis of anti-aging protein klotho. Results : HIIT trained mice demonstrated dramatic improvement in most domains of physical performance, including: grip strength meter (10.9% ± 7.7% versus -3.9% ± 10.8 in sedentary mice, **p<0.01), treadmill endurance (32.6% ± 24.8% versus -2.0% ± 14.4%, ***p<0.001), uphill sprint endurance (29.3% ± 34.0% versus -15.6% ± 34.0%, **p<0.01), and gait speed (107.0% ± 51.5% versus 39.0% ± 29.0%, ***p<0.001). Improvement was not observed in rotarod (HIIT -4.8 ± 16.4% versus 12.4 ± 33.4%, p=0.12) or open field activity (crossings: HIIT -20.9 ± 33.8% versus - 5.9 ± 39.4%, p=0.33). However, consistent with improved strength and endurance performance, HIIT exercised mice exhibited greater muscle weight in both the soleus (9.4 ± 1.7 mg versus 7.3 ± 1.0 mg, n = 12, **p=0.0013) and the extensor digitalis longus (12.2 ± 1.2 g versus 10.8 ± 1.0 g, n = 9 & 6, *p=0.0334), and larger cross-sectional area of fast twitch muscle fibers from the anterior tibialis (5043.5 ± 717.2 μm2 versus 4282.9 ± 606.5 μm2, *p=0.0119). HIIT exercised mice also exhibited greater mitochondrial biomassin both soleus (ratio of mitochondrial to nuclear DNA: HIIT 1.32± 0.07 versus Sed 1.21± 0.10, ** p=0.0048) and anterior tibialis (HIIT 1.37± 0.10 versus Sed 1.25 ± 0.10, *p=0.0110). In addition we observed reduced cerebral oxidative stress (protein carbonyl content, HIIT 0.55 ± 0.09 nmol versus Sed 1.06 ± 0.45 nmol, *p=0.0196). Although mean complex IV activity was higher in HIIT mice, this was not statistically significant (normalized to citrate synthase activity: 1.93 ± 0.78 versus 1.48 ± 0.45, p=0.11). Additionally, our data are highly suggestive that HIIT increases serum levels of Klotho (424.1 ± 117.5 pmol/L versus 258.6 ± 109.2 pmol/L, p=0.055, n=3). Our frailty assessment tool identified 8 mice as being frail or pre-frail, with 6 of these starting in the HIIT group. Following 16 weeks of training, 5 of the 6 mice improved such that all parameters were above the frailty cut-offs. Conclusions: These data demonstrate dramatic benefits of HIIT in aged mice, achieved using a shorter session time and fewer days per week than commonly reported exercise programs. Additionally, the physiological adaptations to HIIT were akin to both strength training (increased strength, muscle mass and fiber size) and endurance training (greater endurance, mitochondrial biomass, and reduced oxidative stress). Further, we have made significant progress in the characterization of frailty in an animal model, and using this tool, demonstrate that HIIT may be a potent intervention to prevent or ameliorate frailty. Ultimately, benefits identified using this mouse exercise model hold promise in leading to the development of a human equivalent version that promotes successful aging in our growing older population.

OC19- INFLUENZA VACCINE RESPONSE IN COMMUNITY-DWELLING GERMAN PREFRAIL/FRAIL OLDER PERSONS.
J. Bauer[1], R. Diekmann[1], C. Romagny[2], A. De Castro[2], S. Nodland[3], J. Benyacoub[2], K. Vidal[2] *(1. Oldenburg, Germany; 2. Lausanne, Switzerland; 3. Eagan, USA)*

Backgrounds: Immune senescence is a well described critical change in immune competence occurring during ageing. This age-related dysregulation of the immune system in older persons results in greater susceptibility to infection and reduced responses to vaccination, especially in frail individuals who suffer the greatest of morbidity and mortality due to infection. Recently, significant impairment in anti-influenza antibody titers and increased rates of influenza infection post-vaccination were reported in community-dwelling American frail older adults (Yao et al., 2011). We conducted a study to evaluate the influenza vaccine response in community-dwelling German prefrail/frail older persons. Methods: An exploratory assessment of antibody responses after influenza vaccination during the 2014-2015 influenza season was performed in 76 prefrail/frail community-dwelling German older persons, among the population recruited in the frame of a larger clinical trial. The participants were identified as prefrail/frail according to the frailty criteria of Fried et al. The standard dose of a seasonal, trivalent, inactivated, split-virus influenza vaccine (Influsplit SSW® from GSK) was used for vaccination. The vaccine contained: A/California/7/2009(H1N1) pdm09-like virus, A/Texas/50/2012 (H3N2)-like virus and B/Massachusetts/2/2012-like virus. Blood samples were taken before and 30 days after vaccination to examine haemagglutination-inhibiting (HAI) IgG antibody response. Three standard measures of vaccine response were studied for each of the vaccine strains: 1) post-vaccination geometric mean titer (GMT) of HAI antibodies, 2) seroconversion rate: percentage of subjects with a 4-fold increase in antibody titers, 3) seroprotection rate: percentage of subject with a titer higher than 40. Results: Of the 76 volunteers, 50 were prefrail and 26 were frail older persons (60.5% female), aged ≥ 70 years (mean age = 76, range = 70-93). Prior influenza vaccination coverage rate was 77.6%. Pre-vaccination HAI titers observed for the two influenza A strains, i.e. H3N2 and H1N1, were high, most of which were titers ≥ 40, with a seroprotection rate of 61.8% and 44.7%, respectively. Lower pre-vaccination HAI titers were observed for the B antigen, with a GMT of 10.5 and a seroprotection rate of 11.8%. Significant increases in the values of HAI antibody titers were observed after vaccination against the three influenza vaccine strains. Post-vaccination values observed for H3N2 and H1N1 vaccine strains were similar, with a GM ratio > 2, seroconversion rate around 30% and seroprotection rate around 80%. However, a lower post-vaccination response was found against the B antigen (GM ratio = 2.0, seroconversion rate of 15.8%, seroprotection rate of 30.3%). Thus, the antibody responses against the two A strains, i.e. A/California (H1N1) and A/Texas (H3N2), were above the requirements of the European Commission (CHMP) for influenza vaccines for adults > 65 years of age (increases in GMT > 2, post-vaccination rate of seroconversion ≥ 30% and ≥ 60% for seroprotection), but these thresholds were not reached for the B/Massachusetts antigen which appears to have less immunogenicity. Conclusion: In the present study, the antibody responses to influenza vaccine of community-dwelling German prefrail/frail older persons were surprisingly high and strong for 2 out the 3 strains present in the vaccine. These results question the previously suggested relationship between defined prefrail/frail condition and low immune competence and may likely deserve to be further explored. Moreover, the unexplained finding that all three CHMP licensing criteria were met for the two A strains contained in the vaccine but not for the B strain argues towards a more heterogeneous response to influenza vaccination in prefrail/frail older persons than anticipated. Subgroup analyses with regard to specific patient phenotypes are currently ongoing.

OC20- OUTPATIENT COMPREHENSIVE GERIATRIC ASSESSMENT - EFFECTS ON FRAILTY IN COMMUNITY DWELLING ELDERLY PEOPLE WITH MULTIMORBIDITY - AN RCT.
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Backgrounds: Frailty is a common late-life and long-term condition associated with functional decline, adverse health outcomes and increased mortality. The prevention and treatment of frailty is a great challenge to health care in the future. Earlier studies report decreased institutionalization and mortality in elderly receiving Comprehensive Geriatric Assessment (CGA) as hospital inpatients. There are few studies evaluating CGA in an outpatient setting. The aim of this study was to analyze the effects of outpatient CGA on frailty among community dwelling elderly people with multimorbidity compared with those receiving usual care, over a two-year period. Methods: The Ambulatory Geriatric Assessment – Frailty Intervention Trial (AGe-FIT) was a randomized controlled trial studying the effectiveness of outpatient CGA and subsequent intervention program. The primary outcome was number of hospitalizations and secondary outcomes were health related. The current study reports on frailty classified with the criteria from the Cardiovascular Health Study (CHS) at baseline and 24 months follow-up. Participants were community dwelling elderly people with multimorbidity (N=382). Inclusion criteria were: age ≥75 years, ≥3 diagnoses per ICD-10, and ≥3 inpatient admissions during 12 months prior to study inclusion. Patients were randomized to receive CGA-based care in an Ambulatory Geriatric Unit consisting of a multiprofessional team (intervention group, n=208) or to receive usual care (control group, n=174) comprised of primary care in general practice, and in-hospital care as needed. Results: Baseline data for frailty was available in 364 (95.3%) participants, (intervention n = 198, control n = 166). Of these, 191 (52.5%) were frail, 130 (35.7%) pre-frail, and 43 (11.8%) robust, with no significant difference in frailty between patients randomized to either group (p=0.15). After 24 months there were 235 participants with data on frailty. Of these 109 (46.3%) were frail, 100 (42.6%) pre-frail and 26 (11%) robust. There was a significant difference in mortality and proportion of patients classified as pre-frail between the intervention group and control group, p = 0.013 (Pearson Chi Square) (Table 1). Conclusion: There were significantly more pre-frail patients than expected and lower mortality in the intervention group after 24 months. The high number of deaths was to be expected considering the high risk of mortality related to old age, multimorbidity and frailty. Our preliminary findings support that outpatient CGA and subsequent intervention could have an important role in delaying both mortality and development of frailty.

Table 1
Frailty after 24 months

	Robust	Prefrail	Frail	Deceased	Total
Control group	10 (6.9%)	33 (22.7%)	54 (37.2%)	48 (33.1%)	145
Intervention group	16 (9%)	67 (37.9%)	55 (31.1%)	39 (22%)	177

OC21- RESULTS OF GERIATRIC CARDIAC SURGERY CO-MANAGEMENT OF FRAIL OLDER PATIENTS WITH VALVULAR HEART DISEASE. E. Ortolani, N. Pavone, S. Forcina, M. Massetti, R. Bernabei, E. Marzetti *(Rome, Italy)*

Backgrounds: The growing burden of valvular heart disease (VHD) in older populations demands a substantial change of the current management of this condition. The present work reports preliminary results of a multidisciplinary approach for the care of older patients with VHD. Methods: Data are from an ongoing prospective study analysing clinical outcomes of older VHD patients admitted to the Heart Valve Clinic (HVC) of our Centre. All patients underwent multidisciplinary evaluation including echocardiography, cardiac surgeon consultation, multidimensional geriatric assessment, and neuropsychological testing. Other consultations were performed as needed. Demographic characteristics and clinical outcomes of older VHD patients undergone valve replacement surgery before and after HVC implementation were analysed. Results: Twenty-height older VHD patients admitted to the HVC between April 2014 and February 2015 underwent cardiac surgery. HVC patients were older relative to those treated in 2013 (n=121) (79.1±4.3 vs. 76.5±4.2 years; p<0.01), with no differences in gender distribution, VHD type and severity, NYHA class or number of co-morbid conditions. The total length of hospital stay was unvaried, despite longer time spent in postoperative intensive care unit by HVC patients (159.4±166.7 vs. 86.0±70.0 hours; p<0.001). The number of specialist consultations was reduced after HVC implementation (0.8±1.0 vs. 2.5±1.9; p<0.0001). None of HVC patients died during hospitalisation, whereas 4 patients died in 2013 (p=0.7). Conclusions: The implementation of a multidisciplinary clinical pathway dedicated to geriatric patients with VHD allows extending eligibility to surgery to older and frailer subjects and optimising the use of resources, without impacting mortality or length of hospitalisation..

OC22- THE PHYSICAL FRAILTY PHENOTYPE IN ADULTS OF ALL AGES WITH END STAGE RENAL DISEASE (ESRD). M. McAdams-DeMarco, H. Ying, I. Olorundare, E. King, B. Buta, A. Gross, K. Bandeen-Roche, J. Walston, D.L. Segev *(Baltimore, USA)*

Background: The physical frailty phenotype has emerged as an important risk predictor in adults of all ages with End Stage Renal Disease (ESRD) undergoing dialysis and kidney transplantation (KT). In patients undergoing dialysis, frailty is associated with mortality, hospitalization and falls. In those undergoing KT, frailty increases the risk of delayed graft function (need for dialysis within the first week after KT), early hospital readmission and mortality. However, adults with ESRD are a very different population than community dwelling older adults and thus, the correlates and covariation of the components of frailty may differ. While it is clear that frail adults with ESRD represent a high risk group, the correlates of the physical frailty phenotype and covariation of the 5 components is unclear in this population. The goal of this study was to characterize which patients with ESRD are likely to be frail and what components of frailty are common in this population. Methods: 1,665 patients undergoing dialysis and being evaluated for KT as well as 693 KT recipients were enrolled in a prospective cohort study (December 2008-October 2015) at Johns Hopkins Hospital. We studied the physical frailty phenotype using the Fried frailty score (nonfrail=score of 0 or 1; intermediately frail=score of 2; and frail=score ≥3). Frailty, activities of daily living (ADL)/ instrumental activities of daily living (IADL) disability, Centers for Epidemiologic Studied-Depression Scale (CESD), education and health related quality of life (HRQOL) were measured at the time of evaluation and admission for KT. Additionally, age, sex, race, obesity status, smoking status, time on dialysis, cause of ESRD and donor type (for KT cohort only) were ascertained from the medical record. We used adjusted multinomial regression (frail vs. nonfrail and intermediately frail vs. nonfrail) to identify correlates of physical frailty in each cohort and principal components analysis to identify patterns of the 5 components, separately for adults undergoing dialysis and KT. Results: Among patients undergoing dialysis 22.6% were frail and 62.2% were intermediately frail; among KT recipients 19.1% were frail and 63.8% were intermediately frail. In both cohorts, there was increasing frailty by age (Dialysis: Age 18-45: 17.25%, 46-65: 23.64%, and >65: 26.57% and KT: 18-45: 14.36%, 46-65: 20.23%, and >65: 22.45%). Older adults under going dialysis (age>65) were 2.22-fold (95%CI: 1.45-3.39, P<0.001) more likely to be frail than younger adults. For those undergoing dialysis, ADL and IADL disability and CESD depressive symptoms were associated with frailty status (ADL=3.16, 95%CI: 1.17-8.53, P=0.02; IADL=1.77, 95%CI: 1.08-2.91, P=0.02; CESD=7.19, 95%CI: 3.15-16.38, P<0.001). Additionally, those with diabetes as the cause of ESRD were 2.69-fold (95%CI: 1.45-4.97; P=0.002) more likely to be frail, compared to those who had hypertension as the cause of ESRD. Compared to those who reported good HRQOL, fair/poor HRQOL was associated with a 2.35-fold (95%CI: 1.55-3.59; P<0.001) increased prevalence of frailty while excellent/very good HRQOL was associated with 0.54-fold (95%CI: 0.34-0.86, P=0.009) increased prevalence of frailty. Older age, CESD depressive symptoms, time on dialysis, diabetes as the cause of ESRD and HRQOL were associated with intermediate frailty status among adults undergoing dialysis. In contrast, among KT recipients only older age (age>65=2.95, 95%CI: 1.36-6.38, P=0.006) and HRQOL (fair/poor HRQOL=3.62, 95%CI: 1.39-9.43, P=0.011; excellent/very good HRQOL=0.26, 95%CI: 0.12-0.56, P=0.001) were associated with frailty status. Older age and HRQOL were associated with intermediate frailty status among KT recipients. In both cohorts, the two most frequent components of frailty were low physical activity (dialysis: 54.5%; KT: 48.8%) and poor grip strength (dialysis: 50.3%; KT: 49.2%). For patients undergoing dialysis, the most common pattern of the 5 components among those who were frail was poor grip strength, low physical activity and exhaustion (23.40%) and the next most common pattern was poor grip strength, low physical activity and weight loss (21.54%). For those undergoing KT it was poor grip strength, low physical activity and slowed walk speed (18.94%) and the next most common pattern was poor grip strength, low physical activity and exhaustion (13.64%). In both cohorts of adults with ESRD there were no associations between the 5 components in the physical frailty phenotype suggesting the patterns observed are due to chance. Conclusion: Frailty is common in adults of all ages with ESRD, regardless of whether they are undergoing dialysis or KT. While age was a strong correlate of frailty, those who reported fair/poor HRQOL were likely to be frail regardless of ESRD treatment. Among those undergoing dialysis, ADL/IADL disability and CESD depression were correlated with frailty. Importantly, there was not one pattern of the components that led ESRD patients to be frail, suggesting that no single component drives the definition of frailty in this population.

OC23- HOW IS FRAILTY IDENTIFIED AND MANAGED IN EMERGENCY AND ACUTE CARE? A SCOPING REVIEW OF EVIDENCE AND POLICY. O. Theou[1], K. Mallery[1], J. Goldstein[2], J. Armstrong[1], J. Greene[1], B. Douglas[1], B. Devereaux[1], J. Lee[2], K. Rockwood[1] *(1. Halifax, Canada; 2. Toronto, Canada)*

Background: Many older adults, particularly those in a clinical setting, are frail. Even so there is no agreement on how frailty should be measured in this setting. The purpose of our project is to conduct

a scoping review focused on frailty identification and management in pre-hospital and in-hospital settings. Methods: Our multidisciplinary team includes investigators, collaborators and health care professionals who work in pre-hospital (paramedic/emergency medical services) and in-hospital settings. We followed the methodological framework for scoping reviews endorsed by Arksey & O'Malley and Levac & colleagues. MEDLINE, CINAHL, Embase, PsycINFO, Eric and Cochrane were systematically searched up to September 2015. The primary search terms used were "frail" and appropriate descriptors of "acute care" and "pre-hospital setting" which were developed in consultation with a librarian. The database search results were uploaded in DistillerSR software which was used to manage the screening process. Two reviewers independently screened titles and abstracts. We included original research articles that were published before 2000 and measured frailty in older adults in pre-hospital or in-hospital setting. Studies were not excluded based on year of publication, language, quality or outcome measures. Disagreements between the two reviewers were resolved by a third reviewer. Full text of articles that met reviewers' agreement was further screened. Results: The search yielded 8697 articles: 2278 from MEDLINE, 2832 from CINAHL, 2917 from Embase, 350 from PsychINFO, 254 from Cochrane, and 66 from Eric. A total of 6111 articles remained after duplicates were removed. After screening titles and abstracts, 2773 articles were included in the next phase and 2539 were excluded. The reviewers disagreed on 798 articles which are currently being resolved by a third reviewer. After the screening of the full text is complete (400 screened up to date) reviewers will extract from each included article data on descriptive characteristics (participant demographics, study design etc), frailty measurement tools, feasibility estimates and outcome measures. We will also conduct a grey literature search of relevant websites, government reports, and clinical guidelines. Conclusion: This scoping review will synthesize the literature and policies/practice related to frailty worldwide in order to inform how frailty assessment can be incorporated within the pre-hospital and in-hospital acute care settings. Identifying frailty early could lead to more targeted care and could help end unnecessary assessments of the severely frail.

OC24- DIETARY SUPPLEMENTS MARKETED WITH LABEL STATEMENTS ON AGING, SARCOPENIA AND FRAILTY IN THE NIH'S DIETARY SUPPLEMENT LABEL DATABASE (DSLD). J.T. Dwyer, R. Bailen *(Bethesda, USA)*

Background: The National Health and Nutrition Examination Survey (NHANES) reports that nearly half of Americans use dietary supplements; among those over 65 years of age, the prevalence is even higher, and preliminary estimates indicate that use may be even greater. Total sales of anti-aging dietary supplements were $226 million in 2014, approximately 8.8% of total supplement sales, according to Nutrition Business Journal, a trade publication. There is little evidence from clinical trials to support such claims, however. We strived to identify supplements with label statements marketed with wording that might attract frail elders., using the DSLD, a free, publicly available database of dietary supplement labels marketed in the USA. Methods: We searched the DSLD to identify products making label statements about: aging; frailty; sarcopenia; synonyms for and terms used in the Fried Frailty Index (muscle weakness, exhaustion, unintentional weight loss, slowness while walking, low levels of activity) and in other frailty criteria (anxiety, depression, cognitive impairment, dependence, falls and fractures, incontinence, pressure ulcers, mobility problems, senility, dementia, delirium) as well as related terms (memory, life extension). Results: Among the 50,000 dietary supplement labels in the DSLD that were on market in the USA in 2015, many label statements that included the terms listed above: 33 contained aging in their product names, 14 had dietary ingredients worded as aging, and over 2180 products mentioned aging in label statements. 22 products used anti-aging in their names, 11 claimed to contain anti-aging dietary ingredients, and 247 had label statements claiming anti-aging properties. No products mentioned sarcopenia in their product names, but 2 did so in label statements. No products mentioned frailty on the label. Only two of the Fried Index characteristics were mentioned on labels: exhaustion (48 labels) and muscle weakness(4). As to words mentioned in other frailty criteria, label statements included depression (492), anxiety (6 product names, 447 statements), dependence (20 statements), dementia (6) incontinence (3) and senility (1). Moreover, 451 products had memory in their label statements, 38 used it in the product name, and 1 product used life extension in its name. Of the labels specifically mentioning aging, the most popular ingredients were botanicals, vitamins , minerals, amino acids or protein, fats and fatty acids , fiber, and other constituents in that rank order, but many products contained many of these ingredients as well as other constituents. Conclusion: Although their effectiveness for most of the conditions is unproven, many dietary supplements are marketed with label statements that may appeal to the frail elderly. The DSLD provides an image and complete label information on form, dose, and ingredients in these products that may be of interest to researchers and consumers.

OC25- INTER-MUSCULAR ADIPOSE TISSUE IS ASSOCIATED WITH RAISED LEVELS OF NOVEL BIOMARKER MCP-1 AND POORER PERFORMANCE CHARACTERISTICS IN A GROUP OF COMMUNITY DWELLING OLDER ADULTS. J.P. Lim, L. Tay, Y.X. Yang, C.H. Tan, S. Yew, A. Yeo, N.H. Ismail, C.H. Tan, B. Leung, Y.Y. Ding, M.S. Chong *(Singapore)*

Background: Studies looking at repair of muscles after muscle injury have shown that inflammatory processes are vital to muscle regeneration. In sarcopenic obesity however, a chronic inflammatory state is associated with increased muscle catabolism, aberrant muscle regeneration and repair leading to adipose tissue infiltration and fibrosis. Inter-muscular adipose tissue (IMAT) is believed to originate from such processes: in which dysdifferentiation of muscle-derived stem cells occurs, turning them into cells with adipocyte phenotype. The objectives of our study are a) to examine the association of IMAT to traditional and novel inflammatory biomarkers i.e. Interleukin-6 (IL-6) and C-reactive protein (CRP); Monocyte Chemoattractant Protein-1 (MCP-1) respectively, b) to examine the association of IMAT to functional performance characteristics. Methods: We consecutively recruited a total of 190 community dwelling, cognitive intact, well older adults. 3 patients were excluded as they were on immunomodulators for inflammatory diseases. Baseline data were collected on subjects' demographics, co-morbidities and socioeconomic factors. Performance measures of knee extension strength and upper limb grip strength were measured. Values were collected and averaged after 2 tries in each limb. Gait speed was based on the time to walk 3 m and the Short Physical Performance Battery (SPPB) was used to measure physical performance. Il-6, CRP and MCP-1 levels were obtained from assays in accordance to manufacturer's instructions. Magnetic resonance imaging was performed in both thighs using Dixon GRE sequences. Muscles, subcutaneous adipose tissue and inter-muscular adipose tissue were automatically segmented using an in-house machine learning based segmentation. Volumes of muscles and fat were calculated for the middle third of each patient's thigh. Inter-muscular adipose tissue is defined as adipose tissue located between muscle groups and beneath

the muscle fascia and intramuscular adipose tissue that is distributed within individual muscles visible on MRI. IMATratio is expressed as the ratio of the IMAT volume to total volume of the imaged thigh. Pearson correlation analyses were performed on biomarkers with IMATratio, and on IMATratio with performance measures of gait speed, knee extension strength and grip strength. Spearman correlation analyses were performed on MCP-1 and IMATratio with SPPB results. Multiple regression analyses were performed to correct for age and gender. The results were further stratified into different gender groups and associations of IMATratio and performance measures analysed. Results: In our study population, only MCP-1 levels are significantly correlated to IMATratio. (Pearson correlation coefficient = 0.286, p =0.000). This significant positive correlation relationship remains even after adjusting for age and gender (Beta coefficient = 0.258, p=0.000). The Pearson correlation coefficient and corresponding p values for IMATratio with the biomarkers of IL-6 and CRP are -0.035, p=0.631; 0.084, p=0.256 respectively. MCP-1 is also significantly correlated to SPPB scores (Spearman correlation coefficient -0.167, p = 0.023). The results show that raised MCP-1 levels are associated with higher percentage of IMAT and poor SPPB scores. Presence of higher ratio of IMAT is significantly associated with poorer functional measures. Grip strength, knee extension strength and gait speed are correlated to IMATratio in an inversely proportionate manner. (Pearson correlation coefficient for grip strength – 0.244, p= 0.001; knee extension -0.205, p=0.005; gait speed -0.170, p =0.020). After stratifying by gender: in females (n= 131) the significant association of IMATratio with knee extension strength (r= -0.172, p=0.049) and grip strength (r=-0.223, p=0.011) remains. In males (n=56) no significant association of IMATratio with functional parameters were observed after gender stratification. The possible reason for this result may be due to the relatively small numbers of male subjects hence causing a failure to detect a significant positive correlation. Conclusions: Raised MCP-1 levels may be a more sensitive marker of inflammatory states in muscles and raised IMAT compared to the traditional markers of inflammation in sarcopenic obesity in older adults. As a novel biomarker of inflammation, MCP-1 has recently been studied in acute muscle injury. Knock out MCP-1 -/- mice with MCP-1 deficiency have demonstrated impaired muscle regeneration, suggesting an important role for macrophages and MCP-1 in tissue reparative processes. Contradictorily, raised MCP-1 levels in ventilated patients in critical care settings have been associated with diaphragmatic inflammation and impaired contractile strength. Together with our study results showing that MCP-1 is associated with increased IMAT and in turn poorer performance status, we could infer that homeostatic balance of inflammation is important maintaining skeletal muscle function and quality. MCP-1 and IMAT could potentially be targets for intervention trials looking into modulating of inflammatory processes associated with sarcopenia. .

OC26- MAGNETIC RESONANCE IMAGING (MRI) AND SPECTROSCOPY (MRS) IN SARCOPENIA TO VISUALIZE MUSCLE MORPHOLOGY AND QUANTIFY MUSCLE FAT.

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Backgrounds: Sarcopenia is a syndrome characterized by loss of skeletal muscle mass and function in the elderly population. It is mainly caused by replacement of muscle tissue with intramuscular fat, which restricts muscle function. The purpose of this study was to develop an MRI pulse sequence protocol suitable for quantifying muscle volume, intramuscular fat, and its distribution within muscle tissue. Methods: 54 females (> 70 yrs) with sarcopenia, randomized in control (n1 = 19) and training (n2 = 35) groups, were examined twice using a 3T system (MAGNETOM Skyrafit, Siemens Healthcare, Erlangen, Germany). Between both measurements, whole-body electromyostimulation (miha bodytec, Gersthofen, Germany) training (20 minutes, 85 Hz, 350 ms, 6 s EMS - 4 s rest, once weekly) was carried out over a period of three months. MRI acquisition was performed at the thigh (18-channel body surface coil) and included the following sequences: T1w TSE, PDw SPACE, PDw TSE Dixon, q-Dixon (multi-echo GRE VIBE Dixon), and HISTO (multi-echo T2-corrected single-voxel spectroscopy, at musculus semitendinosus). The total acquisition time (incl. localizer) was 16:17 min. Detailed parameters are given in the Table. Multiple contrasts were acquired using the q-Dixon sequence to quantify fat accurately. T1 bias was addressed by using a low flip angle of 4 degrees. T2* decay was considered as a degree of freedom in the parameter extraction. Fat and water fractions were calculated as parametric maps.Spectroscopic fat quantification with T2-correction was done by extrapolating fat and water integrals for TE = 0 using an exponential fit of signal peaks acquired at five successive TEs. The long TR of 3000 ms was chosen to avoid T1 bias. Isokinetic maximum leg extension and flexion strength (0.6 m/s) were measured in all subjects using a leg press (Con-Trex LP physiomed, Schnaittach, Germany) at baseline and follow-up exams. Results: Figures 1 shows the results of one randomly chosen training group subject for T1w TSE (a) and q-Dixon (b) sequences. T1w TSE images show high spatial and contrast resolution beneficial for morphological analysis. On opposed-phase Dixon images, muscle-fat-boundaries appear hypointense (Figure 1 b) because here fat and water concentrations are similar. Hence, they can be used for segmentation of individual muscles. q-Dixon's fat and water fraction images give additional quantitative information on tissue composition. Figure 2 shows a q-Dixon fat fraction image at three-month follow-up exam after manual muscle segmentation in comparison with an anatomical thigh muscle model1. Fat fractions were calculated for each muscle. Muscles stressed through extension are vastus lateralis, rectus femoris, vastus intermedius, and vastus medialis (quadriceps femoris), while the largest part of flexion (37%) is carried by semimembranosus. For the subject shown in Figure 2, maximum leg extension (flexion) strength was 1088 (366) N at baseline and 1180 (266) N at follow-up. Average extension (flexion) strength (MV ± SD) of all subjects was 1228 ± 314 N (461 ± 203 N) and 1261 ± 393 N (479 ± 203 N) at baseline and follow-up visits, respectively. The high fat content (25.9%) in the semimembranosus of the shown subject may explain the low flexion strength compared to the group average. However, this finding has to be validated for the whole study cohort before a definitive conclusion can be derived. Still, a robust and automated segmentation algorithm has to be developed. MRS showed a change of fat content over all controls of +2.86 ± 15.59% (MV ± SD) and over all trainings of +9.53 ± 16.92% in semitendinosus. Spectroscopy is considered as reference standard for fat quantification in e.g. liver MRI. However, since muscle deforms easily, voxel repositioning in longitudinal studies is limited due to inhomogeneous fat/muscle distributions within large spectroscopic voxel volumes. This challenge is also reflected in the high SD of the change in fat content. Unlike spectroscopy, imaging sequences and subsequent image segmentation are easier to perform and more representative for the whole muscle volumes than a much smaller VOI typically selected in MRS. Also, precision in muscular MRI may be higher than in muscular MRS. Conclusion: Current results of our examination show that MRI is capable to measure parameters quantifying muscle degradation in sarcopenia. The use of spectroscopy is challenging with regard to voxel repositioning and assessment of the entire muscle volume. References: 1. Heuck A, Steinborn MM, Rohen JW, Lütjen-Drecoll E. MRT-Atlas des muskuloskelettalen Systems. 2. ed. Stuttgart, New York, NY: Schattauer 2009. XI, 385 p.

Table

Detailed sequence parameters of the sarcopenic MR imaging and spectroscopy protocol

Sequence	Voxel size [mm³]	Slices	FoV [mm²]	TR [ms]	TE [ms]	Averages	PAT factor and mode	Bandwidth [Hz/px]	Sequence specifics	TA [min]
T_1w TSE	0.5 x 0.5 x 3.0	34	250 x 250	844	14	1	2, GRAPPA	488	n.a.	2:54
PDw SPACE	0.7 x 0.7 x 0.7	144	250 x 250	1100	56	1.5	2, GRAPPA	534	n.a.	6:18
PDw TSE Dixon	0.5 x 0.5 x 3.0	34	250 x 250	3000	44	1	2, GRAPPA	514	n.a.	4:23
q-Dixon	0.8 x 0.8 x 3.0	36	250 x 250	13.45	1.99, 3.83, …, 11.19	1	off	780	6 echoes	1:15
HISTO	10 x 10 x 10	n.a.	n.a.	3000	12, 24, 36, 48, 72	4	n.a.	1200	5 echoes, using STEAM	1:00

Figure 1

T1w TSE (a) and q-Dixon opposed-phase (b) images at follow-up exam; exemplarily shown for one subject (89 yrs)

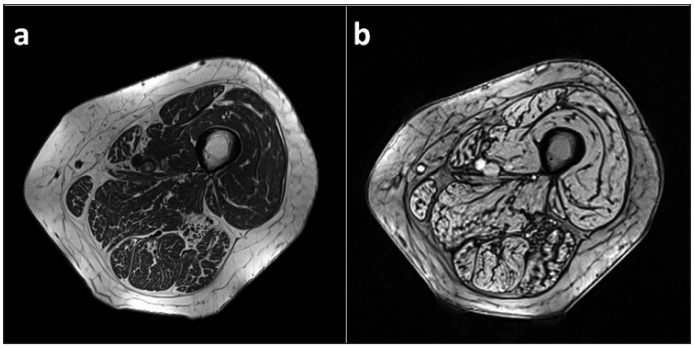
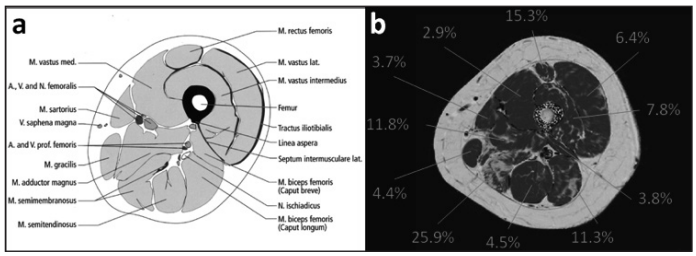


Figure 2

Anatomical thigh muscle model at mid femur (a)1 and q-Dixon fat fraction image at follow-up exam after manual segmentation with the results of fat fraction calculation for each muscle; exemplarily shown for one subject (74 yrs) (b)



OC27- FEASIBILITY AND PREDICTIVE VALIDITY FOR MEASUREMENT OF FRAILTY IN PATIENTS WITH CARDIAC IMPLANTABLE ELECTRICAL DEVICES (CIEDS).

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Background. Older patients with heart failure are frequently treated with cardiac implantable electrical devices (CIEDs), including implantable cardioverter-defibrillators (ICDs), implantable loop recorders (ILRs), and pacemakers (PMs). Despite the effectiveness of these devices, such patients remain at elevated risk of sudden death or hospitalization. No current risk model for these outcomes has an established role in clinical practice, and none have included measures of frailty or been assessed for utility in anticipating intermediate conditions such as functional decline or mobility disability. In this project we sought to demonstrate the feasibility and predictive validity of a tractable measure of the frailty phenotype in patients with CIEDs. Methods. Individuals eligible for study included all English-speaking patients followed in an ambulatory cardiac device clinic at the Beth Israel Deaconess Medical Center in Boston, MA over a period of approximately 14 months. Participant interactions and data collection occurred in the context of routine clinical visits. After completing the informed consent process, participants completed a brief verbal questionnaire, anthropometric measurements, and limited functional testing. Additional data were obtained by electronic medical record review, including key comorbidities and characterization of heart failure severity using the New York Heart Association (NYHA) classification. Frailty was measured using the protocol developed in the Study of Osteoporotic Fractures (SOF). This measure is designed to be clinically tractable and consists of three components: self-reported exhaustion or lack of energy (obtained by interview, in response to the question "Do you feel full of energy?"); self-reported weight loss in excess of 5% over the prior three years; and inability to do five chair stand tasks (obtained via testing in the context of the clinical visit). By convention, a participant satisfying none of these criteria is considered robust, a participant satisfying exactly one is considered pre-frail, and a participant satisfying two or three is considered frail. The feasibility of obtaining this measurement was operationalized as the proportion of attempts resulting to a completed measurement of each of the three components. The predictive validity of the measure in anticipating intermediate risk states was conceptualized as its ability to capture inter-individual variation in four-meter (4m) gait speed, an important measure of mobility and physical function. Descriptive statistics and regression modeling were used to describe sample characteristics and quantify the strength of associations. The study sample size was sufficient to provide approximately 80% power to detect a standardized effect size of at least 0.35 for a difference in gait speed between any two frailty categories (e.g. robust vs. pre-frail). Preliminary data indicated that this corresponded to an absolute difference in 4m gait speed of approximately 0.10 m/s, considered a highly substantial and clinically meaningful difference. Results. Of 434 eligible individuals approached for study, N = 405 (93%) were enrolled, including 151 with ICDs, 239 with PMs, and 15 with ILRs. Mean (standard deviation) participant age and body mass index were 70 (14) y and 28 (6), respectively, and 137 (34%) were female. A total of 264 (65%) had NYHA functional classification I, 116 (29%) had NYHA II, 19 (5%) had NYHA III, and 6 (1%) had NYHA IV. Measurement of the SOF frailty score proved highly feasible; of 405 individuals on whom the measure was attempted, it was completed on 100%. A total of 153 (38%) participants were robust, 187 (46%) prefrail, and 65 (16%) frail. As expected, age and NYHA class were strongly associated with the frailty phenotype. The phenotype demonstrated substantial predictive validity in capturing inter-individual variation in 4m gait speed: mean (95% confidence interval; CI) gait speed in the robust, prefrail and frail categories was 0.87 (0.83, 0.91), 0.78 (0.74, 0.82), and 0.55 (0.49, 0.61), respectively. Controlling for age, BMI and sex, pre-frail participants had mean (95% CI) 4m gait speed -0.04 (-0.10, 0.01) m/s lower than their robust counterparts, while frail participants' mean gait speed was -0.26 (-0.33, -0.18) m/s lower than that of robust individuals. Conclusion. These results demonstrate the feasibility of integrating a simple frailty measure in the routine clinical evaluation of ambulatory CIED patients. The measure demonstrates the expected affiliation with age and a major marker of cardiac morbidity (NYHA functional class). It further demonstrates predictive validity in capturing variation in gait speed, an important measure of physical function and a cardinal risk marker for downstream outcomes including disability and mortality. Notably, the mean 4m gait speed difference observed between robust and frail individuals was well in excess of the established threshold for clinical significance, even after statistical adjustment for age, sex and BMI. We conclude that the measurement of frailty may be useful in this population for refinement of clinical risk models, and identification of those at elevated risk of functional decline or the onset of mobility disability.

OC28- PREVALENCE OF SARCOPENIA IN A POPULATION OF NURSING HOME RESIDENTS ACCORDING TO THEIR FRAILTY STATUS: RESULTS OF THE SENIOR COHORT. F. Buckinx, J.Y. Reginster, C. Beaudart, J.L. Croisier, J. Petermans, O. Bruyère *(Liège, Belgium)*

Background: Frailty and sarcopenia, because of their clinical, social and economic consequences, are regarded as important Public health problems. The aim of this study is to investigate the relationship between these two geriatric syndromes, by evaluating the prevalence of sarcopenia among frail, pre-frail and robust elderly nursing home resident, in Belgium. Methods: This is an analysis of data collected at baseline in the SENIOR (Sample of Elderly Nursing home Individuals: an Observational Research) cohort, which consists of a prospective follow up of 650 nursing home residents aimed to identify the most predictive factors of frailty. Subjects are volunteer nursing home residents from Belgium. All subjects receive a diagnosis of sarcopenia, based on the definition proposed by the European Working Group on Sarcopenia in Older People (EWGSOP). For the diagnosis of sarcopenia, EWGSOP recommends using the presence of both low muscle mass + low muscle function (strength or performance). The frailty evaluation is based on FRIED's definition. A large number of demographic and clinical characteristics is also collected : age, sex, body mass index, smoking and alcohol status, physiotherapy, walking assistance, drugs consumed, medical history, level of physical activity (Minnesota questionnaire), cognitive status (MMSE), nutritional status (MNA), quality of life (SF-36 and EQ-5D questionnaires), level of autonomy (katz and lawton index), fear of falling (FES-1 questionnaire), functional and motors skills (Tinetti test, Timed Up and Go test, SPPB test, walking speed, grip strength, maximal isometric strength of 8 muscle groups (knee flexors and extensors, ankle flexors and extensors, hip abductors and extensors, elbow flexors and extensors) and peak flow) and body composition (BIA). Prevalence of sarcopenia is evaluated among frail, pre-frail and robust subjects. Comparison of demographic and clinical characteristics between sarcopenic sujects and non-sarcopenic ones is performed by means of the Student t test (or non-parametric Mann-Whitney test) for continuous variables and by means of the Chi squared test for categorical variables. Results: A total of 662 subjects is included in this analysis. Among them, the mean age is 83.2 ± 8.99 years and 484 (73.1%) of them are women. In this population of nursing home residents, the prevalence of sarcopenia is 38.1% whereas the prevalence of frailty and pre-frailty are respectively 24.7% and 61.4%. Among frail, pre-frail and robust subjects, respectively 47%, 38.9% and 16.3% were diagnosed sarcopenic. Some clinical and demographic characteristics differ between subjects with sarcopnia and those without sarcopenia. Indeed, sarcopenic subjects are older (85.6 ± 7.48 years) than healthy subjects (81.9 ± 9.51 years; p<.0001), they have a lower BMI (23.8 ± 5.15 vs. 27.2 ± 5.43 kg/m^2; p<.0001) and a worse MMSE (23.4 ± 4.85 vs. 24.5 ± 4.26; p=.002). Sarcopenic subjects more often come from nursing home providing care (35.4%) than non-sarcopenic subjects (25.6%; p = .02). They also use more often walking assistance (62.1% vs. 52.1%; p = .009). Compared to non-sarcopenic subjects, sarcopenic ones have a lower level of physical activity (p = .002), a better score at the Tinetti test (p <.0001), «Timed Up and Go» (p = .04), «SPPB» (p <.0001), gait speed (p <.0001) and grip strength (p <.0001). Isometric muscle strength is also lower among sarcopenic subjects than among non-sarcopenic subjects for knee flexors (p = .004) and extensor (p = .004), ankle flexors (p = .003) and extensors (p = .01), hip abductors (p = .03), elbow flexor (p <.0001), and extensors (p = .002). Appendicular lean mass divided per height square is also lower among sarcopenic subjects (p<.0001). Finally, nutritional status is poorer among sarcopenic subjects (p = .04), as well as the quality of life linked to «emotional role», «functional role» and «change in health» (respectively p = .02, p = .02 and p = .04). Conclusion: This research highlights that over a third of nursing home residents are sarcopenic and the percentage is almost 50% among frail subjects; knowing that in nursing home setting, about 1 in 4 is frail. As expected, sarcopenic subjects have lower functional and motor abilities than non-sarcopenic ones..

OC29- ASSOCIATIONS BETWEEN DIETARY PROTEIN AND MAGNESIUM AND SKELETAL MUSCLE MASS AND STRENGTH IN MEN AND WOMEN FROM THE UK BIOBANK COHORT. A.A. Welch[1], M. Hickson[2] *(1. Norfolk, United Kingdom; 2. London, United Kingdom)*

Background : The maintenance of skeletal muscle mass and function is crucial in maintaining mobility and quality of life in our populations. A loss of muscle mass and function are risk factors for the onset of frailty and sarcopenia and mortality. Intake of dietary protein is important for prevention of the age-related loss of the skeletal muscle mass and function although intervention studies with dietary protein in people with sarcopenia have found inconsistent results (1,2). It is important to identify other potential nutrients for the treatment and prevention of sarcopenia and we recently found that magnesium intake was positively related to skeletal muscle mass and leg explosive power in a cross-sectional study in women of all ages (3). As magnesium is integral to skeletal muscle physiology and protein synthesis we therefore investigated the association between protein and magnesium intake and indices of skeletal muscle mass and strength in men and women from the UK Biobank Cohort. We investigated firstly the independent associations between protein and magnesium intake on the outcomes of skeletal muscle mass and grip strength and secondly the relationship between protein and magnesium intake on these outcomes. Methods : We investigated the association between skeletal muscle mass measured as fat free mass (FFM) with Bioelectrical Impedance (Tanita BC-418 MA – Tanita Corporation, Arlington Heights, IL.), and hand grip strength (measured with the Jamar J00105 hydraulic hand dynamometer) and dietary intake of protein and magnesium measured using a 24-hour recall method in 12,602 men and women (5,678 men and 6,924 women) aged 40-69 years in the UK Biobank Study with complete data for all body composition and dietary measurements. For grip strength the maximum of both hand measurements was used. Total FFM was expressed either as the percentage of body weight ((FFM kg/body weight Kg)*100) or the fat free mass index (FFMI – fat free mass in Kg/height2). Dietary intake was divided into quintiles and regression analysis (analysis of covariance) was used to calculate the associations between the measures of body composition and grip strength and adjusted for the covariates of age, smoking status, physical activity, energy intake, dietary mis-reporting, and menopausal status and HRT medication in women. FFFMI was also adjusted for total fat mass and grip strength for standing height. Analysis was performed in STATA SE 14.0. Results : Mean age in men was 56.7 Y in men and 55.4 Y in women. Whole body mean FFM% was 76.1% and 65.3% and mean FFMI was 20.3 kg/m2 and 16.5 kg/m2 in men and women, respectively. FFM% was significantly and negatively associated with percentage protein intake (-0.33% per quintile (P trend <0.001) in men and -0.28% (P<0.001) in women) whereas for magnesium intake the association was positive (0.42% per quintile (P trend <0.001) in men and 0.45% per quintile in women (P<0.001)), in the fully adjusted models. With both nutrients together in the statistical models the association with protein was more negative and that of magnesium was more positive in men (protein -0.36% (P<0.001), magnesium 0.46% (P<0.001) and protein -0.32% (P<0.001), magnesium 0.50%

(P<0.001) in women, indicating an interaction between the nutrients. There was no association between FFMI or grip strength and either dietary protein or magnesium in either men or women. Conclusion: We found strong positive associations between magnesium intake and FFM% and a negative association with protein. The finding of the direction of the association with protein was surprising, although given the inconsistent results from previous cross-sectional and interventional studies may not be entirely unexpected. However, the associations were strengthened when both nutrients were included in the statistical model, suggesting an interaction and supporting our previous findings for magnesium that were previously found only in a female population (3). We also found no association between grip strength and either nutrient also supporting our previous findings (3). These results suggest the interaction between protein and magnesium intake on skeletal muscle mass and function deserves further research. References: (1) Murton AJ, Proc Nut Soc, 74, 387-396 ; (2) Hickson M, Proc Nut Soc, 74, 378-386 ; (3) Welch AA et al, JBMR, 2015 Aug 19. doi: 10.1002/jbmr.2692. This research has been conducted using the UK Biobank Resource.

OC30- GRIP STRENGTH AS AN INDICATOR OF CLINICALLY RELEVANT MUSCLE WEAKNESS IN OLDER AMERICANS: IDENTIFYING CUTPOINTS AND NATIONAL PREVALENCE ESTIMATES BY RACE IN THE U.S. HEALTH AND RETIREMENT STUDY. K. Duchowny, M. Peterson, P. Clarke *(Ann Arbor, USA)*

Background: A growing body of research suggests that muscle weakness is an important indicator of future disability. Grip strength, a simple and cost-effective measure of muscle strength, may serve as a robust prognostic indicator of muscle weakness and subsequent functional limitations. Yet, grip strength cutpoints to determine muscle weakness have not been established in a nationally representative sample. While recent cutpoints were proposed by the Foundation of the National Institutes of Health (FNIH), these criteria were established using largely white, non-nationally representative data. Therefore, the primary objective of this study was to (1) establish cutpoints of grip strength and estimate the prevalence among men, women, Blacks and Whites in a nationally representative sample of Americans aged 65+ and (2) examine the diagnostic properties of the grip strength cutpoints. Methods: Classification and Regression Tree (CART) models were used to establish cutpoints for grip strength (mean of two tests by dynamometer) associated with clinical slowness (walking speed <0.8 m/s) among 7,688 individuals (57% female, mean age= 74.6±10.07years) from the 2010/2012 Health and Retirement Study. Identified cutpoints were then used to quantify the prevalence of weakness by sub-group. Imputed gait speed values (n=832) were generated using the multiple imputation method in SAS 9.3. Sensitivity/specificity analyses were conducted to assess the classification of true cases on both weakness status (weak vs. normal) and slow walking speed (slow vs. normal). Classification of individuals on weakness status (weak vs. normal) and ADL status (1+ vs. 0) was also examined. Results: Grip strength cut-points were higher than those obtained by FNIH, and the prevalence of weakness was greater in this nationally representative sample of older Americans. Forty percent of white men (max grip strength <37kg) and 49% of white women (<22kg) were classified as weak compared to 10.5% and 13.2%, respectively using the FNIH cutpoints. Higher cutpoints were identified for Black males (<40kg) and females (<31kg), and the prevalence of weakness (61% and 88%, respectively), was higher compared to Whites. We found high sensitivity and specificity for the classification of true cases (sensitivity) and non-cases (specificity) among White men (56% SE, 72% SP) and White women (60% SE, 68% SP) when classifying individuals on both weakness and slow walking speed. However, the sensitivity for Black men (70%) and Black women (90%) was notably higher, while specificity was lower for Black men (65%) and Black women (29%). When comparing individuals on both weakness and ADL status, we found similar sensitivity and specificity values for all subgroups, providing further support that grip strength cutpoints were consistently classifying similar individuals. Conclusions: These results highlight stark differences compared to results obtained by FNIH and indicate that population level cutpoints obtained in a nationally representative sample may be a better measure of weakness. We observed a high prevalence in both grip strength and slow walking speed, and when considered concurrently, have important implications for health disparities as it relates to future disability risk. This is the first study to establish cut-points for clinical weakness in a nationally representative sample by sex/race. Results underscore the importance of using population level data to identify individuals at greatest risk for adverse health outcomes.

OC31- ASSOCIATION BETWEEN HEMOGLOBIN A1C AND FRAILTY IN ELDERLY COMMUNITY-DWELLING INDIVIDUALS. S. Nie[1], Q. Sun[1], K. Tan[1], L. Wang[1,2], H. Qin[1], L. Zhao[1], S. Wang[1] *(1. Sichuan, China; 2. Chengdu, China)*

Backgrounds: Frailty, an early stage of disability in elderly persons, has proved to be a predictive factor of a variety of poor outcomes in old populations, such as falling down, getting into medical institution and even death. The prevalence of frailty is variable in different countries (4.0-59.1%), community-dwelling populations (6.9-20.0%) and medical institutions (29.2-53.7%). As for pathogenic mechanism, it is thought as a result of comorbidity, polypharmacy, lacking of exercises, as well as aging itself. Studies have shown that diabetes mellitus in elderly has high prevalence of frailty, frailty inturn make the plasma glucose control become more difficult. Many studies in the past years were designed to prove that lower Hemoglobin A1c (HbA1c) level associate with less prevalence of vascular complications, but for the old diabetic patients who combined with frailty or functional limitations, hypoglycemic drugs should be stopped when it dropped to 7.5% or less and, 8% or more were recommended for such group. A prospective study including 543 community-dwelling women aged 70 to79, found that the prevalence of frailty was increased steadily when HbA1c level is 6.5% to 8.9%, but when HbA1c level is up to 9.0% or greater, the prevalence is significantly increased. So the aim of this study is designed to find out the possible relationship between HbA1c level and frailty status among community-dwelling elderly persons aged 65 years or older. Methods: This is a cross-sectional study. A total of 668 community-dwelling persons who aged 65 years and over participated in this study. Those who with severe visual or hearing impairment, severe dementia and unwilling to accept the survey were excluded. “FRAIL” scale was chose to define the status of frailty. HbA1c levels, demographic characteristics, geriatric assessment and some chronic diseases were surveyed in this study. Means±standard deviation was used to describe quantitative data meeting to normal distribution and interquartile range (IQR) was used to present data meeting to non-normally distribution. Crude frequencies were used to describe qualitative data. ANOVA and chi square test were used to analysis the quantitative data and qualitative data respectively, and p value less than 0.05 were considered statistically significant. The relationship between HbA1c and frailty were analyzed using multivariate logistic regression model. Results: For the whole group, the prevalence of frailty was only 6.74%, however the prevalence of pre-frailty was higher than frailty, which up to 60.63%. Reference

to HbA1c level lower than 6.0%, the range of HbA1c level around 7.0-8.0% was associated with a prevalence of pre-frailty (P=0.020, OR=3.151, 95% CI=1.200- 8.271) and HbA1c higher than 8.0% was associated with a prevalence of frailty (P=0.014, OR=6.958, 95%CI=1.486-32.587). Meantime, pre-frailty and frailty status were also correlated significantly with higher BMI, lower MNA-SF score, medical insurance absence, vision decreasing, and chronic diseases such as angina, chronic obstructive pulmonary disease, arthritis, stoke, hypotension and asthma respectively. After adjusting BMI, MNA-SF score, medical insurance, vision and chronic diseases, high levels of HbA1c still had association with frailty status significantly. Conclusion: Both of the prevalence of frailty and pre-frailty was found in this community-dwelling population and the prevalence of pre-frailty is higher than that of frailty. HbA1c level around 7.0-8.0% was associated with a prevalence of pre-frailty and higher than 8.0% was associated with a prevalence of frailty compared to HbA1c level less than 6.0%. Higher BMI, lower MNA-SF score, medical insurance absence, vision decreasing, and chronic diseases were found as risk factors for the prevalence of frailty status.

OC32- CHARACTERIZATION OF THE HETEROGENEITY WITHIN COMMUNITY DWELLING MALNOURISHED OLDER ADULTS WITH SARCOPENIA. M. Tian[1], S. Pereira[1], D. Hustead[1], A. Cruz Jentoft[2], F. Landi[3], M. Zamboni[4], V. Mustad[1] *(1. Columbus, USA; 2. Madrid, Spain; 3. Rome, Italy; 4. Verona, Italy)*

Background: Malnutrition and sarcopenia are conditions that are common and overlapping in older adults. Sarcopenia is currently defined as the combined loss of muscle strength and/or functionality and muscle mass in older adults. Thus the sarcopenia population is possibly heterogeneous given the inclusion of people at various stages of sarcopenia severity and different strength and functional outcomes. The objective of this work was to characterize a malnourished, sarcopenic, community dwelling, older population to determine if differences exists, in terms of body composition and strength, based on sarcopenic severity. Blood biomarkers were used to further characterize the population to identify potential physiological or metabolic differences within the subgroups. Blood biomarkers are important tools to elucidate the underlying mechanism for better characterization of specific study populations. Methods: Community-dwelling older men and women (n=328) with malnutrition and sarcopenia from eight countries in Europe and North America were recruited into a clinical study to examine the impact of two different oral nutritional interventions (Group A and Group B). Malnutrition was identified by Subjective Global Assessment (Category B or C included) and sarcopenia defined by guidelines from European Working Group on Sarcopenia in Older People (EWGSOP). Baseline analyses were carried out in these subjects by comparing two subgroups within each treatment group: Severe Sarcopenia (low muscle mass in combination with both low gait speed and low grip strength) vs. Sarcopenia (low muscle mass without both low gait speed and low grip strength), in terms of body composition and isokinetic leg strength. In addition, baseline fasting blood samples were collected and over 190 biomarkers were analyzed using 1) a multiplexed immunoassay from Myriad-RBM (Human Discovery MAP-175+ v.1, Human custom MAP), 2) ARCHITECT, 3) manual ELISA, 4) Blood chemistries by ICON. Of 190 markers measured, 60 markers were excluded from evaluation due to results being below detection levels in ≥30% subjects; 130 markers were used for final evaluation of subjects. Results: Compared to the Sarcopenia subgroup, Severe Sarcopenia subgroup demonstrated significantly higher % body fat, and lower % lean mass, total leg lean mass, and isokinetic leg strength at 60°/sec. Blood biomarker analyses revealed that, compared to Sarcopenia subgroup, the Severe Sarcopenia subgroup had significantly lower prealbumin level and higher levels of markers associated with vascular dysfunction and inflammation, some of which include angiopoietin, angiotensinogen 2, IL-8, TNF-alpha receptor 2, RAGE. Conclusion: Baseline physical characteristics, taken together with biomarker findings, point to body composition and possibly physiological differences between the Severe Sarcopenia and Sarcopenia subgroups. The Severe Sarcopenia subgroup appeared more physically compromised compared to the Sarcopenia subgroup, possibly due to compromised nutritional status and underlying metabolic dysfunction, and could potentially respond differently to interventions. This population heterogeneity within the sarcopenia population may be a confounder in sarcopenia intervention studies.

	Group A		Group B	
	Severe Sarcopenia (n=80)	**Sarcopenia (n=83)**	**Severe Sarcopenia (n=64)**	**Sarcopenia (n=101)**
% body fat	38.5 (32.5, 44.2)	35.6 (28.3, 41.0) 0.023	41.1 (34.5, 45.1)	36.3 (27.8, 42.2) 0.001
% lean mass	58.4 (53.5, 64.1)	61.0 (55.6, 67.6) 0.028	55.6 (52.3, 62.3)	60.7 (54.8, 68.1) 0.002
leg lean mass, kg	11.3 (10.1, 13.7)	12.6 (10.4, 15.9) 0.014	10.7 (9.1, 13.3)	12.6 (10.5, 16.0) 0.003
*Isokinetic leg strength, Nm	48.3 (30.0, 65.0) n=44	66.2 (49.7, 81.0)0.001 n=54	45.7 (30.3, 65.0) n=47	65.7 (50.1, 93.0) < 0.001 n=71
			45.7 (30.3, 65.0) n=47	65.7 (50.1, 93.0) < 0.001 n=71

Values are median (25th, 75th Interquartile Range). Superscript p values are vs Severe Sarcopenia within each group, analyzed by Two Sided Wilcoxon Rank Sum Test. * N for isokinetic leg strength is labeled separately after interquartile range.

OC33- AGE ASSOCIATED DECLINE IN THE CONVERSION OF LEUCINE TO B-HYDROXY-B-METHYLBUTYRATE IN RATS. S. Shreeram[1], S.L. Pereira[2] *(1. Singapore; 2. Columbus, USA)*

Background. The loss of muscle mass is considered to be a major factor for strength decline during aging. β-Hydroxy-β-Methylbutyrate (HMB), a metabolite of Leucine has been shown to enhance muscle protein synthesis and attenuate loss of muscle mass by multiple pathways. However, the production and regulation of endogenous levels of HMB over the lifespan has not been investigated. Objective. The objective of the present study was to do a cross-sectional analysis of the basal plasma levels of HMB in male Sprague-Dawley rats of different ages and to compare the efficiency of conversion of leucine to HMB in young versus older rats. Methods. Plasma level of HMB and KIC was analyzed in rats of different age groups (1, 3, 9, 12 and 24 months old, n=10 per group). Levels of 4-HPPD, the enzyme involved in the conversion of KIC to HMB in the liver was determined by ELISA. The conversion efficiency of Leucine to HMB was compared between 3 and 24 month rats after an oral bolus dose of Leucine. Results. Endogenous circulating levels of HMB were significantly reduced in older age rats compared to young rats (100 ± 3.7 vs 156 ± 10 SEM, ng/mL, p<0.001). A significant negative correlation was seen between HMB levels and age. The levels of 4-HPPD in liver was found to be significantly decreased in older compared to young rats. Consistent with this decline, the conversion efficiency of Leucine to HMB was significantly down-regulated. Thus the decrease in endogenous HMB levels was not in the metabolic step leading to the conversion of Leucine to KIC, but in the conversion of KIC to HMB in the liver. Conclusions. In summary, this study depicts for the first time that the basal levels of HMB, a metabolite of amino acid leucine, declines with age, and that this decline is

due to perturbations in the key enzyme 4-HPPD which catalyzes the conversion of KIC to HMB. As a consequence, the efficiency of conversion of Leucine to HMB is diminished in older rats compared to younger rats.

OC34- FRAILTY IS ASSOCIATED WITH LOWER EXPRESSION OF GENES INVOLVED IN CELLULAR RESPONSE TO STRESS. M. El Assar[1], J. Angulo[2], J.A. Carnicero[3], F.J. García García[3], E. López-Hernández[2], J.M. Sánchez-Puelles[2], L. Rodríguez-Mañas[1] *(1. Getafe, Spain; 2. Madrid, Spain; 3. Toledo, Spain)*

Background: Albeit frailty is envisioned as a predictor of disability and mortality, the specific mechanisms underlying this syndrome are not well known. Frailty can be viewed as a loss of functional reserve which results in increased vulnerability to stressors. Thus, pathways regulating cellular response to stress (oxidative stress, inflammation, hypoxia, etc.) have been regarded as possible players in the development of frailty. One of the main objectives of the FRALOMIC Initiative is to develop clinical instruments composed by clinical biomarkers, omics based laboratory biomarkers and classical laboratory biomarkers to predict the risk of frailty. Accordingly, the aim of this study is to evaluate if the expression of certain genes potentially related to aging or cellular response to stress is associated with the presence of frailty in older subjects. Methods. We randomly selected 368 individuals aged 65 years or older from the Toledo Study of Healthy Ageing. The sample consisted of frail (25%), non-frail without cardiovascular risk (25%) and non-frail with cardiovascular risk (the remaining 50%) subjects. Cardiovascular risk was assessed by meeting at least one of the following criteria: hypertension, diabetes mellitus, BMI over 30 or hypercholesterolemia. Frailty was assessed by the Fried's criteria. For gene expression analysis RNA was extracted from PAXgene whole blood tubes and first strand cDNA was synthesized from 500 ng RNA. 50 ng of cDNA was used for gene expression analysis by mean of microfluidic cards type TaqMan Low Density Arrays (TLDAs; Applied Biosystems, Life Technologies). The TLDAs were run on the Applied Biosystems 7900HT Fast system. A total of 23 genes (21 potential candidate genes and 2 reference genes) were analyzed. The genes studied can be grouped as follow: 1- genes implicated in cellular response to stress (NFE2L2: nuclear factor erythroid 2-like 2; TXNRD1: thioredoxin reductase 1; HOMX2: heme oxygenase 2; SIRT1: sirtuin 1; SOD2: mitochondrial superoxide dismutase), 2- genes implicated in inflammation (NOS2: inducible nitric oxide synthase; PTGS2: prostaglandin-endoperoxides synthase 2; IL6: interlukin 6; IL10: interlukin 10; CXCL10: chemokine (C-X-C motif) ligand 10; SDF-1: stromal cell derived factor-1); 3- genes implicated in vascular response (ACE2: angiotensin I converting enzyme 2; ARG2: arginase-1; VDR: vitamin D (1,25-dihydroxyvitamin D3) receptor; CYP27B1: cytochrome P450, family 27, subfamily B, polypeptide 1 (1-alpha hydroxylase); MAS1: receptor Mas of angiotensin 1-7). 4- genes related to hypoxia (HIF1α: Hypoxia inducible factor 1 alpha; EPAS1: Hypoxia inducible factor 2 alpha (HIF2α), and EGNL3: prolyl hydroxylase-3; VEGFR2: vascular endothelial growth factor receptor 2; NOS3: endothelial nitric oxide synthase). The combination of both endogenous reference genes (B2M: beta-2 microglobulin, and ARF-1: ADP-ribosylation factor 1) was used for data standardization. Relative measure of expression of each gene was performed by calculating (2-ΔCt), where ΔCt is the Ct value for each sample normalized with the endogenous reference genes. A logistic regression model was used to assess the relationship of gene expression and frailty after the deletion of outliers or/ and non-valid determinations. Both age and sex were used as potential confounders. Results. Among the analysed genes only the expression of HIF1α, NRF2 and its target genes (HMOX2, TXNRD1), and SOD2 were significantly associated with the presence of frailty after adjustment for age and sex. In fact, frailty was related to a lower expression of these genes related to cellular response to oxidative stress or hypoxia. Furthermore, this association was maintained after the adjustment for cardiovascular risk factors. Conclusion. The reduced expression of several genes implicated in cellular response to oxidative stress or hypoxia are significantly associated with the presence of frailty. This association is independent of age, sex or cardiovascular risk. These results help to fill the gap of knowledge of this evolving field and provide targets for intervention to promote health and independence in the elderly. On behalf of the FRAILOMIC Initiative (305483) that is funded under the European FP7 framework.

OC35- OBESITY, SARCOPENIC OBESITY OR SARCOPENIA: WHICH IS A GREATER RISK FOR KNEE OA? MOST STUDY. D. Misra[1], R. Fielding[1], D.T. Felson[1], M. Nevitt[2], J. Torner[3], C.E. Lewis[4], T. Neogi[1] *(1. Boston, USA; 2. San Francisco, USA; 3. Iowa City, USA; 4. Birmingham, USA)*

Background: Obesity is a major risk factor for knee osteoarthritis (OA) but the mechanism through which it leads to knee OA (mechanical loading vs metabolic effect of proinflammatory adipose tissue products), is unclear. Association of obesity and knee OA in prior studies disappears when adjusted for the loading effect, using body mass index (BMI) or body weight. In these prior studies, obesity was defined using anthropometric measurements (e.g. BMI), which are aggregate measures of fat, muscle and bone mass. Thus, defining obesity by anthropometric measurement does not permit evaluation of the mechanisms through which obesity leads to knee OA. Such an insight into underlying mechanism can be obtained by defining obesity using body composition that allows measurement of the fat mass. Further, body composition assessment allows evaluation of the contribution of muscle mass, particularly low muscle mass (sarcopenia), as low muscle (quadriceps) strength is a risk factor for knee OA, and thus may have heightened risk for knee OA, independently or in combination with obesity. Thus, aim of this study was to determine the association of body composition (obesity, sarcopenic obesity and sarcopenia) to the risk of knee OA, adjusting for mechanical loading (body weight), in community-dwelling older adults. Methods: The Multicenter Osteoarthritis (MOST) Study is a NIH-funded longitudinal observational study of individuals with or at high risk for knee OA. Subjects had whole body Dual Energy X-ray (DXA) at baseline, which was used to define obesity and sarcopenia in a sex-specific manner: 1) obesity (yes/no): highest quintile of total body fat mass (grams); 2) sarcopenia (yes/no): lowest quintile of appendicular skeletal mass (composite of upper and lower extremity muscle mass in grams) residuals, adjusted for age, height and total body fat mass. Based on the obesity and sarcopenia definitions, we then grouped subjects into the following exposure categories: 1) obese non-sarcopenic; 2) sarcopenic-obese (i.e. met definition for both obesity and sarcopenia); 3) sarcopenic non-obese; and 4) non-sarcopenic non-obese (referent group). Outcomes of interest were: 1) incident radiographic OA (ROA): presence of KL grade ≥2 in either knee at the 60-month follow-up visit among those free of ROA at baseline; 2) incident symptomatic OA (SOA): presence of knee pain in addition to ROA in the same knee, among those free of SOA at baseline. We studied the relation of exposure categories to the risk of ROA and SOA, respectively, using binomial regression with robust variance estimation, adjusting for age, race, physical activity (PASE score), smoking, comorbidities and knee injury. In a sensitivity analysis, we additionally adjusted for body weight as a proxy for mechanical loading. Results: Among 2787 participants (mean age

62 years, mean BMI 30 kg/m2, 59% women), 14% were obese non-sarcopenic, 4% were sarcopenic-obese, 17% were sarcopenic non-obese, and 65% were non-obese non-sarcopenic. Three hundred fifty five and 154 subjects developed incident ROA and incident SOA, respectively. Obesity and sarcopenic-obesity were associated with >2-fold increase in the risk of incident ROA, while sarcopenia alone had no increased risk, compared with those who were non-obese non-sarcopenic (Table 1). This association of obesity persisted after adjustment for body weight. Similar results were noted for incident SOA for all categories, except sarcopenic-obesity, where too few numbers did not permit precise assessment. Conclusions: Even after accounting for mechanical loading (adjusting for body weight), adiposity defined by body composition was associated with increased risk of knee OA. No such association was noted for sarcopenia. Our results suggest that adipose tissue may have an independent effect on knee OA risk through metabolic pathways, beyond solely mechanical effects.

Table 1
Longitudinal association of body composition category with incident knee osteoarthritis (OA)

Sex-specific body composition category	n/N	Crude RR	Adjusted *RR	Adjusted *RR
Radiographic Knee OA				
Obese non-sarcopenic	75/312	2.16	2.19 (1.70-2.82)	2.04 (1.45-2.88)
Sarcopenic-obese	21/101	1.87	2.03 (1.29 - 3.18)	1.91 (1.16-3.13)
Sarcopenic non-obese	50/499	0.90	0.90 (0.65-1.24)	0.91 (0.66-1.25)
Non-obese non-sarcopenic (ref)	209/1875	1.0	1.0	1.0
Symptomatic Knee OA				
Obese non-sarcopenic	40/308	2.64	2.64 (1.80-3.86)	3.30 (1.96-5.59)
Sarcopenic-obese	2/101	0.40	0.42 (0.11-1.66)	0.51 (0.13-2.07)
Sarcopenic non-obese	20/499	0.82	0.63 (0.48-1.27)	0.77 (0.47-1.23)
Non-obese non-sarcopenic (ref)	92/1873	1.0	1.0	1.0

*Adjusted for age, race, physical activity (PASE score), smoking, comorbidity and knee injury; **Additionally adjusted for body weight

OC36- THE INCIDENCE OF SARCOPENIA AMONG HOSPITALIZED OLDER PEOPLE: RESULTS FROM THE GLISTEN STUDY. A.M. Martone[1], M. Tosato[1], S. Volpato[2], E. Marzetti[1], R. Calvani[1], A. Sisto[1], E. Ortolani[1], F. Landi[1] *(1. Rome, Italy; 2. Ferrara, Italy)*

Backgrounds: New evidence is emerging on the importance of lean body mass during periods of patient illness and recovery. Increasing awareness of the need for healthy mass during such periods of intense stress will improve both patient and treatment outcomes. However, data concerning the incidence of sarcopenia among older people during hospital stays are scarce in the current literature. The objective of this study was to evaluate the onset of sarcopenia in a sample of hospitalized older subjects. Methods: We used data (485 participants) from the multicenter Italian Study conducted by the Gruppo Lavoro Italiano Sarcopenia – Trattamento e Nutrizione (GLISTEN) in 9 Acute Care Wards (Internal Medicine and Geriatrics) of University Hospitals across Italy. This study was designed to determine the prevalence of sarcopenia at hospital admission and the change in muscle mass and strength during hospitalization. After excluding 32 subjects for missing values in the variables of interest, a sample of 453 subjects age 70 years and older was included in the present study. A hospital stay of more than 48 hours in the emergency department before being admitted to the acute care unit involved in the project, was considered an exclusion criterion. Sarcopenia was assessed as a low skeletal mass index (Kg/m2) along with either low handgrip strength or low walking speed (EWGSOP criteria). Estimation of skeletal muscle mass was performed by bioelectrical impedance analysis (BIA). Results: The mean age of the 453 enrolled subjects (including 219 females who accounted for 48% of the sample) was 80.9±6.4 years (82.3±6.6 and 79.6±6.0, in women and men respectively). The diagnosis of sarcopenia at hospital admission was found in 148 (32.7%) subjects, without significant a significant difference in genders. Among subjects without sarcopenia at hospital admission, 14.3% of the study sample met the EWGSOP sarcopenia diagnostic criteria at discharge. More than 50% of the subjects that developed sarcopenia during the in-hospital stay showed a loss of muscle mass higher than 10% of the baseline value. Subjects that developed sarcopenia were significantly older than subjects without sarcopenia at hospital discharge (81.5±6.9 versus 79.3±5.9 years, respectively; $p<0.01$). The incidence of sarcopenia during hospitalization was significantly associated with the number of days spent in bed in the absence of mobilization and did not correlate with the total length of hospital stay. In particular, subjects suffering sarcopenia during the in-hospital stay spent an average of 3.4 days (28% of the length of hospital stay) in bed compared to 1.7 days (18% of the length of hospital stay) for subjects without sarcopenia at hospital discharge ($p=0.02$). Subjects with sarcopenia showed a significantly lower Body Mass Index compared to the subjects that did not develop sarcopenia (24.8±3.7 Kg/m2 versus 27.7±5.0 Kg/m2, respectively; $p<0.001$). Similarly, the skeletal mass index at the admission was significantly lower among subjects who had developed sarcopenia during the in-hospital stay (9.1±1.6 Kg/m2 versus 8.1±1.3 Kg/m2, respectively; $p<0.01$). Finally, subjects with sarcopenia showed a non-statistically significant lower energy intake during the in-hospital stay as well. Conclusions: The results of this study show that the onset of sarcopenia during in-hospital stays is relatively high. The onset of sarcopenia is directly related to nutritional status and the number of days of bed rest. This is of particular interest considering that during a period of acute illness, the loss of lean body mass can be dire to both a patient's recovery outcomes and their treatment plan. It is important to both protect and preserve muscle functioning in order to optimize recovery. Preventing the loss of muscle mass during in-hospital stays, through specific nutritional programs and early mobilization, will improve both patient and treatment outcomes..

OC37- AN ANALYSIS OF LIFECOURSE INFLUENCES ON MUSCLE STRENGTH: THE ROLE OF DIET QUALITY IN CHILDHOOD. S. Robinson[1], S. Crozier[1], H. Inskip[1], K. Godfrey[1], N. Harvey[1,2], C. Cooper[1,2], A. Aihie Sayer[1,3,4] *(1. Southampton, United Kingdom; 2. Oxford, United Kingdom; 3. Wessex, United Kingdom; 4. Newcastle, United Kingdom)*

Background : Low muscle strength, a key feature of sarcopenia, is a predictor of poor health in older people. Recognition of the importance of low muscle mass and strength in adult life has led to significant research efforts to define dietary and other strategies that slow age-related losses - to promote healthier ageing, and to reduce risk of future morbidity and mortality. However, muscle strength in older age is not only the result of losses in later life but is also influenced by the peak attained in early adulthood. Throughout the lifecourse there is wide variability in muscle strength at any given chronological age [Dodds et al 2014], but relatively little is known about the role of diet in explaining these inter-individual differences. In older adults there is growing evidence of benefits of nutrient-dense diets of higher 'quality' that are consistently associated with greater strength and better physical function. Less is known about effects of diet during the phase

of acquisition of muscle strength in early life, or the effects of diet in early life on later physical function, although in an historical cohort we have observed greater muscle strength among older men who were exclusively breastfed in infancy [Robinson et al 2012]. The aim of the present analyses was to investigate the role of nutrition during early life as a determinant of muscle strength in childhood, assessed at the age of 6 years; we examined associations with breastfeeding duration and quality of diet in infancy and early childhood. Methods : The Southampton Women's Survey (SWS) is a prospective birth cohort, established in 1998, in which the diet, body composition, physical activity and social circumstances of a general population sample of 12,583 non-pregnant women, aged 20 to 34 years, were characterised. SWS women who conceived during the period of the study were followed through their pregnancies, and continued follow-up of these children is ongoing. There were 1981 live singleton births up to the end of 2003; 462 of these children had measurements of grip strength at 6 years of age. Diets were assessed at follow-up visits at the ages of 6 and 12 months, 3 years and 6 years using administered age-specific food frequency questionnaires (FFQ). Breastfeeding duration was defined according to the date of the last feed reported in infancy. Diet quality was assessed using principal component analysis (PCA) of the FFQ data. At each age the first component identified by the PCA described a pattern of diet that complied with infant and child feeding guidance; high scores at every age indicated diets characterized by frequent consumption of fruit, vegetables, wholegrain foods and fish. A score was calculated for this component for each child at the ages when diet was assessed (6 and 12 months, 3 and 6 years); the score was interpreted as an indicator of the child's quality of diet at that age. At the 6-year visit the children's height and weight were measured and physical activity levels were assessed by questionnaire; body composition was assessed by DXA. Grip strength was measured using a Jamar dynamometer ; the maximum of six readings was used in the analysis. Results: The study population included 229 boys (50%); mean maximum grip strength at 6 years of age was 10.1 (SD 2.5)kg for boys and 9.6 (2.4)kg for girls (P=0.029). 290 children (64%) were breastfed for at least one month; the median duration of breastfeeding was 13.0 (interquartile range 1.0-32.4) weeks. There was no association between duration of breastfeeding, or diet quality at the ages of 6 months, 12 months or 3 years, with grip strength assessed at 6 years. However, there was an association between current diet quality and grip strength at that age. In a multivariate analysis that took account of the child's sex, age, height, BMI, level of physical activity and maternal vitamin D status in pregnancy, diet quality scores at 6 years were positively related to grip strength (regression coefficient 0.30 (95% CI 0.04,0.55) kg per SD change in diet quality score (P=0.03). Adjustment for lean body mass at 6 years attenuated this association (regression coefficient 0.21 (95% CI -0.03,0.46) kg, (P=0.091). Conclusion : Consistent with findings in older populations, children aged 6 years who have diets of higher quality, characterised by frequent consumption of fruit and vegetables, have higher grip strength. In addition to known advantages of having a healthy diet in childhood, there may also be unrecognised benefits for gains in muscle mass and strength in early life. Dodds R et al. Grip strength across the life course: normative data from twelve British studies. PLoS One. 2014;9:e113637. Robinson et al Muscle strength in older community-dwelling men is related to type of milk feeding in infancy. J Gerontol (Series A) 2012;67:990-996.

OC38- FEASIBILITY AND ACCEPTABILITY OF A HOME-BASED EXERCISE PROGRAM (HEP) USING A GERONTECHNOLOGY IN COMMUNITY-LIVING OLDER ADULTS AFTER A MINOR INJURY. M. Lauzé, D. Martel, A. Agnoux, M. Émond, M.-J. Sirois, R. Daoust, M. Aubertin-Leheudre *(Montréal, Canada)*

Backgrounds: In Canada, older adults (aged 65 and over) represent 16.1% of the population. A decline in autonomy for activities of daily living (ADL; -7%) and instrumental (IADL;-22%) has been recently observed 3 months following a minor injury in previously independent older adults. Considering that minor injuries accelerate the path to frailty and disability, it is important to take action to prevent the decline following such adverse events. Physical activity (PA) interventions (in laboratory or in community conditions) have proven to be effective in improving functional status in frail people and reducing risk of major disability in a vulnerable older population. Nevertheless, 61% of older adults in Canada are considered inactive and many barriers such as poor health, accessibility, and fear of falling are stated to explain their inactivity. In order to address this issue, adapted HEP are foreseen as a suitable solution to increase PA level. HEP have a good adherence rate and should be considered as efficient as community-based exercise programs to improve functional level in ADL and mobility. However, objective information on adherence to HEP remains weak as it mostly relies on self-report measures that are not robustly validated. Moreover, ones of the most important limitations of HEP are the insecurity feelings of participants and the need for a kinesiologist to be present to ensure proper follow-up. A motion capture system may be a way to counteract these phenomena. The purpose of this study was to explore the feasibility and the acceptability of a HEP using a motion capture gerontechnology in community-living older adults following a minor injury. Methods: Six previously independent individuals (aged 65 and older) were recruited at the Emergency Departement after being evaluated and discharged within 24-hours with a minor injury, and assigned to a HEP using a gerontechnology (Jintronix). This technology is a portable device working with the Kinect motion capture system. It allows the acquisition of individual reports on adherence, active time, level of difficulty, quality and quantity of movements performed. The level of difficulty (e.g. movement type/speed, number of repetitions) can be adapted at distance by a kinesiologist according to each individual's report. However, since the technology is still in development (aim of this project), feedback and reports are currently provided only for resistance and balance exercises. The intervention was a 12-week HEP with 2 sessions/week and started seven days following the injury. Participants were free to decide the day and the time to perform the exercise program, but had to take a minimum of a day off between the two sessions. Each exercise session (50-55min) included a warm-up (5min), 9 aerobic exercises (20min), 9 resistance and balance exercises (20-25min) and a cool down (10min). There were two visits to install the technology and explain the program. Participants were progressively brought to independently use the technology. A kinesiologist visited the participant to supervise 7/24 sessions and was available for support for the remaining sessions. For each session and exercise, feasibility was assessed using Jintronix's reports and acceptability was evaluated using a four level analog scale for personal level of appreciation (PLA) and perceived level of difficulty (PLD). Results: First, 86% (123.25/144) of the sessions were completed and five participants adhered to 99% of the HEP. Despite the fact that the sixth participant was able to execute only 19% of the program due to severe osteoarthritis, this person insisted on using the technology and completing the program as much as possible. Participants executed 96% of the movements (repetitions: 27,154/28,149) and the average

quality of movements ranged from 80 to 91% (mean: 87.5%) for the completed sessions. The sixth participant managed to reach the feasibility's 80% set goal. Average PLD ranged from 3 to 43% (mean: 13%). The highest score was reported by the participant with the second highest number of comorbidities (total of 7). Higher PLD scores were observed in the aerobic portion of the program during sessions 1 to 8. This could be explained by the participants' cardiorespiratory fitness level before the HEP. PLD remained stable for all the sessions in the resistance and balance portion, despite a constant increase in the actual level of difficulty (intensity) by the kinesiologist. The participants' average PLA ranged from 66 to 97% (mean: 85%). Resistance and balance exercises (mean: 87%) were more appreciated than aerobic exercises (mean: 70%). Most importantly, no adverse events were reported, and the majority of the participants asked for the possibility to continue the program and use the technology. Conclusions: This pilot study demonstrated that the use of this gerontechnology by older adults with a minor injury is feasible and acceptable. Thus, this specific HEP should be validated and implemented in a larger population and in other conditions in order to prevent inactivity and, consequently, the loss of autonomy in elderly population.

OC39- THE COACH2MOVE STRATEGY: A NOVEL COST-EFFECTIVE PHYSICAL THERAPEUTIC INTERVENTION FOR FRAIL OLDER ADULTS. T. Hoogeboom, N. de Vries-Farrouh, R. Nijhuis-van der Sanden *(Nijmegen, the Netherlands)*

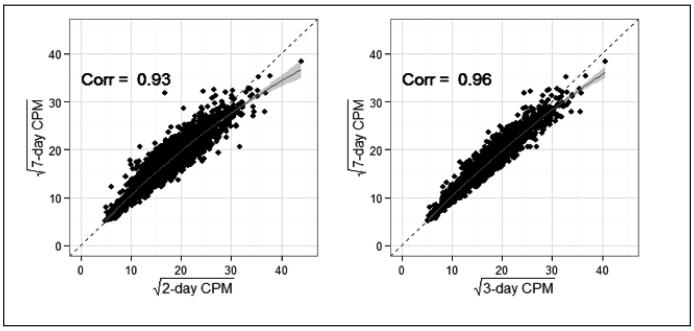
Backgrounds: Even though the health benefits of physical activity are evident, it is a great challenge for frail–older adults with mobility limitations to stay physically active and for physical therapists to stimulate older adults to increase their physical activity level. We developed and evaluated (effectiveness, costs and process) an individualized physical therapy intervention (comprising motivational interviewing, physical examination, individualized goal setting, coaching and advice on self management, and physical training) to increase physical activity levels and physical fitness and, thereby, to decrease the level of frailty in frail–older adults with mobility problems. Methods: We performed a randomized controlled trial in 13 physical therapy practices with measurements at 3 and 6 months. Patients were eligible if aged ≥70 years and having mobility problems (i.e. difficulties with walking, moving, getting up and changing position from bed or chair to standing, or stair climbing). The primary outcome was physical activity (total and moderate intensity) in minutes per day. Secondary outcomes were: frailty, walking speed and distance, mobility, and quality of life. Data were analysed using linear mixed models for repeated measurements. Healthcare costs and quality adjusted life years (QALYs) were computed and combined using net monetary benefit (NMB) for different willingness to pay thresholds. Data on costs, QALYs, and NMBs were analysed using linear mixed models. After the quantitative data collection was completed we performed semi-structured interviews with the physical therapists providing the Coach2Move intervention. Each interview was audio taped and transcribed verbatim. Validation was enhanced by member check, all the participants were asked to verify the interview transcript for errors and misinterpretations. Interview data were analysed using theoretical thematic analysis. The interviews were analysed using QRS Nvivo 10 for Windows. Results: 130 patients participated in this study. At 6 months, patients in the Coach2Move group were significantly more physically active (at moderate-intensity) than patients in the usual physical therapy group [mean difference: 17.9 min per day; 95% confidence interval (CI) 4.0 to 34.9]. The between-group difference for total physical activity was 14.1 min per day (95% CI -6.6 to 34.9; NS). Frailty decreased more in the Coach2Move group compared with usual care [mean difference: -0.03 (95% CI: -0.06 to -0.00]. Compared with usual treatment, the Coach2Move strategy resulted in reduced costs (€849.8; 95% CI: 1607 to 90), improved QALYs, (0.02; 95% CI: 0.00 to 0.03), and improved NMB at every willingness to pay threshold. Our qualitative analysis showed that physical therapists participating in the RCT on the effectiveness of the Coach2Move strategy show a high fidelity to the strategy. The GPTs value the Coach2Move strategy in the treatment of elderly, it helps them to motivate and activate elderly. Adherence of the GPT to the Coach2Move strategy appeared to be influenced by three factors: 1) organizational factors, 2) patient readiness to change, and 3) believes of the therapists. Conclusion: Frail–older adults with mobility problems are able to safely increase physical activity in their own environment and reduce frailty. This study emphasizes both the potential cost-effectiveness of a patient-centred approach in the frail elderly and the importance of physical activity promotion in older adults with mobility limitations. Furthermore, the Coach2Move intervention was highly appreciated by both the patients as well as the therapists providing it.

OC40- MONITORING DAYTIME ACTIVITY AMONG U.S. OLDER ADULTS: HOW MANY DAYS OF ACCELEROMETRY ARE ENOUGH? M. Kocherginsky, M. Huisingh-Scheetz, W. Dale, D.S. Lauderdale, L. Waite *(Riverside, USA)*

Introduction : Activity monitors are widely available and have great potential for clinical application, such as screening patients for low physical activity who may be at risk for frailty or monitoring frailty intervention effects. Since a full week of physical activity monitoring may be burdensome for older adults, we sought to determine how many days of continuous physical activity monitoring adequately captured physical activity level. Methods : We used hip accelerometry data from the 2003-2004 and 2005-2006 National Health and Nutrition Examination Survey (NHANES) to examine daily physical activity levels among adults ≥ 65 years of age, and to determine how well activity estimates obtained from 2 or 3 valid (≥ 10 hours of wear per day) wear days predicted activity measures from 7 valid wear days. Seven days has been a standard in most research studies based on the strong day-of-the week effects noted in the literature, especially for younger, employed adults. We first assessed activity by number of valid days and day of week across all users aged 65+ to determine whether significant variation existed. We then used an ordinal logistic regression model to look at age, sex, race, and working status as predictors of the number of valid days. We then compared average counts per minute (CPM) for the first 2 days and 3 days versus all 7 days of wear among those with 7 valid days of wear using Pearson's correlation and regression models. Results : There were 2208 accelerometry study participants age 65+, among whom 1979 (89.6%) had at least 1 valid day of wear, 1,884 (85.3%) had at least 2 valid days, and 966 (43.8%) had 7 valid days of wear. Average CPM was lower for participants with 1 wear day (128.8 , 95% CI: 107.4-150.1) versus those with 7 wear days (195.7, 95% CI: 184.4-207.0), and the increase was statistically significant ($p<.0001$, linear regression). Those with fewer than 7 days were more likely to be non-whites ($p=0.0001$) and older ($p=0.01$). Activity was similar Monday through Saturday (average daily CMP ranged from 190.1-197.1), but was significantly lower on Sundays (165.0, $p<0.0001$). Among subjects with 7 wear days, CPM averages from the first 2 or 3 days of wear had high correlation with the 7 day average (2 days: $r=0.93$, 3 days: $r=0.96$) (Figure 1A-B). Conclusions : This study suggests that 2 or 3 valid days of activity monitoring on weekdays or Saturdays correlate highly with 7 days among adults age 65+. Sunday activity is typically less than the rest of the week. Shorter accelerometry

protocols of 2 or 3 days for older adults would reduce respondent burden while adequately estimating typical activity, and would allow the inclusion of respondents who are typically non-adherent to longer protocols, minorities and very old adults in this study. A limitation of the NHANES data is that those with 7 days of wear were younger and more likely to be White compared to the full sample..

Figure 1A-B
Pearson's Correlation Relating 2-Day (A) or 3-Day (B) and 7-Day Hip Accelerometry Counts Per Minute (CPM) Among Older Adults



OC41- ANTECEDENT AND CURRENT PREDICTORS OF PERFORMANCE-BASED EARLY FRAILTY IN MIDLFE AND OLDER AGE: THE FELS LONGITUDINAL STUDY. M.J. Peterson, S.A. Czerwinsk, M. Lee, A. Choh *(Kettering, USA)*

Background: Physical frailty is a risk factor for disability and is defined as a loss in functional performance that is not detectable in a typical clinical setting. Physical frailty is typically characterized by very poor physical performance, e.g. inability to rise once from a chair. Identifying functional impairment prior to onset of such poor physical performance, which we have termed performance-based early frailty (PBEF), may be of benefit. Further, identifying antecedents to PBEF, and if they are present in early adulthood, are crucial in the development of preventative interventions and public health practices. We hypothesized that antecedents would be detectable in adults with PBEF in midlife, and remain as midlife predictors into older adulthood. Methods: Data are from 104 (N=35 "midlife" 40-60 years; N=69 "older" 60+ years) participants of the Fels Longitudinal Study, the world's longest running study of human growth and development. PBEF was derived from recently collected chair rise and gait speed measures, and defined using previously published, age-specific cut points for time to complete five chair stands (10 sec. for midlfe; 13 sec. for older) and walk four meters at usual pace (<1.0 m/s midlife; <0.80 m/s older). Impairment in one measure was defined as moderate PBEF and impairment in both measures was defined as severe PBEF. Other data collected at a previous and the current visit included anthropometrics/body composition (fat and lean mass, skinfolds, circumferences), self-reported physical activity, grip strength, serum/plasma markers (LDL cholesterol, HDL cholesterol, Triglycerides, C-Reactive Protein), alcohol use, tobacco use, sleep quality, and quality of life (MOS-36 Short Form sub-scales). Separate proportional odds logistic regression models were used to predict midlife and older PBEF status, respectively, as a function of antecedent and current health and physical measures. Results: Moderate PBEF was identified in 26% and 30% of midlife and older adults, respectively. Whereas severe PBEF was identified in 11% and 14% of midlife and older adults, respectively (x2 p=0.50). PBEF status was highly associated with current self-reported physical functioning in the older group (p=0.006) and marginally associated in the midlife group (p=0.07). In multivariate models predicting midlife PBEF, the only variable that was significantly associated with PBEF was current participation in leisure time sport activities (i.e., tennis and golf) with higher rates of participation conferring an almost 80% lower odds (OR=0.21; 95%CI 0.06-0.78) of PBEF. No antecedent characteristics (mean visit = 21.7 + 8.1 years prior) predicted PBEF status in midlife. In older adults, PBEF status was predicted by previous (mean visit = 16.8 + 7.4 years prior) heavier drinking (OR=3.05; 96%CI 1.39-6.71), previous better grip strength (OR=0.95; 95%CI 0.91-0.99), current poorer sleep habits (OR=1.21; 95%CI 1.05-1.40) and current higher C-reactive protein concentrations (OR=1.18; 95%CI 1.03-1.36). Proportional odds assumptions were met in both models. Conclusion: PBEF is associated with physical functioning, and can be detected using simple physical performance measures and their normative-based cut-points for poor performance. We hypothesized that patterns of antecedent predictors would be consistent in both midlife and older age PBEF; however, differing patterns of predictors emerged for each age group. In midlife only higher current physical activity levels were associated with PBEF, and in fact were highly protective. In the older group, a pattern of antecedent behavioral risk factors (smoking and drinking) emerged, along with the protective role of general strength (grip strength). Further, currently reported poor sleep and higher levels of C-reactive protein, an inflammatory biomarker, added to the risk profile. We conclude that PBEF in midlife is likely a state influenced by current health status, whereas older age PBEF is influenced by both current and antecedent factors and, thus, may be less amenable to intervention. This highlights the importance of healthy behaviors throughout the adult lifespan.

OC42- THE ASSOCIATION OF VITAMIN D DEFICIENCY AND CARDIOMETABOLIC DISEASES WITH INCIDENT FRAILTY IN OLDER. B. Buta[1], P. Pal Choudhury[1], Q.-L. Xue[1], P. Chaves[2], K. Bandeen-Roche[1], J. Walston[1], E. Michos[1], L. Appel[1], M. McAdams DeMarco[1], A. Gross[1], S. Yasar[1], M. Shardell[1], R. Semba[1], L. Ferrucci[1], L.P. Fried[3], R. Rastogi Kalyani[1] *(1. Baltimore, USA; 2. Miami, USA; 3. New York, USA)*

Background : Previous studies have explored the association between low vitamin D and incident frailty with mixed results. The relationship between vitamin D level and incident frailty may be related to certain factors that are also associated with the development of frailty, such as cardiometabolic diseases. We aimed to determine the degree to which vitamin D predicts the incidence of frailty, after accounting for the presence of cardiometabolic diseases. Our hypotheses were as follows: 1) vitamin D deficiency is associated with the development of frailty in older women; and 2) the relationship of vitamin D deficiency to the development of frailty is independent of cardiometabolic diseases. We additionally explored the relationship of vitamin D deficiency to the development of frailty in the presence of other comorbidities and potential mediators (i.e. inflammatory factors). Methods: We performed a secondary data analysis of longitudinal data collected in a prospective cohort study in Baltimore, Maryland. Three hundred sixty-nine women from the Women's Health and Aging Study II aged 70 to 79 at baseline who had all variables needed for analysis. The independent variable, serum circulating 25-hydroxyvitamin D [25(OH)D] level at baseline, was categorized as follows-up = 8.5±3.7 years) using the Cardiovascular Health Study criteria. Covariates included demographic characteristics (age, race, education), season of blood collection, body mass index, cardiovascular disease, diabetes mellitus, dyslipidemia, hypertension, chronic pulmonary obstructive disorder, osteoarthritis, depression, interleukin-6 level, parathyroid hormone level, and use of vitamin D, calcium, or multivitamin supplement. Statistical analyses included Kaplan-Meier survival

analyses and Cox regression models adjusted for important covariates. Results: Among those with 25(OH)D level of <10 ng/mL, the incidence rate of frailty was 32.2 per 1,000 person years compared to an incidence rate of 12.9 per 1,000 person years in those with levels ≥30 ng/mL. The incidence rate of frailty was 23.13 per 1,000 person years in those with 25(OH)D levels 10-19.9 ng/mL, and 15.1 per 1,000 person years among those with levels 20- 20.9 ng/mL. In time-to-event analyses, vitamin D category was associated with incidence of frailty (log-rank p=0.02). In Cox regression models adjusted for demographic characteristics and season, 25(OH)D level of <10 ng/mL (vs ≥30 ng/mL) was associated with nearly three-times greater risk of incident frailty (hazard ratio (HR) = 2.90, 95% CI = 1.20-7.00, p = 0.02). In models additionally adjusted for body-mass index, cardiovascular disease, diabetes, dyslipidemia, and hypertension, 25(OH)D level of <10 ng/ML (vs ≥30 ng/mL) remained significantly associated with incident frailty (HR = 2.59, 95% CI = 1.05-6.37, p = 0.04). The association was attenuated such that it was no longer significant in fully adjusted models that included COPD, osteoarthritis, depression, interleukin-6, PTH, and use of vitamin D or calcium supplements. Conclusion : Serum circulating vitamin D level is associated with the development of frailty in older women independent of cardiometabolic diseases. Dysregulation across multiple systems is likely critical in frailty development, including the complex interactions between vitamin D and other physiological systems. Future studies should further explore other potential mediators of this relationship.

OC43- THE RELATIONSHIP BETWEEN BODY COMPOSITION REMODELING AND MORTALITY: THE HEALTH AGING AND BODY COMPOSITION STUDY. A.J. Santanasto, B.H. Goodpaster, S.B. Kritchevsky, I. Miljkovic, S. Satterfield, A.V. Schwartz, S.R. Cummings, R.M. Boudreau, T.B. Harris, A.B. Newman *(Pittsburgh, USA; Miami, USA; Winston-Salem, USA; Memphis, USA; San Francisco, USA)*

Background: Observational studies show that weight loss at older age is associated with higher mortality risk. The loss of lean mass and shift to central adiposity are related to functional decline, but it is unknown whether these changes predict mortality and/or explain part of the risk of weight loss. The purpose of this research was to examine the association between body composition change, in the context of overall weight change, with mortality. Methods: 5-year changes in body composition, from computed tomography (cm2) and dual x-ray absorptiometry (kg), were quantified in 869 men and 934 women from the Health Aging and Body Composition Study. Participants were 70-79 years of age at baseline. Mortality was monitored for 10-years and risk was assessed using sex-specific Cox models adjusted for total weight change, demographics and chronic disease. Models were also stratified by baseline BMI and weight loss (>3% loss) or gain (<3% change) vs. stability (>3% gain). Results: Body composition changes were quite variable. In men, lean mass decreased (-2.6±4.2%) while fat mass increased (2.0±14.1%, both p<0.01). In women, lean (-1.3±4.7%) and fat mass (-1.1±13.5%) decreased (both p<0.01). In men and women, visceral and subcutaneous abdominal fat decreased; as did thigh muscle and subcutaneous fat (all p<0.01). Men and women gained intermuscular thigh fat (IMAT) (p<0.01). There were 995 deaths. Losing thigh muscle was associated with higher mortality in men (HR: 1.21, 95%CI: 1.08-1.35) and women (1.18, 1.01-1.37, per 9.0cm2) independent of total weight change and was especially strong in normal weight (BMI <25kg/m2) individuals and those losing weight. Losing IMAT was protective against mortality in normal weight (0.66, 0.51-0.86) and weight stable men (0.79, 0.66-0.95, per 3.2cm2). Changes in visceral fat were not associated with mortality. CONCLUSION: Older adults with greater loss of thigh muscle than expected for overall weight change had a higher mortality risk compared to those with relative thigh muscle preservation, suggesting that conservation of lean mass is important for survival in old age.

OC44- THE EFFECT OF HIGH DOSES OF VITAMIN D ON MUSCLE STRENGTH, GAIT, AND PHYSICAL PERFORMANCE IN FRAIL OLDER ADULTS. M. Montero-Odasso[1], A. Islam[1], S. Muir-Hunter[1], G. Duque[2], R. Crilly[1], M. Speechley[1], T. Doherty[1] *(1. London, Canada; 2. Melbourne, Australia)*

Background: The effect of vitamin D supplementation to improve physical performance in individuals with frailty remains controversial. Specifically, it has been hypothesized that higher doses than the current recommended dose (800 IU/day) may be needed to achieve a neuromuscular effect. Methods: We conducted a pilot Phase 2, feasibility, open-label study, to assess the effects of 4000 IU of Vitamin D daily in community-dwelling frail older adults (ages ≥75 years). Frailty was defined using the five criteria of the validated Frailty Phenotype (weight loss, weakness, exhaustion, slow gait, low activity level). Participants were tested on measures of physical performance and balance and using the Short Physical Performance Battery (SPPB), muscle strength (hand grip and knee extension test), cognition, and blood biomarkers. They were also tested for quantitative gait variables using an electronic mat (GaitRITE®) under usual, fast, and dual-task conditions. Participants then received a daily dose of Vitamin D3 (4000IU) and Calcium (1200mg) for 4 months, after which all assessments were repeated. Logistic regression models were run to evaluate the effect of vitamin D supplementation in the outcomes of interest adjusted for age, sex, comorbidities, body mass index (BMI), physical activity levels, and baseline vitamin D levels. Results: Forty older adults with pre-frailty or frailty were included [Mean Age (SD): 84.20(4.88), 78% female]. Fifteen were pre-frail (1-2 components present, 37%) and twenty-five were frail (≥ 3 components, 67%). Analysis of co-variance showed, after four months of intervention, significant improvement in grip strength (p=0.004), SPPB (p=0.013), and dual-task gait velocity (p=0.004) in the frail group. Next, the sample was stratified by baseline vitamin D serum levels as follows: insufficient (n=17) ≤75 nmol/L, and normal (n=23) >75 nmol/L. After intervention, participants in the insufficient group (≤75 nmol/L) significantly increased their performance in the SPPB (p=0.018), fast gait velocity (p<0.05), and grip strength (p=0.043), in the adjusted analysis. Pearson correlations showed a significant association between the increase in Vitamin D levels after intervention and improvement in knee strength (r=0.446, p=0.006) in all participants. Conclusion: A daily supplementation of 4000 IU of Vitamin D over four months improved physical performance in individuals with frailty, particularly in those with vitamin D insufficiency. This preliminary phase II trial show feasibility and efficacy of daily supplementation for improving physical performance in individuals with frailty. Participants who achieved levels over 75nmol/L showed more improvement than those with Vitamin D deficiency. Also participants classified as frail experienced more improvement than the pre-frail groups even after adjusting for covariates. This suggests that Vitamin D supplementation may serve as a beneficial treatment for those that are frail with suboptimal Vitamin D serum levels.

OC45- HIP STRENGTH HELPS TO EXPLAIN WALKING PERFORMANCE AMONG OLDER ADULTS WITH A PRIMARY COMPLAINT OF LOW BACK PAIN. J.M. Sions, P. Coyle, T.O. Velasco, G.E. Hicks *(Delaware, USA)*

Backgrounds: It is well-established that older adults with low back pain (LBP) present with significantly reduced physical function. We have recently found that a large percentage of older adults with a primary complaint of LBP also have concurrent hip pain. Previous researchers have demonstrated that younger adults with LBP have reduced hip range-of-motion and weakness of the hip muscles, especially the hip abductors. However, assessment of hip impairments among older adults with LBP is more limited. Further, to our knowledge, no studies have specifically evaluated the impact of hip strength on physical function among older adults with a primary complaint of LBP. The main purpose of this cross-sectional analysis was to determine to what extent hip strength explains walking performance among older adults with a primary complaint of LBP, while considering that the relationship may be dependent on whether or not concurrent hip symptoms are present. We also sought to determine which of the hip muscle groups (e.g. flexors, extensors, etc.), from a strength standpoint, help to explain walking performance among older adults with a primary complaint of LBP. Methods: Community-dwelling older adults, aged 60-85 years, with a primary complaint of LBP were recruited for a NIH-funded, parent study. Demographics, i.e. sex, age, average LBP intensity (i.e. composite from 'current', 'best', and 'worst pain in the past 24 hours'), and average hip pain intensity, were obtained. Height and weight was collected for calculation of body mass index (BMI) prior to a standardized clinical examination that included the 6 Minute Walk Test. Self-selected and fast walking speeds were obtained using a computerized walkway (GaitMat II). Handheld dynamometers were used to obtain flexion, extension, adduction, abduction, external rotation, and internal rotation hip strength. Maximal isometric strength was obtained from 3 trials per side for each muscle group. Hip strength data was collected by a second examiner blinded to the results of the participant's physical performance testing. Average right-left strength for each muscle group was computed and used for the analyses. Using SPSS Statistics 23, the sample was characterized and linear regression modeling was used to explore relationships between hip strength and walking performance, above and beyond suspected covariates, for individuals with LBP only and those with LBP plus concurrent hip pain. Age, sex, BMI, average LBP intensity, and average hip pain intensity were entered in the first step of each model. Hip strength variables were entered using a stepwise approach for the final steps of each model. A Bonferroni correction was applied to each set of models to control for familywise error rate ($\alpha \leq .004$). Independent sets of regression models were run for each performance test for each group. Results: 211 participants were available for this preliminary analysis. Of the sample, 68.7% (n=145) presented with LBP with concurrent hip symptoms. 50.5% of the sample was female, mean age was 69.5±6.7 years, and mean body mass index was 29.1±5.7 kg/m2. Hip strength means ± standard deviations (kg) were as follows: flexion=13.3±5.7; extension=6.9±3.7, abduction=7.6±2.7, external rotation=8.4±3.6, and internal rotation=6.7±3.0. For the 6 Minute Walk Test, covariates explained 30.9% of the variance (p=.000), while hip adduction strength explained an additional 12.6% of the variance (p=.001) for adults with LBP only. For adults with LBP plus hip symptoms, covariates explained 36.1% of the variance (p=.000) and hip external rotation strength explained 13.2% of the variance (p=.000) for the 6 Minute Walk Test. For self-selected gait speed, hip adduction strength explained 13.9% of the variance (p=.001) in adults with LBP only, while covariates explained 19.7% (p=.000) and hip internal rotation strength explained 12.2% of the variance (p=.000) in adults with LBP plus hip symptoms. For fast gait speed, covariates explained 31.0% of the variance (p=.000), while hip external rotation strength explained an additional 14.6% of the variance (p=.000) in adults with LBP only. Among those with LBP plus hip symptoms, covariates explained 23.3% of the variance (p=.000) and hip internal rotation strength explained an additional 18.7% of the variance (p=.000). Conclusion: Among older adults with LBP with or without concurrent hip symptoms, strength of the hip external rotators, may be a significant factor in walking performance. Additionally, hip adduction strength may be important for optimal walking performance among older adults with LBP only, while hip internal rotation strength may be important among older adults with LBP plus hip symptoms. These preliminary findings suggest that addressing hip strength may be a viable treatment strategy for improving walking in older adults with a primary complaint of LBP. For example, to address reduced gait speed, clinicians might consider strengthening the hip internal rotators among those with LBP plus hip symptoms and the adductors and external rotators among those with LBP only, in addition to interventions targeting the low back. Our results may aide in the development of future clinical trials for older adults with a primary complaint of LBP.

OC46- EFFECT OF SIX MONTHS OF DAILY CONSUMPTION OF A MULTI-INGREDIENT NUTRITION SUPPLEMENT CONTAINING FISH OIL, WHEY PROTEIN, VITAMIN D, AND RESVERATROL ON PHYSICAL AND COGNITIVE FUNCTION IN OLDER (>65 Y) IRISH ADULTS. B. Egan, A. Scotto di Palumbo, C.N. Moran, H. Stynes, M. Hone, A.M. McMorrow, G. Lynch, B. Rooney, A.P. Moran, J. Bramham, G. de Vito *(Dublin, Ireland)*

Background: The etiology of sarcopenia is multi-factorial including the loss of muscle mass and muscle fibers, increased inflammation, altered hormonal profile, anabolic resistance, and inadequate nutrition intake. To date, pharmacological interventions have shown limited efficacy in counteracting the effects of sarcopenia, whereas most nutrition interventions focus on the provision of additional protein. However, a multi-ingredient nutrition strategy may offer additional therapeutic potential by targeting multiple factors associated with the development and consequences of sarcopenia including both physical and cognitive parameters. Methods: A double-blind, placebo-controlled, randomized trial (ClinicalTrials.gov Identifier: NCT02001831) investigated the impact of a six month intervention with a bespoke multi-ingredient nutrition supplement (Smartfish® AS, Norway) on physical and cognitive function in pre-sarcopenic and sarcopenic older (>65 y) Irish adults. The supplement (SUPP) consisted of a 200 mL carton of juice-based drink each day (providing 200 kcal) that contained long chain n-3 polyunsaturated fatty acids (3000 mg: DHA 1500 mg and EPA 1500 mg), whey protein isolate (8 g), vitamin D3 (400 IU), and resveratrol (150 mg). The placebo (PLA) consisted of the fruit juice alone (200 kcal per day). Thirty-seven participants (age, 74.9±3.6 y) completed the six month intervention comprising of 16 in PLA (m=8, f=8), and 21 in SUPP (m=10, f=11). Body composition (DXA), physical function (short physical performance battery) and cognitive function (seven standardized measures) were assessed at baseline, 3 months and 6 months. Results: Lean body mass was unchanged in either group after 6 months, but total body mass was increased in SUPP (71.4±16.3 vs. 72.2±16.0 kg, $p<0.01$), which was explained by a ~6% increase in fat mass ($p<0.01$). Correlation analyses revealed that despite the lack of effect of SUPP on LBM across the groups, a moderate inverse correlation ($r=-0.501$, $p<0.05$) exists between LBM at baseline and

percentage of change in LBM at 6 months i.e. the lower that LBM was at baseline, the greater the effect of SUPP on increasing LBM. Handgrip strength decreased by 6.0% in PLA, but increased by 4.4% in SUPP ($p<0.01$). Tandem balance time was unchanged in PLA, but improved by 21% in SUPP ($p<0.05$). Chair rise time improved ($p<0.05$) to a similar extent (~10%) in both groups. No significant differences in cognitive performance were observed between groups after generation of composite scores grouped according to cognitive domains i.e. executive function, memory function, attention and sensorimotor speed, but performance in the Stroop Colour-Word task was improved ($p<0.05$) in SUPP. Conclusion: Based on the preliminary data, we conclude that this bespoke multi-ingredient nutrition supplement demonstrates potential efficacy in elderly pre-sarcopenic and sarcopenic individuals, particularly in those exhibiting lowest muscle mass prior to intervention, whereas the effects on handgrip and balance are indicative of beneficial effects independent of change in LBM. Remaining analyses will include analysis of blood markers of metabolic health and neuromuscular function, and comparison of gender-specific responses.

OC47- PHYSICAL PERFORMANCE BEYOND MUSCLE MASS IN COGNITIVELY IMPAIRED OLDER ADULTS: INFLUENCE OF INSULIN-LIKE GROWTH FACTOR-1 AND NUTRITION ON MUSCLE QUALITY. L. Tay, W.S. Lim, M. Chan, A. Yeo, B. Leung, M.S. Chong *(Singapore)*

Backgrounds: The accelerated decline in strength relative to concomitant muscle loss underscores an important role for muscle quality. As a harbinger of physical frailty, sarcopenia may offer an upstream target to ameliorate premature functional decline in older adults with early cognitive impairment. This study sought to identify potentially modifiable nutritional, inflammatory, and hormonal factors for sarcopenia in older adults with mild cognitive impairment (MCI) and mild-to-moderate Alzheimer's disease (AD), with particular emphasis on elucidating factors impacting muscle quality. Methods: This is a cross-sectional analysis of patients with MCI and mild-to-moderate AD attending a Memory Clinic, who had completed cognitive, functional and physical performance evaluation. Nutritional status was assessed using the Mini Nutritional Assessment questionnaire. We measured serum lipid parameters and Vitamin D level at baseline, along with blood biomarkers of inflammation [interleukin 6 (IL-6), tumour necrosis factor-α receptor 1 protein (TNFR1) and C-reactive protein (CRP)] and anabolic hormones [insulin-like growth factor-1 (IGF-1) and dehydroepiandrosterone sulphate (DHEAS)]. Appendicular skeletal mass (ASM) and percentage body fat were measured using DXA imaging. Sarcopenia was defined using the Asian Working Group (AWG) algorithm. Subjects not fulfilling criteria for sarcopenia were further classified as either (i) pre-sarcopenia (low muscle mass with intact physical performance measures), or (ii) non-sarcopenia if muscle mass was normal. Muscle quality was defined as the ratio of grip strength to ASM. We performed univariate analyses, followed by multi-nomial logistic regression for independent predictors of sarcopenia at baseline. Results: Amongst the 99 subjects recruited, 36 (36.3%) were non-sarcopenic, 12 (12.1%) were pre-sarcopenic and 51 (51.5%) fulfilled criteria for sarcopenia. There was a significantly greater proportion of males in the pre-sarcopenic group ($p=0.035$), with no differences in age or severity of cognitive impairment. A significant linear increase in the proportion of subjects being at-risk of malnutrition on MNA was observed across non-sarcopenic, pre-sarcopenic and sarcopenic groups (8.3%, 33.3%, 49.0%, $p<0.001$). Serum IGF-1 was significantly lower in sarcopenic subjects compared with their non- and pre-sarcopenic counterparts [137.4 (83.2), 164.4 (97.5), 96.2 (64.1) ng/ml, $p=0.005$]. There was no significant difference in Vitamin D level or serum markers of inflammation between groups. Pre-sarcopenic subjects had the highest muscle quality ([2.87 (1.00), 4.51 (0.54), 3.13 (0.82) kg/kg; $p<0.001$)], persisting even after sub-group analyses by gender. Percentage body fat was lowest in the pre-sarcopenic group. In multi-nomial logistic regression adjusted for age, gender and severity of cognitive impairment, malnutrition was an independent risk factor for being pre-sarcopenic [RRR= 8.12 (1.16-56.76), $p=0.035$] and sarcopenic [RRR=9.56 (2.39-38.19), $p=0.001$]. IGF-1 deficiency (defined as the lowest quartile of a local cohort of cognitively well and independent older adults) significantly increased the risk of sarcopenia [RRR=3.11 (1.09-8.91), $p=0.035$]. Conclusion: Although both sarcopenic and pre-sarcopenic subjects fulfilled AWG cut-offs for low muscle mass, physical performance measures of gait speed and strength remained unimpaired in the pre-sarcopenic subjects, suggesting preserved muscle quality. Malnutrition was a common risk factor for sarcopenia and pre-sarcopenia. However, IGF-1 deficiency significantly increased the risk of sarcopenia but not pre-sarcopenia, suggesting a potential impact on muscle quality beyond mere muscle mass. Our findings, if corroborated, may guide targeted interventions to ameliorate strength decline and maintain functional performance in cognitively impaired older adults.

OC48- ESTIMATING THE PROPORTION OF PHENOTYPIC VARIANCE IN FRAILTY EXPLAINED BY COMMON GENETIC VARIANTS IN THE ENGLISH LONGITUDINAL STUDY OF AGEING. K. Mekli[1], G. Tampubolon[1], J. Nazroo[1], A. Marshall[2], N. Pendleton[1] *(1. Manchester, United Kingdom; 2. St Andrews, United Kingdom)*

Background: Genome-wide association studies provide a hypothesis-free approach to highlight genetic variants playing a role in frailty. However, as with other complex traits, it is very likely that the individual effect of these genetic variants is very small, and account for only a small fraction of the phenotypic variance. On the other hand, considering these variants together, can give an unbiased estimation of the total contribution to the variance in the phenotype. Moreover, this polygenic effect can be considered a genetic propensity to disease risk, and used as a predictor of the frail phenotype, similar to reported examples such as diabetes mellitus or depression. Method: We use the English Longitudinal Study of Ageing survey containing 7200 individuals with 2.5 million genotyped common variants (small nucleotide polymorphisms, SNPs). Frailty status is assessed using the two main methods, the Frailty Phenotype and the Frailty Index. We use two well-accepted analysis methods to firstly estimate the explained variance for both phenotypic measures (Genome-wide Complex Trait Analysis) and secondly for testing for shared genetic risk between them (Polygenic Risk Score). Results: We present the results of the estimation of the amount of variance captured by common genetic variants for both frailty measures. We also demonstrate the extent to which the genetic risk associated with classifying a person as frail using the Frailty Phenotype is a predictor of the their score on the Frailty Index. Conclusion: Our results advance understanding of the genetic determinants of frailty offering a starting position for examining biological pathways.

OC49- IMPACT OF SARCOPENIA ON POST-OPERATIVE MORBIDITY AND MORTALITY FOLLOWING LUMBAR SPINE SURGERY. S.L. Bokshan, A.L. Han, J.M. DePasse, S.E. Marcaccio, A.H. Daniels *(Providence, USA)*

Background: Sarcopenia occurs due to the loss of muscle mass associated with aging and advanced disease. While sarcopenia has

been shown to be an independent predictor of morbidity and mortality in medical and abdominal surgery patients, the impact of sarcopenia on orthopedic and spine surgery outcomes is unknown. Methods: This study retrospectively examined lumbar spine surgery patients over 55 years of age (n = 50) who underwent surgery from 2003 to 2015 and had a perioperative abdominal CT scan. The Mirza Surgical Invasiveness Index assessed procedural complexity, and comorbidity burden was assessed with the Charlson Comorbidity Index. OsiriX imaging software was utilized to assess for sarcopenia by measuring total cross sectional area of the psoas muscle at the L4 vertebrae using perioperative CT scans. Outcome measures included postoperative in-hospital complications, length of postoperative inpatient stay, and mortality. Results: Of the 50 patients assessed, 16 were sarcopenic and were in the lowest tertile for L4 total psoas area. Sarcopenic patients were older than non-sarcopenic patients with a mean age of 76.6 vs. 70.8 ($p = 0.027$), and had a non statistically different mean Charlson Comorbidity Index (3.6 vs. 3.2; $p = 0.59$) and mean Mirza Surgical Invasiveness Index (8.9 vs. 6.8; $p = 0.29$). Sarcopenic patients had a hospital length of stay nearly three times longer than non-sarcopenic patients (12.4 vs. 4.4 days, $p = 0.006$), a six-fold increase in postoperative in-hospital complications (1.9 vs. 0.3, $p < 0.001$), and were more likely to require a rehabilitation or nursing facility (62.5% vs 47.1%; $p = 0.017$). Sarcopenic patients had a 32.8-fold higher risk of mortality during the study period compared to non-sarcopenic patients ($p = 0.019$), with a significantly lower cumulative survival over time (log rank < 0.001). Conclusions: This study is the first to investigate the role of sarcopenia in predicting morbidity and mortality following spinal surgery. Sarcopenic patients have a significantly elevated risk of in-hospital complications, longer length of stay, increased rates of discharge to rehabilitation facilities, and mortality following lumbar spinal surgery. Sarcopenia may be a useful clinical measure of perioperative risk of complications and mortality in spine surgery patients.

OC50- EFFECTS OF WHOLE-BODY ELECTROMYOSTIMULATION ON SARCOPENIC OBESITY IN COMMUNITY DWELLING WOMEN OF 70 YEARS AND OLDER. W. Kemmler, S. von Stengel, K. Engelke, E. Freiberger, C. Sieber *(Erlangen-Nürnberg, Germany)*

Background: Sarcopenic Obesity is a geriatric syndrome that combines low muscle mass and function and high fat mass resulting in negative effects on health and independency due to various interactions of musculoskeletal, cardiometabolic and functional parameters. Exercises positively address a large variety of risk factors and diseases of advanced age [1] and may thus be a key factor for healthy and independent life. With respect to sarcopenia most studies determined a positive impact of resistance training on muscle mass [2] and functional capacity [3] in aging adults. In parallel, most studies confirmed a beneficial effect of exercise on fat mass [4]. Thus, exercise alone or in combination with dedicated diet may be the optimum agent to prevent or reduce Sarcopenic Obesity. Unfortunately, the majority of elderly subjects in our fundamentally sedentary western societies [5] fall far short of the exercise doses recommended for positively impacting muscle mass or disabling conditions [6]. Novel training concepts that overcome some limitations of conventional exercise programs can be an option for these sedentary subjects. Due to its time-efficiency, general attractiveness, and low orthopedic stress whole-body electromyostimulation (WB-EMS) may be an eligible candidate to address both, Sarcopenia and Obesity, at least in the cohort of less active elderlies with functional limitations and/or low sport-affinity. Thus, the aim of the study was to determine the effect of WB-EMS training on Sarcopenic Obesity in women 70+ with Sarcopenic Obesity. Method. After extensive screening 75 eligible community dwelling women of 70 years and older with Sarcopenic Obesity according to EWGSOP (skeletal muscle mass index (SMI): ≤5.99 kg/m2; [7]) and WHO (Body fat ≥35%; [8]) were randomly assigned to three groups. Group 1 (WB-EMS) conducted a 20 min WB-EMS-training (85 Hz, 350 ms, 4s impuls-4s rest) lying in a supine position once per week for 6 months. Group 2 (WB-EMS&P) carried out the same WB-EMS protocol, however, participants were additionally provided with protein supplements (≈0.33 g/kg body mass). Groups 3 represented the control group (CG) with no specific intervention; however, comparably to WB-EMS and WB-EMS&P participants were supplemented with 800 IU/d Cholecalciferol. Body composition was determined via dual-energy x-ray absorptiometry; handgrip strength and habitual gait speed (4 m) were assessed by calibrated standard devices (Jamar Dynamometer, photo sensors). In order to avoid multiple testing, we calculated a Sarcopenia Z-Score. Based on the individual data of the SMI ((appendicular skeletal muscle mass/square body height; kg/m2), gait speed, and hand grip strength), the cut-points proposed by the EWGSOP and the standard deviation (SD) of the cohort the Z-Score were calculated ((0.8 - gait speed)/SD gait speed)+((20-grip strength)/SD grip strength)+(5.99-SMI)/SD SMI). We conducted a completer-analysis that included the data of all subjects with follow-up data. Results. After 6 months, 25 participants of the WB-EMS, 23 of WB-EMS&P and 21 of the CG were assessed for follow-up. Average attendance for WB-EMS was 89±6% (WB-EMS) and 88±7% (WB-EMS&P). Sarcopenia Z-Score significantly improved in both WB-EMS groups (WB-EMS: $p=.001$; WB-EMS&P: $p=.026$) and significantly deteriorate in the CG ($p=.017$). Both WB-EMS groups significantly differ ($p\leq.001$) from the CG. Most causative for this result, SMI and gait speed comparably improved in both WB-EMS groups but decreased in the CG. No significant differences ($p\geq.063$) between the groups were observed for grip strength changes. With respect to obesity, percentage body fat significantly (-1.1±2.0%, $p=.016$) decreased in the WB-EMS and non-significantly ($p\geq.106$) in the WB-EMS&P (-1.2±3.3%) and CG (-0.6±2.8%). However, no significant differences ($p\geq.785$) between the groups were observed. Conclusion: In summary, it is important to create training technologies for elderly subjects unable or unwilling to exercise conventionally. Our findings demonstrate that WB-EMS is a safe, time-efficient, attractive and feasible method to favorably address Sarcopenia and, (more restricted), Obesity, at least in sedentary older women with Sarcopenic Obesity. References: 1. Börjesson M, et al. Physical Activity in the Prevention and Treatment of Disease. Swedish Institute of Health. Stockholm, 2010. 2. Peterson MD, et al. Influence of resistance exercise on lean body mass in aging adults: a meta-analysis. Med Sci Sports Exerc. 2011;43:249-58. 3. Latham N, et al. Progressive resistance strength training for physical disability in older people. Cochrane Database Syst Rev. 2003:CD002759. 4. McTigue KM et al. Obesity in older adults: a systematic review of the evidence for diagnosis and treatment. Obesity. 2006;14:1485-97. 5. Clark DO. Physical activity and its correlates among urban primary care patients aged 55 years or older. J Gerontol B Psychol Sci Soc Sci. 1999;54:S41-8. 6. Chodzko-Zajko WJ, et al. American College of Sports Medicine position stand. Exercise and physical activity for older adults. Med Sci Sports Exerc. 2009;41:1510-30. 7. Cruz-Jentoft AJ, et al. Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. Age Ageing. 2010;39:412-23. 8. WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO expert committee. 1995.

OC51- DEGREE OF AGREEMENT AMONG FRAILTY TOOLS. M. Checa[1], J.A. Carnicero[1], J. Gonzáles[1], C. Palumbo[1], J.J. Solano[2], A. Sinclair[3], A. Scuteri[4], R. Bernabei[5], L. Rodríguez Mañas[1] *(1. Madrid, Spain; 2. Asturias, Spain; 3. Luton, United Kingdom; 4. Roma, Italy; 5. Milano, Italy)*

Background: Disability is the main consequence of the concurrence of three conditions in the elderly: ageing process, life style and health-related conditions. This disability is associated with increased risk of death, hospitalization, need for long-term care, and increased healthcare costs. But when disability occurs in a non-catastrophic way, it is usually preceded by a condition called frailty syndrome. Although there are many tools for detection of frailty nowadays, at this stage we are not sure whether the instruments for frailty detection are useful from a clinical point and it is unknown the degree of concordance among the different scales. This is because up to now, all the tools for detection of frailty have been assessed and validated by epidemiological studies in cohorts, in different population, but not in selected patients and the tools have not been implementing in the same subjects at the same time. One of the objectives of FRAILCLINIC study is to analyze the degree of agreement among the different scales for frailty diagnosis in the elderly people assisted in no-geriatric settings (Emergency Room, Cardiology Ward, Elective General Surgery, Urgent General Surgery and Oncology). Methods: Observational, cross-sectional study in six different hospitals from three European countries (Spain, Italy and the United Kingdom) in different clinical settings (Emergency Room, Cardiology, Elective Surgery, Urgent Surgery and Oncology). General frailty tools were selected for assessing frailty (Fried criteria, FRAIL Scale, Tilburg Frailty Indicator, Groningen Frailty Indicator and Rockwood Modified Scale) also; specific tools like Balducci criteria, VES13 Scale, G8 criteria were assessed in the Oncology Ward, and the ISAR Scale in the ER. The functional status was assessed with the Barthel Index, the cognitive status with the MMSE and mood with the GDS-15 Scale. We will compare the kappa index among all the tools by general and by specific clinical settings and we will use the interpretation on the classification of Landis and Koch about concordance degree. Results: A total of 609 participants were included, 118 came from the Emergency Room (ER), 221 from Cardiology, 115 from Elective Surgery, 65 form Urgent Surgery and 50 from Oncology Ward. Participants younger than 75, with a Barthel Index lower than 40 points, severe cognitive impairment (Global Cognition Scale >6) and institutionalized were excluded from the study. Overall, we cannot attribute a significant degree of agreement among all tools evaluated in this study that makes us think that they are not measuring the same domains. For this reason, it is not possible the replacement of a tool for another when the viability of the scale was not good in clinical practice. Only between the Gröningen Frailty Index and the Tilburg Frailty Index was demonstrated a degree of concordance defined as «considerable» by the classification of Landis (0.66) and with lower degree the concordance between the Fried scale and FRAIL Scale, whose degree of agreement was «moderate» (0.58). In some clinical settings, as Urgent Surgery, the degree of agreement between Fried scale and FRAIL Scale reached higher levels, considered it as «almost perfect» with a kappa index of 0.82. Other scales like Rockwood Modified Scale showed little agreement with the other tools. Other specific tools like ISAR in Emergency Department or Balducci Scale, VES 13 and G8 Questionnaire in Oncology showed optimal concordance agreement despite being specific scales. Only between VES 13 scale and Gröningen Frailty Indicator was the high degree of agreement (Kappa index 0.56). These results could be explained because the domains assessed are different. Conclusion: Overall, the degree of concordance is low among the scales evaluated, suggesting that they measure different clinical entities. Considering Fried scale as the «gold standard», only FRAIL Scale would properly measure frailty in clinical settings. Study funded by DG SANCO – Third Health Programme 2013.

OC52- EFFICACY OF A NOVEL L-CARNITINE-CONTAINING FORMULATION ON LEAN BODY MASS AND FUNCTIONAL MUSCLE STRENGTH IN HEALTHY OLDER ADULTS: A RANDOMIZED, DOUBLE-BLIND PLACEBO-CONTROLLED STUDY. A. Bellamine, M. Evans, N. Guthrie *(Allendale, USA)*

Background: The primary objective of this study was to determine the effects of a novel L-Carnitine-containing formulation product on muscle mass and function. In addition, quality of life and muscle biomarkers have been assessed in this randomized, double-blind, placebo-controlled trial with healthy older adults. Methods: Twenty eight healthy older adults (55 to 70 year old) were randomly assigned to either 2.2 gr of L-Carnitine Tartrate (1.5 gr L-Carnitine), 3 gr of creatine monohydrate and 2 gr of leucine, 0.1 mg of Vitamin D3 as well as other inert products to adjust for the taste (n=14), or placebo (n=14) for 8 weeks. A composite primary efficacy outcome included change in lean body mass, functional upper body strength, functional lower body strength, and distance walked between the L-Carnitine-containing formulation and placebo. Lean body mass was assessed by DEXA scan, while upper and lower muscle function strength was determined via dynamometry. The distance walked was measured using the 6-minute walk test. As secondary outcomes, quality of life and muscle biomarkers were evaluated by the RAND SF-36 Questionnaire and by mRNA and protein analysis, respectively. Clinical monitoring for adverse events, vital signs, and blood chemistry were monitored during the study. Results: The primary composite endpoint improved significantly in the L-Carnitine-containing formulation group (P=0.008), but not in the placebo group (P=0.232). In addition, L-Carnitine-containing formulation group had a significant increase of 63.5% (P=0.013) over the placebo group. Notably, these subjects displayed a +1kg increase in total lean muscle mass (P=0.013), leg lean muscle mass (+0.35 kg, p = 0.005), as well as a +1kg increase in lower leg strength (P=0.029) by the end of 8 weeks. Muscle biopsy analysis showed that mTOR protein expression was significantly up-regulated in participants taking the L-Carnitine containing product at 8 weeks pre-strength (P=0.017) and at 8 weeks post-strength (p=0.058) testing compared to the baseline pre-strength. There were no changes in catabolic genes, suggesting that the increase in muscle mass and strength are driven by an increase in protein anabolism. No changes were observed in the quality of life scores for the duration of the study. All hematology or clinical chemistry parameters remained within the acceptable clinical range for this population between the two groups. Conclusion: These findings suggest that L-carnitine in combination with creatine and leucine has positive effects on muscle anabolism in older adults after 8 weeks of supplementation, providing a needed intervention for muscle wasting in the sarcopenia population.

OC53- RETROSPECTIVE EVALUATION OF COMPUTED TOMOGRAPHY IN A TOTAL HIP ARTHROPLASTY POPULATION. M. Heffler, R. Barlow, A. Chhabra *(Dallas, USA)*

Background: Cross-sectional imaging modalities such as Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) are not commonly used in preoperative screening of potential Total Hip Arthroplasty (THA) patients. In 2015, Wiater et al. retrospectively examined a registry of patients who underwent Reverse Total

Shoulder Arthroplasty and found significant correlations between muscle mass and fatty infiltration as determined by MRI and postsurgical assessment scores. The objective of this study was to retrospectively examine a prospective registry of THA patients and examine correlations between sarcopenia related radiographic data as determined by CT and postsurgical outcome scores. Methods: A prospective, IRB-compliant registry of TJA patients was compiled between 2006 and 2014. All patients were enrolled at the initial, preoperative office visit and completed the WOMAC Hip and Harris Hip Score (HHS) questionnaires. 802 patients were enrolled, and 318 underwent THA between 2006 and 2014, all with one surgeon. Patients completed the WOMAC and HHS questionnaires again at their six month and 12 month postoperative visits. The inclusion criteria for this study were: (1) having a CT within one year before or six months after their surgery and (2) completing at least one set of postoperative questionnaires. Of the 318 THA patients, 42 had a CT study within the indicated time frame. Of those, 28 had at least one complete set of postoperative questionnaires. Two unique readers then measured parameters from patient CTs using an independent workstation. Measured muscles included bilateral gluteus medius/minimus and bilateral iliopsoas. Muscle measurements taken included mean Hounsfield Units, cross-sectional area, average diameter, and perimeter. Additionally, a segmentation algorithm was used to determine the visceral fat area, subcutaneous fat area, ratio of visceral fat to total fat, and waist circumference. The segmentation algorithm was performed at the levels of both the iliopsoas muscles and gluteal muscles. Regression analyses were then performed with stepwise selection and variables with most impact were selected. ICC value was calculated for each measurement to examine inter-observer agreement. Results: Statistically significant correlations were found between HHS and age (0.650, $p < 0.05$), height (-3.21, $p < 0.01$), fat area ratio at the level of the iliopsoas (0.511, $p < 0.05$), and waist circumference at the level of the iliopsoas (1.76, $p < 0.005$). A non-significant trend was found between HHS and mean Hounsfield units of the gluteal muscles ipsilateral to the surgery (0.359, $p = 0.1084$). Results are reported such that a one unit increase in the measurement causes an increase in HHS equal to the reported value. Inter-observer agreement was excellent, with all measurements having ICC > 0.85. Conclusion: Certain sarcopenia related radiographic parameters do correlate with postsurgical assessment scores. Further evaluation with larger populations may be performed to generalize the utility of cross-sectional imaging for preoperative assessment. Evaluation of other cross-sectional imaging modalities and additional sarcopenia related parameters may reveal additional useful relationships.

OC54- THE ROLE OF COGNITIVE IMPAIRMENT IN FUNCTIONAL RECOVERY AND MORTALITY POST HIP FRACTURE COMPARING MEN AND WOMEN.

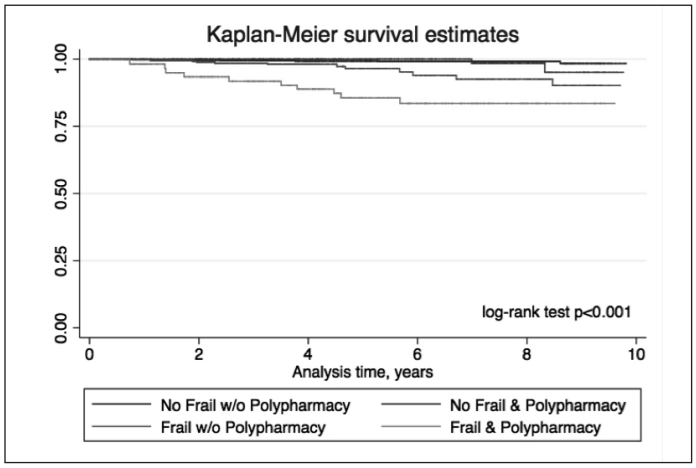
A.L. Gruber-Baldini, M. Hosseini, M. Hochberg, D. Orwig, J. Magaziner *(Maryland, USA)*

Background: There is limited research in cognition after hip fracture among men and the impact of cognition on the observed mortality differences and functional recovery. Therefore, the goals of this study were to: (1) Compare men and women who fractured their hip on cognitive measures after hospital discharge, and (2) Examine the impact of cognition on the differential risk of mortality and physical functioning between men and women. Methods: This longitudinal analysis was conducted using data from the 7th cohort of the Baltimore Hip Studies (BHS-7) that enrolled 168 male and 171 female hip fracture patients age 65 and older. All participants were enrolled within 15 days post-admission for hip fracture. Participants had measures at baseline (with 15 days of hospital admission) and at 2, 6, and 12 months post-fracture. The cognitive measures included the Modified Mini-mental State Examination (3MS, range 0-100), Trail-making test (A and B, range 1-301 seconds), and Hooper Visual Organization Test (HVOT; range 0-30) at all 4 longitudinal time points. Physical performance outcomes included mobility status (self-report return to pre-fracture walking ability) and the Short Physical Performance Battery (SPPB) at 2, 6, and 12 months. The SPPB (score range 0-12) is an objective measure of function that assesses balance, gait speed, and chair rise time. Mortality was assessed over the initial 6 months of follow-up. Baseline t-tests and chi-squares examined sex differences in cognitive functioning. Longitudinal General Estimating Equations (GEE) analyses examined sex differences over time in cognitive outcomes. Proportional hazard predicted death over 6 months by sex and baseline cognition. Longitudinal GEE analyses also examined the associations between baseline cognition and functional outcomes. Results: The mean age of participants was 81 (SD 7.8), mean education was 13.3 years (SD 3.4). Over 92% of the sample was white. Men had more comorbidities at time of fracture (M+/-SD=2.4+/-1.9) than women (M+/-SD=1.6+/-1.6; $p<.001$), but did not differ for any other demographic characteristic. Dementia diagnosis in the chart was higher in men than women (17% vs.11%, $p=.09$), cognitive impairment in the absence of dementia was higher in men on 3MS (men M+/-SD=85.2+/-14.0, women M+/-SD=88.9+/-11.7, $p=.002$), HVOT (men M+/-SD=17.0+/-5.8, women M+/-SD=18.9+/-6.0, $p=.008$), and Trails A (men M+/-SD=92.3+/-65.8, women M+/-SD=75.8+/-49.5, $p=.026$), but not on Trails B (men M+/-SD=211.8+/-83.2, women M+/-SD=197.8+/-85.0, $p=.21$). These statistically significant differences between men and women remained even after controlling for dementia, delirium, age, education, and race, except for Trails A. The trajectory of cognitive change over time did not significantly differ between men and women for any of the cognitive measures (3MS $p=.45$, HVOT $p=.35$, Trails A $p=.71$, Trails B $p=.55$). The overall mean SPPB score over time was 3.9, indicating the severity of lower extremity dysfunction experienced post-fracture. Cognitive functioning (especially 3MS) predicted: SPPB ($p<.001$), gait speed ($p<.001$), chair rise ($p<.001$), and mobility status ($p<.001$) levels, as well as predicted trajectories over time for gait speed ($p=.04$) and chair rise time ($p=.03$). Those with a 3MS<66 had mean gait speeds<0.2 m/sec across all time points, while those with 3MS>95 improved from 0.42 to 0.57 m/seconds from 2 to 12 months. For chair rise, those with a 3MS<66 were unable to perform the 5 chair rises in 1 minute at all time points, while those with 3MS>95 improved in time from 48.3 second to 40.3 seconds from 2 to 12 months. Impact of 3MS on level for all functional outcomes and change in chair rise and gait speed remained significant when adjusted for pre-fracture dementia and demographics. Men had higher rates of 6-month mortality (HR=4.4) and this remained significant after controlling for cognition. Cognitive measures were also significantly associated with mortality, including 3MS, HVOT, and Trails A. Among the cognitive measures, the 3MS was the most predictive of mortality (HR=0.94, $p=.045$), even when controlling for the other cognitive scales and pre-existing dementia. The highest mortality was among men with 3MS<78, with 26.3% dying within 6 months. There were no significant sex by cognition interaction effects on mortality. Conclusions: Men were more cognitively impaired overall after a hip fracture, but did not differ in cognitive trajectories over time. Trajectories of cognition did not stabilize until 6 months or later. Cognition at baseline, especially global cognition as measured by the 3MS, was predictive of 6-month mortality and change over time in gait speed and chair rise time. Cognition alone did not explain higher mortality in men. Future research is needed to better understand why men have higher mortality and also ways to help optimize recovery for those with cognitive impairment after hip fracture.

OC55- POLYPHARMACY IN PEOPLE LIVING WITH HIV: INCIDENCE AND CLINICAL RELEVANCE IN A 10-YEAR FOLLOW UP STUDY. G. Guaraldi[1], S. Zona[1], Dr Calcagno[2], A. Malagoli[1], L. Guaraldi[1], A. Santoro[1], C. Mussi[1], C. Mussini[1], D. Khoo[3], M. Cesari[4] *(1. Modena, Italy; 2. Torino, Italy; 3. Liverpool, United Kingdom; 4. Toulouse, France)*

Background: Polypharmacy (PP) is a growing problem in healthcare as it is a strong predictor of serious adverse events and drug–drug interactions (DDIs). For patients ageing with HIV infection, PP represents a significant challenge because associated with DDIs, increased healthcare expenditures and, potentially, lower adherence to medications. The aggressive management of HIV-associated comorbidities may aliment this issue in the absence of evidence-based recommendations. No study has so far explored the association of PP with falls or mortality. Methods: A retrospective observational study was performed among adult antiretroviral-treated HIV-positive patients attending the Modena HIV Metabolic Clinic between 2006 and 2015. Demographic, therapeutic and clinical data were retrieved and analysed. Endpoints were mortality and falls. Fall frequency was self-reported by patients («During the past 12 months, about how many times have you fallen?"), with a fall event defined as unexpectedly dropping to the floor or ground from a standing, walking, or bending position. Fall frequency was categorized as none, 1, and ≥ 2 falls in the prior 12 months. PP was defined as the use of ≥5 medications beyond antiretroviral drugs. A 37-item Frailty Index (not including HIV-related factors) was used to measure the vulnerability of the patient as the proportion of current deficits out of the number of considered variables. Data are presented as medians (interquartile ranges). Standard parametric and non-parametric tests were used to describe variables while survival analysis were performed (Log-rank and Cox proportional hazard model) to assess covariates' influence on mortality and falls. Results: 3,581 patients (66% males) were included, accounting for 11,565 person-year of follow-up. Median age at first evaluation was 45 (IQR 41–49) years with a significant increase from 2006 [44 (40–48)] to 2015 [51 (47–55)] (Wilcoxon's p<0.001, p for trend <0.001). HIV infection had been diagnosed 19 (12–23) years before. Current and nadir CD4+ T-lymphocytes were 626 (446–821) cells/uL and 191 (80–292) cells/uL. Plasma HIV RNA was <50 copies/mL in 3,410 patients (95%). Prevalence of PP significantly increased during the study period from 2.89% in 2006 to 15.23% in 2015 (p for trend <0.001). A direct linear correlation was observed between PP and the number of non-infectious comorbidities (Pearson's R2=0.21, p<0.001). At multivariate logistic regression analysis age (aOR 1.41, 95% CI 1.33-1.48), recent calendar-year (aOR 14.62, 95% CI 7.65-27.96) and Frailty Index (per 0.1 increase aOR 1.56, 95% CI 1.28-1.90) were independently associated with PP. Fifty-four deaths were observed accounting for a mortality rate of 4.67/1000 PYFU (95% CI 3.57–6.09). At Cox multivariate analysis current CD4+ T-lymphocytes <100/uL (aHR 51.07, 95% CI 12.47-209.08) and 101-350/uL (aHR 9.47, 95% CI 3.23-27.72), PP (aHR 2.51, 95% CI 1.06-5.96), and Frailty Index (per 0.1 increase aHR 1.92, 95% CI 1.33-2.79) were independently associated with death. The highest mortality was observed in frail patients with PP. A history of falls was available in 360 patients with a 2,130 PYFU; 49 reported >1 fall accounting for an incidence rate of 2.30/100 PYFU (1.73–3.04). At Cox multivariate analysis women (aHR 2.41, 95% CI 1.34–4.34) and Frailty Index (per 0.1 increase aHR 1.41, 95% CI 1.03-1.93) were independently associated with falls. PP was marginally associated with falls at univariate (OR 1.80, 95% CI 0.94-3.44, p=0.07) but not at multivariate analysis (p=0.20). Conclusions: Over a 10-year study period, we were able to observe the ageing of a cohort of HIV-positive patients as well as the increasing prevalence of PP. This worrisome condition was predicted by older age, recent calendar year, and frailty. We here describe for the first time in patients living with HIV the effect of PP on mortality and its adjunctive effect in frail subjects. The strong correlation between PP and multimorbidity suggests the need of further prospective studies in order to assess the (both quantitative and qualitative) appropriateness of drugs prescribed to HIV-positive subjects for treating their comorbidities.

Figure 1
Kaplan Mayer curve of PP-Frailty categories for the prediction of mortality



OC56- SARCOPENIA AND FUNCTIONAL RECOVERY POST HIP FRACTURE IN MEN AND WOMEN. D. Orwig, N. Chiles Shaffer, Y. Huang, A. Gruber-Baldini, J. Guralnik, E. Barr, W. Lu, Y.J. Cheng, J. Magaziner *(Baltimore, USA)*

Background: Hip fracture patients are at risk for sarcopenia; however, there is limited research comparing various sarcopenia definitions in hip fracture patients. Additionally, there is limited research on the progression of sarcopenia over the year post fracture. Hip fracture patients are mobility limited and this limitation may persist out to 12 months post-fracture. It is unclear what role sarcopenia plays in mobility and functional recovery after an acute injury. This study assessed sex differences in sarcopenia prevalence post hip fracture using three different operational definitions and investigated the ability of these definitions to predict mobility and functional recovery over 12 months post-fracture. Methods: This longitudinal analysis was conducted using data from the 7th cohort of the Baltimore Hip Studies (BHS-7) that enrolled 339 male and female hip fracture patients age 65 and older within 15 days of admission for hip fracture. Participants had study visits at baseline and at 2, 6, and 12 months post-fracture, all of which included a DXA scan and interview, and performance measures were done at follow-up visits only. The current analytic sample comprised 160 participants (82 men and 78 women) with complete DXA, grip strength, and gait speed data at 2 months post-fracture. The sarcopenia definitions used came from the European Working Group on Sarcopenia in Older Persons (EWGSOP), the International Working Group on Sarcopenia (IWGS), and the Foundation for the National Institutes of Health (FNIH). The main functional outcome measures were self-reported mobility status, which assessed whether a participant's walking ability had returned to pre-fracture status, and the Short Physical Performance Battery (SPPB), an objective measure of function that assesses balance, gait speed, and chair rise time. Cross-sectional validity across the operational definitions was assessed via Cohen's

kappa. External validity of the sarcopenia definitions was assessed by the associations between each operational sarcopenia definition and functional outcomes using longitudinal models estimated by generalized estimating equations (GEE). The stronger the association, the better the operational sarcopenia definition is. Results: The mean age of participants was 81 for men and 80 for women. Men had a significantly higher Charlson Comorbidity Index, indicating that men who fracture are sicker than women. Prevalence of sarcopenia over time varied across definitions. At 2 months, EWGSOP prevalence was 67% for men and 56% for women. Prevalence in men remained constant over time resulting in significantly higher prevalence (62%) at 12 months compared to women (40%), p=.03. Similar prevalence rates by sex were found with the IWGS both at 2 months and over time. The similarities in results between EWGSOP and IWGS are supported by Cohen's kappas > 0.91, corresponding to excellent agreement. The FNIH definition produced a much lower prevalence of sarcopenia than EWGSOP and IWGS with 16% prevalence in men at each time point, and starting at 5% for women at 2 months and increasing to 12% at 6 and 12 months, representing a significant increase in women, p=.02. Not surprising, there is poor agreement between FNIH and the other two definitions, Cohen's kappas < 0.4. Odds of mobility status improvement were significantly higher in the non-sarcopenic group for EWGSOP (p=0.01) and IWGS (p=0.05); however significance went away after controlling for confounders. FNIH sarcopenia definition did not significantly predict odds of improvement in mobility status. For the SPPB models, the FNIH-defined sarcopenia group showed a trend for lower SPPB score over time, even after adjustment. However, sarcopenia by the other 2 definitions was related to better SPPB scores over time with IWGS being statistically significant, p<0.001. Conclusions: Men appeared to be at higher risk for sarcopenia after hip fracture for all definitions, and their prevalence of sarcopenia remained stable over time. Sarcopenia prevalence decreased in women over the 12 months post-fracture based on EWGSOP and IWGS definitions, but significantly increased for FNIH. Sarcopenia seems to play a role in recovery of self-reported mobility status post hip fracture, but not in functional performance. In a mobility limited group of patients, current walking speed cut points may not discriminate who will recover functionally and low muscle mass may not be a good indicator of functional ability, since sarcopenic people did better on SPPB using definitions including ALM. More research is needed to identify the most appropriate measures of muscle and meaningful cutpoints that will predict functional recovery among people who are already mobility limited.

OC57- VITAMIN B12 DEFICIENCY IN SARCOPENIA CAN BE DETECTED BY A CIRCULATING BIOMARKER LINKED TO IMPAIRED INTESTINAL ABSORPTION DURING AGING. A. Pannérec, S. Karaz, J.N. Feige *(Lausanne, Switzerland)*

Background: The diagnostic of sarcopenia and frailty are currently established using on imaging and functional tests, but specific molecular biomarkers measurable in the circulation are still missing. In order to characterize novel candidate biomarkers of sarcopenia, we performed a proteomic screen on the serum of old rats and identified a vitamin B12 transporter deregulated with age. Vitamin B12 deficiency in the elderly is well recognized, and has been linked to an increased risk of a number of age-related diseases such as cardiovascular disease or cognitive dysfunction. However, the potential link between vitamin B12 deficiencies and physical frailty, and the molecular mechanisms of vitamin B12 action in muscle remain largely unknown. Methods: We analyzed the time course of aging in a rat model of natural aging where muscle mass, muscle function and gait speed show an age-dependent decline similar to what is observed in humans. Serum factors deregulated with age were screened at 8, 18 and 24 months using targeted proteomic detection. Circulating vitamin B12 levels were measured in serum and signaling pathways relating to vitamin B12 transport and metabolism were analyzed on skeletal muscle, intestine and kidney tissue. Results: Similar to what is observed in certain elderly populations, vitamin B12 levels declined with age in old rats. Interestingly, vitamin B12 deficiency in aged rats occurred in a controlled environment where animals consumed the same diet, demonstrating that intrinsic physiological mechanisms of vitamin B12 homeostasis are perturbed during aging. Several components of the intestinal vitamin B12 uptake system were strongly de-regulated with age in the gastro-intestinal tract of old rats, while compensatory mechanisms were detected in kidney where vitamin B12 is re-uptaken after glomerular filtration. Conclusion: We have identified a novel candidate biomarker of age-related vitamin B12 deficiency with the potential to discriminate problems linked to vitamin B12 malabsorption. Altogether, our results suggest a possible link between vitamin B12 status and sarcopenia, and provide mechanistic evidence for the role of vitamin B12 on the regulation of muscle mass and function.

OC58- EFFECTS OF A HOME-BASED PHYSICAL TRAINING, NUTRITIONAL AND SOCIAL SUPPORT PROGRAM CARRIED OUT BY LAY VOLUNTEERS ON NUTRITIONAL AND FRAILTY STATUS IN COMMUNITY-DWELLING OLDER PERSONS. E. Luger, T.E. Dorner, S. Haider, A. Kapan, C. Lackinger, K. Schindler *(Vienna, Austria)*

Backgrounds: Over the past decades, older persons are the fastest growing segment of the population, nutrition-related problems such as malnutrition and frailty with subsequent serious health problems are very common. In the literature, findings suggest a high overlap between malnutrition and frailty. Furthermore, nutrition is important in preventing and postponing disability. Additionally, it is proposed that malnutrition and frailty might be reversible conditions by nutritional and physical training interventions. The objective of this study was to investigate the effects of a physical training, nutritional and social support intervention compared to social support only on nutritional and frailty status in older persons living at home. Methods: This randomized controlled trial was conducted between September 2013 and July 2015 in Vienna, Austria. The intervention was carried out by non-professional volunteers in older persons at home over 12 weeks. Participants were randomly assigned to the physical training and nutrition (PTN, n=41) or the social support (SoSu, n=39) group. In both groups, the older persons were visited twice a week by volunteers (buddies). The objective of the nutritional intervention was to maintain adequate fluid, protein, and energy intake by regular foods and beverages without oral nutritional supplements. Therefore, buddies and elderly persons discussed nutrition-related aspects with a guidebook. The aim of the physical training intervention was to improve the strength. Four mobilization and six strength exercises were conducted in a circuit training with two sets and 15 repetitions until muscular exhaustion. The social support intervention (SoSu) served as an active control group. Participants in this group were also visited twice a week by buddies, but without physical training and nutritional intervention. At baseline and after 12 weeks, nutritional and frailty status were assessed with the Mini Nutritional Assessment long-form (MNA®-LF) and with the Frailty Instrument for Primary Care of the Survey of Health, Ageing and Retirement in Europe (SHARE-FI), approximating Fried's frailty definition. The intervention effects on nutritional (MNA®-LF score) and frailty status (SHARE-FI score) were determined using analysis of covariance (ANCOVA) to assess the main group effect (PTN and SoSu group). Sex and baseline

measurements were used as covariates. Paired t-test was used to assess the main time effect (from baseline to 12 weeks). Furthermore, the estimates of the prevalence of impaired nutritional status (MNA®-LF <23.5 points) and frailty between the PTN and SoSu group over 12 weeks were calculated using generalized estimating equations (GEE) with a logit link function for binary outcomes. Results: In total, 80 older adults were analyzed. The mean age was 83 (SD 8) years and 16% were male. 51% were normal nourished, 4% malnourished and 45% at risk of malnutrition. Regarding frailty status, 64% were frail, 35% pre-frail and 1% robust. The mean MNA®-LF score increased in both groups over time with 1.54 (95% CI=0.51, 2.56; p=0.004) points in the PTN group and 0.98 (95%-CI=-0.27, 2.22; p=0.121) points in the SoSu group. However, there was no significant difference between the groups. The prevalence of impaired nutritional status were 27.2% (95%-CI=15.5%, 43.0%) in the PTN group and 22.7% (95%-CI=12.3%, 37.7%) in the SoSu group after 12 weeks. The adjusted OR at 12 weeks was 0.37 (95%-CI=0.17, 0.83; p=0.016) in the PTN and 0.31 (95%-CI=0.13, 0.71; p=0.006) in the SoSu group. The mean SHARE-FI score decreased significantly in both groups after 12 weeks: in the PTN by -0.71 (95%-CI=-1.07, -0.35; p<0.001) and in the SoSu group by -0.35 (95%-CI=-0.66, -0.04; p=0.027). The prevalence of frailty were 45.6% (95%-CI=29.8%, 62.6%) in the PTN and 50.4% (95%-CI=33.9%, 67.0%) in the SoSu group after 12 weeks. Moreover, the adjusted OR was statistically significant for the PTN group with 0.45 (95%-CI=0.23, 0.86; p=0.015). The presence of impaired nutritional status at baseline was independently associated with higher changes in the nutritional status by OR=3.18 (95%-CI=1.26, 7.98; p=0.014) and the frailty status by OR=3.16 (95%-CI=1.01, 9.93; p=0.049) after 12 weeks. Conclusion: The results indicate that a home-based physical training, nutritional and social support program carried out by volunteers can help to tackle malnutrition and frailty in older persons living at home. Particularly, elderly individuals with impaired nutritional status at baseline demonstrated a higher chance of improved nutritional and frailty status due to the intervention.

OC59- RELATIONSHIP BETWEEN WHITE MATTER HYPERINTENSITY LOAD AND PHYSICAL FUNCTION AND MUSCLE STRENGTH IN OLDER ADULTS. K.D. Grooms[1], B.C. Clark[1], L.A. Clark[1], S. Amano[1], T.M. Manini[2], D.W. Russ[1,2], T.D. Law[1], The UNCODE Study Investigators[2], A.J. Woods[2] *(1. Athens, USA; 2. Gainesville, USA)*

Background: Aging is often accompanied by declines in physical function and muscle strength, which reduces quality of life and independence. Age-related decreases in skeletal muscle quantity are responsible for a portion of these physical decrements. Data also indicates that age-related changes in neural factors are responsible for a portion of these physical decrements. Herein, we report preliminary data from The UNCODE Study examining the relationship between cerebral white matter hyperintensities (WMH) and physical function and muscle strength. WMHs have been linked to impaired gait speed, executive function, chronic pain and fall risk in older adults. Accordingly, we hypothesized that WMH load would be positively associated with poor physical performance and muscle weakness. Methods: Ten older adults (age: 85.6±6.8, 8 women and 2 men) underwent physical function testing (i.e., time to rise from a chair 5 times, 6-min walk distance, and stair climb power), isokinetic leg extensor strength testing, a DEXA scan to quantify lean mass, and magnetic resonance imaging (MRI) of the brain. T1 structural and T2 FLAIR (fluid-attenuated inversion recovery) images were obtained and WMH load was calculated (Cortical WMH volume/ Total cortical white matter volume). Associations between WMH load and measures of muscle strength and physical function were assessed using linear regression analyses. Results: WMH load was positively associated with poorer chair rise time (i.e., time to rise from a chair 5 times) (r=0.67, p=0.03). No association was observed between WMH load and 6-minute walk test distance (r=-0.15, p=0.68) or stair climb power (r=-0.17, p=0.62). There were no significant associations between WMH load and leg extension strength (r=0.20, p=0.58), leg extension strength normalized to body weight (r=0.19, p=0.60), or leg extension strength normalized to upper leg lean mass (r=0.46, p=0.18). Conclusion: These data suggest that cerebral WMH load is associated with chair rise performance. However, it questions whether it is associated with broader measures of physical function as well as muscle strength. The higher correlation of WMH with chair rise as opposed to gait or stair climb power may indicate that WMH plays a role in motor initiation. This is supported by previous larger studies showing higher correlations of WMH during similar tasks that involve starting and stopping as opposed to continuous movement (gait or stairs). While these data should be interpreted within the context of the relatively small sample size, they do provide initial insight into the role of the central nervous system on physical function and muscle strength in the elderly. 1. Unraveling the Neural Contributors Of Dynapenia in Elders Study. Research Investigators for The UNCODE Study: Brian Clark, PhD (Principal Investigator; NIH R01AG044424), Christopher France, PhD, David Russ, PT, PhD, Todd Manini, PhD, James Thomas, PT, PhD, Leatha Clark, DPT, Shinichi Amano, PhD, Guang Yue, PhD, Timothy Law, DO, Rachel Clift, MS, Jen-Tzer Gau, MD, PhD, Adam Woods, PhD, Arimi Fitri Mat Ludin, PhD, Dustin Grooms, PhD, Masato Nakazawa, PhD, Julie Suhr, PhD.

OC60- THE DECLINE IN RATE OF TORQUE DEVELOPMENT WITH AGEING IS ASSOCIATED WITH A DECREASE IN TENDON STIFFNESS. J.I. Quinlan[1], M.V. Franchi[1], B.E. Phillips[1], P. Greenhaff[2], N. Szewczyk[1], P.J. Atherton[1], K. Smith[1], C.N. Maganaris[3], M.V. Narici[1] *(1. Derby, United Kingdom; 2. Nottingham, United Kingdom; 3. Liverpool, United Kingdom)*

Background: The age related loss of muscle mass, sarcopenia, is a well-reported phenomenon, known to be associated with a gradual loss of muscle function, mobility and an increased incidence of falls. In order to prevent a fall, one must be able to rapidly produce and transmit force to the joint, resulting in an effective counter movement. It is possible to assess the rate of torque development (RTD) in vivo, which provides a useful measure of an individual's ability to produce a rapid contraction. The RTD depends mostly on two factors, the contractile velocity of the muscle (hence on muscle composition) and also on the mechanical properties of the tendon (stiffness) which provides a mechanical link between muscle and joint. Therefore, changes in tendon stiffness may impact the velocity of force transmission. Unfortunately conclusive evidence for changes in tendon tissue in response to ageing remains elusive. The existing literature suggests that patellar tendon stiffness remains unchanged (1,2). However, stiffness has been shown to decrease within he gastroceminus tendon (3). Therefore this research aims to (1) investigate whether tendon stiffness becomes altered in ageing and (2) whether a change in tendon stiffness alters RTD. Methods: Eight healthy young (24±5yrs, 174±4cm, 72±10kg) and eight healthy elderly (67±2.7yrs, 177±7cm, 79±12kg) were recruited for an 8-week training study. During baseline assessment multiple functional and dimensional assessments were carried out, including the acquisition of patellar tendon stiffness and RTD. Patellar tendon stiffness was derived from combining dynamometry, ultrasound scanning in vivo and automated pixel tracking software (Tracker 4.91, Open Source Physics). Stiffness was calculated at the highest common force for

all individuals, enabling accurate comparison. RTD was assessed over 2 time variables, 0-200ms and 0 - 2/3 maximal force (F2/3), during rapid isometric knee extension at 90° of knee joint angle. Peak quadriceps cross sectional area was acquired with MRI and manually assessed (OsiriX Lite, 7.0.1). MVC was assessed at various knee joint angles (60°, 70°, 80°) and defined as the peak torque value obtained. Significant differences between young and elderly were statistically tested with an unpaired t-test (P=0.05). Correlations between tendon stiffness and RTD in young and elderly were assessed with Pearson's statistical test (P=0.05). Results: Patellar tendon stiffness was found to be significantly reduced in the elderly compared to the young controls (1603±113 N/mm vs 1171±117 N/mm, P<0.05). RTD was compared at multiple time intervals, whereby the elderly had significantly lower RTD at both 0-200ms (829±50N•s1 vs 545±42 N•s1, P<0.001), and 0-F2/3 (981±85 N•s1 vs 700±83 N•s-1, P<0.05). Notably, patellar tendon stiffness was significantly correlated to RTD at both 0-200ms and 0-F2/3 (R2=0.43, P<0.01 and R2= 0.25, P<0.05). In addition, both peak quad CSA (79±5.5cm2 vs 65±5.6cm2, P<0.05) and MVC (277±17Nm vs 186±18Nm, P<0.01) were significantly reduced in the elderly. Conclusion: The above data demonstrates there is an age related decline in the stiffness of the patellar tendon, which contradicts some previous research (1,3). The previously reported values for tendon stiffness in elderly males are much greater than contained herein. As tendon stiffness is largely dependable upon exposure to strain, it is plausible that our particular elderly cohort were less active than that of the previous work. Therefore, we were able to detect a true ageing effect. Nonetheless, we demonstrate that patellar tendon stiffness is significantly correlated with RTD, indicating that tendon stiffness may well be a key factor in RTD. Therefore the age-related decline in patellar tendon stiffness might explain, in part, the decrease in RTD also observed herein. In addition, these data illustrate a reduction in both the quadriceps muscle mass and MVC as a result of the ageing process. Taken together, this is of course of large clinical significance as the elderly are unable to produce as much force, or as rapidly as the young, which would be required to prevent a fall. It is also known that both tendon stiffness (4) and RDT (5) can be increased in the elderly in response exercise and therefore this research further emphasizing the need for maintaining a healthy tendinous tissue with ageing. 1. Carroll CC, Dickinson JM, Haus JM, Lee G a, Hollon CJ, Aagaard P, Magnusson SP, Trappe T a. Influence of aging on the in vivo properties of human patellar tendon. J. Appl. Physiol. 105: 1907–15, 2008. 2. Onambele GL, Narici M V, Maganaris CN. Calf muscle-tendon properties and postural balance in old age. J. Appl. Physiol. 100: 2048–56, 2006. 3. Couppé C, Hansen P , Kongsgaard M, Kovanen V , Suetta C, Aagaard P , Kjaer M, Magnusson SP. Mechanical properties and collagen cross-linking of the patellar tendon in old and young men. J. Appl. Physiol. 107: 880–6, 2009. 4. Reeves ND, Maganaris CN, Narici M V. Effect of strength training on human patella tendon mechanical properties of older individuals. J. Physiol. 548: 971–981, 2003. 5. Maganaris CN, Narici M V, Reeves ND. In vivo human tendon mechanical properties: effect of resistance training in old age. J. Musculoskelet. Neuronal Interact. 4: 204–8, 2004.

POSTER

P1- STUDY OF BIOMARKERS OF FRAILTY IN THE AGING POPULATION. S. Jathar, A.B. Dey *(Maharashtra, India)*

Background: Frailty is a complex entity defined as diminished physiological reserve across multiple homeostatic systems resulting in diminished capacity to respond to external stressors, which predispose older individuals to increased risk of adverse outcomes like mortality, dependency and hospitalization. The syndromic nature of frailty, rather than a single disease entity, is largely accepted. Nonetheless it has been difficult to define it, diagnose it, and treat it. Identifying this complex entity in its earlier stage, whereby it's possible to reverse or halt its progression remains an area of interest. Biomarkers of frailty are seen as a possible answer to this enigma. Aim: To identify physical and biochemical markers of frailty in older adults. Methodology: Older adults in Geriatric Medicine Ward and OPD in AIIMS, New Delhi were divided into robust and frail groups based on Fried's Frailty criteria. Patients were then assessed for demographical and physical parameters and assessed for cognitive decline. About 5 ml of blood was collected after an informed consent, and serum was separated and preserved. Serum levels of proposed biomarkers of frailty like vitamin D, thyroid profile, inflammatory markers like IL-6 and CRP, and molecules like sirtuin 1and 2 were assessed. Results: 143 patients were included, with 89 frail and 54 robust patients. Mean age being 78.8 ± 8.6 years. Frail patients had significantly lower levels of sirtuin 1 and 2, when compared to non-frail ones. Similarly those classified as frail by Rockwood's criteria has higher levels of IL-6 and CRP. Conclusion: frailty is complex, and although individual biomarkers can be helpful, it is thought that a signature of biomarkers or set of biomarkers will be more helpful in predicting this condition.

P2- VALIDATION OF THE STUDY OF OSTEOPOROTIC FRACTURES (SOF) FRAILTY INDEX AS PREDICTOR OF LONG-TERM MORTALITY IN AMBULATORY OLDER MEN. S. De Buyser, M. Petrovic, Y. Taes, K. Toye, J.-M. Kaufman, S. Goemaere, B. Lapauw *(Ghent, Belgium)*

Background: Frailty is characterized by a physiologic decrease of reserve capacity and resistance to stressors. So far, no consensus has been reached on an operational definition for frailty. A definition with criteria that do not rely on distribution-based cut-off points seems appealing for implementation in clinical practice, since the establishment of a reference population is not required. In 2008, the Study of Osteoporotic Fractures (SOF) Research Group developed a straightforward index to identify frailty. However, previous studies found inconsistent associations with mortality depending on ethnicity and setting of the population examined. In this study, we aimed to evaluate the SOF frailty index for prediction of all-cause mortality in a well-described sample of apparently healthy community-dwelling older men in Belgium with long-term follow-up. Methods: Men aged 70-85 years were recruited from the population register of the municipality of Merelbeke (Belgium). This population-based, cohort study started in 1996 with follow-up visits annually until 2000, one visit in 2003, and thereafter annual follow-up by postal questionnaires and telephone contacts (still ongoing). Presence of frailty could be identified retrospectively based on data acquired at the fifth visit in 2000. Frailty status was assessed using the components of weight loss, inability to rise from a chair, and poor energy (SOF index). Survival time was calculated as the number of months from assessment in 2000 until death or up to 15 years of follow-up. Results: Mean age of the 198 study participants was 78.5±3.5 years. Pre-frailty and frailty was present in 30 and 7% of men, respectively. After 15 years of follow-up, 180 men (91%) died. Weight loss (age-adjusted HR = 1.94, 95% CI = 1.26 – 2.98) and poor energy (age-adjusted HR = 1.74, 95% CI = 1.24 – 2.45) were associated with all-cause mortality, but not inability to rise from a chair (age-adjusted HR = 1.24, 95% CI = 0.71 – 2.14). Both pre-frail and frail status was associated with higher mortality rates (age-adjusted HR = 1.68, 95% CI = 1.20 – 2.33; age-adjusted HR = 2.58, 95% CI = 1.41 – 4.74; respectively). Secondary analyses,

adjusted for BMI category, low education, recreational physical activity and living alone did not alter significance of these findings. Conclusion: Our findings confirm the predictive value of the SOF index for mortality in older community-dwelling Belgian men. The non-distributional characteristics of the SOF criteria facilitate their application in clinical setting.

P3- THE AGE-PERFORMANCE RELATIONSHIP. G. Berthelot[1], A. Marck[1], V. Foulonneau[1], J. Antero-Jacquemin[1], P. Noirez[1], A.M. Bronikowski[2], T.J. Morgan[3], T. Garland Jr.[4], P.A. Carter[5], J.-F. Toussaint[1] *(1. Paris, France; 2. Ames, USA; 3. Manhattan, USA; 4. Riverside, USA; 5. Pullman, USA)*

Backgrounds: The physiological traits characterizing human capacities (the ability to move, reproduce or perform tasks) change with age: performance is limited at birth, increases to a maximum, then decrease back to zero at death. Both physical and intellectual skills follow similar ontogenies1,2. The development of sport and chess performances during the lifetime was previously investigated at two different scales: the individual athletes' careers and the world record by age class in 25 Olympic sports and in elite chess players2. For all data sets, a biphasic pattern of growth and decline is described by a simple equation1 and the two processes (growth and decline) are exponential and operate throughout the lifetime, starting at age 0. Here we aim to demonstrate that this biphasic behaviour is probably widespread among biological phenomena and compare the characteristics of the biphasic patterns such as the age of peak performance. Methods: Performances data were gathered for human (200, 400 and 800m races, n=5065, 5013 and 5080, respectively), greyhound (480m competitions, n=47991), mice (distance run on wheels during 24h, n=14241)3 and Caenorhabditis elegans (using an experimental eletrotaxis device). Other data-sets included performance in face recognition4, lung functionality5, muscle width6 in human-related systems plus physical performance in greyhounds and mice3,7, photosynthesis yield in cotton leaves8, the aboveground net primary production in Picea abies with stand age9. Results: A U-inversed biphasic pattern is found in all the studied processes, in both the athletic (human Olympians and elite greyhound) and non-athletic (mice, Caenorhabditis elegans) species. The pattern is always asymmetrical and we found that the estimated ages of peak performance always occur in the early part of life: 20.6 % ±6.7% of estimated lifespan. Conclusion: The pattern is robust, whatever the type of effort and duration: free activity vs. constrained running or overall distance traveled vs. maximum speed. Our results suggest a similar age-related pattern in very different species. The description of the physiological limits shows that there is no brutal transition between the developmental and senescent periods. It thus questions the narrowed link between those two processes. 1. Moore, D. H. A study of age group track and field records to relate age and running speed. Nature 253, 264–265 (1975). 2. Berthelot, G. et al. Exponential growth combined with exponential decline explains lifetime performance evolution in individual and human species. Age 34, 1001–1009 (2012). 3. Morgan, T. J., Garland, T. & Carter, P. A. Ontogenies in mice selected for high voluntary wheel-running activity. I. Mean ontogenies. Evolution 57, 646–657 (2003). 4. Germine, L. T., Duchaine, B. & Nakayama, K. Where cognitive development and aging meet: Face learning ability peaks after age 30. Cognition 118, 201–210 (2011). 5. Schoenberg, J. B., Beck, G. J. & Bouhuys, A. Growth and decay of pulmonary function in healthy blacks and whites. Respir. Physiol. 33, 367–393 (1978). 6. Novotny, S. A., Warren, G. L. & Hamrick, M. W. Aging and the muscle-bone relationship. Physiology 30, 8–16 (2015). 7. Bronikowski, A. M., Morgan, T. J., Garland, T. & Carter, P. A. The evolution of aging and age-related physical decline in mice selectively bred for high voluntary exercise. Evolution 60, 1494–1508 (2006). 8. Kasemsap, P., Crozat, Y. & Satakhun, D. Cotton leaf photosynthesis and age relationship is influenced by leaf position. Nat Sci 31, 83–92 (1997). 9. Ryan, M. G., Binkley, D. & Fownes, J. H. Age-related decline in forest productivity: pattern and process. Adv. Ecol. Res. 27, 213–262 (1997).

P4- ASSOCIATION BETWEEN SARCOPENIA AND QUALITY OF LIFE IN QUILOMBOLA ELDERLY. L.S. Neto, M.G.O. Karnikowski, N.B. Osório, L.C. Pereira, M.B. Mendes, D. Galato, L.B. Gomide, J.P.C. Matheus *(Brazil)*

Introduction: Currently, there is no single consensual definition of sarcopenia in the literature. This creates a challenge for the evaluation of its prevalence and direct or indirect impact on the quality of life of elderly populations of different races and ethnicities. The quilombola population is formed by ethnic/racial groups with a particular historical background, specific territorial relations and self-declared ancestry from blacks who resisted slavery. They have a strong ethnic identity, a particular form of social organization, and live in predominantly rural areas. Furthermore, no studies as yet have analyzed these variables in populations of elderly subjects of the quilombola ethnic group. Objective: To verify the association between sarcopenia and quality of life in quilombola elderly. Method: This was a cross-sectional study of 70 male and female participants (mean age 65.58 ± 6.67 years). Quality of life was evaluated using the SF-36. Sarcopenia was diagnosed according to the Baumgartner cut-off for appendicular skeletal muscle mass, and the criteria recommended by the European Working Group on Sarcopenia in Older People (EWGSOP). Muscle mass (MM) and percent fat mass were analyzed by DEXA, while handgrip strength (HGS) was evaluated using a hand-held dynamometer. Physical performance was assessed through a gait speed (GS) test. Results: The prevalence of sarcopenia was 15% according to the Baumgartner cutoff, and 10% according to EWGSOP criteria. Quilombola elderly classified as physically active or very active are at least six times less likely to develop sarcopenia than those classified as irregularly active or sedentary. HGS was negatively associated with a diagnosis of sarcopenia according to both sets of criteria. Subjects with sarcopenia reported lower scores than those without the condition on the physical role functioning and bodily pain domains of the SF-36. Conclusion: Quality of life was negatively associated with sarcopenia in this sample of quilombola elderly. Additionally, the present results showed that diagnostic criteria for sarcopenia should include reductions in lean mass in addition to measures of functioning and physical performance, since some subjects showed the former symptom without any alteration of the latter two variables. Keywords: Sarcopenia, Quality of Life, Elderly

P5- OSTEOSARCOPENIA IS MORE THAN SARCOPENIA AND OSTEOPENIA ALONE. M. Drey[1], C.C. Sieber[2], T. Bertsch[2], J.M. Bauer[3], R. Schmidmaier[1] *(1. München, Germany; 2. Nürnberg, Germany; 3. Oldenburg, Germany)*

Backgrounds: Sarcopenia and osteopenia/osteoporosis show a high prevalence in old age and incur a high risk for falls, fractures, and further functional decline. Physical performance and bone metabolism in patients suffering from so called osteosarcopenia - the combination of sarcopenia and osteopenia - are currently still unknown. This study investigates physical performance and bone metabolism in osteosarcopenic, prefrail, community-dwelling older adults. Methods: 68 prefrail adults between 65 and 94 years were assigned to four groups according to mean DXA results: osteosarcopenic

(low T-score and low appendicular lean mass (aLM)), sarcopenic (low aLM), osteopenic (low T-score) and controls. Multiple linear regression analysis, adjusted for age, gender, physical activity, and 25-OH-vitamin D3 serum level, was used to identify the influence of being osteosarcopenic, sarcopenic or osteopenic on physical performance (hand grip, chair rise test, sit to stand power, gait speed, SPPB) and serum markers for increased bone turnover (osteocalcin, β-crosslaps and P1NP). Results: Only osteosarcopenic participants showed significantly reduced hand grip strength, increased chair rising time, and STS power time as well as significantly increased bone turnover markers. Conclusion: Due to low physical performance and high bone turnover, older adults with osteosarcopenia have to be regarded as the most at-risk population for fractures and further functional decline. Therefore, up-to-date osteoporosis and post-fracture management of older persons should aim at both, bone and muscle.

P6- POSTACUTE PREVALENCE OF SARCOPENIA: MEASUREMENTS IN AGED IN-PATIENTS DURING REHABILITATION: THE PSMAR STUDY. D. Sánchez-Rodríguez, E. Marco, J.M. Muniesa, E. Casanovas-Atienza, O. Vázquez-Ibar, R. Miralles *(Barcelona, Spain)*

Backgrounds: Few systematic studies have focused on the prevalence of sarcopenia in hospital-based postacute geriatric rehabilitation settings. Furthermore, when rehabilitation success is assessed by performance of activities of daily living, using rehabilitation impact indices, the relationship with sarcopenia remains unclear. The aims of the proposed study are to assess the prevalence of sarcopenia in elderly inpatients in a hospital's postacute care setting focused on rehabilitation and to determine the relationship between sarcopenia and scores on rehabilitation impact indices. Methods: A prospective, longitudinal study in a post-acute care unit has been designed to meet the study aims. Rehabilitation-eligible deconditioned in-patients aged 75 or older and prospectively admitted to post-acute care will be invited to participate. Inclusion criteria are having been ambulatory prior to hospitalization, being medically stable (absence of acute infection, absence of symptomatic worsening of chronic disease and absence of acute confusion) at discharge, and being willing to participate and to provide a signed informed consent. Rehabilitation-eligible status will be determined by an initial comprehensive geriatric assessment performed by the postacute unit's interdisciplinary care team. Data to be collected include sex, age, medical history, medications, geriatric syndromes, functional status (assessment of basic and instrumental activities of daily living by Barthel index and Lawton index, respectively), mobility, cognitive status (Mini-Mental State Examination, Yesavage), comorbidity (Charlson index), nutritional status (Mini-nutritional Assessment), and laboratory parameters. Sarcopenia diagnosis will follow European Working Group on Sarcopenia in Older People (EWGSOP) criteria, including body composition (measured by bioelectrical impedance analysis), handgrip strength, Short Physical Performance Battery and 4-meter walking speed test, to be assessed at admission, at discharge and at 3-month follow-up. Outcome measures will include absolute functional gain (AFG, admission-to-discharge Barthel change), relative functional gain (RFG, achieved percentage of potential gain) and rehabilitation efficiency index (REI, AFG over length of stay). The relationship between sarcopenia and rehabilitation effectiveness will be calculated. Results: The proposed study will estimate the prevalence of sarcopenia in a postacute care geriatric setting, using the EWGSOP algorithm and criteria. Demographic, anthropometric, and functional data associated with sarcopenia and the relationship between a diagnosis of sarcopenia and rehabilitation outcomes will be reported. Conclusions: The PSMAR study should improve knowledge on the prevalence, characteristics, and rehabilitation effectiveness implications of sarcopenia in hospital-based geriatric rehabilitation settings.

P7- IMPROVEMENT IN MUSCLE PERFORMANCE AFTER ONE-YEAR CESSATION OF LOW-MAGNITUDE HIGH-FREQUENCY VIBRATION IN COMMUNITY ELDERLY. K.-S. Leung, W.-H. Cheung, C.-Y. Li *(Hong Kong)*

Backgrounds: Fragility fractures result from a combination of poor balance, falls, and deteriorating bone strength. Exercise training is effective in reducing fall risks, improving balance and increasing lower extremity strength in elderly; however, this is only beneficial to those with good compliance to exercise programs. In our previous study involving 710 postmenopausal women, low-magnitude high-frequency vibration (LMHFV) was proven to significantly reduce fall incidences throughout 18-month intervention, together with improvement in balancing ability and muscle strength. The effects of vibration were confirmed as early as after 3 months of treatment. In this study, we aimed to investigate the effects on muscle performance after one-year cessation of 18-month LMHFV intervention in the untrained community elderly. Methods: This is a case-control study with 59 community elderly women (25 control without any treatment; 34 received 18-month LMHFV but discontinued for 1 year from our previous clinical study [Leung et al. Osteoporos Int. 2014]). Muscle strength, balancing ability, occurrence of fall/fracture, quality of life (QoL) and bone mineral density (BMD) were assessed 1-year after cessation of intervention. The fall incidences during cessation of intervention were recorded according to report from subjects. All parameters were compared between groups in order to evaluate the effects of LMHFV in elderly by independent t-test. Human experiments approval was obtained from the Clinical Research Ethics Committee of the Chinese University of Hong Kong and written consents were obtained from all subjects. Results: After stopping the LMHFV for 1 year, the muscle strength of non-dominant (between-group difference=2.26kg; 95%CI, 1.02-3.5, p=0.001) and dominant (between-group difference=1.49kg; 95%CI, 0.18-2.81, p=0.027) legs in treatment group were significantly better than the baseline, as compared with the control. In balancing ability test, reaction time, movement velocity and maximum excursion of treatment group remained significantly better (all $p<0.02$), as compared with the control group. Changes of muscle strength, balancing ability, and quality of life from 18-month endpoint to 1-year post-intervention showed a decreasing trend in both groups without significant differences between two groups. A drop of -1.26% and -0.38% total hip BMD were observed in the vibration and control groups respectively during cessation of intervention, yet not significant (mean between-group difference=-0.89%, 95%CI, -2.3 to 0.5, p=0.203). Conclusion: The positive effect of LMHFV on muscle performance in community elderly can last for one year after the cessation of 18-month intervention. LMHFV not only enhanced subjects' muscle strength and balancing ability during the intervention period, but also brought significant enhanced effects one year after cessation of intervention. Implementing LMHFV of at least 3 sessions a week in training and rehabilitation programs is recommended to bring long-term improvement in muscle functions, especially for elderly who can benefit with lower fall and fracture risks. Fall and fracture prevention program with LMHFV should last for at least 9 months, and ideally for 18 months or longer to maximize the treatment effect, as well as the sustained effect. For elderly who stopped LMHFV treatment due to various reasons (e.g. acute medical conditions, travel), restarting the treatment within one year is advised for a continuous positive effect.

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P8- EFFECT OF LOW-MAGNITUDE HIGH-FREQUENCY VIBRATION TREATMENT ON RETARDATION OF SARCOPENIA–SENESCENCE ACCELERATED MICE-P8 (SAMP8) MODEL. W.H. Cheung, A.Y. Guo, J.H. Qin, S.K.H. Chow, K.S. Leung *(Hong Kong)*

Backgrounds: Sarcopenia is an age-related systemic syndrome characterized by the decline of muscle strength along with the progressive loss of muscle mass, as well as poor physical performance. High-intensive resistance exercise was proven to be effective in increasing skeletal muscle strength, muscle function and hence reducing fall incidences; however, the compliance of exercise in community elderly is usually low. Low-magnitude high-frequency vibration (LMHFV) is a non-invasive biophysical modality providing cyclic loading to whole body transferring mechanical energy to the subjects physically. This is a well-accepted intervention which has been proven to be beneficial to the musculoskeletal system in elderly, including muscle mass and strength, blood flow and balancing ability. In this study, we hypothesized that LMHFV stimulated the sarcopenic animals by increasing the skeletal muscle mass, improving muscle function, enlarging muscle satellite cells (SCs) pool and reducing the serum myostatin level in SAMP8 animal model. The objective of this research was to evaluate the effects of LMHFV on the sarcopenic animals and explore the related mechanisms. Methods: Experimentation Ethics Approval (ref: 12/012/MIS) was obtained from The Animal Experimentation Ethics Committee of The Chinese University of Hong Kong. SAMP8 mice were selected as sarcopenia animal model with the gastrocnemius as the target muscle. The 6-month-old male SAMP8 mice were randomized into control (Ctrl) group and vibration (Vib) group. The mice in Vib group were treated with systemic vertical LMHFV at 0.3g, 35Hz, 20min/day, 5days/week. All the parameters were assessed at 1-, 2-, 3-, 4-month post-treatment and the two groups shared the same baseline time-point at 0-month post-treatment, with 6 mice in each time-point. Functional outcomes were measured with ex vivo muscle functional test system (800A, Aurora Scientific Inc). ATPase staining was performed for fiber cross-sectional area (FCSA) evaluation and muscle fiber typing. The investigation of satellite cell (SC) pool by immunofluorescence with Pax7 and the assessment of myostatin expression by ELISA were performed to evaluate the muscle regeneration. One–way ANOVA with Tukey post-hoc test was performed for within-group comparison among time-points; two-way ANOVA with Tukey post-hoc test was used for between-groups comparison; independent-samples T test was performed for comparison between groups at corresponding time-points with $p \leq 0.05$ as significant level. Results: For muscle mass, there was no significant difference between Ctrl and Vib groups ($p=0.285$). For twitch force (SF0), Ctrl increased from month 0 to 3 but decreased slightly from month 3 to 4; Vib group showed increasing trend from month 0 to 4 and peaked at month 4. The SF0 of Ctrl group was significantly lower than Vib group at month 4 ($p=0.028$). For tetanic force (SFt), Ctrl group was higher than Vib group from month 1 to 3 with significant difference at month 1 ($p=0.008$) but the trend reversed a month 4. Contractibility was generally significantly shorter in Vib group than Ctrl group (contraction time, $p<0.01$; half-relaxation time, $p<0.01$); fatigue rate in Ctrl groups was higher than that in the Vib group ($p=0.01$). For FCSA, Vib group had larger FCSA of type IIA than the Ctrl group ($p<0.01$) and the differences were significant at month 1, 2 and 3 ($p<0.01$, $p=0.035$ and $p=0.003$ respectively. For SC counts, Vib group had higher SC amount at month 3 and month 4 than those at the corresponding time-points in the Ctrl group ($p=0.001$ and $p=0.001$ respectively). Also, a significantly lower myostatin level was found in Vib group than Ctrl group ($p=0.050$). Conclusion: The effect of LMHFV on skeletal muscle function was positive. The reduction of twitch force and tetanic force at the early stage and the increase at the late stage indicated that the acute effect of LMHFV on muscle force was negative but the long-term effect was positive. Furthermore, the vibration treatment improved the skeletal muscle contractibility and endurance, and maintained SCs pool. The muscle fiber type IIA was more sensitive to the LMHFV compared with the other types of muscle fiber. Although no visible improvement of muscle mass was observed, the fiber distribution of the gastrocnemius was changed by the vibration treatment, which indicated that LMHFV improved the skeletal muscle function by optimizing the muscle composition but not increasing the muscle mass directly. Based on the diagnostic criteria proposed by the European Working Group on Sarcopenia in Older People (EWGSOP) in 2010, we are unable to demonstrate that LMHFV has positive effects on reversing sarcopenia progression. Nonetheless, LMHFV could retard the age-induced decrease of skeletal muscle function with no adverse effects. This non-invasive physical intervention would be a good recommendation for prevention program in falls and fall-related injuries in community dwelling elderly. Acknowledgments: This study was supported by General Research Fund (Ref: 14103314 and 469911), Research Grants Council, HKSAR.

P9- FRAIL-NH PREDICTS OUTCOMES IN LONG TERM CARE. E.W. Kaehr, T.K. Malmstrom, L.C. Pape, J.E. Morley *(St. Louis, USA)*

Background/Objectives: To investigate the validity of the short, simple FRAIL-NH frailty screening tool in the long term care population and to compare predictive validity with the frailty index (FI) for 6-month adverse health outcomes. Design: Retrospective study using the Minimum Data Set (MDS) 3.0 and chart review from June-December 2014. Setting: Two Long Term Care Facilities in Saint Louis, MO. Participants: 270 patients ages ≥ 65 years old residing in long term care. Measurements: Frailty was measured using the FRAIL-NH and FI criteria. Two versions of the FRAIL-NH (FRAIL-NH1 and FRAIL NH2) were compared with a 26-item FI. Adverse outcomes at 6-month follow-up included falls, hospitalizations, and hospice enrollment/mortality. Results: Based on screening tool used frailty prevalence, was 48.7% for FRAIL-NH1, 35.6% for FRAIL-NH2, and 30.3% for FI. The FRAIL-NH1 pre-frail (Adjusted Odds Ratio [AOR]=2.62; 95% Confidence Interval [CI]=1.25-5.54; $p=0.11$) classification was associated with 6 month risk of falling and mortality/hospice enrollment was associated with the frail classification, AOR=3.96 (1.44-10.87, $p=0.007$). Combining the pre-frail and frail categories all three measures predicted 6 month mortality with the FRAIL-NH1 being the strongest predictor (AOR=3.36; 95%CI=1.26-8.98; $p=0.016$) and the FI was a more modest predictor with an AOR of 2.28; 95%CI=1.01-5.15; $p=0.47$. Conclusion: In comparison to the FI, the FRAIL-NH preformed just as well at screening for frailty and was a slightly better predictor of mortality. The FRAIL-NH1 is a brief, easy-to-administer frailty screening tool appropriate for long term care patients and predicts increased risk of falls in the pre-frail and mortality/hospice enrollment in the frail.

P10- ADULT GRANDCHILDREN AND GRANDPARENTS DEMENTIA: WHEN THE THIRD GENERATION BECOMES THE PRIMARY CAREGIVER. D. Huvent-Grelle[1], S. Demarle[2], J.B. Beuscart[1], L. Delannoy[1], E. Boulanger[1], F. Puisieux[1] *(1. Lille, France; 2. Bouvigny Boyeffles, France)*

Background: Most demented patients are cared for at home by family members, usually elderly spouses. Dementia often has a serious impact on family life in household care giving situations. With the increase in multi-generational families, Adult Grandchildren (AGC) are playing a bigger role in caring for demented Grandparent (GP). Objective: We have studied the importance of the role of the AGC, the third generation, in caring for an elderly person with dementia. Study Design: Multicentric, prospective and observational study over a two-year period. Method and Setting: The participants (dyad: demented grandparent (GP) and AGC) have been recruited through the system of the French National Alzheimer Data Base. A structured telephone non recorded interview lasting about 15 minutes was conducted with the AGC. They were asked what type of caregiving activities they provide for their GP and if they encountered physical or mental health problems associated with their caregiving experience. Results: The sample group had 70 elderly demented GP and 70 AGC. A vast majority of the AGC were women, mean age 38years, married, employed. They had two children on average. The demented GP were women, mean age 87-years-old. AGC have been providing care for 5 years or even longer. Half of the AGC felt stressed and more of one third had sleep disturbances. Nevertheless, the AGC considered themselves satisfied about their health, and they said they had a good quality of life. Conclusion: Literature has begun to consider the contributions of this "forgotten generation". The study highlights the important role that AGC play in family caregiving. Clinicians may need to pay particular attention to atypical family member caregivers such as AGC.

P11- STUDY OF SARCOPENIA IN ELDERLY PATIENTS WITH TYPE 2 DIABETES. A.H.A. Sayed Mahmoud, E.M. Esmayel, A.S. Ahmed *(Zagazig, Egypt)*

Background: Until recently, there has been no widely accepted definition for sarcopenia that was suitable to be used in research and clinical practice. The European Working Group on Sarcopenia in Older People (EWGSOP) defined sarcopenia as a syndrome characterized by progressive and generalized loss of skeletal muscle mass and strength associated with a risk of adverse outcomes such as physical disability, poor quality of life and mortality. Despite having the highest prevalence of diabetes of any age group, elderly population have often been excluded from clinical trials, although diabetes in older adults is linked to higher mortality, dependence and increased risk of institutionalization. Data about sarcopenia and factors affecting it in Egypt are sparse. So, this study was conducted to investigate sarcopenia in elderly individuals with and without type 2 diabetes mellitus and to check the contributing factors that can be associated with increased risk of sarcopenia. The effects of glycemic control in the diabetic elderly were also assessed. Methods: A total of 260 elderly (age≥65years) were recruited to the study and divided into two equal groups, 130 of them were non diabetics with mean age: 69.24 ± 4.22 (58 were men) and 130 were diabetics with mean age: 69.22 ± 4.22 (63 were men). The diabetic group was subdivided according to HbA1C into controlled and uncontrolled groups. All subjects of this study were subjected to thorough full history intake (with assessment of nutrition by Mini Nutritional Assessment scale), general examination and anthropometric measurements (mid upper arm, mid calf and waist circumferences and body mass index). Muscle mass was evaluated by bioelectrical impedance analysis (BIA), muscle strength was measured by hand grip strength (HGS), physical performance was assessed by 4 meters walking speed test and the EWGSOP definition was used to diagnose sarcopenia. All subjects of this study were also subjected to laboratory investigations including CBC, liver function tests, kidney functon tests, coagulation profile, fasting blood sugar, total cholesterol, triglycerides and HbA1C. Results: The prevalence of sarcopenia was significantly higher in elderly diabetics compared to non-diabetics (37.7 vs. 15.4% respectively) and was also significantly higher in both men and women with diabetes than in non- diabetic counterparts (38.1% vs 20.7% in men and 37.3% vs 11.1% in women). As regards the impact of glycemic control on sarcopenia, our study revealed that the prevalence of sarcopenia in controlled diabetics was significantly lower than in uncontrolled diabetics (26.2 vs 49.2%). As regards muscle mass in our study, it was significantly lower in diabetics than in non-diabetics (15.06 ± 2.20 vs 15.39 ± 1.66 kg/m2) and was significantly lower in uncontrolled diabetics when compared to controlled diabetics (14.47 ± 2.17 vs 15.64 ± 2.1 kg/m2). As regards muscle strength in our study, it was significantly lower in diabetics than in non-diabetics (18.83 ± 6.43 vs 26.61 ± 9.97 kg) but no significant difference in muscle strength was found between controlled diabetics and uncontrolled diabetics. As regards gait speed in our study, older adults with type 2 diabetes were associated with slower walking than non-diabetics (0.74 ± 0.2 vs 0.96 ± 0.2 m/s). Moreover, gait speed was significantly lower in uncontrolled diabetics than in controlled diabetics (0.68 ± 0.2 vs 0.8 ± 0.17 m/s). Our study revealed a positive correlaion between hemoglobin and each of muscle mass, muscle strength and physical performance. Sarcopenia in our study showed positive correlation with age and HbA1c but negative correlation with BMI, serum albumin and hemoglobin. Conclusions: Risk of sarcopenia is higher among elderly patients with type 2 DM especially those who are poorly controlled and increases more with aging and low BMI. Hypoalbuminemia and anemia may be risk factors for sarcopenia.

P12- SARCOPENIA AS DETERMINANT OF LOWER SURVIVAL IN CHILEAN OLDER PEOPLE. THE ALEXANDROS STUDY. L. Lera, C. Albala, H. Sánchez, B. Angel, P. Arroyo, C. Marquez, F. Insunza *(Chile)*

Background: Sarcopenia is the progressive loss of skeletal muscle mass and strength producing serious impact on the health of older adults. The objective of this study was to determine the association of sarcopenia with all-cause mortality in older Chileans. Methods: Follow up of 2311 community dwelling people 60y and older (mean ± SD: 69.2 ± 6.9 years; 67.3% female), from the ALEXANDROS cohorts, designed to study disability associated with obesity in Chilean older people, observed between 5-15 years, in Santiago Chile. Anthropometric measurements, handgrip strength, mobility and physical performance tests were performed. Appendicular skeletal muscle mass index (SMI), was calculated as the ratio of appendicular skeletal lean mass (ASM) and height2 (kg/m2). Nutritional status and obesity were defined according to World Health Organization (WHO) standards. Sarcopenia, Pre-sarcopenia, and severe sarcopenia were defined using the European Working Group on Sarcopenia in Older People (EWGSOP) algorithm. Muscle mass was estimated with a Chilean population prediction model. Low SMI was defined with cut-off points validated for the Chilean population using DXA as gold standard (men: ≤ 7.45 kg/m2; women: ≤ 5.88 kg/m2). Low Muscle strength was defined by hand dynamometry ≤ the 25 percentile of the Chilean older population: men 27 kg; women 15 kg. For physical performance we used the combination of 3 m walking speed, five chair- stands and time up go test (TUG). Information

about deaths was available for all subjects. Mortality data were obtained from death certificates of the National Civil Registry. Total deaths in the period under observation were 478. Life tables for survival data, Kaplan Meier estimations and Cox regression were calculated. Results: The prevalence of sarcopenia was 20.2% (95%CI: 18.6% to 21.9%), similar in both sex; pre-sarcopenia was identified in 20.4% (95%CI: 18.8% to 22.1%) of the sample and only 3.5% (95%CI: 2.8% to 4.3%) had severe sarcopenia. Kaplan Meier survival estimates according sarcopenia, demonstrated lowest survival rates for the people with sarcopenia (Log-rank test for equality of survivor functions: p<0.0001). The 15y survival probability was 0.5502 for the people with sarcopenia and 0.7902 for the individuals without sarcopenia. The 5y to 10y survival probability was 0.5889 for people with sarcopenia and 0.8166 for those without sarcopenia. A dose-response was observed in the survival rates according the stages of sarcopenia, showing lowest survival rates for the people with severe sarcopenia followed of older adults with sarcopenia, pre-sarcopenia and without sarcopenia (Log-rank test for equality of survivor functions: p<0.0001). The 15y survival probability was 0.5203 for the people with severe sarcopenia, 0.5565 for those with sarcopenia, 0.7993 for pre-sarcopenia and 0.8011 for the individuals without sarcopenia. After adjusting by age, sex, nutritional status and number of chronic diseases Hazard ratios for death showed higher risk for subjects with sarcopenia: HR=1.47 (95%CI: 1.17-1.83, p=0.001) in comparison with people without sarcopenia. Conclusion: The results confirm higher risk of all-cause death in older adults with sarcopenia than in those non-sarcopenic and a dose-response in the survival rates being the higher for those subjects without sarcopenia and the lower for those with severe sarcopenia. Funding: This project was supported by FONDECYT (Fondo Nacional de Desarrollo Científico y Tecnológico) Grant 1130947.

P13- QUADRICEPS MUSCLE POWER AND OPTIMAL SHORTENING VELOCITY AS DETERMINANTS OF FUNCTIONAL ABILITIES OF OLDER ADULTS IN A LONG-TERM CARE HOME: A ONE-YEAR FOLLOW-UP STUDY. I. Kozicka, T. Kostka *(Lodz, Poland)*

Backgrounds: Aging is associated with progressive drop in physical health, as well as increased risk of disability and dependency. The role of muscle strength in maintaining independence in activities of daily living has been demonstrated in many studies. In recent years growing interest in quadriceps muscle power (Pmax) as well as optimal shortening velocity (υopt) has been observed. Furthermore, in studies comparing the relationships between muscle strength and muscle power with functional abilities (FA), muscle power almost always seems to be a stronger determinant. In the available literature we did not find studies that assessed simultaneously handgrip strength (HGS), Pmax and υopt in older institutionalized adults. Therefore, the main purpose of this study was to assess the relative role of HGS, Pmax and υopt in maintaining FA in older adults living in a long-term care home. Methods: Forty-one inactive older institutionalized adults aged 69.8±9.0 years participated in the study. Each of the patients (17 females and 24 males) underwent multidimensional assessments twice, at baseline and at the one-year follow-up. All the participants led sedentary lifestyles and none of them practiced any regular physical activity. HGS, Pmax, υopt, as well as cognitive function using the Mini-Mental State Examination (MMSE), depressive symptoms using the Geriatric Depression Scale (GDS), nutritional status using the Mini Nutritional Assessment (MNA) and physical activity (PA) using the Seven-Day Physical Activity Recall Questionnaire (SDPAR) were assessed at baseline and at the 1-year follow-up. FA were assessed with the Activities of Daily Living (ADL), Instrumental Activities of Daily Living (IADL) and Timed Up & Go (TUG) tests. Results: The average age of the entire cohort was 69.8±9.0 years. Participants had been diagnosed with the following concomitant diseases: ischemic heart disease (n=25), arterial hypertension (n=25), chronic heart failure (n=24), history of stroke (n=7), osteoarthritis (n=16), eye diseases (n=12), chronic obstructive pulmonary disease (n=9), gastrointestinal diseases (n=13), depression (n=12). Women were characterized with significantly lower values of HGS, Pmax/kg and υopt as compared with men, both at baseline and after the one-year follow-up. At baseline, FA were related to HGS, Pmax, υopt, GDS and PA. At follow-up, FA were correlated with Pmax, υopt, MNA and PA. The relationship of Pmax and υopt to FA was more powerful than that of HGS. Pmax and υopt, but not HGS, decreased significantly after one year. Nevertheless, 1-year changes in FA were not statistically significantly related to changes in HGS, Pmax and υopt or changes in PA level. Conclusion: The present study has demonstrated that Pmax and υopt are important determinants of FA of older, inactive adults living in a long-term care home. When assessed cross-sectionally, Pmax and υopt are adversely related to age and positively associated to PA level and FA. Furthermore, the relationship of Pmax and υopt to FA is more powerful than that of HGS, both at baseline and after the one-year follow-up. Declining PA levels of older adults are accompanied by decreasing FA, Pmax and υopt. Nevertheless, 1-year changes in FA were not related to changes in muscle strength, power, υopt or changes in PA level. Further studies are needed to explore the potential possibilities of alleviating functional decline by protecting muscle function in long-term care residents.

P14- SCREENING AND PREVENTING RISKS OF FRAILTY IN COMMUNITY-DWELLING SENIOR CITIZENS: A GLOBAL PERSONALISED APPROACH TO PROMOTE HEALTHY AGEING. M. Noguès, J. Millot-Keurinck, J. Bousquet, J. Touchon, V. Bruguière, G. Onorato, J.-C. Reuzeau *(Montpellier, France)*

Backgrounds: Fried's frailty phenotype (2001) is a predictive marker of autonomy loss, based on physiological criteria. A multidomain frailty approach, developed by Rockwood (2005) and Gobbens (2010), includes a psycho-cognitive and social dimension. The French Retirement and Occupational Health Insurance Agency (Carsat) concentrates its reflexion far preceding the state of acknowledged frailty. Through a global approach, it aims to improve frailty prevention by targeting social and environmental components. To reach its objective, the Carsat created the Regional Institute of Ageing (IRV) in 2004, developing services open to all citizens thanks to many partnerships. Methods : One of the IRV's operational poles is the concerted service window, targeting retirees and pre retirees at risk of frailty, advising and orienting them towards appropriate services. This experimental project is held within the French Proximity Autonomy Plan, a joint initiative from the Public Health & Retirement Insurances, aiming at coordinating their actions for the screening of people at risk of frailty. People are identified either through the IRV's Frailty Observatory (geographical information system), or by diverse partners (hospitals, prevention centres, associations). Then, they are invited to meet a prevention case manager. This one conducts a face-to-face (or telephone) 45 min interview with a 42 question multidimensional grid, which was built upon to the EIP-AHA questionnaire (Bousquet, 2015), based on the WHODAS and WHOQOL. This grid is composed of 9 thematic items allowing the evaluation of cognition, mobility, personal care, relationship support, activities of daily life, social interaction, quality of life, resources and nutrition. From this global needs approach, personal advices concerning rights and health access are then formulated. If necessary, orientation is proposed towards adequate social protection

organisations competent services. Regular follow-up is provided at least during 6 months to all the individuals who benefited from prevention recommendations, with the help of a simplified 4 sections-20 question grid (somatic, cognition, psychosocial, nutrition). Results: Survey is ongoing since June 2014. Data collection reached 600 cases in November 2015 from elders aged 58 to 66 years old at risk of frailty. 1. Insured expressed needs : 53% of the concerned insured people do not show a specific need at first contact with the prevention case manager. More than 30% express financial difficulties to sustain their living. Other struggles are related to housing, care, loneliness as well as acquiring complementary health insurance. 2. Prevention case manager's identified needs : Average age of individuals contacting the prevention case manager is 65, for equal parity men- women. 56% are tenants, of whom 95% benefit from Housing Assistance Program. 15% are unsatisfied of their residence. 43% benefit from a complementary health insurance. Because of poor incomes or misinformation, 14% remain without any health coverage. 43% have a personal health insurance of whom 20% ignore they can benefit from the health insurance's financial help. Concerning medical care, 73% declare being followed-up by their general practionner, except for both visual and auditory aspects: 16% acknowledge having troubles with hearing and sight. Furthermore, 22% have to give up on dental care because of its high cost, neither reimbursed by health insurance nor complementary. The 600 interviews allowed orienting 336 individuals to adapted professionals: Carsat's Social Service (42%), French Health Insurance (17%), Carsat's Social Action (17%), Carsat's Retirement Service (11%), Prevention and Examination Centres (11%), Family Allocations Office (2%). Referrals to social services led to 15% of social support. Follow-up withdrawals account for 3% of the cases. Data analysis shows that women get more specialized medical follow-up than their male counterpart. For both sexes, principal advice concerns lifestyle: physical activity and nutrition. Main advice to men is cancer screening. Finally, concerning the Social Action Services to access daily living assistance and housing design, only 15% of insured elders have returned their application form. They highlight the procedure's complexity thus not taking the time to inform their case. Conclusion : The present 600 cases study confirms the importance of working on early identification of risks of frailty, before acknowledge frailty. This allows people to boost their resilience capacity as well as to fix uneasy situations linked to their environment. The active and healthy ageing grid is of precious help for professionals and local stakeholders responsible for the monitoring of frailty within the elder's population. This shows the relevance of the concept developed by the IRV. A reflexion is ongoing to enhance existing tools from new technologies input. Considering the increasing number of individuals followed-up, the objective is to disseminate the competencies at a local scale. The Carsat will still insure coordination, professional training as well as research and evaluation. Being validated by the French authorities, the concerted service window will thus be spread out at a national level as from the beginning of 2016. .

P15- IMPROVEMENT OF GAIT SPEED AFTER THREE MONTHS OF HOME-BASED EXERCISE PROGRAM (HEP) USING A GERONTECHNOLOGY IN COMMUNITY-LIVING OLDER ADULTS FOLLOWING A MINOR INJURY.
D. Martel, M. Lauzé, A. Agnoux, M. Émond, M.-J. Sirois, R. Daoust, M. Aubertin-Leheudre *(Québec, Canada)*

Backgrounds: In Canada, 16.1% of the population have 65 years and over and 700,000 elderly people per year visit emergency department for minor injuries. It has been recently recognized that 3 months after a minor injury, mobility assessment, fall efficacy, autonomy in activities of daily living (ADL) (-7%) and instrumental ADL (-22%) declined in previously independent older adults. In addition, it has been observed that decreased of gait speed is a good predictor of physical autonomy decline and mortality in the elderly. It is important to note that these minor injuries can eventually lead to frailty and disability. Physical activity (PA) interventions (in laboratory, in community or in home-based program) have proven to be effective in improving functional status in autonomous elderly individuals and frail people, and in reducing risk of major disability in vulnerable older adults. Still, many barriers exist for this kind of interventions and 61% of elderly individuals are considered inactive. PA interventions require people to leave their house, involve the presence of a kinesiologist, and may induce a feeling of insecurity when practiced without supervision. Moreover, poor health and fear of falling are the most cited barriers to PA in the older adults and may prevent them from being active. Thus, it is essential to find interventions (such as individual and personalized exercise programs) that can increase, or at least maintain, physical autonomy. To address this issue, HEP using gerontechnology seem to be a suitable avenue to increase the level of PA participation of elderly individuals. The purpose of this pilot study was to evaluate if a HEP using a gerontechnology based on a motion capture system can prevent physical functional and mobility decline in community-living older adults following a minor injury lacking health care. Methods: Twelve participants were recruited at the Emergency Departement (ED) after being evaluated and discharged within 24-hours for a minor injury. To be eligible for the study, subjects needed to be fully independent in ADL before injury. They were assigned to a HEP group using a gerontechnology called Jintronix (HEP) or to a control group (Control). Participants were assessed with subjective [MoCA, IADL, Frailty index (SOF), SF-36, comorbidities questionnaires, fear of falls)] and objective physical measurements [SPPB, TUG, handgrip strength and body composition (BIA)], within 7 days of their visit at the ED and three months later. The Jintronix technology used is a portable device working with the Kinect motion capture system. It differs from similar type of technology (e.g. Wii) as it allows the acquisition of individual reports on adherence, active time, level of difficulty, quality and quantity of movements performed. The level of difficulty (e.g. movement type/speed, number of repetitions) can be adapted at distance by a kinesiologist according to each individual's report. The intervention was a 12-week HEP with 2 sessions/week and started seven days following the injury. Participants were free to decide the day and the time to perform the exercise program, but had to take a minimum of a day off between the two sessions. Each exercise session (50-55min) included a warm-up (5min), 9 aerobic exercises (20min), 9 resistance and balance exercises (20-25min) and a cool down (10min). There were two visits to install the technology and explain the program. Participants were progressively brought to independently use the technology. A kinesiologist visited the participant to supervise 7/24 sessions and was available for support for the remaining sessions. Results: At baseline, no difference ($p>0.05$) were observed between groups for age (73yrs±2.93 vs. 76yrs±6.51), BMI (32.42kg/m^2±6.50 vs. 27.98 kg/m^2±6.22), MoCA (25.20/30±2.49 vs. 26.2/30±1.92), number of comorbidities (4.00±3.22 vs. 4.33±1.97) which could be confounding variables. In addition, physical and functional capacities such as SPPB score (8.83/12±1.17 vs. 7.67/12±1.37), handgrip strength (19.83kg±3.19 vs. 16.50kg±6.57) handgrip/bodyweight (0.27±0.05 vs. 0.23±0.11), fat mass (42.08%±6.09 vs 36.20%±7.86) and muscular mass (24.34%±2.78 vs 22.98%±5.62), frailty index (3/3±0.0 vs. 3/3±0.0) were also similar. The only difference between groups at baseline was found in fear of falls (8.33/28±1.51 vs. 7.00/28±0.00; $p=0.022$). As expected, HEP and Control groups decreased their bodily pain (SF-36 sub-score) from baseline to post-intervention (respectively

+40.83%±37.41, p=0.046 and +26.5%±20.66, p=0.08). HEP group increased its PA level compared to Control group (+29.63%±31.95 vs. -16.67%±24.09; p=0.035). Similarly, HEP group tended to reduce its frailty index (SOF) compared to Control group. The HEP group tended to increase its time to unipodal balance compared to Control group (+11.9sec±18.50 vs. +2.16sec±8.41; p=0.078). Finally, the HEP group increased significantly its walking speed compared to Control group (+0.25m/s±0.12 vs. 0.05m/s±0.09; p=0.025). Conclusion: This pilot study demonstrated that HEP using a gerontechnology can increase gait speed which is one of the most important predictor of mobility loss and mortality in the elderly. In addition, other functional outcome measures such as frailty index, unipodal balance, physical activity level and SPPB would undoubtedly improve with a larger number of participants.

P16- ENGLISH TRANSLATION AND CROSS-CULTURAL ADAPTATION OF THE SARQOL® QUESTIONNAIRE. C. Beaudart[1], M. Edwards[1], E. Dennison[2], C. Moss[2], O. Bruyère[1], J.Y. Reginster[1], R. Moon[2], C. Demoulin[1], C. Cooper[2] *(1. Liège, Belgium; 2. Southampton, United Kingdom)*

Background: Recently, the SarQoL® (Sarcopenia and Quality of Life), a quality of life questionnaire specific to sarcopenia, has been developed and validated in French1. To extend the availability and utilisation of this questionnaire, its translation and validation in other languages is necessary. The purpose of this study was therefore to translate the SarQoL® questionnaire into English. Methods: The translation was performed according to translation guidelines2. Five different phases were followed : 1. The initial translation from French to English by two independent bilingual translators which were English native speakers ; 2. The synthesis of the first two translations to provide a single "version 1" of the translated questionnaire ; 3. The backward translation by two independent bilingual blinded to the original French version and having French as their first language ; 4. An Expert Committee review to compare the backward translations with the original questionnaire and consent on a "version 2" of the translated questionnaire ; 5. The pre-test of the "version 2" of the SarQoL® to ensure good comprehension of each question of the questionnaire and conclude with the "version 3", final version of the English SarQoL®. Results: The 22 questions of the SarQoL® questionnaire were translated without any major difficulties. Some complications have however been encountered regarding the choice of responses displayed for the 4-likert scale. Cross-cultural adaptation have been made on one question and one example used in this question has consequently been deleted. A pre-test was performed on 10 different subjects. Minor changes have consequently been made to the questionnaire "version 2". These changes, which did not modify the meaning of the sentences, were mainly related to choice of words used for the 4-Likert scale choices. The rigorous translation and adaptation processes provide equivalence between the French and the English version of the SarQoL®. Conclusion: The English version of the SarQoL® questionnaire is now available and has been showed to be comprehensible. Investigations are now required to verify the psychometric properties (validity, reliability and responsiveness) of the English version of the SarQoL® questionnaire. 1 . C. Beaudart, E. Biver, JY Reginster, R. Rizzoli, Y. Rolland, I. Bautmans, J. Petermans, S. Gillain, , F. Buckinx, J. Van Beveren, JM. Jacquemain, P. Italiano, N. Dardenne, O. Bruyère. Development of a self-administrated quality of life questionnaire for sarcopenia in elderly 65 years and older: the SarQoL. Age Ageing. 2015 Oct 3. pii: afv133. [Epub ahead of print]; 2. Beaton DE., Bombardier C., Guillemin F., Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine. 2000, Volume 25, Number 24, 3186–3191

P17- HIGH PREVALENCE OF SARCOPENIA IN WOMEN WITH OSTEOPOROTIC FRACTURES. C. Fernández, B. Oliveri, A. Bagur, D. Gómez Glorioso, D. González, C. Mautalen *(Buenos Aires, Argentina)*

Background: Studies in patients after a hip or vertebral fracture showed them to have significantly lower muscle mass compared to that of control subjects. Furthermore, prospective studies have established that sarcopenia is a significant risk factor for predicting future bone fractures. On the present study the prevalence of sarcopenia on women with DXA established osteopenia/osteoporosis or in patients with fragility fractures was assessed. Methods: Patients: 91 ambulatory women with osteopenia or fragility fractures have been examined for the diagnosis of sarcopenia. Body composition was determinated by DXA (GE. Lunar Prodigy).The studied variables included weight, height, body mass index (BMI), bone mineral density (BMD) of the total skeleton, total fat mass, total lean mass and appendicular fat and lean mass (ALM). In addition, the index: appendicular lean mass (arms+legs)/height^2 was determinated. Muscle Function and streght assessment. Grip strength was measured using a dynamometer (Camry). Self-selected gait speed was measured during a 5 meter walk. Results: Average results were: age 71.3 ± 8.3 years, weight 57.3 ± 9.0kg, height 156 ± 6cm, BMI: 23.4±3.4 kg/h^2.Total fat mass: 22.0 ±7.1 kg, total lean mass 33.4±3.7kg, appendicular lean mass 14.4 ±2.1 kg , appendicular fat mass 11.0 ±3.3 kg and appendicular lean mass/h^2: 5.89 ± 0.68 kg/h^2. Walking speed 0.95 ±0.22m/s and handgrip: 18.6±5.1kg. The following significant correlations were observed: Appendicular lean mass/h^2 with: BMI+ 0.41 ($p<0.001$), total lean mass +0.56 ($p<0.001$) and total fat + 0.23($p<0.05$).Hand grip was correlated with: Total lean mass +0.32 ($p<0.01$), appendicular lean mass +0.30 ($p<0.001$),appendicular lean/h^2 +0.22 ($p<0.01$), gait speed +0.39 ($p<0.001$), and negatively with age -0.30 ($p<0.01$). The prevalence of Pre-sarcopenia and sarcopenia was assessed using 3 different criteria (table 1). While prevalences of sarcopenia with the IWG or the EWG are similar, the FNIH criteria identifies a significantly reduced number of patients. Significant differences on body composition and muscle test between patients with or without sarcopenia (IWG criteria) were as follows: (Table 2). Osteoporotic fractures: 29 patients had osteoporotic fragility fractures (12 non-vertebral, 12 vertebral and five both). Average Age: 71.4±7.8 y.o. The prevalence of presarcopenia and sarcopenia is showed on table 3 (IWG criteria). Conclusion: The prevalence of sarcopenia in non-selected older women (age >65 y.o) varies according with different studies. A recent review (1) points out a prevalence of 11.8% (IWG criteria) or 13.3% (EWG criteria). In the present study of sarcopenia in a selected population of osteopenic/osteoporotic patients the prevalence was almost twice as great (22.0 to 25.2%). However most of the difference was due to the very high prevalence observed on patients with osteoporotic fragility fractures ~ 41%. The results suggest that osteoporotic fractures could be added to the list of diseases whose patients should undergo studies for sarcopenia detection#. (1) Dam. T.T , et al. J Gerontol A Biol Sci Med Sci 69:584,2014.

Table 1

	Presarcopenia (1) %	Sarcopenia %
International Working Group	37.4 (34)	25.2 (23)
European Working Group	29.6 (27)	22.0 (2) (20)
Foundation FIH	8.8 (8)	3.3 (3)

(1)ALM/h^2 below <5.67kg/m^2 (IWG); <5.45 kg/m^2 (EWG) and ALM/BMI < 0.512 (FNIH); (2) Sarcopenia: (n)=15; Severe Sarcopenia (n)=5. Number of patients within parentheses

Table 2

	Sarcopenia (n=23)	Non-Sarcopenia (n=68)	
Total lean Mass (kg)	31.57±4.17	34.02±3.39	P<0.01
Appendicular Lean Mass (kg)	13.01±2.06	14.86±1.88	P<0.001
Appendicular lean mass/ h^2 (kg/m^2)	5.17±0.36	6.14±0.59	P<0.0001
Gait speed (m/s)	0.82±0.17	0.99±0.22	P<0.05
Hand Grip (kg)	17.33±4.21	19.07±5.34	0.05>p<0.1

Table 3

	Normal ALM/h^2 >5.67 kg/m^2	Pre Sarcopenia ALM/h^2 <5.67 kg/m^2	Sarcopenia ALM/h^2 <5.67 kg/m^2 and Gait speed <1.0 m/s
All patients (91)	62.6% (57)	37.4% (34)	25.2% (23)
No Fractures (62)	67.7% (42)	32.2% (20)	17.7% (11)
Osteoporotic fractures (29)	51.7% (15)	48.2% (14)	41.4% (12)

Number of subjects within parentheses

P18- MUSCLE STRETCHING EXERCISE REDUCES FIBROSIS IN THE SOLEUS MUSCLE OF AGED FEMALE RATS. H.R. Fiuza Martins[1], T. Gnoatto Zotz[1], S. Peviani Messa[2], R. Zotz[1], L. Noronha[1], M.L. Viola de Azevedo[1], A.R. Silveira Gomes[1] *(1. Paraná, Brazil; 2. São Paulo, Brazil)*

Background: Aged-related sarcopenia is considered the major cause of frailty and disability in older people. It´s characterized by the loss of muscle mass, strength and increased intramuscular fibrosis which may be related to elevate connective tissue content. Changes in collagen synthesis occurs with age, in which there is a considerable increase in the deposition of type I collagen in the skeletal muscle tissue in relation to type III collagen, suggesting a more marked contribution by type I collagen to the aging fibrosis. Stretching exercises often constitute physical activity programs for the elderly, and have been shown to increase range of motion, improve balance, gait pattern, functional capacity and also decrease the risk of injury and falls in community and institutionalized elderly. Stretching exercises performed in young rats prevented connective tissue proliferation and increase the cross-sectional area. Besides, it was observed that daily short bouts of stretching after immobilization in young male rats, promoted molecular reorganization of the collagen bundles and muscle hypertrophy. Considering that stretching exercise can reduce connective tissue infiltration, this study aimed to evaluate the effect of acute passive stretch in soleus muscle morphology of aged rats. Methods: Fifteen 26-month old female rats were divided into two groups: Stretching (SG; n = 8; 354±53g) and control (CG; n=7; 341±43g). The stretching protocol consisted by one set of 4 repetitions of 1 minute with 30 seconds interval between each repetition, 3 times a week, for 1 week. Mechanical passive stretching protocol was performed on the left soleus muscle through a device built specially to monitor the force applied to stretch soleus muscle. Twenty four hours after last stretching session, the rats were anesthetized and the left soleus muscle was removed. Immunohistochemistry and gene expression by PCR Real Time for quantification of TGFβ-1, type I Collagen and type III Collagen were performed. The comparisons between groups were analyzed for non-parametric data by Kruskal-Wallis and when parametric by ANOVA One way ($p<0.05$). Results: The stretching group compared to CG showed less type I Collagen (1.41±1.21 vs 1.67±1.91, p = 0.01) and TGFβ-1(1.60±1.69% vs 1.90 ± 2.85%, p=0.04) percentage of immunostain per soleus muscle fiber area. The type III Collagen percentage of immunostain per soleus muscle fiber area was greater in the SG than CG (7.06±6.88 vs 4.92±5.30, p = 0.01). The TGFβ-1 gene expression decreased (0.83±0.89 vs 4.47±5.65 AU, p=0.0001, ANOVA one way) in the SG. No significant difference in collagen I and collagen III gene expressions were observed between groups. Conclusions: Acute stretching in the soleus muscle of aged female rats presented an anti-fibrotic effect, demonstrated by a decrease in type I collagen content and an increase in type III collagen, possibly via the TGFβ-1 pathway.

P19- PREVALENCE OF SARCOPENIA IN FEMALE OLDER PERSONS OF A PUBLIC HOSPITAL FROM SOUTH BRAZIL. A.M. Vianna Benke Pereira, J.M. Filho, S. Biesek, G. Carrascosa Molina, L. Bendhack, R.F. Michalouski, A.R. Silveira Gomes *(Paraná, Brazil)*

Background: Sarcopenia is defined as the reduction of skeletal muscle mass, strength and performance and it is recognized as an important aging clinic outcome. Also, sarcopenia can be associated with disability, morbidity, frailty and mortality. The aim of the present study was to investigate the prevalence of sarcopenia in female older outpatients at a public hospital from South Brazil. Method: Retrospective cross-sectional study approved by Ethic Committee from Federal University of Parana. It was examined 137 patient medical records of female older people from a public outpatient Health Aging ambulatory in Curitiba, Brazil. It was considered the criteria proposed by EGWSOP (European Working Group on Sarcopenia in Older People) to sarcopenia diagnosis: calf circumference (<31cm); handgrip strength with dynamometer (<20Kg) and gait speed in 4 m (<0.8m/s). The data were analyzed as frequency distribution (absolute and relative) and as mean±standard deviation, achieved in Excel®. Results: It was excluded 51 records whose were missing any data necessary to sarcopenia diagnosis. The mean age described in the 86 patient medical records was 75 ± 8 years old. The mean calf circumference was 35.6±4.2cm; handgrip strength (21.2±9.1Kg) and gait speed (0.75±0.26m/s). The sarcopenia prevalence was 10.5% (n=9). The analysis of EWGSOP conceptual stages of sarcopenia showed 2.3% (n=2) presarcopenia; 4.7% (n=4) sarcopenia and 5.8% (n= 5) severe sarcopenia. Conclusion: The prevalence of sarcopenia in elderly women was similar to studies that used calf circumference to assess muscle mass. The severe sarcopenia was more pronounced than sarcopenia. It is suggested future studies using best methods to evaluate skeletal muscle mass, as DXA, to obtain sarcopenia diagnosis. Also, longitudinal studies should be performed to investigate the incidence of sarcopenia. Clinical trials must be performed specially to treat severe sarcopenia.

P20- ASSOCIATION OF SPONTANEOUS 3-YEAR CHANGES IN PHYSICAL FUNCTION WITH SUBSEQUENT 15-YEAR MORTALITY IN COMMUNITY-DWELLING OLDER MEN. S. De Buyser, M. Petrovic, Y. Taes, K. Toye, J.-M. Kaufman, S. Goemaere, B. Lapauw *(Ghent, Belgium)*

Backgrounds: Physical function is a predictor for mortality in older persons. So far, few studies have examined the association between changes in physical function and subsequent mortality. At present, evidence is lacking that improvement of physical function would lead to relevant improvements in clinical outcomes. This study aimed to examine whether spontaneous 3-year changes in physical function in community-dwelling older men might predict subsequent 15-year all-cause mortality, independently from age and baseline physical function. Methods: This population-based cohort study included 171

ambulatory men aged 71 years and more at baseline, living in the semi-rural community of Merelbeke (Belgium). Spontaneous 3-year changes in physical function (Short Form-36 Physical Function, Grip Strength, Chair Rising, Timed Up and Go)- not caused by any predefined intervention- were calculated using data obtained at four annual visits. The association with subsequent 15-year mortality was assessed using Cox proportional hazards models with time-dependent covariates of change in physical function. Results: After 15 years of follow-up, 149 men (87%) died. Median survival time was 8.2 (4.2 – 12.4) years. Spontaneous improvements in physical function during three years follow-up were associated with significantly lower hazards of subsequent all-cause 15-year mortality, independently from age and baseline physical function. However, the association of spontaneous improvement in Short Form-36 Physical Function, Grip Strength, and Chair Rising was significantly attenuated after 7-year time. Conclusion: Spontaneous changes in physical function in community-dwelling older men can provide prognostic information for subsequent long-term mortality hazard, independently from age and baseline physical function. However, the association of spontaneous improvement in physical function with lower subsequent mortality hazard attenuates with time.

P21- MUSCLE THICKNESS AND INDICATORS OF SARCOPENIA IN COMMUNITY OLDER WOMEN. L.H. Gallo, E. Valevein Rodrigues, J. Melo Filho, C. Tissiane de Souza Silva, A.R. Silveira Gomes *(Paraná, Brazil)*

Background: Advancing age is a significant risk factor for the development of physical disability, which can be among other aspects related to muscle mass and strength loss, called sarcopenia. A wide range of techniques can be used to assess muscle mass. Calf circumference correlates positively with muscle mass. However, age-related changes in fat deposits contribute to errors of estimation in older people. There are relatively few studies investigating the correlation among anthropometrics data and body imaging techniques. Thus, the purpose of this study was to analyze the muscle thickness with ultrasonography and indicators of sarcopenia in community older women. Method: A cross-sectional design study was performed with community-dwelling older women from Parana, Brazil. The study was approved by the Research Ethics Committee of Federal University of Paraná (UFPR, number 36003814.2.0000.0102). The sample consisted by 20 elderly women (69.7 ± 4.1 years, 63.5 ± 10.2 kg, 1.5 ± 0.1 m, 27.5 ± 3.6 kg/m2). To evaluate the indicators of sarcopenia the following tests were adopted: a) the 10 m Gait Speed test (GS), which consisted of walking 6m in usual speed. The first and last 2 m were not considered due to acceleration and deceleration, respectively. It was considered low physical performance when results were below 0.8 m/s; b) the Handgrip Strength (HS) test was measured in the dominant hand with hydraulic dynamometer, considering as low muscle strength values according to body mass index (BMI), ≤ 23 ≤ 17 kg, BMI 23.1–26 ≤ 17.3 kg, BMI 26.1–29 ≤ 18 kg, BMI > 29 ≤ 21 kg; c) the Calf Circumference (CC), tape was applied around the greater prominence of the calf muscle with the individual seated and with the right leg relaxed, and was considered muscle mass depletion results lower than 31 cm. Muscle thickness of the medial gastrocnemius (MG) was measured at 20%, 30% and 40% proximal between the lateral malleolus of the fibula and the lateral condyle of the tibia, using a B-mode ultrasonography (US) imaging device (Logiq Book XP, General Eletric®) with a linear-array probe (50mm, 11 MHz, General Eletric®). The mean value between the three parts (20, 30 and 40%) was considered for statistical analysis. Muscle thickness was defined as the mean distance between deep and superficial aponeuroses, measured at five places along the ultrasound image. All US imaging analyses were performed using ImageJ software (Version 1.46r, National Institutes of Health, Bethesda, MD, USA). For statistical analysis, the Pearson correlation test was adopted to verify the association between variables ($p< 0.05$). Results: It was found a strong correlation between: muscle thickness and CC (r= 0.69, p=0.01); muscle thickness and HS (r=0.54, p=0.015); BMI and muscle thickness (0.63, p=0.03); BMI and CC (r=0.75, p=0.0001). In addition, the data of each criterion for the diagnosis of sarcopenia were: HS (21.9 ± 4.1 kg); CC (36.5 ± 2.5cm) and GS (1.4 ± 0.2 m/s). Conclusion: the muscle mass assessed by ultrasonography showed association with calf circumference and also with physical performance in non-sarcopenic community-dwelling older women.

P22- INTAKE OF PROTEIN AND LEUCINE PER MEAL IN MALNOURISHED NURSING HOME RESIDENTS. S. Wijers[1], H. Heyman[1], S. Verlaan[1,2], D. Van De Looverbosch[3] *(1. Aartselaar, Belgium; 2. Amsterdam, The Netherlands; 3. Antwerp, Belgium)*

Background: In order for older people to maintain their muscle mass, it is indispensable that their muscle protein synthesis is activated after a meal, i.e. reaching the so called anabolic threshold. Recent recommendations advice taking 25 to 30 grams of high quality protein, containing 2.5 to 2.8 grams of leucine, per meal in order to overcome the anabolic threshold [1, 2]. Methods: For this secondary analysis, baseline values of a randomized, controlled, single blind, study (NTR2565) on the renal safety of high protein oral nutritional supplementation, performed in nursing homes in Belgium and the Netherlands were used. Sixty-seven nursing home residents older than 65 years in the need of oral nutritional supplements were included in this study. Before start of oral nutritional supplementation, three-day food records were completed by the patients. These data were used for the present analysis. Leucine intake was estimated from the intake of animal protein (conservative estimation: 10% leucine content) and vegetable protein (conservative estimation: 8% leucine content). Results: Mean protein intake was 13.1±0.7 g for breakfast, 21.3±1.0 g for lunch and 13.4±0.7 g for dinner. One patient (1%) achieved the intake of 25 g of protein at breakfast, 28 patients (41%) at lunch, and one patient (1%) at dinner. Mean leucine intake was 1.2±0.1 g for breakfast, 2.0±0.1 g for lunch and 1.19±0.1 g for dinner. None of the patients achieved the intake of 2.5 g of leucine at breakfast, 24 patients (35%) at lunch, and 1 patient (1%) at dinner. Conclusion: Malnourished nursing home residents have a low intake of protein and leucine per meal. Only a small proportion of malnourished patients consumes sufficient protein and leucine to overcome the anabolic threshold, even once per day. This is likely to have implications on the activation of muscle protein synthesis after the meals, which might result in a decline in muscle mass. References: 1. Bauer, J., et al., Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. J Am Med Dir Assoc, 2013. 14(8): p. 542-59. 2. Paddon-Jones, D. and B.B. Rasmussen, Dietary protein recommendations and the prevention of sarcopenia. Curr Opin Clin Nutr Metab Care, 2009. 12(1): p. 86-90

P23- EFFECT OF NUTRITIONAL STATUS, MACRONUTRIENT INTAKE AND LIFE STYLE TO MUSCLE GRIP STRENGTH REDUCTION IN ELDERLY. Y.S. Handajani, Y. Turana *(Jakarta, Indonesia)*

Backgrounds One of the capacities physicals practices with the practice regular of physical exercise is the muscular strength, the grip strength reduction in older people often related with reduced physical performance, functional decline and psychological factors. The objective of study to identify factors associated with muscle grip

strength reduction among elderly in Indonesia, such as life style, nutritional status, macronutrient intake, ADL & IADL disability and balance. Methods : A cross-sectional study used in the study towards 67 male and 71 female of elderly, from nursing homes. Grip strength was measured using a handgrip dynamometer. A semi- quantitative food frequency questionnaire was used to evaluate macronutrient intake. Measurement tape was used to measure height and a digital scale was used to measure body weight. Berg balance scale was used to measure balance. Results: The mean BMI was normal and most of the respondents had a moderate level of physical activity. Most subjects had a lower score of grip strength mean , with an average strength of 18.542 kg. One third of the respondents had a moderate level of physical activity. The mean BMI was (23.12±5.51 kg/m2), majority of the subjects were dependent according to Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) scores. and the average of balance score was 36.12±12.27. The risk of grip strength reduction of woman 2.9 time compared with man. Respondents with less intake of protein, carbohydrate, fat, energy and BMI were more inclined to experience muscle grip strength reduction 2.4- 2.7 times. Beside those, smoker will experience muscle grip strength reduction, 1.8 times compared non smoker. Conclusion. Macronutrient intake, nutritional status and life style lowered the muscular strength of elderly especially grip muscle strength, therefore consumption of adequate protein, carbohydrate, energy fat and protein and health education for smoker were needed to maintain muscle strength and preventing disability and balance.

P24- CONCORDANCE BETWEEN TOOLS FOR THE DETECTION OF COMMUNITY DWELLING FRAIL ADULTS. I. Vergara[1,3], M. Machón[1,3], K. Vrotsou[1,3], N. Egües[1], A. Bueno[2], J. Nuñez[2], A. Díez[1,2], M. Mateo-Abad[1,3] *(1. San Sebastian-Donostia, Spain; 2. Renteria, Spain; 3. Bilbao, Spain)*

Background: Frailty is one of the most relevant clinical expressions of ageing and a powerful indicator of the health status of older populations. Tools to identify frailty can be classified into three groups: those based on rules, like the Tilburg Frailty Indicator (TFI) and those based on functional performance, such as Gait Speed (GS) and Timed Up and Go (TUG) tests. More advanced research is needed to assess the ability of existing tools to identify frail individuals in primary care settings. With this overall aim, this study explores the concordance between two functional performance tests (GS and TUG), and TFI scores. Method: this is a prospective open cohort study with three years of follow-up (the KoS-frail study). All surviving individuals from the original cohort were invited to participate in the third year assessment. Those willing to participate received a comprehensive assessment including a frailty scale (TFI), two functional status tests (Barthel and Lawton), two function performance (GS, TUG) tests and blood tests, among others. The study has been approved by the Gipuzkoa Health Region Ethics Committee. Written informed consent was obtained from all participants. Results: a total of 89 patients were assessed. Recruited patients have a mean age of 83 years (SD 82.2-83.8) and 62% of them were women. Regarding frailty status, according to TFI, 29.4% of the studied population were classified as frail. The mean gait speed value was 0.96 (0.90,1.02) and the mean TUG test valie was 13.29 (11.94, 14.63) The Pearson's correlation coefficient of TFI and TUG test was 0.70 and -0.63 with gait speed, respectively. Conclusions: Frailty is a highly prevalent condition among community dwelling older adults. Understanding the frailty process is essential to prevent decline towards disability. TFI indicator and functional performance test correlated adequately and could be considered as effective tools for the identification of frail individuals in primary care settings.

P25- PREVALENCE OF SARCOPENIA IN DIABETIC ELDERLY IN EGYPT. E. Esmayel, M. Eldarawy, A. Shoukri *(Zagazig, Egypt)*

Introduction: There is little agreement about the prevalence of sarcopenia in diabetics, as well as the association between diabetes control and sarcopenia in various studies. Subjects and methods: this cross sectional study included 130 elderly diabetics as well as 130 non diabetic elderly. The diabetic group was subdivided according to HbA1C into 65 controlled diabetics (HbA1C≤7.5%) and 65 uncontrolled diabetics (HbA1C>7.5%).Muscle mass was assessed by bioelectrical impedance analysis, muscle strength was assessed by hand grip strength (HGS) and physical performance was assessed by 4 meters walking speed test & the European Working Group on Sarcopenia in Older People (EWGSOP) definition was used to diagnose sarcopenia. Results: Prevalence of sarcopenia was significantly higher in diabetics compared to non -diabetics (37.7%vs.15.4%, p<0.001), with similarly highly significant prevalence in uncontrolled, compared to controlled diabetics(49.4% vs. 26.2, p= 0.007). . Both muscle mass, HGS strength and walking speed were significantly lower in diabetics compared to non -diabetics, and in uncontrolled compared to controlled diabetics ($p < 0.001$) Sarcopenia in our study was positively correlated with age, fasting blood sugar and HbA1c. No significant difference was noticed between men and women as regards prevalence of sarcopenia and walking speed, while both muscle mass and strength were significantly lower in women compared to men($p<0.001$). Conclusions: Sarcopenia is a common clinical problem in elderly population, being more common in diabetics especially poorly controlled. Physicians should consider screening for sarcopenia, especially in geriatric settings for better care of the elderly.

P26- HOUSING CONDITIONS, FRAILTY AND LIMITATIONS IN PHYSICAL FUNCTION AMONG OLDER ADULTS. F. Rodríguez-Artalejo, E. García-Esquinas, B. Pérez-Hernández, P. Guallar-Castillón, J.R. Banegas, J.L. Ayuso-Mateos *(Madrid, Spain)*

Background: Housing conditions are an important social determinant of health. However, to our knowledge, no previous study has systematically assessed the association between housing conditions, frailty and physical function limitations in older adults; moreover, whether this association is independent of socioeconomic status achieved earlier in life is still uncertain. Methods: Cross-sectional analysis conducted among 2012 non-institutionalized individuals aged ≥60 years, who participated in the Seniors-ENRICA cohort. Participants reported the following poor housing conditions: living in a walk-up building, lacking heating, or feeling cold frequently. We assessed lower extremity performance with the Short Physical Performance Battery [SPPB], mobility or agility limitations with standardized questions, frailty according with the Fried criteria, and disability in instrumental activities of daily living [IADL] with the Lawton & Brody questionnaire. Results: In analyses adjusting for demographic, behavioral, and comorbidity variables, when compared to those living in homes without poor housing conditions, those with ≥2 poor conditions showed worse scores in the SPPB (beta: -1.06; 95% confidence interval [CI]: -1.46;-0.65) and higher frequency of agility limitation (odds ratio [OR]: 1.62; 95%CI: 1.00; 2.61) and frailty (OR: 8.78; 95%CI: 3.00; 25.60). These associations held after adjustment for educational and occupational level. Living in a walk-up building was associated with higher frequency of frailty, while lacking heating was linked to lower scores in the three SPPB tests, as well as with increased frequency of frailty and four of its components (exhaustion, slow walking speed, low physical activity

and weakness). Feeling cold was linked to increased exhaustion. No association was found between housing conditions and IADL disability. Conclusions: Poor housing conditions, particularly living in a walk-up building and lacking heating, are independently associated with frailty and limitations in physical function in older adults. This entails serious inequalities in functional status, which should be firmly addressed. This work was supported by FIS grant no. 12/1166 (Instituto de Salud Carlos III, State Secretary of R+D+I and FEDER/FSE), the FRAILOMIC Initiative (European Union FP7-HEALTH-2012-Proposal no. 305483-2) and the ATHLOS project (European project H2020- Project ID: 635316). The funding agencies had no role in study design, data analysis, interpretation of results, manuscript preparation or in the decision to submit this manuscript for publication.

P27- PATTERNS OF ALCOHOL CONSUMPTION AND THE PHYSICAL AND MENTAL COMPONENTS OF QUALITY OF LIFE IN OLDER ADULTS. F. Rodríguez-Artalejo, R. Ortolá, E. García-Esquinas, I. Galán *(Madrid, Spain)*

Background: Health-related quality of life (HRQOL) is a more powerful predictor of health services use and mortality than many objective measures of health. However, in older adults the association between the main patterns of alcohol consumption and the physical and mental components of HRQOL is uncertain. Methods: Prospective cohort with 2163 community-dwelling individuals aged ≥60 years, recruited in Spain in 2008-2010 and followed-up through 2012. At baseline, participants reported alcohol consumption. HRQOL was measured with the SF-12 questionnaire, at baseline and in 2012. Results: In cross-sectional analyses at baseline, and compared to non-drinkers, better scores on the physical component summary (PCS) of the SF-12 were reported in moderate (β = 1.59 [95% confidence interval 0.61 to 2.58]) and heavy drinkers (β = 2.18 [0.57 to 3.79]). Better scores on the PCS were also reported by drinkers who adhered to the Mediterranean drinking pattern (MDP) (β = 1.43 [0.30 to 2.56]) as well as those who did not (β = 1.89 [0.79 to 2.99]). However, no association was observed between average alcohol consumption or the MDP and the mental component summary (MCS) of the SF-12; or between beverage preference or drinking with meals and either the PCS or MCS scores. In prospective analyses, the only association observed was for women who drank exclusively with meals, who showed better scores on the PCS than women who drank only outside of meals (β = 3.64 [0.79 to 6.50]). Conclusions: The small association between alcohol consumption and better physical HRQOL found at baseline was not apparent after a few years of follow-up.This work was mainly supported by grant no. 02/2014 from the Plan Nacional sobre Drogas (Ministry of Health of Spain). Additional funding was obtained from FIS grant no. 12/1166 (Instituto de Salud Carlos III, State Secretary of R+D+I), the FRAILOMIC Initiative (FP7-HEALTH-2012-Proposal no. 305483-2) and the ATHLOS project (EU H2020- Project ID: 635316). The funding agencies had no role in study design, data analysis, interpretation of results, manuscript preparation or in the decision to submit this manuscript for publication.

P28- ASSOCIATIONS OF IADL WITH GRIP STRENGTH AND RELATED INDICES OF AGILITY, DEPENDING ON SEX AND AGE. - INVESTIGATION BY A NEWLY-DEVELOPED GRIP STRENGTH MEASURING DEVICE. Y. Matsui[1], R. Fujita[1], A. Harada[1], T. Sakurai[1], T. Nemoto[1], N. Nod[2], K. Toba[1] *(1. Obu, Japan; 2. Tokyo, Japan)*

Background: We are currently developing a new type of grip dynamometer that includes a time axis for measuring physical function in older adults, and have proposed indices related to agility measured by this device. There have been some studies reporting the associations between maximum grip strength and IADL (Instrumental activity of daily living), but they did not deal with specific abilities (such as using telephone etc) and did not consider gender difference or age. The aim of this study is to investigate the associations between these indices and IADL, depending on sex and age. Methods: The subjects were 707 outpatients (284 men, 423 women, mean age 75.4 years) of the memory disorders clinic at the National Center for Geriatrics and Gerontology, Japan. The indices related to agility are 1) maximum grip strength, 2) response time, 3) time to reach maximum strength, 4) time to reach turning point, 5) strength at turning point, 6) inclination from start to turning point, 7) time from turning point to reach maximum strength, 8) inclination from turning point to maximum strength, 9) ratio of strength (turning point/maximum strength), and 10) time from start of response to reach turning point. We investigated the associations between the above 10 indices and the IADL scale [Lawton & Brody], total score and each individual score for sub items (5 items regarding men's ability to use the telephone, do shopping, mode of transportation, responsibility for own medications, and handle finances; while women's ability to handle the above 8 items plus food preparation, housekeeping, and laundry) with the non-dominant hand. It was found to be more related than the dominant hand in our pre-study, among men and women below 70, and in their 70s and 80s, using Pearson's partial correlation coefficient adjusted for MMSE. Results: Among men below 70, significant correlations were seen in 1) and 5) with total score, 1) and 5) with ability to use telephone, 4) with transportation, and 1), 5) and 6) with ability to handle finances. In their 70s, significant correlations were seen among 1), 2), 4), 5) and 6) with total score, 1), 2), 4) and 6) with ability to use telephone, 1) and 5) with shopping, 1), 2), 5) and 6) with transportation and 1),2) and 5) with ability to handle finances; and in their 80s, significant correlations were found among 4), 6), and 8) with total score, 2), 4) and 10) with ability to use the telephone, 1) with shopping, 4), 6), 8) and 10) with transportation, 8) with responsibility for their own medications, 4), 6) and 10) with ability to handle finances.On the other hand, among women below 70, significant correlations were rarely seen, in none with total score, and merely 3) and 7) with housekeeping and laundry, whereas in their 70s, significant correlations were seen in 3), 6) and 8) with total score, 1), 3), 5), 6) and 8), with shopping, 9) with transportation, 3) and 6) with responsibility for own medications,7) with ability to handle finances, 1), 5) and 7) with food preparation, 1) and 5) with laundry. And in their 80s, significant correlations were seen in 1), 2), 5), 6) and 8) with total score, 1) and 5) with ability to use telephone, 1), 2), 5) and 6) with transportation, not to mention 1), 5) and 8) with food preparation, 1), 3), 4) and 8) with housekeeping, and 1), 5) and 10) with laundry. These may be summarized as follows. Among men, telephone, transportation and ability to handle finances were related with more indices in their 70s and 80s. In the meantime among women, shopping was related with most indices in their 70s but no index was related in their 80s, while housekeeping was related with most indices in their 80s and no index was related in their 70s.Conclusion: Associations between grip strength together with specific indices related to agility and IADL were investigated. Few associations were seen in subjeats under 70. However, in their 70s and 80s, many new indices other than maximum strength showed a significant correlation with some sub IADL items, although associations diverged depending on sex and age. The results of this study suggested the significance of utilizing new indices related to agility by our newly developed grip strength measuring device, while considering the time axis.

P29- OCTOGENARIANS AND NONAGENARIANS EXHIBIT IMPAIRMENTS IN LEG EXTENSOR VOLUNTARY ACTIVATION, BUT NOT ELBOW FLEXOR VOLUNTARY ACTIVATION. L.A. Clark[1], S. Amano[1], R. Clift[1], D.W. Russ[1], T.M. Manini[2], T.D. Law[1], B.C. Clark[1] *(1. Athens, USA; 2. Gainesville, USA)*

Background: Aging is associated with reduction in muscle size, muscle strength, and motor performance, all of which contribute to decreased physical function. An age- related decline in the nervous system's ability to fully activate skeletal muscle voluntarily (i.e., voluntary, or neural, activation) is commonly cited as a contributor to loss of strength. Numerous discrepancies regarding whether, and to what extent, older adults exhibit impairments in voluntary activation are present in the existing literature. It has been suggested that intermuscle differences in voluntary activation may account for these inconsistent findings. Accordingly, the purpose of this study was to compare the voluntary activation capacity of the elbow flexor and leg extensor muscle groups in octogenarians and nonagenarians. Methods: Six elderly subjects (5 women and 1 man, 88.7±2.7 years) participated in this study. Voluntary activation was quantified using supramaximal, percutaneous superimposed electrical stimulation (100-Hz doublet pulse) applied to the respective muscle groups while subjects performed maximal voluntary isometric contractions. The evoked force during the contraction was expressed relative to that evoked at rest following the contraction and the percent of voluntary activation was calculated. Paired t-tests were used to compare differences in voluntary activation between muscle groups. Results: The leg extensors exhibited significantly greater voluntary activation impairments when compared to the elbow flexors (p=0.005). More specifically, the voluntary activation of the leg extensors was consistently impaired in all subjects tested (range: 71.7 – 93.5%) with the mean level of voluntary activation being 87.3±8.04. Conversely, the voluntary activation of the elbow flexors was consistently near optimal (98.9±2.4; range: 94.1-100%). Conclusions: Our preliminary data suggest that octogenarians and nonagenarians exhibit impairments in voluntary activation of the leg extensors, but not the elbow flexors. Acknowledgements: This work was funded by a grant from the National Institute on Aging/National Institutes of Health (R01AG044424 to BC Clark).

P30- PROMOTION OF ADVANCE CARE PLANNING FOR ELDER PEOPLE NEARING PRE-FRAILTY AND FRAILTY: PROPOSAL FROM PREVENTING, AVOIDING, POSTPONING OR REDUCING FRAILTY PROGRAM IN NATIONAL CENTER FOR GERIATRICS AND GERONTOLOGY, JAPAN. K. Senda, S. Satake, S. Takanashi, S. Sakakibara, K. Kinoshita, Y. Iida, N. Asano, I. Kondo, M. Nishikawa, H. Miura, H. Endo *(Obu, Japan)*

Backgrounds : In unprecedented and the most aged society, Japan, the Ministry of Health, Labour and Welfare (MHLW) is constructing "Integrated Community Care System (ICCS) for the Elderly" to continue living in their own hometown through to the end with a sense of security from 2012. Frailty prevention is one of five key components of ICCS. Despite of MHLW's advocacy, establishment of effective and efficient frailty prevention program is still halfway in local communities. The gap, between huge unmet needs of elder Japanese for health and long-term care and conventional clinical practice in hospitals and clinics, still remains, and home care medicine (HCM) with geriatric inter-disciplinary team care (GITC) in ICCS is one of promising remedies. Especially, provision of high-quality end-of-life care (EOLC) in HCM with GITC is essential. EOLC standing at the view of the patient, is based on continuous discussion of advance care planning (ACP) between patients and GIT throughout from nearing pre-frailty status to EOL, which is consistent with the principles of Patients-Centered Care and respecting patients' preference. ACP discussion is supported by Shared Decision-Making (SDM) policy. However, SDM policy has not permeated through Japanese health and long-term care communities and ACP is hardly available at usual health and long-term care settings. Methods: Organizing-committee for Preventing, Avoiding, Postponing or Reducing Frailty Program (PAPRFP) in National Center for Geriatrics and Gerontology (NCGG), was formed with inter-disciplinary team, including geriatricians, nurses, dietitians, physical therapists in February, 2014 and edited textbook for promotion of frailty prevention. Textbook contains introduction of frailty, healthy diet, promotion of adequate exercise and tips for elder people's daily life. The feasibility of PAPRFP was studied with pilot group, who are able to walk, recruited from out-patient clinic in NCGG. Pilot seminars were held for 4 times in 2014 and followed by advanced course in 2015. In advanced course, introduction of ACP discussion for elder people nearing pre-frailty and frailty was proposed. PAPRFP committee sent NCGG delegations to 5th International Conference on Advance Care Planning and End-of-Life Care (ACPEL), Munich, Germany, and Gold Standards Framework (GSF) Annual Meeting, London, UK, in September, 2015 and discussed about ACP standing at the view of the patient, supported by SDM policy. Advanced courses of PAPRFP in 2015 consists of 4 sessions and going to be followed by expanded seminars in 2016 with revised textbook containing ACP promotion for elder people nearing pre-frailty and frailty, which will be spread nationwide with Train-the-Trainer Strategy. Results: Pilot group in feasibility study of PAPRFP is consisted of 21 female and 14 male; age: 78.2 +/- 6.7 (65-91) years; frailty (classified by Japanese Kihon Checklist for assessing frailty status): 10, pre-frailty: 16 and robust: 9. During 4 sessions of PAPRFP in 2014, 32 participants completed PAPRFP with more than 3 times attendance and 24 presented all sessions. Participants were satisfied with PAPRFP contents and expressed their interests in further education for frailty prevention in advanced course. Enhancement of physical activity, increase in walking speed (1.14 +/- 0.24 to 1.27 +/- 0.17 m/sec) and decrease of appendicular skeletal muscle mass index (6.39 +/- 1.19 to 6.17 +/- 1.199 kg/m2) were observed. During PAPRFP in 2014, committee recognized needs for promotion of ACP conversation between patients, family and GIT, because ageing is inevitable, immortality is never achieved, and so preventing frailty has its own limitation. As health and long-term care professionals caring frailty, PAPRFP committee had to discuss about exit strategies after frail status for participants' sense of security. In ACPEL and GSF meeting, the 3 Steps of GSF Strategies were introduced; 1. Identification of EOL patients using the Prognosis Indicator Guidance with the Surprise Question, 2. Assessment leading to ACP standing at the view of patients supported by SDM policy, 3. Plan for patients at EOL. Enhancement of ACP discussion with patients nearing frailty was advocated repeatedly. The proposal, advanced frailty means that EOL is close and should trigger a proactive EOLC approach, is reasonable and supposed to be introduced into Japanese clinical and long-term care. Conclusion: Pilot study of PAPRFP in NCGG seemed to be feasible. Efficacy and efficiency of advanced course of PAPRFP with Train-the-Trainer Strategy remain to be investigated. PAPRFP has potential to be an effective element of ICCS, Japan. PAPRFP is the entrance strategy for high-quality EOLC, as trigger to initiate ACP conversation standing at the view of the patients between patients and GIT, supported by SDM policy. ACP assures the exit strategy for patients beyond frailty status to EOL with high-quality and proactive EOLC based on continuous ACP conversation standing at the view of

the patients. In advanced course of PAPRFP in 2016, promotion of ACP for the elder people nearing pre-frailty and frailty is introduced.

P31- ANNUAL CHANGE OF KIHON CHECK LIST FOR PREDICTING FRAILTY STATUS IN JAPANESE ELDER PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A THREE-YEAR OBSERVATION AT OUTPATIENT CLINIC FOR COMPREHENSIVE PULMONARY REHABILITATION. K. Senda, S. Satake, I. Kondo, M. Nishikawa, H. Tokuda, H. Miura, H. Endo *(Obu, Japan)*

Backgrounds : Chronic obstructive pulmonary disease (COPD) is a highly prevalent, however preventable and treatable chronic systemic inflammatory disease. COPD could be understood as one of geriatric syndromes associated with sarcopenia leading to frailty. Sarcopenia in COPD patients has been studied as limb-muscle dysfunction and the treatable target of exercise training in pulmonary rehabilitation (PR). However, information about significance of frailty in COPD patients is scarce and especially, in Japanese senior COPD patients, even rarer. The Kihon Checklist (KCL) for assessing frailty status (Satake, et al. Geriatri Gerontol Int 2015; published online) is a self-administrated questionnaire developed to screen for users of Preventive Care Service under Long-Term Care Insurance by the Ministry of Health, Labour and Welfare, Japan. Clinical application of KCL in patients with co-morbidity, including COPD, still remains to be investigated. KCL is expected as effective, efficient and simple prognostic measure to predict frailty and application into COPD Integrated Care system with inter-disciplinary team, respecting Patient-Centered Care policy and enhancing patients' self-management. This study aimed to investigate application of KCL for Japanese elder COPD patients at the outpatient clinic for comprehensive PR program. Methods : Clinically stable 43 outpatients with COPD at the PR clinic of the National Center for Geriatrics and Gerontology, Obu, Japan, underwent a comprehensive geriatric assessment (CGA) including interview and anthropometry by a registered nurse, body composition with dual-energy X-ray absorptiometry, Charlson Co-morbidity Index (CCI), nutritional status with Mini Nutritional Assessment (MNA), Total Activity score of self-administered Modified Baecke Questionnaire, health-related quality of life (HRQOL) with St. George's Respiratory Questionnaire (SGRQ), self-rated health status with COPD Assessment Test (CAT) and pulmonary function. The cohort consisted of 40 male and 3 female; age: 74.9 +/- 5.9 (65-87) years; the Global Initiative for Chronic Obstructive Lung Disease (GOLD) stage I: 8, stage II: 20, stage III: 11, Stage IV: 4; the BODE index: integrated body mass Index (BMI), air flow obstruction, dyspnea and exercise capacity; 2.7 +/- 1.9 (0-7) /10) and followed for 3 years with repeated annual CGA. We adopted the cut-off value for Japanese senior people in Obu Study of Health Promotion for the Elderly (Shimada, et al. JAMDA 2013; 14: 518-24), which were low walking speed <1.0m/s, low grip strength <26kg for male or <17kg for female and 5% body weight loss in the last 2 years. Results : Initial total KCL score was 5.2/25 +/- 4.4 (0-18). With Fried's frailty criteria, mean number of positive frailty CHS criteria (Number of frailty) was 1.2 +/- 1.2 (0-5 /5) and 7 were classified as frail, 23 as pre-frail, and 13 as robust. Four patients showed reduced walking speed, 9 reduced weights, 13 showed low grip strength, 14 had fatigue, 11 showed low activities. Total KCL score was positively correlated with Number of frailty by Fried ($r = 0.71$, $p < 0.001$). All of 7 frail patients (by Fried criteria) were KCL >7/25 and 5/7 frailty by Fried were KCL >8/25 (suggested cut-off value for Frailty by KCL). Of 23 Pre-frailty by Fried, 9 were KCL: 4-7 (suggested cut-off value for pre-Frailty by KCL), and 10 were KCL <4 and 4 were KCL>7. The total KCL score was also significantly associated with BODE index and parameters of health status, nutrition (MNA score), mood, dyspnea, gait speed and physical activity, however, not with pulmonary function, co-morbidity and Appendicular Skeletal Muscle Index. Three patients died before re-study of CGA and 8 patients declined further CGA appointment. During 3-year observation (39.9 +/- 12.9 months) at outpatient PR clinic, in 32 patients with more than twice CGA sessions, improvement of total KCL score: 9, unchanged KCL: 5, decline: 18 were observed. With 30.4 +/- 14.5 months interval, 8 deaths were observed. A frail patient (KCL =16) died of suffocation with aspiration pneumonia. Total of 5 pre-frail patients' death were observed; respiratory failure (KCL=8, with weight loss and fatigue, preserved-muscle mass, GOLD stage I and BODE index: 5/10 at the initial evaluation), heart failure (KCL=6) and two with cancer of bile duct (KCL=3, 6), sepsis with pneumonia and severe decubitus ulcer (KCL=5). A robust patient (KCL=4) died of heart failure and another (KCL=4) died of brain infarction. Conclusion : The total KCL score was significantly associated with Number of frailty criteria by Fried and other clinical parameters in CGA. Application of KCL into Japanese health and long-term care settings for COPD patients seems to be feasible. Japanese elder COPD patients are bearing the constellation of s frailty, disability and co-morbidity (including COPD itself) which impacts on health status and mortality. KCL could measure the progression of complicated constellation and could be a useful evaluation tool for inter-disciplinary team to offer integrated care for elder COPD patients.

P32- FREQUENCY ANALYSIS OF ELECTROMYOGRAMS OF THE MUSCLES AROUND THE KNEE IN KNEE OSTEOARTHRITIS PATIENTS. Y. Suzuki, Y. Matsui, R. Fujita, A. Harada *(Fukushi, Japan)*

Backgrounds : In knee osteoarthritis (OA) patients changes in knee alignment are accompanied not only by changes in muscle strength, but also possibly by qualitative changes in the muscle itself. Frequency analysis of electromyograms have suggested a relationship with the proportion of slow and fast muscle in the qualitative change in muscle, but there has been very little investigation of the differences in the individual knee muscles in knee OA. The aim of this study is to compare the difference between frequencies in electromyograms of the knee muscles in elderly knee OA patients and young people during knee extension and flexion. Methods : The subjects were 82 elderly female knee OA patients (mean age 75.3 years) being treated in the orthopedic surgery department of our center and 20 healthy young women (mean age 26.8 years). The subjects performed maximal isometric knee extension and flexion for 3 sec in a sitting position, during which time surface electromyograms of the vastus medialis, vastus lateralis, rectus femoris, biceps femoris, semitendinosis, and gastrocnemius were obtained. At the same time, maximum knee extension and flexion muscle strength was measured. On the electromyograms, the data for the last 2 of the 3 sec measured were adopted. The electromyogram signals were analyzed by fast Fourier transform (FFT), and the median frequency was obtained. For muscle strength, the maximum output measured by a force gauge at the distal end of the tibia was used. Each trial was performed twice, and the average value was obtained. The relationships between the knee extension and flexion strength normalized by body weight and the mean frequencies in the electromyograms were investigated using Pearson's correlation coefficient. Results : Compared with the young subjects, median frequency in the electromyogram was significantly lower in the knee OA group for the vastus medialis ($p < 0.001$), vastus lateralis ($p < 0.05$), and rectus femoris ($p < 0.01$), and significantly higher for the gastrocnemius ($p < 0.01$). No significant differences were seen in the biceps femoris or semitendinosis. In a comparison of the median frequencies between the different

quadriceps muscles in the young subjects, there were no significant differences between the vastus medialis or vastus lateralis, but the rectus femoris was significantly lower than the vastus medialis ($p < 0.05$) and vastus lateralis ($p < 0.01$). In a comparison of the median frequencies between the quadriceps muscles in the knee OA subjects, the median frequency was significantly lower in the vastus medialis ($p < 0.001$) and rectus femoris ($p < 0.001$) than in the vastus lateralis, but there were no significant differences between the vastus medialis and rectus femoris. In a comparison of the median frequencies on electromyograms of the hamstring muscles and gastrocnemius in the young subjects, the frequency was significantly lower in the biceps femoris than in the gastrocnemius ($p < 0.01$), and in the semitendinosis than in the biceps femoris ($p < 0.05$). In a comparison of the median frequencies on electromyograms of the hamstring muscles and gastrocnemius in the knee OA subjects, similarly the frequency was significantly lower in the biceps femoris than in the gastrocnemius ($p < 0.001$) and in the semitendinosis than in the biceps femoris ($p < 0.001$). In the knee OA patients, significant correlations were seen between knee extension strength normalized by body weight and the median frequencies in the vastus lateralis ($r = 0.28$, $p < 0.05$). In the young subjects, significant correlations were seen between knee flexion strength normalized by body weight and the median frequencies in the gastrocnemius ($r = –0.57$, $p < 0.05$). The proportion of slow muscle in the leg muscles (vastus lateralis) is said to decrease with age. The proportions of slow and fast muscle are also said to have an effect on the changes in frequency in electromyograms. Since the knee OA patients in this study were elderly, the present results suggest that the proportion of fast muscle in the quadriceps overall changes with age. However, the magnitude of the effect of knee OA on electromyogram frequency remains an issue for the future. Meanwhile, no trend for decreasing frequency was seen in the hamstring muscles and gastrocnemius, and there is a possibility that unlike the quadriceps muscles the percentage of fast muscle does not decrease in these muscles. A correlation between muscle strength and frequency was seen only in some muscles. Conclusion : Compared with young people, the median frequencies in electromyograms of elderly OA patients were lower in the quadriceps muscles, unchanged in the hamstrings, and higher in the gastrocnemius. Among the quadriceps muscles, a lower median frequency was characteristic especially in the vastus medialis in the elderly OA patients. A correlation between muscle strength in knee extension and electromyogram frequency was seen in the vastus lateralis in knee OA patients.

P33- FRAILTY AS A RISK FACTOR FOR ADVERSE OUTCOMES IN OLDER PERSONS WITH DELIRIUM. J. Chew, M.S. Chong, W.S. Lim, M. Chan, L. Tay *(Singapore)*

Background : While delirium has been generally regarded as a transient and reversible condition, it is increasingly recognized that recovery may not always be complete, with residual subsyndromal delirium (RSSD) having been observed despite resolution of the full syndromal episode. Frailty has been proposed as a risk factor for negative outcomes in delirium, which may exacerbate the frailty cascade. The aim of this study is to examine the impact of baseline frailty on outcomes of (i) delirium duration and RSSD, and (ii) 1-year mortality among hospitalized older adults admitted to a specialized delirium unit. Methods : This was a prospective cohort study of individuals admitted to the Geriatric Monitoring Unit (GMU), a five-bed unit specialized in managing older adults with delirium, between December 2012 and August 2013. Diagnosis of delirium was in accordance with the Confusion Assessment Method (CAM). All patients underwent assessment for delirium severity (Delirium Rating Scale-98 [DRS] and CAM-severity), cognitive performance, functional status (modified Barthel Index [MBI]), comorbidity (Charlson's), and illness severity (modified Severity of Illness Index) at admission. Data on precipitating factors for delirium was also collected. Serial daily assessments of delirium severity and cognitive performance were performed until discharge upon clinical resolution of delirium. A 20-item frailty index (FI) was derived following a comprehensive geriatric assessment and comprised comorbidities (excluding presence of underlying dementia), functional performance in activities of daily living, presence of sensory and swallowing impairment, and laboratory markers (serum albumin and hemoglobin levels). Patients with FI ≥ 0.25 were defined as being frail. RSSD was defined as DRS severity score ≥ 13 at discharge. Univariate analyses were performed, followed by multiple regression to examine the independent impact of frailty on the short-term outcomes of delirium duration, RSSD and mortality at 1-year. Results : 234 individuals (mean age 84.1 ± 7.4 years) were included in the study. 159 (67.9%) were frail. 119 (74.8%) frail individuals had pre-existing dementia at baseline. Frail individuals were older (85.3 ± 7.4 years versus 81.6 ± 6.6 years, $P < 0.001$), had significantly lower scores on the MBI (22.7 ± 20.7 versus 41.6 ± 25.7, $P < 0.001$) and higher DRS severity scores on admission (23.7 ± 5.7 versus 20.3 ± 5.4, $P < 0.001$). There were no differences between frail and non-frail participants with respect to gender, pre-existing dementia, comorbidity and severity of illness indices. Individuals who were frail had a longer duration of delirium [median (interquartile range): 6 (4 – 8) versus 4 (3 – 7) days, $P = 0.007$]. Multiple linear regression analysis adjusting for age, gender, illness severity and pre-existing dementia showed that delirium duration was significantly associated with FI score ($\beta = 5.02$, $P = 0.02$) and delirium severity on admission ($\beta = 0.16$, $P = 0.006$). There were a higher proportion of frail individuals who developed RSSD, [117 (73.6%) versus 28 (37.3%), $P < 0.001$]. Frailty was an independent predictor for RSSD, after adjusting for age, gender, illness severity, admission delirium severity and underlying dementia (adjusted OR 3.73, 95% confidence interval 1.77 – 7.90). Mortality data was available for 167 (71.4%) participants. In a multiple regression model adjusting for age, gender, illness severity and underlying dementia, there was a trend towards increased 12-month mortality for frail individuals (adjusted OR 2.48, 95% CI 0.93 – 6.58, $P = 0.07$). Conclusion : Frail individuals had a longer duration of delirium, were more likely to develop residual SSD and showed a trend towards increased risk of mortality in the year following discharge. This suggests that frailty is a risk factor for adverse outcomes in delirium. Our findings, if corroborated, may guide post-discharge care and rehabilitation plans for frail older adults with delirium given their higher risk of RSSD.

P34- SARCOPENIA AND FRAILTY PREVALENCE AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE ON HEMODIALYSIS, THROUGH SIMPLE SCREENING METHODS: MACAÉ CITY STUDY/ RIO DE JANEIRO, BRAZIL. R. Borba de Amorim Oliveira, A.P. Menna Barreto, C.C. Diogo Ferreira, L. Raimundo Soares, R. Melquiades Silva de Andrade, C. de Aquino Paes, M.F. Larcher de Almeida, I. Ferreira de Azevedo *(Macaé, Brazil)*

Backgrounds: Chronic kidney disease (CKD) is considered one of the greatest public health problems of current time worldwide. The census of the Brazilian Society of Nephrology (2013) showed that there was an increase in the number of dialysis patients in Brazil from 91.314 in 2011 to 100.397 in 2013. The reduction in renal function promotes the occurrence of a number of physiological disorders related to hormonal and metabolic changes contributing to the depletion of nutritional status, marked by muscle injury. Thus, those very conditions of CKD predisposes the patient (even not

old), the condition of frailty and/ or sarcopenia. The prevalence of sarcopenia and frailty in CKD were evaluated in a few Brazilian studies. The sarcopenia was observed in 4-63% of elderly patients undergoing Hemodialysis (HD) (depending on the method used, cutoff point and population characteristics). The pre-fragile was observed in 40.5% of cases (in a similar Brazilian population) and the fragility in 37.8%. Early detection of these syndromes can minimize their harmful effects. There are simple screening methods which are able to quickly diagnose the presence of Sarcopenia (SARC-F) and Frailty (FRAIL). In addition, it may be necessary to use functional tests, imaging features and others, as well as specific biomarkers. Thereby, this study aimed to evaluate the prevalence of sarcopenia and frailty in CKD patients on HD through simple screening methods and anthropometry and compare these two methods. Methods: Cross-sectional study with adults and seniors in HD >3 months. Were not included individuals with acute infections, malignancies and autoimmune diseases, acquired immunodeficiency syndrome, degenerative diseases and disabled people. To calculate the sample size it was used the WinPepi program. Measured anthropometric variables (after HD, upper limb opposite to the fistula): weight, height, body mass index (BMI) (classified according to WHO 2000 and Lipschitz 1994), Triceps Skinfold Thickness (TSF), Arm Muscle Circumference (AMC) and the adductor pollicis muscle thickness (APMT). For the suitability of the TSF and AMC were used the values of the 50th percentile (according to age and gender) proposed by Frisancho (1981) and classified according to the criteria of Blackburn & Thornton 1979. The APMT normal value was 10mm for both genres (Pereira et al., 2013). The diagnosis of sarcopenia and frailty were based on validated questionnaires SARC-F and FRAIL. All patients signed a written informed consent and the project was approved by the Research Ethics Committee of the University (Opinion Number: 48974815.2.0000.5699). The Shapiro-Wilk and Kolmogorov-Smirnov test was used to verify that the continuous variables were normally distributed. It was used the Spearman test for the analysis of correlation and the statistical evaluation of the comparison of ratios was based on the chi-square test. Statistical significance level was set at $p<0.05$. Statistical analysis was performed using STATA 13.0 software. Results: Were evaluated 73 patients (37 women; 50.7%), aged 49.76 ± 12.39 years, BMI 23.99±6.44 kg/m2 (57.7% normal weight, overweight 28.7% and down weight 13.7%), TSF 14.57 ± 8.71mm (serious injury 53.4% and 29% of overweight), AMC 23.76 ± 3.44cm (eutrophic 63%), and 13.08 ± 3,40 APMT 3.40 mm (84% normal weight). Sarcopenia was observed in 19% (SARC-F). FRAIL classified 43% as pre-frail and 14% as frailty, mainly in the female group. The Correlation Matrix between SARC -F and anthropometric variables showed to TSF correlation nonexistent and BMI, MAMC and EMAP, weak correlation. In Male group, BMI showed an average correlation. The correlation between the FRAIL and anthropometry revealed to APMT a nonexistent correlation and the other, a weak correlation. Conclusion: A large number of patients had sarcopenia and frailty, mainly in the female group. Moreover, anthropometric assessment (BMI, APMT and AMC variables) showed suitability for most of the patients studied. Only by TSF was observed serious injury for most volunteers. There was a weak correlation between the frailty and sarcopenia screening methods and the anthropometric variables for the patients in this study.

P35- PATTERNS OF ALCOHOL CONSUMPTION AND RISK OF FRAILTY IN COMMUNITY-DWELLING OLDER ADULTS. F. Rodríguez-Artalejo[1], R. Ortolá[1], E. García-Esquinas[1], L.M. León-Muñoz[1], P. Guallar-Castillón[1], J.L. Valencia-Martín[1,2], I. Galán[1] *(1. Madrid, Spain; 2. Móstoles, Spain)*

Backgrounds: Consumption of moderate-to-heavy amounts of alcohol has been associated with lower risk of cardiovascular disease and diabetes. Although both diseases are main causes of the frailty syndrome, no previous study has assessed the association between alcohol drinking patterns and risk of frailty in older adults. Methods: Prospective cohort with 2086 community-dwelling individuals aged ≥60 years, recruited in 2008-2010. Drinking patterns were self-reported at baseline. Moderate drinking was defined as alcohol intake <40 g/day in men and <24 g/day in women. A Mediterranean drinking pattern (MDP) was defined as moderate alcohol intake, with wine preference (≥80% of alcohol proceeds from wine) and drinking only with meals. Study participants were followed through 2012 to ascertain incident frailty, defined as ≥2 of the following 4 Fried criteria: exhaustion, muscle weakness, low physical activity, and slow walking speed. Analyses were performed with logistic regression and adjusted for the main confounders. Results: After a mean follow-up of 3.3 (SD: 0.6) years, 292 subjects with incident frailty were identified. Compared to non-drinkers, the odds ratio (OR) and its 95% confidence interval (CI) of frailty was 0.90 (0.65-1.25) for moderate drinkers. The corresponding results were 0.74 (0.48-1.16) for wine versus other beverage preference, and 0.53 (0.31-0.92) for drinking only with meals versus only outside meals. Lastly, compared to non-drinkers, the OR (95% CI) of frailty was 0.68 (0.47-0.99) for those adhering to the MDP. Conclusions: Certain drinking patterns, in particular drinking only with meals and the MDP, are associated with a lower risk of frailty in older adults. This work was supported by grant no. 02/2014 from the Plan Nacional sobre Drogas (Ministry of Health of Spain), FIS grant no. 12/1166 (Instituto de Salud Carlos III, State Secretary of R+D+I and FEDER/FSE) and the FRAILOMIC Initiative (FP7-HEALTH-2012-Proposal no. 305483-2). The funding agencies had no role in study design, data analysis, interpretation of results, manuscript preparation or in the decision to submit this manuscript for publication.

P36- HOW TO MANAGE FRAIL ELDERLY? A COMMUNITY OUTREACH CONDUCTED BY THE TOULOUSE GÉRONTOPÔLE AND THE MUNICIPALITY OF CUGNAUX. N. Tavassoli[1], C. Lafont[1], J. de Kerimel[1], M. Soto[1], M. Pedra[1], C. Lagourdette[1], L. Bouchon[1], A. Chaléon[2], B. Vellas[1] *(1. Toulouse, France; 2. Cugnaux, France)*

Introduction : Limiting, in the years ahead, the number of dependent elderly is one of the economic and human challenges raised by population aging. The concept of frailty developed by geriatricians is a basic reflection which seems essential to identify the steps that lead to the loss of autonomy and implement a targeted prevention plan. Indeed, frailty defined by Fried as five physical criteria, triples the risk of disability. However, the state of frailty is a reversible condition with an appropriate care. Screening frail elderly subjects, identifying the causes of their frailty, and implementing targeted interventions are certainly a way to delay the loss of independence among the seniors. We report the experience of screening and care management of frail elderly conducted in Cugnaux, city of 16,314 inhabitants located near Toulouse, by the Toulouse Gérontopôle and the municipality of Cugnaux. Method : After informing healthcare professionals of the city of Cugnaux during a conference about the concept of frailty and the project, a frailty screening self-administered questionnaire (FInD questionnaire) was sent by post to residents of

75 years old and over, living at home who were on the city electoral list. The questionnaire was accompanied by a covering letter and a postage-paid return envelope. The responses were analyzed by a geriatrician of Gérontopôle and the subjects were separated into three groups (robust, frail, impaired mobility) based on their responses. Frail subjects and those with impaired mobility invited to undergo a frailty assessment in order to identify the causes of their frailty and to their propose a personalized intervention plan. The assessment was carried out by a nurse of Gérontopôle formed in geriatric assessment. This assessment included a multi field evaluation using validated scales: - Cognitive assessment (MMSE, Wechsler); - Functional assessment (ADL, IADL) ; - Assessment of physical performance (SPPB, Fried criteria, one-leg standing balance test, Wrist strength) ; - Nutritional assessment (BMI, weight changes, MNA); - Psychosocial assessment (socio-demographic data, GDS4) - Sensorial assessment. Following this assessment, a meeting between the nurse and a hospital geriatrician allowed, in simple situations, the diagnosis of frailty, the identification of the causes and the proposal of targeted and personalized interventions. In complex cases, further consideration proposed in the framework of specialized consultations or a day hospitalization. The proposed interventions were based on existing resources at municipal and social services. Specific activities for frail elderly subjects were also developed: balance and physical activity workshop, nutrition workshop and cognitive stimulation workshop. The programs contents were developed in partnership with the Gérontopôle. They rely on recent literature data and include the exercises that have demonstrated their effectiveness. Each subject was informed of the results of his assessment and intervention proposals were discussed with him in order to promote his adhesion. The assessment report and recommendations were communicated by mail to his GP. The subjects were followed by a social worker in order to control the implementation of recommendations 1 month after assessment. A reassessment at 1 year will be scheduled for subjects who agree. Results : 1,253 questionnaires were sent. After the first mailing, 388 (31%) responses were received. The responders had an mean age of 81.4 ± 2.8 years. There were 62.1% women. 35% were robust, 23.7% frail, 37.1% had an impaired mobility and 1.2% could not be classified due to missing data. The assessment was proposed to frail subjects (n = 92) as well as subjects with impaired mobility (n = 144). To date, 60 subjects underwent the assessment and received a personalized intervention plan. The objective is to assess at least one hundred subjects. Conclusions: This study shows the acceptability, for the elderly, to undergo a frailty assessment realized by a nurse as well as the level of adhesion of seniors to preventive community outreaches in the city where they reside. It also optimizes the use of medical and social resources set up by the municipality to prevent the loss of independence among older residents of the town. However, the effectiveness of such a model on the prevention of disability cannot be judged due to the small number of subjects included. Further studies need to be conducted on a larger population.

P37- ESTABLISHMENT AND DESCRIPTION OF THE MIDI-PYRÉNÉES FRAILTY DATABASE. M. Soto, J. de Kerimel, N. Tavassoli, C. Lafont, M. Pedra, S. Guyonnet, B. Vellas *(Toulouse, France)*

Introduction : The Toulouse GERONTOPOLE established a Regional Team on Aging and Prevention of Dependency (ERVPD) to extend its innovative geriatric projects to the Midi-Pyrénées region, with the support of the Regional Health Agency (ARS). One of the priorities of the ERVPD is to implement the structures for management of frailty and prevention of disability in the Midi-Pyrénées area in order to provide equal healthcare services to frail older persons regardless of where they live. The development of such outreaches should allow early interventions which are the most effective to prevent disability. In Midi-Pyrénées, the frailty evaluation is mostly performed in geriatric day hospitals or during a frailty medical visit. Actually, 18 structures for management of frailty and prevention of disability have been developed in Midi-Pyrénées. Three pilot programs in primary care have been engaged. Thermal medicine is carrying out a pilot project in 2 facilities, several mutual insurance and retirement fund start frailty care. Although there is a difference between screening tools, the assessment is, in its main lines, common to all these actors. This concerns a lot of clinical and socio- demographic data. It is therefore essential to create a common data collection. The purpose of the "Frailty" database is to collect clinical data of the frail elderly. It could be eventually used as a research tool. Method: The collected data results from a consensus of a multidisciplinary team (geriatrician, nurse...) that sets the minimum exams required diagnosing the frailty and identifying its causes. The data are computerized and gather the main variables in 16 categories: - Patient's Identification ; - Detection modality of frail elderly ; - Assessor's Identification ; - Assessment reason ; - GP's identification ; - Social status ; - Medical history and treatments; - Sensorial assessment (subjective evaluation) ; - Physical and functional assessment (SPPB, ADL, IADL) ; - Cognitive assessment (MMSE, Wechsler) ; - Nutritional assessment (MNA, BMI, weight changes) ; - Psychological assessment (GDS4) ; - Fried criteria ; - Identified frailty domains ; - Proposed interventions ; - Syntheses. The database, realized by a computing company, is a "Web" application accessible by a web browser. The data are entered directly by each center and are stored under an authorized system hosting personal health data. The database has been declared to the National Commission on Computer Technology and Freedom (CNIL). The ERVPD manages the list of the participating centers and determines the access to the database. Each center or health professional has a personal identification and password allowing the input, and the access to the personal patients' data. The center can also have an identification that authorizes the access to the whole anonymized data to carry out requests or analyses. In term of use, the data system is intuitive, composed by a home page where figure a current year dashboard, indicating the number of new centers, new patients and visits. Activity indicators of the whole centers are also presented. Tabs give access to the zones to inform the 16 headings. Extractions and requests are easily realizable. An instruction manual is given to each center. Results: This database will be operational on January 2016 and the 80 centers partners of Gérontopôle will be able to enter data. They are geriatric day hospitals of Midi-Pyrénées area offering frailty assessment, frailty medical visits, GPs offices, liberal nurses in pluri-professional health offices (Maisons de santé pluriprofessionnelles) exercising within the framework of the protocol of cooperation, nurses carrying out assessments within the municipalities, the solidarity houses of departmental councils («Maisons de Solidarités des Conseils Départementaux »), the thermal medicine facilities, the mutual insurance companies or certain retirement funds. We estimate more than 2500 per year the number of old subjects evaluated by all 80 centers. The first results from the database will be exploitable in the first six-month period of 2016. Conclusion: This database that gathers the frailty assessment data from all the structures for management of frailty and prevention of disability in the Midi-Pyrénées area must support the improvement of knowledge in the field of frailty as well as the optimization of the preventive actions undertaken.

P38- REASSESSMENT OF THE PREDICTION OF GRIP STRENGTH: IMPLEMENTATION OF GROUP-RHYTHMICAL INTERVENTION FOR MIDDLE-AGED ADULTS WITH INTELLECTUAL DISABILITY. H.L. Chin *(Taiwan)*

Introduction Lower grip strength is associated with incident as well as prevalent disability, age-related loss of muscle mass and volitional muscle strength can be a cause as well as a consequence of physical disability(Syddall, Cooper, Martin, Briggs, & Sayer, 2003). The relation between grip strength and future mortality has been shown, not only in older people(Gale, Martyn, Cooper & Sayer,2007) but also in middle-aged and young people(Ortega, Silventoinen, Tynelius & Rasmussen, 2012). Grip strength may prove a more useful single marker of frailty for older people of similar age than chronological age alone(Leong, Teo & Rangarajan, 2015). But there is still no evidence about the people with intellectual disability. Method The participants are 39 young people between 20-40 with intellectual disability. Through "group-rhythmical intervention" in 28 weeks including rhythmical exercise and whole body vibration(WBV). The evaluating tool includes bone density testing, body fat percentage, hand grip strength and static body equilibrium. Result The pretest data indicates the relationship between grip strength and degree of the intellectual disability (r=-.313**,p≤.01) as well. Nevertheless, there is no significant relationship between grip strength and bone mineral density. The posttest data shows the relationship between grip strength and BMR (r=.427**,p≤.01), static body equilibrium (r=.517 **,p≤.01). And the relationship between grip strength and intellectual disability level is more positive (r=-.713**,p ≤.01) than before. Conclusion Though the relation between grip strength and physical disability has been shown. This study illustrate the value of group-rhythmical intervention for adult with intellectual disability, and calls upon enough training through group-invention for young people with intellectual disability. Key words:Grip strength; Group-rhythmical intervention; middle-aged adults with intellectual disability; Whole body vibration.

P39- MACRONUTRIENT , OBESITY , CARDIOVASCULAR DISEASES ON SARCOPENIA : CASE STUDY OF ELDERLY IN COMMUNITY AND INSTITUTIONAL BASE. Y.S. Handajani, N.T. Widjaja *(Jakarta, Indonesia)*

Backgrounds. Sarcopenia refers to the loss of skeletal muscle mass and strength that occurs with normal aging and may be of great importance, as it can lead to disability and chronic. It was a complex, multifactorial process facilitated by a combination of voluntary and involuntary factors including the adoption of a more sedentary lifestyle and a less than optimal diet. Another important factor of sarcopenia was obesity, the condition in which not only is muscle mass replaced by adipose tissue, a widespread phenomenon, but where excess adiposity, resulting in overweight or obesity,coexists with weakness due to sarcopenia. Some studies suggest that approximately 15% of those with sarcopenia are also obese .Recent population trends indicate an alarming rise in the prevalence of obesity among older adults , it was potentially adding a complementary condition that compounds the risk of poor health outcomes. Obesity increases the chance of numerous chronic health conditions and is also associated with an increased risk of mortality. Methods. A subsample of 210 subjects ≥ 60 years of age was identified from the community and nursing home. Sarcopenia was defined using Bioelectrical Impedance Analysis, handgrip, and Timed Get Up and Go Test), and assessment of nutrition intake using 24-hours recall method within two days to assess energy, carbohydrate, fat, and protein intake. Measurement tape was used to measure height and a digital scale was used to measure body weight and obesity was based on % body fat. Multivariate analysis used for analyzing several factors which be influenced to sarcopenia. Results. The prevalence of Sarcopenia in this study was 58.7% (50.7% Sarcopenia class 1 and 8% Sarcopenia class II), and the prevalence of chronic diseases (diabetes mellitus, hypertension and cardiovascular disease) were 24%, 51% and 27%. There were 47.1% subjects with obese. Subjects with obesity were at risk for cardiovascular disease 2 times compared subjects were not obesity and they were at risk 2.9 times for getting sarcopenia. Similarly, those with less energy, carbohydrate and protein intake were at risk of 2.5-2.6 times to experience sarcopenia. This means that obesity directly affect cardiovascular disease and the effects of sarcopenia finally happened. Conclusion. Obesity among elderly was potentially adding a complementary condition that compounds the risk of poor health outcomes, especially cardiovascular disease . Macronutrients (energy, carbohydrate and protein) as impotant risk factors of sarcopenia. Key words : Macronutrient, obesity, cardiovascular, sarcopenia, elderly

P40- THE ROLE OF VITAMIN D AND EXERCISES IN CORRECTION OF AGE-RELATED SKELETAL MUSCLE CHANGES IN POSTMENOPAUSAL WOMEN. V. Povoroznyuk, N. Dzerovych, R. Povoroznyuk *(Kyiv, Ukraine)*

The aim of the study was to evaluate the role of vitamin D and exercises in correction of age-related skeletal muscle changes in postmenopausal women. Materials and methods. 38 postmenopausal women aged 53-82 years (mean age – 67.00±7.08 yrs; mean height – 160.31±6.83 cm; mean weight – 63.25±8.59 kg, body mass index – 24.62±3.09 kg/m2) were examined. All subjects were free of systemic disorders (endocrine, renal, hepatic etc.) and did not take any medications known to affect skeletal and muscle metabolism. The women were divided into the following groups: A – control group (n=10), B – women who took an individually-targeted vitamin D therapy (n=11), C – women who took an individually-targeted vitamin D therapy and OTAGO Exercise Programme (http://www.hfwcny.org/Tools/BroadCaster/Upload/Project13/Docs/Otago_Exercise_Programme.pdf) during 12 months. The assessment of the examined women was conducted every 3 months at the medical center. We used the following questionnaires: SARC-F, IADL-questionnaire, frailty scale, Desmond fall risk questionnaire. For evaluation of skeletal muscle function and strength, we assessed the usual gait speed and used hand dynamometry. 25(OH)D total and iPTH levels were measured by electrochemiluminescent method i.e. Elecsys 2010 analytical system (Roche Diagnostics, Germany) and test-systems cobas. The lean mass was measured by the DXA method (Prodigy, GEHC Lunar, Madison, WI, USA). "Statistika 6.0" © StatSoft, Inc. was used for the data processing purposes. Results. At the baseline, the groups of examined women did not differ in their age, anthropometric characteristics, 25(OH)D values, data of skeletal muscle mass, strength and function. In women of the control group, the mean 25(OH)D level significantly increased after 9 months of observation (9 months – p=0.03) purportedly due to the seasonal factors. In women of 2nd and 3rd groups, the 25(OH)D level significantly increased after 3, 6, 9 and 12 months of observations (2nd group: 3 months – p=0.009, 6 months – p=0.007, 9 months – p=0.005, 12 months – p=0.003; 3rd group: 3 months – p<0.001, 6 months – p<0.001, 9 months – p<0.001, 12 months – p<0.001). The data of SARC-F, IADL-questionnaires did not change during 12 months of observation in women of 1st and 2nd groups; however, in the 3rd group the SARC-F data significantly decreased after 12 months (p=0,02) while the IADL data – significantly increased after 9 (p=0.04) and 12 months (p=0.05). The data of frailty scale and Desmond fall risk questionnaire

did not differ in all groups during 12 months. The muscle strength significantly increased after 9 months (p=0.01) in women of 3rd group while in women of 1st and 2nd group this parameter did not change. The usual gait speed and lean mass assessed by DXA did not change in all groups during 12 months. The fall frequency in women of 1st group significantly increased after 12 months, in women of 2nd group it did not change while in women of 3rd group the fall frequency significantly decreased. Conclusion. Using individually-targeted vitamin D therapy and OTAGO Exercise Programme during 12 months significantly improves daily activity, muscle strength and decreases the fall frequency in postmenopausal women. .

P41- PREVALENCE OF FRAILTY AMONG NURSING HOME, ACCORDING TO DIFFERENT OPERATIONAL DEFINITIONS. F. Buckinx, J.Y. Reginster, S. Gillain, J. Petermans, T. Brunois, O. Bruyère *(Liège, Belgium)*

Background: Data on prevalence of frailty vary from one study to another, which is probably due to the method used to evaluate this geriatric syndrome. The aim of this study is to compare the prevalence of frailty according to different operational definitions, among elderly nursing home resident in Belgium. Methods: This is an analysis of data collected at baseline in the SENIOR (Sample of Nursing home Elderly Individuals: an Observational Research) cohort. Subjects are defined frail, pre-frail or robust according to 10 different operational definitions: Clinical Frailty Scale, Groningen Indicator, Edmonton scale, Frail Scale Status, Frailty Index, Fried definition, Sega gird, Share Frailty Index, Strawbridge questionnaire and Tilburg indicator. The percentage of frail and pre-frail subject is calculated for each definition. A large number of demographic and clinical characteristics are also collected : age, sex, Body Mass index, walking support, number of drugs consumed, number of comorbidities (CIRS-G), cognitive status (MMSE), energy expenditure (Minnesota questionnaire), quality of life (EQ-D and SF-36 questionnaires), level of autonomy (Katz), functional and motors skills (Tinetti test, SPPB test, Timed Up and Go test and gait speed). Relationship between the different operational definitions of frailty and subjects' characteristics is evaluated by means of a multiple or logistic regression, when appropriate. Results: A total of 662 volunteers subjects from 28 nursing homes are included in this analysis. Among them, the mean age is 83.2 ± 8.99 years and 484 (73.1%) of them are women. Prevalence of frailty varies from 1.7% (Frailty Index) to 76.3% (Groningen Frailty Indicator) according to the tool. Prevalence of pre-frailty varies from 28% (Clinical Frailty Scale) to 60.8% (Fried definition). After adjustment on age, sex and body mass index, some demographic and clinical characteristics are significantly different between frail subjects diagnosed by the different definitions. This is true for walking support, number of drugs consumed, cognitive status, energy expenditure, nutritional status, quality of life, level of autonomy, Tinetti test, SPPB test and gait speed. Conclusion: Prevalence of frailty is highly dependent of the operational definition used. It is therefore necessary to reach a consensus on the operational definition of frailty to use, in order to make data comparable between epidemiological studies but also from a clinical point of view, to optimize the management of subjects suffering from frailty.

P42- PHYSICAL AND MUSCLE PERFORMANCES AMONG ELDERLY NURSING HOME RESIDENTS: RESULTS OF THE SENIOR COHORT. F. Buckinx, J.Y. Reginster, J.L. Croisier, J. Petermans, O. Bruyère *(Liège, Belgium)*

Background : Aging is generally characterized by a progressive loss of muscle function (i.e. muscle strength and muscle performance). This change is often associated with a decrease in mobility that in turn could lead to disability, frailty, falls, and even death. The aim of this study is to assess muscle function among frail, pre-frail and robust elderly nursing home residents, in Belgium. Methods : All subjects from the SENIOR (Sample of Elderly Individuals : an Observational Research) cohort were included in this analysis. The SENIOR cohort is a prospective follow up of nursing home residents aimed to identify prognostic factors of frailty. Physical and muscular performances have been evaluated. Grip strength is measured using an hydraulic dynamometer. Maximal isometric strength of 8 different muscle groups (knee flexors and extensors, ankle flexors and extensors, hip abductors and extensors, elbow flexors and extensors) is evaluated with a portable dynamometer (i.e. the MicroFET2). Functional and motors skills are evaluated by means of the Tinetti test, the Timed Up and Go test, the SPPB test and the gait speed. The diagnosis of frailty is based on Fried's definition. Physical and muscle performances are then compared between frail, pre-frail and robust subjects by means of an Anova analysis. Results: The SENIOR cohort included 662 nursing home subjects aged 83.2 ± 8.99 years on average, among which 484 (73.1%) are women. These subjects are relatively oriented (MMSE= 24.1 ± 4.52 points) and able to walk. The mean grip strength of the subjects is 18.6 ± 10.9 kg and their isometric muscle strength measured at 8 different muscle groups ranged from 63.2 ± 29.1 N (elbow extensors) to 101.6 ± 52.4 N (knee extensors). These subjects have a mean Tinetti score of 22.4 ± 6.23 points and a mean SPPB score of 5.56 ±3.23 points. Their average time to perform the timed up and go test is 25.6 ± 19.3 seconds whereas their gait speed is 0.89 ± 4.05 seconds. All these data of strength and muscle performances are significantly different (p<.0001) between frail, pre-frail and robust. Conclusion : The decline of mobility is common among elderly, especially in nursing homes. The frailest subjects have muscle and physical performances reduced. These results provide important public health perspectives, to identify subjects requiring intervention.

P43- EFFECT OF GENDER ON THE AGE SPECIFIC ONSET IN CHANGES OF ORGANS AND TISSUE MASSES, RESTING ENERGY EXPENDITURE (REE) AND THE REE-BODY COMPOSITION RELATIONSHIP IN HEALTHY CAUCASIANS. C. Geisler[1], W. Braun[1], M. Pourhassan[1], L. Schweitzer[1], C.-C. Glüer[1], A. Bosy-Westphal[2], M.J. Müller[1] *(1. Kiel, Germany; 2. Stuttgart, Germany)*

Backgrounds: The effect of gender on the age specific onset of changes in fat free mass (FFM), its components (organs and tissues) and resting energy expenditure (REE) are not well defined. We investigated the effect of gender on (1) age specific onset of changes in body composition parameters and age-related changes in (2) REE and (3) REE-body composition association. Methods: We analyzed a cross-sectional whole body MRI- database of 267Caucasian subjects with 150 females and 117 males varying in age (18–78 years) and BMI (16.8-43.8 kg/m2). FFM, low metabolic (LMR i.e. skeletal muscle mass (SM), adipose tissue (AT) and bone mass) and high metabolic (HMR i.e. brain, heart, liver, kidney mass) rate tissues and organs were measured. REE was assessed by indirect calorimetry (REEm) and calculated (REEc) based on organ-specific metabolic rates of body components as described previously (Müller et al, 2013). Peak ages of body composition parameters and REE were calculated using the corresponding slopes of quadratic equations. Differences in age specific declines and regression lines were tested by ANOVA and GLM. Multivariate linear regression analyses were performed using REEm FFM as dependent variables. A p-value <0.05 was accepted as the limit of significance. Results: (1) Body composition: Age was nonlinearly (age2) related to body composition parameters. There

were gender specific differences in the onset of age-related changes in metabolic active tissues and organs. In females, age specific periods of declines started nearly one decade earlier than in males for i.e. LMR (35.0 vs. 44.0 years), HMR (34.6 vs. 45.0 years), SM (29.4 vs. 39.6 years) and AT (38.2 vs. 49.9 years). Gender differences (females vs. males) were also observed in the declines of LMR (-6.87 vs. -4.60 kg/decade), HMR (-0.15 vs. -0.23 kg/decade, $p<0.05$) and AT (-5.69 vs. -0.59 kg/decade, $p<0.05$). (2) REE: Age was nonlinearly related to REE and gender specific differences were observed in onset of age specific periods of declines. Age specific changes of REEm started earlier in females than in males (31.9 vs. 36.8 years). This was also true for specific metabolic rates of organs and tissues (30.7 vs. 54.8 years). Females and males were different in age-related decreases in REEm (-0.47 vs. -0.31 MJ/day). This decrease was due to decreases in organs and tissue masses rather than in their specific metabolic rates. (3) REE-body composition association: Previous findings suggested a gender-specific association between REEm and FFM. We did not find an effect of gender on the REE-FFM association with age. In multivariate regression models REEm was used as dependent variable. Model 1 included FFM, HMR, AT and gender as independent variables, whereas gender was excluded in model 2. FFM and HMR explained 72.9% and 76.6% of the variance in REEm before and after the peak age, gender did not enter model 1. In model 2, FFM explained 57.4% and 68.1% of the variance in REEm in females and males before peak age, respectively. After peak age, HMR was the major determinant of REEm in females (72.1%) and males (62.5%), respectively. Within HMR, liver explained most of the variance in REEm in females (64.9%) and and males (59.0%). In females, REEmFFM HMR explained 34.8% of the variance in REEmFFM after the peak age. Conclusion: We conclude that gender affects the age specific onset of changes in body composition and REE. However, gender does not affect the age-related "REE-body composition relationship". This trial was registered at linicaltrials.gov as NCT01737034. Advances in the understanding of specific metabolic rates of major organs and tissues in humans. Müller MJ, Wang Z, Heymsfield SB, Schautz B, Bosy-Westphal A. Curr Opin Clin Nutr Metab Care. 2013 Sep;16(5):501-8. doi: 10.1097/MCO.0b013e328363bdf9.

P44- PREVALENCE OF SARCOPENIA AND ASSOCIATED FACTORS COMMUNITY-DWELLING ELDERLY IN RIO DE JANEIRO STATE/BRAZIL.

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Background: Several body composition changes are known to occur with aging. The progressive loss of skeletal mass and muscle strength associated with aging, termed sarcopenia, may result in physical disability, dependence and reduced quality of life. The assessment of hand grip strength (HGS) is an important variable to estimate the impairment of overall muscular strength. Methods: Cross-sectional study of elderly patients of both genders, attended at the nutrition clinic of a University Hospital in Rio de Janeiro city. This study aimed to correlate the HGS with anthropometric variables and subjective assessment of nutritional status and establishing the diagnosis of sarcopenia in the group. Nutritional status was determined using the body mass index (BMI), circumference of the arm (AC), arm muscle circumference (AMC), calf circumference (CC), arm muscle area (AMA), triceps skinfold thickness (TST), fat percentage and muscle mass. Mini Nutritional Assessment (MNA) was used to subjective analysis of nutritional status. The diagnosis of sarcopenia was done through anthropometry and the HGS analysis using the Jamar® Hydraulic Hand Dynamometer. Participants were asked two successive replications and the end result corresponding to average of these values. Reference values of Lauretani et al. (2003) was used for performance analysis of the HGS of the elderly, being considered as reduced muscle strength below 30 kg for men and 20 kg for women. The calculation of the muscle mass was obtained by the equation Lee et al. (2000). From the result of muscle mass (kg), these individuals were classified according to the degree of sarcopenia, by Muscle Mass Index (MMI) with the equation proposed by Janssen et al. (2004), where the established cut-off points were ≤ 10.75 kg / m2 for men and ≤ 6.75 kg / m2 for women. All statistical tests were performed assuming a confidence interval (CI) of 95% and the significance level ≤ 0.05. Data analysis was made using the software s- plus 8.0. Results: The sample included 50 elderly of both genders, being 40 women and 10 men. The average age was 73.92 ± 7.0 years. The prevalence of sarcopenia was observed in 28% of the elderly. The results of the Pearson correlation tests revealed that AC (r = .45), TST (r = .46), AMA (r = .43), AMC (r = .44), and fat percentage showed significant correlations and moderate with the HGS in women. Male significant correlations were not observed. Values of age (r = .58), CC (r = .38), muscle mass (r = .46) and MNA (r = .34) were associated with the HGS in the total population. In the simple linear regression analysis, it was observed that both age and education influenced the results of the FPM. It was found that the age explained about 11% of the variability of the FPM and was found loss in HGS around 1.53% each year the individual ages. The education explained about 20% of variability of the data, and for each year studied there was an increase of around 3.7% in HGS. BMI had no significant influence on the HGS. Conclusion: The results demonstrate that there was a statistically significant correlation between parameters of nutritional status and HGS in the studied elderly. Linear regression analyses showed a significant decline of HGS with age and increase with higher education. There was an association of AC, TST, CC, AMA, AMC and fat percentage with HGS only in females. The prevalence of sarcopenia was 28%, similar among men and women in older individuals. The measurement of HGS associated with nutritional assessment techniques is of great value for the constant monitoring of muscle strength loss of the elderly thus enabling the prevention of sarcopenia phenomenon.

P45- THE IMPACT OF SARCOPENIA OR SARCOPENIC OBESITY IN THE OLDER SUBJECTS WITH DIABETES.

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Background: Diabetes has been increasing especially in the elderly. It has been reported that the frequency of sarcopenia is higher in diabetes and insulin resistance underlies the association between sarcopenia and diabetes. On the other hand, it is reported that sarcopenic obesity has a poorer prognosis than obesity alone or sarcopenia alone, however the impact of sarcopenic obesity in diabetic patients has not been fully examined yet. Therefore, we performed the following examinations to clarify the frequency of sarcopenia or sarcopenic obesity and the significance of each in the older subjects with diabetes. Methods : Consequent 73 subjects aged 65 and over, who were hospitalized in our department and diagnosed as diabetes. In addition the routine examinations on admission, the measurements of muscle mass and grip or lower-limb muscle strength, physical functions (walking speed, one-leg standing time, etc.), comprehensive geriatric assessment (CGA; Barthel index and instrumental ADL (IADL), Mini-Mental State Examination (MMSE) and Geriatric Depression Scale (GDS)), hearing of history of fall and assessment of fall risk were performed. Hearing of history of

diabetes and measurement of HbA1c, serum insulin level, fasting and postprandial blood glucose (BS) were also performed. Sarcopenia was defined based on the criteria of Asian Working Group for Sarcopenia (AWGS), and sarcopenic obesity was defined using the median value of waist circumference and lower-limb muscle strength. Results: The average of age of all the subjects was 75.6 years old, and the frequency of sarcopenia was 20.5%, which was higher than that in the community-dwelling elderly. History of diabetes was significantly longer in the sarcopenia group than in the non-sarcopenia group, however there were no differences in HbA1c, HOMA-IR between both groups. Postprandial BS was significantly higher in the sarcopenia group than in non-sarcopenia group, but not fasting BS. Multiple logistic regression analysis revealed that postprandial BS was extracted as an independent factor for sarcopenia as well as history of diabetes. The frequency of sarcopenic obesity increased with increasing age, whereas that of obesity without sarcopenia decreased. Walking speed and one-leg standing time was lower, and the score of depression scale and the frequency of fall was higher in the sarcopenic obesity group than in the obesity without sarcopenia group. Conclusion : In the older subjects with diabetes, postprandial hyperglycemia was associated with sarcopenia as well as longer history of diabetes, and detection of sarcopenic obesity might be very useful for prediction of risk for fall or disability..

P46- A CASE-CONTROL STUDY ON HEMOGLOBIN CHANGES AND TRANFUSION REQUIREMENT AFTER HIP FRACTURE IN FRAIL NURSING HOME RESIDENTS COMPARED WITH COMMUNITY-DWELLING OLDER PEOPLE. K.S.F. Khow, C. McNally, P. Shibu, S.C.Y. Yu, M. Chehade, R. Visvanathan *(Adelaide, Australia)*

Background: Anemia and blood loss is common in patients with hip fractures. Nursing home residents tend to be frailer, have multiple comorbidities and they have a two to three times higher risk of hip fractures compared with age- and sex-matched people living in the community. Living in a nursing home at the time of a hip fracture is also associated with a higher mortality. Preoperative and postoperative anemia in older people with hip fractures have been associated with higher risk of mortality and reduced ambulation. Red blood cell (RBC) transfusion rates vary between studies depending on the strategy adopted by each institution. However little is known about the magnitude of hemoglobin change during the course of admission with hip fracture and if this change is significantly different among frail residents from nursing homes. This study aims to compare temporal changes in hemoglobin from admission to discharge, RBC transfusion requirements and mortality within a year after hip fractures in patients who were admitted from nursing homes and the community. Methods: A retrospective case-control study was conducted among patients aged ≥65 years who had surgery for low-energy traumatic hip fractures in an Australian tertiary referral hospital between 1 January 2011 and 31 December 2012. Patients with pathological fractures, high-energy trauma and non-operative interventions were excluded. Data on patients' characteristics, comorbidities type of fractures, type of surgical fixation, hemoglobin trend during the admission and RBC transfusion were collected. This database is linked with the local death registry to determine the mortality rate within the first year after the hip fracture. Nursing home residents were those who were living in long-term residential care facilities. Community-dwelling patients were used as the control group in this study. Anemia is defined as hemoglobin of less than 130 g/L for males and less than 120 g/L for female. Nadir postoperative hemoglobin refers to the lowest hemoglobin within the first week of surgery. Discharge hemoglobin is the last hemoglobin measurement within a week of the patient completing the acute stay in hospital and this value may include correction with RBC transfusion for some patients. Trigger hemoglobin for RBS transfusion refers to the hemoglobin just prior to administration of the blood product. Results: During the study period, 303 patients were included consisting of 100 patients who were nursing home residents and 203 from the community. Patients from nursing homes were older (86.1±6.4 vs 83.3±7.9 years; $p = 0.002$) and had a higher Charlson Comorbidity Index ($p < 0.0001$). Compared with community-dwelling patients, nursing home residents had a significantly lower preoperative (117.0±22.5 vs 122.2±18.9 g/L; $p = 0.035$) and discharge (101.5±14.8 vs 106.0±14.7 g/L; $p=0.016$) hemoglobin. However there was no significant difference in the nadir postoperative hemoglobin or change in hemoglobin between admission and the nadir value when comparing between these two groups. RBC transfusion were received by 55% and 47% of nursing home residents and community-dwelling patients, respectively, but there was no significant difference in the rate. The mean trigger hemoglobin for RBC transfusion in both groups were similar (79.2±10.2 vs 79.9±8.2 g/L; $p = 0.64$). In both groups, about half of the RBC transfusion recipients had a trigger hemoglobin of <80 g/L. The one-year mortality rate was higher in the nursing home group (47% vs 20%; $p < 0.001$) while there is no significant difference between the groups for in-hospital mortality. Conclusion: Nursing home residents had a lower preoperative hemoglobin which may reflect their frailty and multiple comorbidities. Furthermore, their discharge hemoglobin after hip fracture surgery was also significantly lower despite more nursing home residents receiving RBC transfusion. Preadmission residential status was not associated with the degree of change in hemoglobin after hip fracture surgery. Living in nursing homes is associated with a two-fold higher risk of mortality a year after hip fracture but the effects of discharge hemoglobin on this outcome needs further exploration. This study suggests that nursing home residential status among patients with hip fracture has prognostic significance. More research is required to evaluate the effects of preoperative and discharge hemoglobin on clinical outcomes after surgery. In addition, the optimal strategy in RBC transfusion for hip fracture also requires investigation.

P47- WIDE RANGE EVALUATION OF THE COGNITIVE AND PHYSICAL PERFORMANCE IN THE PENSIONERS. C. Mautalen, S. Mastaglia, O. Tomarevska, O. Poliakov *(Kiev, Ukraine)*

Backgrounds: Increased average life expectancy of people leads to aging creates a problem of working disability and independence and frailty of older people. Investigated functional ability of the elderly shows that the age decrease of labor effectiveness of a person occurs due to a cumulative effect of aging of separate elements of human organism functional systems. Methods: It has been studied anthropometric and functional parameters of respiration, physical performance, mental and psychomotor activity, sensory skills, as well as the rate of functional aging 120 persons aged 60 - 89 years, 99 persons aged 90 – 104 years and 43 men aged 20 - 30 years. We have also analyzed the professional history, social status, and factual nutrition of the surveyed older people. Results: It was found general involution trends, which deals to the deterioration of anthropometric and functional parameters. Cognitive function, hand grip strength and endurance, vital capacity, functional parameters of external respiration declines with age. Body mass index and the rate of functional aging worsen with the age. According to the physiological and ergometric tests and subsequent clustering, correlation and regression analysis made it possible to develop a method for determining the residual performance of the person 60 years and more. Gerontechnology

optimization approaches work and daily activity of the person allowed to allocate the residual levels of human performance on the actual capabilities of mental and physical activity. The development of the scale assessment the level residual capacity also contributed to the study of employment persons in paid employment. As a results the three typical of classes has been established according to labor parameters i.e. severity and intensity the severity and intensity the, and recommends the best professions in intensity and severity. Finally it was designed rating scale of the residual working performance for the persons over 60 years. Indicators residual capacity for work 90% - 100% correspond to the potential young people. The data at the level of 70% to 89% reflects the average level of residual disability. The level of 50% - 69% reflects level below average. An index on range 20% - 49% means overstrains of organism and requires rehabilitation, 1% - 19% of the related frailty. The remaining working capacity in the retirement people was calculated according to standard health of young healthy individuals (men and women for 30 years). Thus, it revealed the full preservation of the total disability in the age groups 60 - 74 years for men 23.6% and women at 7%. The maximum reduction to 20% of the overall health of women and men is observed in the age 60 - 74 years without severe chronic pathology. In the age group 75 - 89 years for men and women did not reveal the preservation of efficiency of over 79%, in particular, the percentage of men observed the remaining amount of less than 69%. At 4.7% of women aged 75-89 years receive 70 - 79% of the remaining whole capacity. The main sample of elderly people is the overall health level of residual 20% - 49%. Keeping the overall health of at least 19%, which corresponds to the frailty was found in 23.5% of the studied men and 39.5% of women aged 75 - 89 years and the main sample of people centenarians, is also in this group. It was found that average residual working capacity in elderly group 60 - 74 years overstrain 64.63%, in the group of elderly 75 - 89 years was 30.46% and in the group of centenarians was 9.45%. There have been general trends of decline in self-service on the Barthel index, percent body fat a person older than 60 years. In turn, the number of cases falls 12.93% have a significant impact on the remaining amount of the persons over 60 years. The impact factor of body mass index in the residual performance has a valid contribution to 5.44% in the group of people aged 60 - 89 years, and centenarians this relationship - 10.5%. In the residual performance affect respiratory function parameters: peak flow 34.39%, inspiratory breath 40.1% and 38.21% on the exhale. The reduction of the use of information sources is a prognostic factor of 7.95%, which determines the amount of residual human performance in the retirement age. At the same time indicators of the impact of professional activity, which has been in the past or ongoing at the time the study showed a greater percentage impact than the parameters of physical activity on the remaining amount of the elderly person. Conclusion: As a result of a comprehensive study and mathematical modeling was developed a quantitative method for assessing the residual working capacity for elderly persons.

P48- THE PREVALENCE OF FRAILTY IN NEW ZEALAND DIALYSIS PATIENTS USING THE EDMONTON FRAILTY SCALE AND FRIED FRAILTY SCALE. K. Bloomfield, J. de Zoysa, S. Dixon *(Auckland, New Zealand)*

Background: There has been a variable prevalence of frailty reported in chronic renal failure and dialysis patients internationally. No New Zealand (NZ) studies have been previously reported. Over the last 20 years there has been an increase of over 400% of the old (75-84 years) and very old (85 years and over) on dialysis in NZ. We wished to study the prevalence of frailty in our local population using two frailty tools: Edmonton Frailty Score (EFS) and the Fried score. Methods: Patients attending dialysis at either community or hospital based dialysis centers at Waitemata District Health Board were assessed for frailty by Edmonton Frailty Score (EFS) and the Fried score. Background demographic information, duration and indication for dialysis, and comorbidity data were collected. Results: Data on 87 patients has been collected so far, with complete frailty data on 82 patients. The mean age of patients in the overall group was 61 years (median 65 years, range 29 to 82 years), 50 (57%) were men and the mean duration of dialysis was 73 months. Diabetes was the most common etiology of underlying renal disease (44%). The group is ethnically diverse as follows: NZ-European 29%, Maori 17%, Samoan 17%, Other Pacific Islander 21%, Chinese 7%, Other European 6%, Indian 3%. The mean EFS in the overall group was 6.4 and the mean Fried score 1.5. The mean Charleson Comorbid Index (CCI) was 3.9. Sixteen out of 82 patients (20%) were frail as per Fried criteria, and 41 (50%) were pre-frail. Mean age of frail patients was 70 years, significantly older than those pre-frail (mean age 60 years, p=0.003) and those not frail as per Fried criteria (mean age 53 years, p <0.005). There were no significant differences between frail, pre-frail and non-frail groups in terms of sex or ethnicity. CCI in the frail group was 4.5, significantly higher than the non-frail (3.35, p=0.02) but not the pre-frail group (3.93, p=0.2). Although there were no significant differences in duration of dialysis, there was a trend of shorter duration in the frail group: mean duration 63 months in frail, 69 months in pre-frail and 91 months in non-frail. Twenty-three patients were frail by EFS criteria (28%), 33 were 'vulnerable' (40%) and 26 not frail (32%). The mean age in the frail group was 66 years, significantly older than the non-frail (55 years, p=0.004) but not the vulnerable group (60 years, p=0.09). Again no differences were seen in sex or ethnicity between groups. Similar trends were seen in frailty and shorter duration of dialysis: 67 months in frail, 88 months in non-frail, but this was not significant (p=0.4). The mean CCI was higher in the frail group (4), compared to the non-frail group (3.2, p=0.04), but was not significantly higher between the frail and pre-frail groups. Conclusion: In this ethnically diverse dialysis group, frailty was of the lower end in comparison to previous reports at 20% (Fried) and 28% (EFS). More patients are to be included in this cohort to further study any differences in sex, ethnicity and duration of dialysis. Outcome data at one year is also to be studied.

P49- THE RELATIONSHIP BETWEEN SARCOPENIA AND PULMONARY FUNCTION IN OLDER PEOPLE. S. Yu, R. Visvanathan *(Adelaide, Australia)*

Backgrounds: Age-related changes of body composition are characterized by loss of muscle mass and strength. There have been six consensuses on the criteria for sarcopenia world-wide since 2010. The European Working Group on Sarcopenia in Older People (EWGSOP) definition is most commonly used, which defines sarcopenia as the presence of low muscle mass combined with either low grip strength or low physical performance. Sarcopenia has been associated with many adverse clinical outcomes including falls, risk of fractures, functional decline and physical disability. Recently, it has been shown that low muscle mass was associated with a decreased pulmonary function in community-dwelling older Korean adults. By inference, it is possible that low muscle mass with additional muscle parameters such as grip strength (sarcopenia) may also be associated with lower pulmonary function and this relationship has not been previously established. The aim of the current study is to examine the relationship of sarcopenia and the pulmonary function in people aged 65 years and over. Methods: A Representative sample of the population from the North West Adelaide Health Study (NWAHS), recruited between the period 2004 and 2006 was used for this study. Participants with

chronic respiratory condition including asthma, chronic bronchitis and emphysema were excluded. Subjects underwent anthropometric measurements, spirometry and muscle mass estimation by dual energy x-ray absorptiometry (DXA). Sarcopenia was defined as the presence of low muscle mass and low grip strength. Low muscle mass was defined as the value of appendicular skeletal muscle mass (ASM) divided by height squared (ASM/Ht2) that was the lowest 20% of the distribution of the normative population (7.36 kg/m2 for men and 5.81 kg/m2 for women). Low grip strength was defined as <30kg for men and <20kg for women. Results: 497 (n=273 for women) community dwelling subjects were included in the current study. Forced expiratory volume in s (FEV1[L]) and forced vital capacity (FVC[L]) were correlated with grip strength (r=0.43 for men, p<0.001 and r=0.43 for women, p<0.001, respectively) and ASM/Ht2 (r=0.17 for men, p=0.01 and r=0.13 for women, p=0.05, respectively). 43 subjects fulfilled the criteria for low grip strength and low muscle mass (sarcopenia). Sarcopenic, as compared to non-sarcopenic subjects, were noted to have decreased FEV1 for both men and women (2.44 [±0.54]L vs. 2.68 [±0.52]L for men, p=0.03 and 1.70 [±0.32]L vs.1.94 [±0.40]L for women, p=0.01, respectively), but no difference were noted in terms of FVC. The observed association was further adjusted for age, sex, body mass index, smoking and physical activity using logistic regression analysis. Interestingly, after adjustment, there was no association between sarcopenia and FEV1 (Odds Ratio[OR]=1.86, 95% confidence interval[CI] 0.57-6.07, p=0.303 for men and OR=2.05, 95% CI 0.49-8.60, p=0.329 for women) and FVC (OR=1.84, 95% CI 0.69-4.90, p=0.223 for men and OR=1.4, 95% CI 0.45–4.46, p=0.544 for women). Conclusion: Contrary to previous suggestion, the current study does not support the notion that sarcopenia is associated with decreased pulmonary function in those aged 65 years and over. The lack of association may be related to the smaller number of sarcopenic subjects. Future studies with larger number of subjects are required to study the relationship between sarcopenia and pulmonary function.

P50- THE ASSOCIATION BETWEEN BASELINE FRAILTY AND POSTOPERATIVE COMPLICATIONS, DELIRIUM, AND FUNCTIONAL STATUS CHANGE AFTER CARDIAC SURGERY. A. Graham, J. Walston, E. Ledford, L. Max, C. Hogue, C. Brown *(Elkridge, USA)*

Background: The syndrome of frailty describes older adults with reduced ability to maintain homeostasis after destabilizing events.1 For patients undergoing cardiac surgery, baseline frailty may identify those older adults at increased risk for morbidity and mortality.2 However, the associations between preoperative frailty and important patient-centered outcomes—including complications, delirium, discharge location, and changes in functional status—have not been well investigated. Poor functional outcomes in the frail would provide evidence to support targeted interventions for these patients. Additionally, it is unknown how frailty status changes in patients after cardiac surgery, information which might help risk-stratify patients prior to surgery. Methods: We conducted a nested cohort study with IRB approval and patient written informed consent. The study was nested in an ongoing randomized trial of cerebral autoregulation monitoring to improve neurological outcomes after cardiac surgery. Significant inclusion criteria were patients undergoing coronary artery bypass graft surgery (CABG) and/or valve or aortic surgery using cardiopulmonary bypass. Frailty was evaluated at baseline and at 1-month follow-up based on a validated scoring method of 5 age-related domains: shrinking, weakness, exhaustion, low physical activity, and slow walking speed, each of which was scored 0 or 1, based on predefined criteria. The sum of each domain score was used to classify patients as non-frail (0-2) or frail (3-5). Delirium was assessed on three of the first four postoperative days using the validated Confusion Assessment Method (CAM) or CAM-ICU. Functional status was measured using discharge location (home vs. non-home) and decline in instrumental activities of daily living (IADL) from baseline to 1-month. Complications were defined prospectively as atrial fibrillation, mechanical ventilation >48 hours, inotropic drug>24 hours, intra-aortic balloon pump insertion, new dialysis requirement, sepsis, and stroke or TIA. Because of the small sample size, we generally present summary statistics, using t-tests, rank-sum tests, and chi-squared tests. We did examine delirium and discharge location in relation to frailty using multivariable regression. Results: Among 81 patients, 19 (23.5%) were frail, and 62 (76.5%) were non-frail. Frail compared to non-frail patients were similar in age (70±9 y/o vs. 71±8 y/o; p=0.65), gender (68% vs. 77% male, p=0.63), race (79% vs. 85% Caucasian), and log EuroSCORE (median 5.5, IQR 0.4-9.7 vs. median 3, IQR 0.9-7.5; p=0.61). There was more diabetes (72% vs. 35%; p=0.006) and COPD (22% vs. 7%; p=0.05) in frail compared to non-frail patients. Complications: The incidence of any postoperative complication was greater among frail (11/19 [57.9%]) compared to non-frail patients (24/62 [38.7%]), although this difference was non-significant (p=0.14). Delirium: In 78 patients with delirium assessments, the overall incidence of delirium was 39.7%. The incidence of delirium was significantly higher in frail (11/17 [65%]) compared to non-frail patients (19/59 [32%]; p=0.016). In models adjusted for age and log EuroSCORE, the odds of delirium were 4.1-fold higher for frail compared with non-frail patients (OR 4.1; 95%CI 1.2-13.8; p=0.02). Discharge location: The percent of patients NOT discharged home was higher, although not significantly so,in frail (44%) compared with non-frail (23%) patients. In models adjusted for age and log EuroSCORE, the odds of NOT being discharged home were 2.7-fold higher for frail compared with non-frail patients. (OR 2.7; 95%CI 0.78-9.45; p=0.1).Transitions in frailty: Sixty-three patients completed 1-month follow-up testing. Overall, 13 patients (20%) had a change in frailty status at 1-month compared to baseline. Specifically, 7/49 patients (14.3%) who were non-frail at baseline transitioned to frailty at follow-up. Conversely, 6/14 patients (42.9%) who were frail at baseline transitioned to non-frailty at follow-up (p=0.001). This pattern was generally similar across each domain of frailty, except for grip-strength, for which there was no change from baseline to follow-up. IADL: Baseline IADL scores were lower in frail (median 13 ([IQR11-14]), compared to non-frail patients (median 14 [IQR 14-14]; p<0.001). However, the decline in IADL scores was not different for frail (median 0, IQR -0.5 to 0, range -3 to 1) compared to non-frail patients (median 0, IQR -1 to 0, range -11 to 1; p=0.50). Conclusions: In a small sample, frailty status was associated with an increased incidence of delirium, and a trend towards a greater incidence of postoperative complications and lower odds of being discharged home after cardiac surgery. There was no difference in change in functional status at 1-month after surgery. A significant number of patients who were frail at baseline were not frail at 1-month follow-up. A larger sample size is needed to better characterize complications and functional consequences of frailty after cardiac surgery, as well as what factors are associated with changes in frailty status. Frail patients may benefit from targeted strategies in the perioperative period to optimize recovery. References: (1) J Am Geriatr Soc 2006;54(6):991–1001, (2) Circulation 2010;121(8):973–8.

P51- PREVALENCE OF SARCOPENIA AND MALNUTRITION IN ACUTELY ILL HOSPITALIZED OLDER ADULTS. R.R. Deer, E. Volpi *(Galveston, USA)*

Backgrounds. The prevalence of sarcopenia and malnutrition in older adults who become acutely ill has not been well investigated.

Reduced nutrient intake, particularly protein, contributes to sarcopenia. Malnutrition increases susceptibility to disease; in turn, acute illness can significantly reduce appetite and induce malnutrition. Several operative definitions have been published over the past few years and debate is still ongoing on how to best define and measure sarcopenia. Additionally, there is no international consensus on a single 'best screening tool' to determine the prevalence of malnutrition in acutely ill older adults. Methods. We examined the prevalence of sarcopenia and malnutrition in a cohort of older adults (n=140; >65 yrs) hospitalized for an acute disease in the Acute Care for the Elderly unit at UTMB. We measured body composition (DEXA), muscle strength (hand grip dynamometer), and gait speed (4-meter walking test) and used two operational definitions for sarcopenia: Foundation for the NIH Sarcopenia Project (FNIH), and European Working Group on Sarcopenia in Older Persons (EWGSOP). Prevalence of malnutrition was assessed using a standard definition of malnutrition (presence of either BMI <20kg/m2 or >5% unintentional weight loss in the last 6 months) and three commonly used screening tools (Malnutrition Screen Tool (MST), Mini Nutritional Assessment Short Form (MNA-SF), and Malnutrition Universal Screening Tool (MUST)). Results. Prevalence of sarcopenia differed depending the criteria used, ranging from 20% using FNIH to 29% using EWGSOP. A definitive diagnosis of sarcopenia was not possible in a large portion of our subjects (31%) because they were not able to perform at least one of the criteria measures (DEXA: 43 patients, gait speed: 31 patients. handgrip strength: 9 patients) due to being bedridden or requiring intensive treatments. The prevalence of malnutrition also varied greatly depending on which nutritional assessment tool was used. According to the standard definition 25% of our cohort was at-risk of malnutrition/malnourished. Using the common screening tools, the highest prevalence of subjects "at-risk/malnourished" was obtained with MNA-SF (75%), followed by MUST (30%) and finally MST (21%). Of the three tools, MUST had the best sensitivity, specificity, and negative predictive values (>90%) when compared to the standard definition of malnutrition. Conclusion. These data from our ongoing study suggest that sarcopenia and malnutrition are highly prevalent in acutely ill, hospitalized older adults. Sarcopenia could not be measured in 31% of the sample due to patient inability to complete the measures, indicating the need for modified criteria to determine sarcopenia in this vulnerable population. MUST was determined to be an appropriate malnutrition screening tool to be used in acutely ill older adults. Further research is necessary in this vulnerable population to determine how to best define and measure sarcopenia and malnutrition. Dairy Research Institute (1229) and UTMB Claude D. Pepper OAIC (5P30 AG024832)..

P52- SENSITIVITY AND SPECIFICITY OF THE DOMAINS OF FRAILTY ASSESSMENT TOOLS IN CLINICAL SETTINGS.

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Background: Although a lot of scales and questionnaires have been used in the detection of frailty; all of them have been developed and validated in epidemiological settings but not in clinical ones. Currently, any study has assessed these tools in the same population, at the same moment and in clinical settings with high risk of disability. At this stage, we are not sure whether the instruments for frailty detection are useful from a clinical point of view or not. One of the main objectives of FRAILCLINIC study is to evaluate the usefulness of the frailty assessment tools, in different clinical settings and to evaluate the sensitive and specificity of the domains in the different scales. Methods: Observational, cross-sectional study in six different hospitals from three European countries (Spain, Italy and the United Kingdom) in different clinical settings (Emergency Room, Cardiology, Elective Surgery, Urgent Surgery and Oncology). Patients 75 years and older attended at any of those settings were included. General frailty tools used for assessing frailty were Frailty Phenotype criteria (CHS), FRAIL Scale, Tilburg Frailty Indicator, Groningen Frailty Indicator and Rockwood Modified Scale. In addition, some specific tools were used in Oncology (Balducci criteria, VES13 Scale, G8 criteria, and in the Emergency Room (ISAR Scale). Results: Globally, by Fried scale, the item that showed higher sensitivity was grip strength (92.16%), but it is also the least specific (55.99%). The gait speed also showed high sensitivity (84.62%) but not high specificity (77.97%), especially in Urgent Surgery, where was altered in the 50% of non-frail patients. The most important item was the physical activity because of its high sensitivity (70.16%), but mainly because of its high specificity, especially in Urgent Surgery. In FRAIL Scale, globally, the item with the highest sensitivity was fatigue (86.57%). In Urgent Surgery this sensitivity was 92.59%, but its specificity was 67%. The second most prevalent item among frailty was ambulation (80.3%) and the third one was resistance (72.91%). Ambulation, comparable to Fried gait speed was a sensitive and specific item, except in Emergency Room were up to 40.3% of non-frailty patients had this parameter altered. Weight loss showed the lowest sensitivity of all the tool items with 54.68%. The presence of comorbidities was positive in only 59.11% of frail patients. In Tilburg Frailty Indicator, fatigue was the most sensitive out of the all the 15 items in all settings (86.75%), followed by psychological domain with questions about anxiety (80.6%) and sadness (83.5%). In Gröningen Frailty Indicator, although taking 4 or more drugs was the most sensitive item (84.66%), it was also the least specific (39.27%). Psychological domain showed a significant sensitivity in all clinical settings, but they were not especially specific. Basic daily activities performance had little sensitivity; however they showed important specificity (97.45%). Weight loss had low sensitivity (33.87%) as well as low specificity (82.85%). In the ISAR scale, the most relevant question of this questionnaire was: «Since the illness or injury that has brought you to the emergency room has you need more help than usual to take care of yourself?» because it showed high sensitivity (70.11%) and high specificity (100%). In Balducci Scale, the presence of geriatric syndromes showed to be the most important parameter, thus for sensibility (85.71%) and for specificity (97.69%). No frail participant was older than 85 years old. In the G8 Scale, the 65% of frail participants had more than 3 kg of weight loss; however, no one of the non-frail subjects had so much weight loss. All robust patients had a BMI > 23despite being oncological participants. In VES 13 Scale the 70.56% of frail participants had a perception of simply acceptable or poor health status. Most of the non-frail (90.63%), despite they were oncological participants, considered their health status as good, very good or excellent. The 82.35% of frails presented some difficulty in performing basic or instrumental activities of daily living, while all the non-frail participants performed these tasks without difficulty. Conclusion:This is the first time that tools for screening and diagnosis of frailty are systematically evaluated in the same patients and in different settings. The usefulness of most of the tools we have now for the diagnosis of frailty syndrome varies depending on the clinical setting where they are implemented. Study funded by DG SANCO – Third Health Programme 2013..

P53- A RANDOMIZED, PLACEBO-CONTROLLED TRIAL TO EVALUATE THE EFFICACY AND SAFETY OF BIO101 ON SARCOPENIC OBESITY. W. Dioh[1], P. Guillet[1], P. Dupont[1], A.-S. Foucault[1], R. Lafont[1,2], S. Veillet[1] *(1. Romainville, France; 2. Paris, France)*

Background: Sarcopenic obesity (SO), an emerging condition defined by the loss of muscle mass and function and a concomitant increase of fat mass, is mainly affecting older obese individuals. Sarcopenia is being considered as one of the underlying causes of physical frailty, a frequent reversible condition in subjects above age 70, which if left untreated, paves the way to physical invalidity and dependence. 20-hydroxyecdysone (20E), a polyhydroxylated sterol found in plants and pharmacologically active in mammals, has been reported in vitro to inhibit myostatin gene expression and to enlarge muscle fibers. Recent cellular signaling studies showed that 20E effects involve the activation of MAS receptor, a GPCR, whose endogenous ligand is Angiotensin 1-7. In vivo, 20E oral treatment prevented adipose tissue development, decreased myostatin gene expression in muscle, while enhancing expression of several markers of myogenesis. It also increased muscle mass. In the few clinical trials reported up to now, 20E induced slight body weight reduction due to fat mass reduction in obese subjects and reduced lean mass loss in condition of intense physical training in athletes. In a randomized double-blind controlled study, the ability of 20E to prevent fat mass regain was evaluated in overweight or obese subjects during a 6-week weight loss dietary intervention (WL) followed by a 6-week weight loss maintenance phase (WLM). 20E significantly induced android fat mass loss and adipocyte diameter reduction. Insulin sensitivity was also improved in the 20E group compared to placebo. Based on these results, we developed a drug candidate BIO101, formulated with 20E purified from Stemmacantha carthamoides, to study its effects in sarcopenic obese subjects. Methods: This randomized placebo-controlled clinical study is designed to evaluate the effects of BIO101 on muscle function and physical performance in overweight or obese (BMI = 27-35) subjects, aged 65 years and above with sarcopenia defined as muscle mass index between 8.51-10.75 kg/m2 in men and 5.7-6.75 kg/m2 in women; walking speed < 0.8 m/s in a 4 m assay or grip strength <30 kg for men and 20 kg for women. This 24-week study will include 180 sarcopenic obese volunteers and will be conducted at several clinical investigation centers in France, Belgium and USA. The 6-minute walk test, which reflects the ability to perform daily living activities, was selected as the primary endpoint. Several secondary endpoints, including body composition, physical performance tests, metabolic and plasma parameters, will also be evaluated during the study. Muscle and adipose tissue biopsies will be done to evaluate histology parameters of adipocytes and muscle fibers. Results: The first enrollments are scheduled to start by the end of the first semester of 2016. The total duration of the trial is expected to be 12 months. Results will be presented as they become available. Conclusion: Increasing longevity and its related well known decrease in muscle performance with age, compounded with increasing prevalence of obesity in the general population, lead to the emergence of sarcopenic obesity as a potential public health issue, characterized by decreased functional capacity, frailty and eventually physical disability and dependence in a larger fraction of the population. It is therefore important to evaluate compounds which have pharmacological activity both on the adipocyte and the muscle fiber to tilt the imbalance in these systems towards better muscle fibers anabolism, reduced adipocyte growth and normalization of the insulin sensitivity.

P54- A COMPREHENSIVE VALIDATION OF FRAILTY ASSESSMENT TOOLS TO SCREEN AND DIAGNOSE FRAILTY IN DIFFERENT CLINICAL AND SOCIAL SETTINGS. M. Javier[1], C. Palumbo[1], M. Ballesteros[1], M. Checa[1], J.A. Carnicero[1], B. Vellas[2], M. Cesari[2], R. Bernabei[3], F. Landi[3], T. Grodzicki[4], A. Kantoch[4], A. Parnicka[4], A. Sinclair[5], L. Rodríguez Mañas[1] *(1. Madrid, Spain; 2. Toulouse, France; 3. Milano, Italy; 4. Krakow, Poland; 5. Luton, United Kingdom)*

Background: Dozens of scales and questionnaires have been used in the detection of frailty; however a universal operational definition of frailty or a generalized method for its screening and diagnosis is still lacking. In addition, these tools have been developed and validated in epidemiological settings but not in clinical ones. The aim of FRAILTOOLS project is to evaluate the usefulness of several instruments to detect frailty in clinical and social settings. In addition, we will design frailty detection algorithms according to the clinical setting. Methods: This is an observational, multicenter, longitudinal and prospective study. 1940 subjects (388 per setting) older than 75 years will be included from the following clinical (Acute Care Geriatric Unit, Outpatient Geriatric Office, Primary Care) and social (nursing homes) settings in Spain, Italy, France, United Kingdom and Poland. Exclusion criteria include a MMSE score less than 20 points or having a terminal illness (life expectancy < 6 months). Additionally for patients attended in hospital (Acute Geriatric Unit and Outpatient Geriatric Consultation) and primary care settings, those being dependent in more than 2 Instrumental Activities of Daily Living (IADL) in women (Lawton < 6), and in more than 3 IADL in men (Lawton < 5) will be excluded. Patients attended in a nursing home will be excluded if their score in the Barthel index is <40 points. Participants will be assessed about comorbidities through Charlson Comorbility Index, Functional status (Barthel Index, Lawton and SPPB) and Cognitive status (MMSE). Frailty assessment will be made with the following instruments FTS-3, SHARE-FI, Rockwood Modified Scale, FRAIL and GFS. Results: As a prompt for the participant, a telephone call will take place at month 6 after the inclusion to assess whether any falls have occurred. At 12 and 18 months, a personal interview with each participant will take place to register data on functional status (Barthel Index, Lawton and SPPB) and cognitive status (MMSE). Death and hospitalization episodes will be also recorded. The feasibility (% of patients assessed and time for doing the assessment), performance for each instrument will be assessed (sensitivity, specificity, ROC curve, AUC, predictive values, likelihood ratios) and the sensitivity to change of the scales and the association of the scales with other measures as the SPPB through a mixed linear model will be assessed. Finally, we will establish the associations between instruments to build the necessary algorithms for the different sequences of settings of care, through a meta-analysis of each combination. Conclusion: It is imperative to determine which tools are the most appropriate to detect frailty in different clinical and social settings. Once this is done, it will be possible to design frailty detection algorithms facilitating management of this prevalent condition in the elder population. Study funded by DG SANCO – Third Health Programme. Founding Health Initiatives (2014-2020)

P55- THE FRAILCLINIC PROJECT: SAMPLE CHARACTERISTICS AND FRAILTY PREVALENCE IN DIFFERENT CLINICAL SETTINGS. C. Palumbo[1], J. Gonzáles[1], M. Checa[1], J.A. Carnicero[1], J.J. Solano[2], R. Bernabei[3], A. Sinclair[4], A. Scuteri[5], L. Rodríguez Mañas[1] *(1. Madrid, Spain; 2. Asturias, Spain; 3. Milano, Italy; 4. Luton, United Kingdom; 5. Roma, Italy)*

Background: Frailty prevalence has been mainly analysed in epidemiological settings. As a consequence, the tools for diagnosis

frailty have been validated in these settings. However, data about the prevalence in clinical settings and the usefulness of usual instruments in those settings are far from being established. The aim of FRAILCLINIC is to assess both the prevalence of frailty in different clinical settings with a high risk for developing disability and the performance of classical instruments that evaluate frailty. In this communication we show socio-demographic characteristics and frailty status according to different tools used in different clinical settings included in the FRAILCLINIC project. Methods: It is an observational, cross-sectional study in six different hospitals from three European countries (Spain, Italy and the United Kingdom) in different clinical settings: Emergency Room (ER), Cardiology, Elective Surgery, Urgent Surgery and Oncology. Patients 75 years and older attended at any of those settings were invited to participate. Participants with a Barthel Index lower than 40 points, severe cognitive impairment (Global Cognition Scale >6) and institutionalized were excluded from the study. General tools used to assess frailty were Frailty Phenotype criteria, FRAIL Scale, Tilburg Frailty Indicator, Groningen Frailty Indicator and Rockwood Modified Scale. In addition, some specific tools were used in Oncology (Balducci criteria, VES13 Scale, G8 criteria, and in the Emergency Room (ISAR Scale). Results: A total of 609 participants were included, 118 from the ER, 221 from Cardiology, 115 from Elective Surgery, 65 form Urgent Surgery and 50 from Oncology Ward. The average age of participants was 81 years, the setting with the oldest participants was the ER (83.71) and the one with the youngest was Oncology (78.9). The 52.81% of the total of participants were men, 54% were married and 22.77% of the sample lived alone. The most prevalent comorbidities were hypertension 77.27% (81.2% in the ER and 94.09% in Cardiology), heart failure 33.50% (43.97% in the ER and 49.55% in Cardiology), hypercholesterolemia 40.36%, Diabetes Mellitus 30.48% and cognitive impairment only in 4.45% (9.40% in the ER and 12.31% in Urgent Surgery). Functional physical status, assessed by the Barthel Index, was a 42.34% of independent participants, 17.46% with low disability, 32.95% with moderate disability and 7.25% with severe disability. The highest percentage of patients classified as frail, with all the tools aplied, was detected in the ER setting (60%), followed by Cardiology (54.61%), the lowest prevalence was detected in Elective Surgery (21.27%). The obtained results with the different tools were the most homogeneous in Cardiology (41.36% - 65.55%) and the most heterogeneous in Oncology (6.00% - 81.63%). The tool that classified the highest percentage of frail participants in all different settings was the Groningen Frailty Indicator (52.23%), followed by Tilburg Frailty Indicator (51.27%), Frailty Phenotype criteria (47.34%), Frail Scale (33.67%) and finally Rockwood Modified Scale (28.34%). Conclusion: The sociodemographic characteristics of the participants in the FRAILCLINIC project are representative of the aged population in which geriatric clinical practice is usually performed. The high prevalence of frailty detected in different settings, in addition to the variability to classify as frail with the different tools, show the need to determine the most appropriate and reliable tools to detect frail patients in different clinical settings, in order to improve the provided treatment, optimize medical resources and reducing adverse events that frail elderly are more vulnerable, such as hospitalization, falls, institutionalization and death. Study founded by DG SANCO «HEALTH - 2013».

P56- FRAGMENTATION OF SEDENTARY TIME AND ITS ASSOCIATION WITH TOTAL ENERGY EXPENDITURE, BODY COMPOSITION AND FUNCTIONAL TESTS IN FRAIL AND NON FRAIL OLDER ADULTS. E. Ferriolli[1], F. Pessanha[1], K. Pfrimer[1], P. Fascini[1], N. Alves[1], J. Carneiro[2], L. Marchesi[1], A. Dos Santos[1], N. Lima[1], J. Moriguti[1] *(1. São Paulo, Brazil; 2. Jequie/Bahia, Brazil)*

Background: Physical activity (PA) and frailty seems to have an inverse association, being higher levels of the first mentioned as a preventive factor for the syndrome. However, the influence of the pattern of PA of older adults, including the Fragmentation Index of sedentary time (FI), has been little explored in this population. PA pattern was recently associated with body composition and functional characteristics of healthy older people. The aim of this study was to compare the FI in frail (F) and non frail (NF) older persons and its association with total energy expenditure (TEE), body composition and functional tests. Methods: Volunteers, aged ≥65 years, were invited to participate in the study and were classified according to Fried et al criteria. Healthy older people were allocated from the community while the frail group was composed mostly by institutionalized older persons. The total energy expenditure and the body composition were measured by doubly labeled water (DLW). The FI was calculated as the ratio of the number of sedentary bouts divided by the total sedentary time measured by an activity monitor (activPAL®); five uninterrupted days were included in the analysis. The Short Physical Performance Battery (SPPB) and hand grip strength were used for functional assessment. The Kolmogorov-Smirnov test was used to assess normality and Mann-Whitney U test was employed to compare groups. The Pearson and Spearman correlation tests were used to verify the correlation between FI and other variables, as appropriate. Results: The sample was composed by 22 older adults (10 F and 12 NF), mostly women (72.7%). The mean age was 77.3±4.7 years for F and 71.0±5.6 years for NF group. The FI was 2.5±1.5 for F and 3.3±0.8 for NF (p=0.02), TEE measured by the physical activity monitor was 32.1 ± 1.6 and 34.1 ± 1.3 Mets/day, (p=0.01), fat mass was 12.8 ± 4.3 and 9.6 ± 3.8 Kg (p=0.05), the number of steps 4299 ± 2947 and 8184 ±3057steps/day, (p<0.01), Sedentary Time (ST) 18.8 ±3.7 and 15.5 ± 5.5 hours/day and performance in the 6-minute walk test was 249.7 ± 109.9 and 478.7± 86.9m, (p<0.01) in F and NF volunteers, respectively. There was no difference between groups in relation to the TEE measured by DLW (2283 ± 475.1 and 2358 ± 700.4 kcal/day), BMI (31.1±5.9 and 27.1±5.2 kg.m2) and lean mass (18.1± 2.9 and 17.2 ± 2.5 kg) for, respectively F and N. FI had a positive and strong association with TEE measured by the monitor (r = 0.75, p = 0.01) and the number of steps (r = 0.75, p = 0.02) and a negative strong correlation with ST (-0.85, p<0.01) in F Group. In the NF group the FI had a strong negative association with the performance in SPPB (ϱ= -0.60, p = 0.04) and the handgrip strength (ϱ = -0.67; p = 0.02). However this could be explained by a gender difference. Conclusions: In this study, F older persons fragmented less their sedentary time than NF, staying uninterruptedly inactive for longer. Within this group, however, those with higher activity (TEE/Number of steps) have also a more fragmented sedentary time. Further studies are needed in order to explain this finding. Funding: This study was funded by FAPESP, São Paulo Research Foundation, process number 2011/50768-7.

P57- FEASIBILITY OF TOOLS FOR SCREENING AND DIAGNOSIS FRAILTY. J. Gonzales[1], M. Checa[1], C. Palumbo[1], J.A. Carnicero[1], J.J. Solano[2], R. Bernabei[3], A. Sinclair[4], A. Scuteri[5], L. Rodriguez Mañas[1] *(1. Madrid, Spain; 2. Asturias, Spain; 3. Milano, Italy; 4. Luton, United Kingdom; 5. Roma, Italy)*

Background: The current aging of the population is increase that never before achieved. One of the most important characteristics of this group is the heterogeneity among individuals, finding robust, pre frail, frail and disabled. Frailty is a syndrome very studied and currently is the main risk factor for develop disabled en elderly people and other adverse outcomes such as hospitalization, falls, institutionalization and death. Although frailty is often studied in the elderly population in the community, in our study we will be done in hospitalized patients. The FRAILCLINIC project aims to determine the feasibility and effectiveness of implementation a program who detect frailty in different clinical settings. In this paper we will focus on evaluated the feasibility to passing some tools for screening frailty in different clinical settings. Methods: Observational, cross-sectional study in six different hospitals from three European countries (Spain, Italy and the United Kingdom) in different clinical settings (Emergency Room, Cardiology, Elective Surgery, Urgent Surgery and Oncology). Patients 75 years and older attended at any of those settings were included. Participants with a Barthel Index lower than 40 points, severe cognitive impairment (Global Cognition Scale >6) and institutionalized were excluded from the study. General frailty tools used for assessing frailty were Frailty Phenotype criteria (CHS), FRAIL Scale, Tilburg Frailty Indicator, Groningen Frailty Indicator and Rockwood Modified Scale. In addition, some specific tools were used in Oncology (Balducci criteria, VES13 Scale, G8 criteria, and in the Emergency Room (ISAR Scale). Results: A total of 609 participants were included, 118 came from the Emergency Room (ER), 221 from Cardiology ward, 115 from Elective Surgery, 65 form Urgent Surgery and 50 from Oncology ward. The feasibility of Fried phenotype was modified according to the clinical setting. The service with the highest rate of full implementation was Elective Surgery (87.74%) and the service with the lowest implementation was Urgent Surgery (12.31%). Frail scale had and optimal viability; 98.52% of the participants responded to all the questions of the 5 domains. The participants with fewer responses were those from Emergency Room, even though the scale could be implemented in a 94.07%. In Urgent Surgery and Oncology Frail Scale could be completed in all patients. The feasibility of Tilburg Frailty Indicator was 92.45%. In the Oncology Department, all participants fulfilled the scale while in Emergency Room was 85.59%. Groningen Frailty Indicator showed a global viability of 91.3%, but this percentage decreased in Cardiology and Emergency Room (86.43% and 85.59% respectively). Rockwood modified scale (Clinical Frailty Scale) did not show problems of implementation, with a 100% viability in all settings. ISAR Scale is a specific tool for Emergency Department. 93.22% of the patients passed the full scale. Balducci Scale had a very high feasibility (98% of the subjects answered the questionnaire). In the same way, G8 Scale and VES 13 showed a very good feasibility (98% both). Conclusion: Fried criteria showed the lowest feasibility comparing to the rest of the tools, we show that scale is a good diagnostic tool for frailty in a medical consultation (elective surgery) because implement this tool hasn´t environmental limitations (i.e. lack of space for performing walking test) or measure grip strength compared to other clinical settings and normally the patients have a good health in that time. The feasibility of passing the other scales in all clinical settings is possible because do not require a measurement that includes functional assessment as walking speed or do grip strength and in many cases the scales have simple direct questions and the information can be provided by another person such as family or caregiver.

P58- IS FOLLOW UP TIME MISLEADING CLINICIANS ABOUT BODY COMPOSITION CHANGES IN MEN AND WOMEN AGED 70 YEARS AND OVER? G. El Hajj Boutros[1], P. De Souto Barreto[2], M. Cesari[2], S. Andieu[2], D.L. Waters[3], B. Vellas[2], Y. Rolland[2], M. Aubertin-Leheudre[1] *(1. Montréal, Canada; 2. Toulouse, France; 3. Dunedin, New Zealand)*

Background: Body composition changes occurring during the "normal" aging are associated with functional deficits. Epidemiological studies have shown that LBM and MS decline, and fat mass (FM) increase after the age of 50 years and accelerate after the age of 70 years. It has been observed that muscle mass, strength or quality indices (such as LBM/height(m2) or MS/Body weight or MS/MM) are better predictors of functional capacity than absolute values. However, there is a disagreement between the characteristics of older persons willing to participate in RCTs (and randomized in them) and those taking part to epidemiological studies. Since sample size calculations are often based on these latter, biased estimations of statistical power in the design of future RCTs are frequent. In other words, if sample size analyses will be conducted on the basis of data retrieved from a population similar to that to be later randomized, the chances of success for the RCT will be improved. To our knowledge, no study has specifically examined the evolution of body composition (absolute and relative) parameters in a population taking part to a RCT. Thus, the aim of this study is to describe the body composition modifications occurring over 1, 3 and 5 years in a sample of community-dwelling older persons recruited in a clinical trial. Methods: A total of 320 men and women aged 70 years and older were recruited to participate in a 5-year randomized controlled trial (The GUIDAGE Study). Annually, anthropometrics (weight, height, BMI) and body composition (DXA total leg and appendicular LM and FM) measurements were assessed. Participants were divided into three sub-groups based on the number of completed follow-up visits. The first group (Group-1; mean age: 76 years, mean MMSE: 28.3/30) included 122 men and 198 women who completed at least two consecutive measurements (baseline and 12 months). The second group (Group-3; mean age: 75.5 years, mean MMSE: 28.4/30) included 105 men and 159 women who completed at least four consecutive measurements (baseline,12, 24 and 36 months). The third group (Group-5; mean age: 75.1 years, mean MMSE: 28.4/30) included 82 men and 126 women with at least six consecutive measurements (baseline,12, 24, 36, 48 and 60 months). The drop out rate was 0%, 17.5% and 35% in Group1, Group3 and Group5, respectively. Relative indices (Leg LM/BW; Leg LM/height (m2), FM/BW and FM/height (m2)) were calculated. Results: There were no differences in BMI between the three groups of men and women. Regarding absolute total LBM, no changes were observed in Group-1 of women (p=0.19). However, there was a significant decrease in the total LBM for Group 3 (delta: -0.52, p<0.001) and Group 5 (delta: ; -1.05, p<0.001) of women. A significant increase was observed in leg (delta: +0.74, p<0.001; +0.51, p<0.001) and appendicular LM (delta: +0.74, p<0.001; +0.24, p<0.001) for Group 3 and Group 5, respectively. In men, there was a change of total LBM in all groups. Similarly to the women, leg LM (delta changes: +0.67, p<0.001; +0.64, p<0.001) increased significantly in Group 3 and Group 5, respectively. Appendicular LM increased significantly only in Group 3 (delta change: +0.43, p=0.031). Men and women were similar for absolute total FM. There was no significant change in Group 1. A significant increase in total FM was reported in Group 3 and Group 5 in both women and men. Regarding relative LM indices, Leg LM/BW and Leg LM/height (m2), seems to change similarly in men and women. However, both indices increased

in participants included in Group-3 and Group-5, whereas it decreased in Group-1 of men (delta changes:-0.15,p=0.012) and women (delta changes:-0.016,p=0.048). Regarding relative FM indices, no changes appear in Group-1 of men and women. However, total FM/BW and total FM/height (m2) changed significantly in men and women for Group-3 and Group-5. Both indices increased in Group-3 and Group-5 for men (delta changes:+0.40, p<0.001) 1) and women (delta changes:+0.27, p<0.001 ; +0.44, p<0.001). Total FFM/total FM decreased significantly in Group-3 (- 0.17/-0.10; p<0.001) and Group-5 (-0.3/-0.1; p p<0.01 in men and women but only in women in Group-1 (- 0.02;p=0.030). Conclusion: BMI is not a good clinical indicator of body composition changes. Finally, to be able to calculate accurately the sample size and the power effect needed, researchers need to be aware that depending of time the drop-out rate increased dramatically (from 0 to 35%) which could induced a bias in their conclusion or design since it is often healthier people who remain in the cohort. This study is the first to show that the evolution of body composition (absolute and relative) are different regarding the time of follow up. Thus clinicians need to be more cautious when they evaluate and follow the body composition of their patient and try to predict which patient is more at risk.

P59- IMPACT OF 12-WEEK POWER TRAINING ON MUSCLE FUNCTION IN ELDERLY MEN ACCORDING TO THEIR IGF1/IGFBP3 STATUS. G. El Hajj Boutros, C.H. Pion, M.C. Dulac, J.-P. Leduc-Gaudet, L. Pinheiro-Carvalho, M. Bélanger, S. Chevalier, G. Gouspillou, J.A. Morais, P. Gaudreau, M. Aubertin-Leheudre *(Montréal, Canada)*

Rationale: Aging is associated with a decrease in muscle mass, an increase in fat mass and a decline in skeletal muscle function. These changes can have deleterious consequences on functional capacities, mobility and autonomy. Interestingly, reduction in muscle mass and strength and/or gain in fat mass have been associated with decreased circulating levels of total insulin-like growth factor-1 (IGF-1) and IGF binding protein 3 (IGFBP3). Functional impairments have been associated with decreased circulating levels of IGF-1 and IGFBP3, mostly in women. Power training has been proposed as the more efficient training to improve muscle function and counteract functional capacity decline. Moreover, it has been demonstrated that muscle quality and muscle strength are the best predictors of functional capacity. Therefore, the aim of this study was to examine whether or not muscle adaption following a 12-weeks of power training (PT) in elderly men is dependent on IGF1/IGFBP3 molar ratio status. Methods: Fifty one elderly men completed the PT intervention and were divided in 2 groups: IGF1/IGFBP3 positive change (IGF1/IGFBP3+; n=26; mean±SD age: 67±8 y; BMI: 26.2±2.9 kg/m2) and IGF1/IGFBP3 negative change (IGF1/IGFBP3-; n=25; age: 70±4; BMI: 25.9±3.9 kg/m2). IGF1/IGFBP3+ group was defined as positive delta change in IGF1\IGBP3 molar ratio following the PT intervention and IGF1/IGFBP3- group as negative delta change in IGF1\IGBP3 molar ratio. Lean body mass (LBM; DXA), muscle strength (MS: knee-extension (KES)), muscle quality (KES/Leg-LM;), functional capacity (4-meter gait speed (GS), stair and chair stand tests), aerobic capacity (6 min walking test (6-MWT)), circulating levels of insulin, glucose (HOMA and QUICKI indices), total IGF-1 (ng/ml), IGFBP3 (µg/ml), adiponectin (µg/ml) and leptin (ng/ml) levels were measured by ELISA before and after a 12-week power training intervention (PT; 3 times/w; 1h/session; tempo: 0-0-2). Power training consisted of 4 power and 6 functional exercises. Mann-Whitney tests were used for baseline and changes (post-pre intervention, in %) and non-parametric paired t-tests evaluated within group PT intervention. P< 0.05 was considered significant. Results: At baseline (To), no difference (p>0.05) in age (70±4 vs 67±8 yrs), BMI (26.2±2.9 vs 25.9±3.9 kg/m2), body composition (total (52.4±4.4 vs 52.4±5.3 kg) or leg LM (18.6±1.8 vs 18.7±2.4 kg) or total FM (28.1±5.9 vs 25.2±7.2 %) muscle strength (KES: 136.7±43.1 vs 157.3±56.7 kg), functional capacities [GS normal (2.88±0.5 vs 2.88±0.5 sec), GS fast (1.82±0.33 vs 1.87±0.37 sec), chair test (21±4.2 vs 21.43±2.76 sec), stair test (31±5 vs 32±6 nb)] or blood levels of glucose (5.99±1.42 vs 6.16±1.93 mmol/L), QUICKI (0.38±0.04 vs 0.36±0.05) adiponectin (10.28±5.15 vs 10.46±7.25 µg/ml) and leptin (2.93±1.96 vs 2.35±1.52 ng/ml) were observed between groups. By design, IGF1 level and IGF1/IGFBP3 molar ratio increased significantly (data as % change) in IGF1/IGFBP3+ group (13.0±15.6 and 16.4±13.5 respectively) and decreased significantly in IGF1/IGFBP3- group (-8.1±8.8 and -12.4±7.3 respectively), with no change in IGFBP3 (-2.7±10.6 and 5.8± 16.7 respectively). As a response to the intervention, both groups IGF1/IGFBP3+ and IGF1/IGFBP3- significantly increased (data as % change; IGF1/IGFBP3+ and IGF1/IGFBP3 groups respectively) LBM (2.4±2.7 and 1.7±2.4); leg LM (3.6±4.4 and 2.4±2.7), KES-MS (33.1±23.1 and 37.8±19.0), KES-MQ (31.8±21.7 and 36.5±18.8), and improved functional capacities [normal GS (-4.8±10.8 and -9.2±11.4); fast GS (-5.2±10.6 and -6.2±9.8); chair test (-10.0±17.3 and -7.8±15.4); stair test (13±12 and 13±10)] and 6-MWT (6.0±6.9 and 3.1±5.5) (all p<0.05). Total FM decreased only in the IGF1/IGFBP3+ group (-2.4±11.7; p=0.008) whereas no significant change in IGF1/IGFBP3- group. No significant change was observed in both groups IGF1/IGFBP3+ and IGF1/IGFBP3- in glucose (-1.7±8.9 and 0.9±12.2), adiponectin (-9.1±23.9 and -3.7±49.7) or leptin (-4.4±35.6 and 8.0±60.4) serum levels. QUICKI increased significantly only in the IGF1/IGFBP3+ group (4.7±10.8; p=0.032). No differences in % change of the other variables measured were found between groups. Conclusion: Overall, both groups have beneficial effects on muscle function following a PT intervention, which confirmed that PT could be considered as effective intervention to counteract age-related muscle decline. A positive change in the level of somatotroph activity following a PT, as assessed by the IGF1/IGFBP3 molar ratio status, was associated with decreased adiposity and improve insulin sensitivity (QUICKI), which are also important for maintenance of functional capacities.

P60- L-ARGININE DELAYS THE ONSET OF MUSCULAR DYSTROPHY. G. Danialou *(Saint-Jean-sur-Richelieu, Canada)*

Introduction: Duchenne muscular dystrophy (DMD) is a lethal, X-linked disorder associated with dystrophin deficiency that results in chronic inflammation, sarcolemma damage, and severe skeletal muscle degeneration. Effective drug therapy for reducing or delaying the skeletal muscle weakness and necrosis could be a great hope for individuals suffering from DMD. Here we hypothesized that the early treatment of mdx neonatal mice with L- arginine could ameliorate muscular dystrophy. Methods: Seven days old animals were treated IP daily with 800 mg/kg of L-arginine (L-arg) or saline (control group) for six weeks. The hind limb skeletal muscle, the Tibialis Anterior (TA) was investigated. The following parameters were evaluated: the force generated, muscle resistance to mechanical stress, the level of centronucleation, detection of utrophine by immonostaining and western blot, creatine kinase (CK) activity and, nitric oxide (NO) production. Results: Our results show that: 1) TA weight and the percentage of centronucleation in L-arg treated animals were significantly lower than in control animals despite the fact that body weights were not different; 2) L-arg improved TA ability to resist injury caused by high- stress contractions; 3) CK level was two time higher in control animals compared to L- arg treated mice, however, this difference was not statistically significant; 4) NO

production was significantly higher in L-arg treated animals; 5) there was no evidence that the improvements observed in L-arg treated mice were associated with utrophin upregulation. Conclusion: Our data strengthen the usefulness of L-Arginine as a powerful pharmacological tool in Duchenne muscular dystrophies. However, the improvements observed were not associated with utrophin upregulation.

P61- IMPROVEMENT OF BEHAVIORAL AND PSYCHOLOGICAL SYMPTOMS OF DEMENTIA (BPSD) AND HIGHER CAREGIVER'S RECOGNITION OF THE RESPONSE CHANGE IN COGNITIVE FRAILTIES BY COMPREHENSIVE STANDARDIZED CARE METHODOLOGY. M. Ito, M. Honda *(Tokyo, Japan)*

Backgrounds: Most of developed countries are facing to rapid growing aging society. Despite of high quality care for dementia is crucial, many challenges for caregivers exist to provide the care. Typical difficulties are the refusal of care by person with moderate to severe cognitive impairment, especially who is in Behavioral Psychological Symptoms with Dementia (BPSD). Approach to the cognitive frailties has been taught as one of the fundamental components in the education of nursing. However, healthcare professionals are still struggling in care and it is directly related to resign of caregivers due to job-related burnout. A multimodal comprehensive French-origin care methodology for vulnerable elderlies, Humanitude, focuses on their perception, emotion and verbal-nonverbal communication. In previous studies, the reduction of BPSD and reduction of caregiver's burnout by this methodology were reported. Further studies of detailed analysis of its effectiveness are needed. The Objectives of this study is to evaluate effectiveness analysis of the methodology, Humanitude, in a nursing home in Japan focusing on the recognition of the change in cognitive frailties. Methods: Study design: Prospective, two-arm, clinical pilot study in two wards of a single clinical site. The study was conducted at a long-term care facility in Japan. Forty one caregivers were enrolled and divided into two arms. Nineteen caregivers were assigned to the intervention arm and twenty two were assigned to the control. The intervention arm had the lecture of the multimodal comprehensive care methodology, Humanitude. The training was consisted of 4 key structures with verbal and nonverbal communications, which contains the techniques of 1) to gaze, 2) to talk, 3) to touch and 4) to assist to erect position. Every care was to perform in one sequence constructed by 5 steps using the 4 key structures above comprehensively. The control arm continued their conventional care to their clients. Each arm worked for each ward. In the intervention ward, there were 13 clients with age over 75 years old and MMSE less than 20, while in the control ward 11 clients in the same characteristics. Both clients and caregivers were followed up at month 0, 1, 3. For the clients, BPSD was evaluated by behavioral pathology in Alzheimer's Disease Scale; BEHAVE-AD. The caregivers were evaluated about recognition of any change of the clients in narrative analysis. This study was approved by the institutional review board of Tokyo Metropolitan Institute of Gerontology, and Tokyo Medical Center. Results: In the intervention arm, average BEHAVE-AD score of the client at month 1 and 3 was -1.0 and -1.0 from the base line, while in the control arm was +2.9 and +3.1 respectively. There was significant improvement of BPSD in the intervention arm (two-way ANOVA, $p<0.05$). All 13 clients (100%) in intervention arm were described by caregivers that there was any change in communication or behavior, while 4 out of 11 clients (36.3%) were described in control arm. In comparison of caregivers in each arm, 54.7% of caregivers in intervention arm recognized change of clients, and 3.5% recognized the change in control arm, which showed significant difference (paired t-test, $p<0.001$). In the description about clients by caregivers, there are many recognitions of response changes in intervention arm to bedridden clients who did not show obvious response to caregivers at the study enrollment. Sub-analysis of clients who were recognized any change in communication or behavior, there was no significant correlation between change recognition by caregiver and BEHAVE-AD score of clients. Conclusion: A comprehensive multimodal care methodology was effective for improvement BPSD and brings care giver's higher recognition of client's response change in communications. It was especially obvious for the advanced cognitive frailty with bed ridden.

P62- THE MATTER OF HANDGRIP STRENGTH CUT OFF POINTS FOR SARCOPENIA DEFINITION C.H. Gonzalez-Correa, A. Millena López-Salazar, D. Gonzalez-Gonzalez *(Caldas-Manizales, Colombia)*

Background: Muscle Strength (MS) is a key parameter for sarcopenia definition. Lower MS has been associated with most adverse outcomes in elderly. It is measured by lower limbs or hand muscle strength. Both measurements are well correlated; however, handgrip strength (HGS) is more useful for assessing sarcopenia because it is simpler and cheaper than lower limbs strength. Due to HGS is associated with several variables such as ethnicity, gender, age, weight, height, hand size, hand dominance, and occupation, among others; results obtained in a specific population should be interpreted in comparison to reference values developed in people with similar conditions. Cut-off points depend upon the measurement technique chosen and on the availability of reference studies. Colombia does not have cut-off points based on normative populations. Although the European Working Group on Sarcopenia in Older People (EWGSOP, 2010) recommended the use of cut-off points at two standard deviations below the mean reference value of normative (healthy young adult) rather than other predictive reference populations, the suggested cut off points in this document were obtained from two specific small towns during an Italian study of sarcopenia prevalence. The data were differentiated by sex but not by age groups and dominance. Different authors have suggested using values that are below 85% of a chosen predictive population data set of reference values for the same purpose but taking into account the age group and dominance. Mathiowetz' reference values, developed in United States, are broadly used to interpret the HGS results. Hence, the aim of this study was to evaluate the level of agreement between classifications of HGS as normal or abnormal using both kind of cut off points to assess whether or not the diagnosis of muscle function changes substantially. Methods: This was an analytical cross-sectional descriptive study. A representative sample (n=203) recruited from the population aged 65-75 years living in Manizales-Colombia, was evaluated. The sample size was calculated based on data from the population census at the time of the study design. The following evaluations were conducted: personal clinical history as self report, HGS test, anthropometric measurements, skeletal muscle mass estimation by bioelectrical impedance analysis using reference values from NHANES III (1996), and the Short Performance Physical Battery (SPPB). The dominant hand was used for HGS test by using the American Society of Hand therapists (ASHT) protocol. Three 3 consecutive attempts with 30-seconds intervals were each measured in kilograms with a Baseline 12-0247 Digital LCD Hand Dynamometer (Sammons Preston, Bolingbrook, IL, USA). Data were categorized as normal or abnormal and the Kappa coefficient was calculated. Afterwards, when data' normality was determined, the intraclass correlation coefficient (ICC) for statistical analysis was quantified. Results: The study subjects were 119 women and 84

men with mean age 69,6 ± 3 years. BMI was 25,4 ± 3,6 (kg/m2). The manual dynamometry values were 27.1 ± 9,11 Kg/force The overall score of SPPB was 9,9 ± 1,7 points. The overall rate of skeletal muscle mass index was 8,4 ± 1,8 kg/m2 ; (females 7,3 ± 0,9 and males 9,9 ± 1,0). The mean and SD of maximum grip strength from three trials of dominant hand aged from 65 to 75 years was 21.2 ± 5.3 kg/f in women and 35.6 ± 6.6 kg/f in men . The difference was significant (P < 0.001). The Kappa coefficient was 0.628 (SE of kappa = 0.061), the 95% confidence interval was 0.508 to 0.748. The strength of agreement was considered as 'good'. The ICC was 0.6282 and F between raters was 3.3723. Conclusion: Estimates of the prevalence of sarcopenia may change depending on cut-off points for normality or abnormality of the different parameters used in its definition. Further, cut-off points partially depend upon the availability of reference studies. Nevertheless, in this studied population, the use of cutoff points based on assessments made to populations of different origin had a degree of agreement regarded as good. However, more studies are needed to obtain reference values for our own populations in order to achieve a better accuracy when estimating prevalence of sarcopenia.

P63- IMPROVEMENT OF BEHAVIORAL AND PSYCHOLOGICAL SYMPTOMS OF DEMENTIA (BPSD) AND HIGHER CAREGIVER'S RECOGNITION OF THE RESPONSE CHANGE IN COGNITIVE FRAILTIES BY COMPREHENSIVE STANDARDIZED CARE METHODOLOGY. K.M. Ito, M. Honda *(Tokyo, Japan)*

Backgrounds: Most of developed countries are facing to rapid growing aging society. Despite of high quality care for dementia is crucial, many challenges for caregivers exist to provide the care. Typical difficulties are the refusal of care by person with moderate to severe cognitive impairment, especially who is in Behavioral Psychological Symptoms with Dementia (BPSD). Approach to the cognitive frailties has been taught as one of the fundamental components in the education of nursing. However, healthcare professionals are still struggling in care and it is directly related to resign of caregivers due to job-related burnout. A multimodal comprehensive French-origin care methodology for vulnerable elderlies, Humanitude, focuses on their perception, emotion and verbal-nonverbal communication. In previous studies, the reduction of BPSD and reduction of caregiver's burnout by this methodology were reported. Further studies of detailed analysis of its effectiveness are needed. The Objectives of this study is to evaluate effectiveness analysis of the methodology, Humanitude, in a nursing home in Japan focusing on the recognition of the change in cognitive frailties. Methods: Study design: Prospective, two-arm, clinical pilot study in two wards of a single clinical site. The study was conducted at a long-term care facility in Japan. Forty one caregivers were enrolled and divided into two arms. Nineteen caregivers were assigned to the intervention arm and twenty two were assigned to the control. The intervention arm had the lecture of the multimodal comprehensive care methodology, Humanitude. The training was consisted of 4 key structures with verbal and nonverbal communications, which contains the techniques of 1) to gaze, 2) to talk, 3) to touch and 4) to assist to erect position. Every care was to perform in one sequence constructed by 5 steps using the 4 key structures above comprehensively. The control arm continued their conventional care to their clients. Each arm worked for each ward. In the intervention ward, there were 13 clients with age over 75 years old and MMSE less than 20, while in the control ward 11 clients in the same characteristics. Both clients and caregivers were followed up at month 0, 1, 3. For the clients, BPSD was evaluated by behavioral pathology in Alzheimer's Disease Scale; BEHAVE-AD. The caregivers were evaluated about recognition of any change of the clients in narrative analysis. This study was approved by the institutional review board of Tokyo Metropolitan Institute of Gerontology, and Tokyo Medical Center. Results: In the intervention arm, average BEHAVE-AD score of the client at month 1 and 3 was -1.0 and -1.0 from the base line, while in the control arm was +2.9 and +3.1 respectively. There was significant improvement of BPSD in the intervention arm (two-way ANOVA, $p<0.05$). All 13 clients (100%) in intervention arm were described by caregivers that there was any change in communication or behavior, while 4 out of 11 clients (36.3%) were described in control arm. In comparison of caregivers in each arm, 54.7% of caregivers in intervention arm recognized change of clients, and 3.5% recognized the change in control arm, which showed significant difference (paired t-test, $p<0.001$). In the description about clients by caregivers, there are many recognitions of response changes in intervention arm to bedridden clients who did not show obvious response to caregivers at the study enrollment. Sub-analysis of clients who were recognized any change in communication or behavior, there was no significant correlation between change recognition by caregiver and BEHAVE-AD score of clients. Conclusion: A comprehensive multimodal care methodology was effective for improvement BPSD and brings care giver's higher recognition of client's response change in communications. It was especially obvious for the advanced cognitive frailty with bed ridden.

P64- THE IMPACT OF PHYSICAL EXERCISE PROGRAMM OF MODERATE INTENSITY UPON NEUROENDOCRINE AXIS, MYOARTOKINETIC SYSTEM AND CLINICOFUNCTIONAL PARAMETERS IN ELDERLY PATIENTS. C.R. Revnic[1], A.S. Nica[1], C. Pena[1], F. Revnic[1], S. Voinea[1], B. Paltineanu[2] *(1. Bucharest, Romania; 2. Mures, Romania)*

Background: Ageing can be accounted for as a decrease in resistance to human growth hormone(hGH),in a certain way as type II Diabetes which is accounted for a decrease to insulin resistance.The lack of physical activity plays an important role in body composition and the metabolic status could related to GHRH/GH/IGF1 axis.hGH represents the locomotive which pulls out all the other hormones during aging. Hormones levels could be controlled by drugs prescription,by means of physical exercises programs,as well as by dietary suppliments. The aim of study:Evaluation of a standard physicalexercise program of moderate intensity upon hGH,secretion, upon glucose levels and lipolitic action as well as upon skeletal muscle function. Material and method: 24 pacients aged between 45-78 years old admited in Rehabilitation Clinique for osteoarticular and postraumatic pathologies able to perform a 30 minutes physical exercise programm for 6 weeks,five times a week according to the published protochol.12 active patients free of pathology belong to Control(group A) and 12 sedentary patients associated with obesity and lack of physical activity were included in group B. hGH levels in group A and B have been evaluated before and after training with a DELFIA 1234 Research Spectrofluorimeter using Eu+ labeled kits purchased from Pharmacia LKB.The parameters of glucose and lipid metabolism as well as the levels of CK si CKMB have been evaluated before and after training with a Beckman Multyanaliser.Evaluation of muscle strength/efficiency has been performed for biceps and triceps muscles with Scwartzer-Picker 2000 Electromyograph. Results: Our data have pointed out lower hGH levels in elderly sedentary and obese patients from group B,accompanied by high glucose,cholesterol ,triglycerides and total lipids levels. Following 6 weeks physical training programm,there was an increase in hGH serum levels in group B accompanied by an increase in muscle strength and by a reduction in

glucose cholesterol,total lipids and triglyceride serum levels as well as a reduction in CK and CKMB enzymes levels. Conclusions.Our data have pointed out that the decline with aging in hGH serum levels is not irreversible and that physical training is one of the modalities of stimulating hypothalamus and anterior hypophysis to secrete hGH in the elderly.hGH may reverse the aging clock,manifesting a lypolitic and metabolic activity,increasing the muscle strength with a positive effect upon elderly self esteem ,increasing patients quality of life and life expectancy.

P65- ASSESSMENT OF POSTURAL CONTROL COMPLEXITY IN THE FRAILTY SYNDROME BEFORE AND AFTER THE EXECUTION OF A FUNCTIONAL TASK. A.C. de M. Takahashi[1], V. de V. B. Carmelo[1], M.S.S. Buto[1], A.M. Catai[1], A. Porta[2] *(1. São Paulo, Brazil; 2. Milano, Italy)*

Backgrounds: The Frailty Syndrome is recognized as a condition of pre-disability, having high prevalence with increasing age and it is associated with increased risk of adverse outcomes, such as falls. This outcome is related to an impairment in postural control and it has high occurrence during postural transition. Postural control can be evaluated by complexity analysis. This type of assessment may be useful in the frailty syndrome, since the loss of physiological complexity is also related to the frailty process. Thus, the aim of this study was to evaluate the complexity of postural control in nonfrail, prefrail and frail elderly, before and after sitting and rising up from a chair. Methods: The oscillations of the center of pressure (CoP) in the anteroposterior (AP) and mediolateral (ML) direction were obtained from a force platform ((BERTEC, sampling frequency: 100 Hz). The assessment of balance started with the subject in a quite-standing position for 30 seconds (pre). Then the subject sited in a chair and rose up, remaining in the quite-standing position for 30 seconds (pos). The data were processed by MATLAB software. The complexity of the signal was analyzed by approximate entropy (ApEn) and the normalized version (NapEn). For statistical analysis 2-way ANOVA repeated measures was performed and the effects: group (frail, prefrail and nonfrail), time (pre and post sitting and rising up) and the interaction between the effects for anteroposterior and mediolateral direction were evaluated. Results: It was evaluated 42 elderly who were allocated in groups: nonfrail (n=15; 75.60 ± 4.18 years), prefrail (n=15; 78.87 ± 6.76 years) and frail (n=12; 72.98 ± 19.17 years). In anteroposterior direction, it was observed only moment effect: prefrail and nonfrail groups demonstrated a significant decrease post functional task for ApEn and NApEn analysis (nonfrail: ApEn pre: 1.11 ± 0.07, ApEn pos: 0.99 ± 0.07; NApEn pre: 0.48 ± 0.03, NApEn pos: 0.43 ± 0.03; prefrail: ApEn pre: 1.16 ± 0.07, ApEn pos: 1.01 ± 0.07; NApEn pre: 0.51 ± 0.03, NApEn pos: 0.44 ± 0.03; frail: ApEn pre: 0.95± 0.08, ApEn pos: 0.95± 0.08; NApEn pre: 0.42 ± 0.03, NApEn pos: 0.41± 0.03). In mediolateral direction, only nonfrail group demonstrated significant decrease post functional task for the ApEn and NApEn analysis (nonfrail: ApEn pre: 1.23 ± 0.09, ApEn pos: 1.09 ± 0.09; NApEn pre: 0.54 ± 0.04, NApEn pos: 0.48 ± 0.04; prefrail: ApEn pre: 1.25 ± 0.09, ApEn pos: 1.16 ± 0.09; NApEn pre: 0.55 ± 0.04, NApEn pos: 0.51 ± 0.04; frail: ApEn pre: 1.08 ± 0.10, ApEn pos: 1.06 ± 0.10; NApEn pre: 0.47 ± 0.04, NApEn pos: 0.46 ± 0.04). The frail group showed no reduction in entropies after all the situations from both the AP and ML direction. Conclusions: The results demonstrated that there is a reduction in complexity after rising from a chair only for the nonfrail and prefrail groups. This reduction after the motor functional activity of rising up from a chair demonstrates that postural control becomes less automatic, possibly due to the subjects have devote more attention to the postural control system after the disturbance of postural change. This mechanism may reduce the risk of falls, noting that many falls occur in situations of postural transition. The complexity reduction is not observed in the frail group compared to the other groups, possibly because their entropies values were already lower before the functional task. Financial support: CAPES-PVE: 23028.007721/2013-4, CNPq: 479769/2013-3 e CAPES.

P66- SARCOPENIA AND ITS ASSOCIATED FACTORS IN IRANIAN OLDER INDIVIDUALS: RESULTS OF SARIR STUDY. G. Shafiee[1], R. Heshmat[1], R. Hashemi[1], A.D. Motlagh[1], P. Pasalar[1], A. Esmailzadeh[2], F. Siassi[1], B. Larijani[1] *(1. Tehran, Iran; 2. Isfahan, Iran)*

Background: Sarcopenia, an age- related loss of muscle mass, is a significant associating factor for functional impairment among older adults. The aim of this study was to investigate the prevalence of and associated factors for sarcopenia and severe sarcopenia among older adults in Iran. Methods: A total of 300 individuals aged over 55 years were randomly participated from the 6th district of Tehran, Iran, in 2011.Sarcopenia was defined according to the European Working Group on Sarcopenia in Older People (EWGSOP) algorithm. The skeletal muscle mass was assessed using DXA. Appendicular skeletal muscle mass (ASM) was measured for each participant as the sum of upper and lower limb muscle mass (kg) according to DXA results. The muscle mass index was then calculated as: Muscle Mass Index=(Appendicular SkeletalMuscle)/(Height^2). Following the cut off points recommended by the EWGSOP, the muscle mass values of less than 5.45 (kg/m^2) for women and 7.26 (kg/m^2) for men were considered low. Muscle strength and muscle performance were assessed according to hand grip strength and 4-meter usual walking gait speed test. Based on this definition those with low ASM were considered as pre-sarcopenia. The pre-sarcopenic cases with either low hand grip or low muscle performance were considered as sarcopenia; and the pre-sarcopenic cases with both low hand grip and low muscle performance are considered as severe sarcopenia. A logistic regression analysis was performed. Results: The prevalence of presarcopenia, sarcopenia, and severe sarcopenia and were 52.7%, 20.7%, and 6%, in men and 25.3%, 15.3%, and 5.3% in women, respectively. The prevalence of sarcopenia was higher in men older than 75 years than women in the same age range (36.7% vs. 20%, respectively). The mean±SD values of sarcopenia variables were as follows: ASM/h2, 7.19±0.75 kg/m2 and 6.06±0.87 kg/m2 in men and women, respectively. Gait speed 0.89±0.21 m/s in men and 0.80±0.23 m/s in women and hand grip strength 13.62±2.91Psi and 8.60±2.13 Psi in men and women, respectively. The multiple logistic regression models of the risk factors for sarcopenia staging are shown that the coefficient of age is greater than 1 which indicates getting older increases the odds of sarcopenia. Similarly, men seem to have higher odds of sarcopenia in all models .None of the factors such as waist circumference, systolic blood pressure, History of diabetes and diastolic blood pressure show significant association in any of the models. Smoking is in general raises the odds of sarcopenia in all the models but the association is only significant in models 2 and 3 [OR= 1.89 (95% CI: 1.01-3.56), OR= 2.71 (95% CI: 1.21-6.09)]. As expected the higher BMI lowers the odds of sarcopenia in all models[OR=0.47 (95% CI: 0.36-0.62), OR= 0.58 (95% CI: 0.47-0.72), OR=0.46 (95% CI: 0.33-0.64), OR= 0.50 (95% CI: 0.35-0.71)]. So, using multiple logistic regression models, age, sex, smoking, and body mass index (BMI) were independently associated with different stages of sarcopenia. Conclusions: The prevalence of sarcopenia is high in Iranian older adults. The older age, men sex, smoking and lower BMI were independently associated with presarcopenia, sarcopenia and severe sarcopenia.

P67- DOES EXCITATORY BRAIN STIMULATION ENHANCE ELBOW FLEXOR MUSCLE STRENGTH IN THE ELDERLY? K. Oki, L.A. Clark, S. Amano, R. Clift, T.D. Law, B.C. Clark *(Ohio, USA)*

Background: We have previously reported that the elderly exhibit diminished levels of cortical excitability (McGinley et al., Exp Gerontol, 2010), and weaker seniors with motor cortex hypoexcitability have impaired levels of voluntary (i.e., neural) activation (Clark et al., J Gerontol A Med Sci, 2015). Accordingly, we hypothesized that raising motor cortex excitability via anodal transcranial direct current stimulation (tDCS) would transiently increase muscle strength in the elderly. Methods: The objective of this pilot study was to determine whether 20-minutes of anodal tDCS applied to the motor cortex of older adults (n=5; 85.0±4.4 years) acutely increased elbow flexor muscle strength when compared to a sham stimulation condition. We used a within-subjects design where all participants elbow flexor strength (3 trials) was tested before and after receiving the anodal tDCS treatment or a sham treatment. The order of the treatments was randomized, and the study participant and laboratory staff were blinded to stimulation condition. Voluntary activation was also quantified on a separate laboratory visit using the interpolated doublet technique. Results: The anodal tDCS condition did not increase muscle strength relative to the sham condition (p=0.865). More specifically, the anodal tDCS condition resulted in a 0.2±2.2% increase in strength following the anodal tDCS treatment, whereas the sham stimulation condition resulted in a 0.7±4.5% reduction in strength. Elbow flexor voluntary activation levels were near maximal (99.96±0.04%). Conclusions: These results, while preliminary, suggest that the application of excitatory brain stimulation does not transiently bolster elbow flexor muscle strength in the elderly. However, the older adults tested in this study demonstrated near optimal levels of voluntary activation, which may explain our inability to observe a transient enhancement of strength. Further work is warranted to determine the effects of excitatory brain stimulation on muscle strength in muscle groups or individuals with impairments in voluntary activation. Acknowledgements: This work was funded by a grant from the National Institute on Aging/National Institutes of Health's (R01AG044424 to BC Clark).

P68- EVALUATION OF THE INTRA-INDIVIDUAL VARIABILITY OF MYOSTATIN AND ACTIVIN A, TWO BIOMARKERS OF SARCOPENIA: IMPACT ON THE LEAST SIGNIFICANT CHANGE AND FOLLOW-UP OF THE PATIENTS. E. Cavalier, C. Piron, F. Watar, S. Kovacs, C. Beaudart, F. Buckinx, O. Bruyère, C. Le Goff, J.-Y. Reginster *(Liège, Belgium)*

Introduction: Myostatin (MYO) and Activin A (AA) are muscle growth inhibitors that act via the ActR/TGFβ receptors, followed by phosphorylation and activation of transcription factors Smad2/3. These biomarkers may be useful to help in the diagnosis of sarcopenia, to follow the diagnosed patients or to observe the impact of a treatment. For such a purpose, knowing the Least Significant Change (LSC) would be mandatory. Indeed, this parameter, that takes into consideration the analytical variability (CVa) and the intra-individual biological variability (CVi) can help to decipher whether a biologically significant change has occurred between two measurements in the same individual, with a given probability. For memory, the LSC formula is $LSC=SQR(2)*1.96*SQR(CVa^2+CVi^2)$. We have recently shown that the R&D assays presented a CVa of 7 and 8%, for AA and MYO, respectively, but no data was to date available for the CVi of both analytes. Material and methods: Twenty-two healthy young laboratory technicians (11 males, 11 females, 29.7±4.6 years old) gave informed consent and were included in the study. At 08:00 AM, a blood sample was obtained while they were still in a fasting status. They were offered a standardized breakfast and then underwent a second blood sampling at 12:00. They were allowed to drink 500 mL of a poorly mineralized water between the two samplings, but were not allowed to eat any food. This study took place on the Mondays, Wednesdays and Fridays of two consecutive weeks of December. All the samples were processed immediately and frozen at -80°C for not more than 1 month. The assays were run with the R&D MYO and AA ELISA, in duplicate, in the same series and by the same experienced technician to minimize any other sources of variations. We used the one way analysis of variance to estimate the CVi of both parameters. Results: Mean values obtained in the population were of 236.5±58.7 pg/mL and 3106±1030 pg/mL for AA and MYO, respectively. CVi was quite similar for both biomarkers: 12.3% for AA and 13.3% for MYO. This led to a LSC of 39 and 42% for AA and MYO, respectively. Conclusions: LSC is mandatory to decipher whether a change occurred between two measurements of biomarkers is significant or not. In this study, we established the LSC for AA and MYO, two promising biomarkers of sarcopenia. Our data show that if this change is not higher that ≈40%, it means that it is only due to random and cannot be considered as significant, with a probability of 95%. This information will be most useful for the follow-up of the patients.

P69- FRAILTY AND GENETIC LONGEVITY MARKERS IN CENTENARIANS OFFSPRINGS; PRELIMINARY RESULTS OF A CASE-CONTROL STUDY IN LA RIBERA COUNTY (VALENCIA, SPAIN). A. Belenguer-Varea, J.A. Avellana Zaragozá, F.J. Tarazona-Santabalbina, P. Sanchis Aguilar, J. Viña *(Valencia, Spain)*

Introduction: Clinical and genetic variables associated with humans increased longevity have been studied. First-degree offsprings of centenarian subjects can be considered genetically enriched for extreme longevity. Observational studies are needed to verify these associations and explore its relationship with variables that reflect the functional status of the elderly. Objective: To determine if the elders offsprings of centenarians have a lower frailty prevalence. Method: A case-control study was designed. 68 subjects were enrolled between January 2nd, 2014 and June 30th, 2015 in La Ribera county (Valencia, Spain). Cases were subjects with first-degree offsprings of centenarians and controls were subjects without this familiar characteristic matched for gender, place of birth and age ± 5 years. Results: Preliminary sample was composed by 34 subjects in each group (case and control groups). 59,8% of the sample were women, and average age was 69,6 (SD 4,1) years old. Frailty risk relative in first-degree offsprings of centenarians was 0,33 (95%IC 0.11-0.98, p value=0.045). Conclusion: Genetics can play a role in transmission of functional status in elderly people. Our provisional results suggest that elderly theoretically genetically enriched for extreme longevity have a more beneficial functional profile, which would suggest an heritable component.

P70- THE EFFECT OF A MULTICOMPONENT EXERCISE PROGRAM ON FUNCTION AND COGNITION IN ELDERLY FRAIL PATIENTS ADMITTED IN AN ACUTE GERIATRIC UNIT. A. Casas Herrero, M. Izquierdo, F. Zambom Ferraresi, J. Alonso Renedo, M. López-Sáez de Asteasu, N. Martínez Velilla *(Pamplona, Spain)*

Background: Frail older adults have reduced functional and physiological reserves, rendering them more vulnerable to the effects

of hospitalization, which frequently results in failure to recover from the pre-hospitalization functional los, new disability or even continued functional decline. Alternative care models with an emphasis on multidisciplinary and continuing care units are currently being developed. Their main objective, other than the recovery of the condition that caused admission, is the prevention of functional decline. Many studies on functional decline have discussed the available evidence regarding the effectiveness of acute geriatric units. Despite the theoretical support for the idea that mobility improvement in the hospitalized patient carries multiple benefits, this idea has not been fully translated into clinical practice. Methods: Randomized clinical trial conducted in 102 patients admitted in a Geriatrics Acute Unit of a tertiary public hospital located in Pamplona (Spain). Hospitalized patients who met inclusion criteria (75 years and older, medical stable, frail or prefrail – SPPB 4-9-, previous ability to walk, able to communicate) were randomly assigned to the intervention or control group. The intervention consisted of a multicomponent exercise training programme, composed of supervised progressive resistance exercise training at low-moderate intensities, balance-training, and walking for 5–7 consecutive days. During the training period, patients were trained in 20 min sessions twice a day (morning and evening). Evaluations of functional capacity (SPPB, Gait velocity, gait velocity under dual task conditions, Barthel index), strength and power assessments (maximal isometric force of handgrip, knee extension and hip flexion , 1RM -leg press, chest press and knee extension-, muscle power at 50% 1RM in leg press) cognition (MMSE, TMT-A, Isaacs test), pain (categorical scale), depression (GDS Yesavage 15), quality of life (EQ-5D) were conducted at admission and previous to discharge in the control and intervention group . BMI, Cumulative Illness Rating Scale for Geriatrics (CIRS-G), nutritional assessment (MNA) and diseases considered to be grouped by ACG of Salisbury and CIE 10 codes were registered at admission in both groups. Results: 92 completed pre/post evaluations (control group (CG) n= 48, intervention group (IG). n=44), Dropout was 9.8% due to different medical reasons (10 participants) Mean age 86.84 (CG 86.64, IG 87.06), mean BMI 27.07 (CG 26.63, IG 27.07), mean CIRS-G 11.95 (CG 11.22, IG 12.75), mean MNA 23.57 (CG 23.21, IG 23.97). In the IG, significant improvements were observed after the intervention in all strength and power assessments (hand grip, knee extension, hip flexion, muscle power 50 % RM, p<000.1) and functional capacity parameters (SPPB, Gait velocity , gait velocity with dual task conditions, p<0.0001) except for the Barthel index (p, 0167). Significant improvements were observed also in cognition (MMSE, p<0001, TMT-A p <0.05, Isaacs test p<0.0001), depression (GDS Yesavage p<0.05), quality of life (EQ-5D p<0.0001) and pain (p<0.05). In contrast, in the CG, no significant improvements after evaluations were detected in any of the strength, functional, cognitive, mood or quality of life parameters studied. Conclusions: A multicomponent exercise program, with special emphasis in progressive resistance training, is an effective therapy to improve functional capacity, cognition, mood disorders and quality of life in frail patients admitted to an Acute Geriatric Unit . Individualized an planed exercise programs should be prescribed routinely in all frail patients admitted to hospitals, as same as other medical treatments, in order to prevent functional and cognitive impairment.

P71- ADDITIVE EFFECT OF DYNAPENIA AND ABDOMINAL OBESITY ON BLOOD PRESSURE, LIPID AND GLUCOSE METABOLIC PROFILE, METABOLIC SYNDROME AND CARDIOVASCULAR DISEASES IN OLDER ADULTS.

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(1. São Carlos, Brazil; 2. Campinas, Brazil; 3. São Paulo, Brazil; 4. Montreal, Canada; 5. Ribeirão Preto, Brazil)

Background: Dynapenia, decreased muscle strength related to age, and obesity are major risk factors associated with physical functional decline and mortality in older adults. However, there is still little evidence that dynapenia and obesity, defined as dynapenic obesity, has additive effect on blood pressure, lipid and glucose metabolic profiles, metabolic syndrome and cardiovascular diseases. Thus, the aim of this study is to assess the additive effect of dynapenia and abdominal obesity on blood pressure, lipid and glucose metabolic profiles, metabolic syndrome and cardiovascular diseases in elderly people living in São Paulo. Method: This is a cross-sectional study involving 1,124 elderly participants of the third wave of the Health, Well-being and Aging Study (SABE Study; 2010) which were classified as: (0) non-dynapenic / non-abdominal obese (ND/NOA; n=392; W:190/M:202); (1) non-dynapenic / abdominal obese (ND/OA; n=432; W:345/M:87); (2) dynapenic / non- abdominal obese (D/NOA; n=171; W:75/M:96); and (3) dynapenic / abdominal obese (D/OA; n=129; W:116/M:13); based on waist circumference (WC) (≥ 102 cm for men and ≥ 88 cm for women) and handgrip strength (< 26 kg for men and < 16 kg for women). The dependent variables were: blood pressure (systolic blood pressure ≥ 130 mmHg; diastolic blood pressure ≥ 85 mmHg), lipid profile (triglycerides: ≥ 150 mg/dl; total cholesterol: ≥ 200 mg/dl; high LDL cholesterol: ≥ 100 mg/dl; low HDL cholesterol: <50 mg/dl for men and <40 mg/dl for men), fasting glucose (≥ 100 mg/dl) and glycated haemoglobin (≥ 6.5%) (glucose metabolism), metabolic syndrome, heart disease and stroke. The presence of at least three of the five following criteria were considered to have metabolic syndrome: (a) Waist circumference (≥ 102 cm for men and ≥ 88 cm for women); (b) Hypertriglyceridemia (≥ 150 mg / dl) or individuals using fibrates and/or omega-3 and/or nicotinic acid for the treatment of hypertriglyceridemia (Anatomical Therapeutic Chemical [ATC] Classification System codes C10); (c) low HDL cholesterol (<50 mg/dl for men and <40 mg/dl for men) or individuals using fibrates and/or nicotinic acid to increase HDL cholesterol (ATC Classification System codes C10); (d) High fasting glucose (≥ 100 mg/dl) or individuals using insulin and/or oral hypoglycemic agents (ATC Classification System A10 codes); e) Elevated systolic blood pressure (≥ 130 mmHg) and/or elevated diastolic blood pressure (≥ 85 mmHg) or individuals using antihypertensive medications (ATC Classification System codes C02, C03, C04, C07, C08, C09). Rao and Scott Wald test and chi-square test with Rao and Scott correction were performed to compare groups. Logistic regression was used to analyze the additive effect of dynapenia and abdominal obesity on blood pressure, lipid and glucose metabolic profiles, metabolic syndrome and cardiovascular diseases ($p < 0.05$ was considered significant). Results: D/AO (73.1%) and ND/AO (70.6%) groups had significant higher proportion of metabolic syndrome than ND/NAO (22.9%) and D/NAO (28.4%). D/AO and ND/AO groups had higher plasma concentrations of glycated haemoglobin than ND/NAO (6.2 and 6.2, respectively vs 6.0; $p < 0.01$). D/AO and ND/AO groups had higher plasma concentration of total cholesterol than D/NAO (209.1 and 209.1, respectively vs 197.9; $p < 0.05$). ND/AO group had higher plasma concentrations of glucose than ND/NAO and D/NAO (103.2 vs 96.45 and 103.2 vs 94.4, respectively; $p < 0.01$. D/AO and ND/AO

groups had higher plasma concentrations of triglycerides than ND/NAO (147.8 vs 125.7; $p < 0.01$; 150.0 vs 125.7 $p < 0.01$, respectively) and D/NAO (147.8 vs 120.3 < 0.01; 150.0 vs 120.3; $p < 0.01$). ND/AO group had higher diastolic blood pressure than ND/NAO (82.8 vs 80.7; $p < 0.05$); D/NAO (82.8 vs 76.4; $p < 0.01$) or D/AO (82.8 vs 80.0; $p < 0.01$). D/NAO and D/AO groups had significantly more heart disease than ND/NAO (33.7% vs 19.1%; $p < 0.01$; 34.5% vs 19.1; $p < 0.01$, respectively) or ND/AO (33.7% vs 20.1; $p < 0.01$; 34.5% vs 20.1%; $p < 0.01$, respectively). No difference between groups was found in HDL cholesterol plasma concentration and stroke. However, after adjusting regression models for confounding variables, there is an increased odds of D/OA group to present low plasma concentrations of HDL cholesterol (OR = 2.50, 95% CI: 1.36 - 4.60), hypertriglyceridemia (OR = 2.11, 95% CI: 1.18 - 3.78) and metabolic syndrome (OR = 9.20, 95% CI: 5.5 - 15.3) than ND/NAO, ND/OA and D/NOA. Conclusion: Our results showed that dynapenia when combined with abdominal obesity induced an additive effect on lipid profile and metabolic syndrome. Thus, public health strategies need to take care of elderly with D/OA and follow them closely to reduce lipid metabolism disorders, as well as prevent metabolic syndrome. Keywords: dynapenia, obesity, dynapenic obesity, metabolic syndrome, elderly, SABE Study.

P72- PROSPECTIVE ANALYSIS OF THE IMPACT OF PRETRANSPLANT SARCOPENIA ON SURVIVAL AFTER LIVER TRANSPLANTATION. T. Kaido, Y. Hamaguchi, S. Okumura, A. Kobayashi, S. Yagi, Y. Tamai, N. Inagaki, S. Uemoto *(Kyoto, Japan)*

Backgrounds: We reported that preoperative low skeletal muscle mass was an independent risk factor for survival after living donor liver transplantation (LDLT). The present study prospectively investigated the impact of pretransplant sarcopenia on survival after LDLT. Moreover, we examined sequential changes in sarcopenic parameters after LDLT. Methods: Seventy-two consecutive adult patients who underwent LDLT at our institute between January 2013 and October 2015 were enrolled in this study. Median patient age was 55 (range, 21-68), 38 (53%) were male, median MELD score was 18 (range, 6-41). Sarcopenia was assessed by the measurement of skeletal muscle mass (SMM) obtained by a multifrequency body composition analyzer (InBody 720®) and handgrip strength (HS). We defined patients with sarcopenia as those with low SMM (< 90% of the standard SMM) and low HS (< 26kg for men, < 18kg for women). The impact of pretransplant sarcopenia on short-term survival and sequential changes in sarcopenic parameters including SMM and HS were analyzed. Results: The overall survival rate in patients with preoperative sarcopenia (n=10) was significantly lower than that in patients without sarcopenia (n=62) (1-year overall survival rate; 56% versus 98%, resepctively) ($p<0.001$). SMM worsened after LDLT and did not recover to preoperative levels until 1 year after LDLT. In contrast, HS recovered to preoperative levels at 6 months after LDLT following sharp decrease at 1 month after LDLT. According to preoperative sarcopenia, postoperative HS in patients without sarcopenia tended to be lower compared to patients with sarcopenia, while postoperative SMM did not differ between patients with sarcopenia and those without sarcopenia. Conclusion: Prospective analysis clarified that pretransplant sarcopenia had negative impact on short-term survival after LDLT. The recovery of handgrip strength preceded that of SMM.

P73- PREVALENCE OF CONCOMITANT BONE AND MUSCLE WASTING IN PATIENTS FROM THE SARCOPHAGE STUDY. M. Locquet, C. Beaudart, J.Y. Reginster, J. Petermans, S. Gillain, A. Quabron, J.E. Slomian, F. Buckinx, O. Bruyère *(Liège, Belgium)*

Background: Recent studies suggest that bone and muscle wasting are closely interconnected. Dysfunctions of the "muscle-bone unit" generate an increased risk of morbid outcomes, i.e. injurious falls and fractures, physical disability, hospitalization, loss of independence and ultimately mortality. However, the relationship between age-related muscle and bone loss is not yet fully elucidated. Our objective is to assess the prevalence of osteoporosis (OP) in a population of individuals diagnosed with sarcopenia (Sp). Methods: We investigated women, aged 65 years old and above, for whom bone mineral density (BMD) was available at the time of inclusion in the SarcoPhAge (Sarcopenia and Physical Impairments with advancing Age) study. SarcoPhAge is an ongoing prospective study following community-dwelling elderly subjects to assess health and functional consequences of Sp. For this ancillary study, looking at the prevalence of low BMD in patients with or without Sp, women taking a pharmacological treatment against osteoporosis were excluded. Muscle strength was assessed with a hydraulic hand-dynamometer (Saehan Corporation, MSD Europe Bvba, Belgium), muscle mass (i.e., appendicular lean mass) and BMD by Dual-Energy X-Ray Absorptiometry (DEXA) (Hologic Discovery A, USA) and physical performance by the Short Physical Performance Battery (SPPB) test (/12 points). Sp was diagnosed according to the EWGSOP definition, i.e. a low muscle mass (<5.5kg/m^2 for women and <7.26kg/m^2 for men) plus either low muscle strength (<20kg for women and <30kg for men) or low physical performance (SPPB <8 points). A BMD T-score equal to or below -2.5SD at the lumbar spine or at the hip was used to define osteoporosis (World Health Organization definition). Results: 106 women aged 73.21±6.32 years with a BMD assessment at baseline were included. Among them, 22 where diagnosed with Sp (20.75%) and 19 (17.92%) with OP. After adjustment for potential confounders, a significant lower appendicular lean mass was observed in OP women compared to women without OP (5.32±0.65 kg/m^2 versus 5.91±0.78 kg/m^2, $p = 0.018$). We also observed, in OP subjects, a lower muscle strength (19.49±7.23 kg versus 22.28±6.08 kg, $p = 0.021$ after adjustment) and a lower physical performance (7.89±3.23 points versus 9.16±2.67 points, $p= 0.014$ after adjustment). There were more OP women among Sp subjects (36.4%) than among non-Sp subjects (13.1%) ($p=0.011$). Numerical values of BMD were lower in the Sp versus non-Sp populations but the differences did not reach the level of statistical significance: 0.968±0.224 g/cm^2 versus 0.998±0.186 g/cm^2 for the lumbar spine ($p=0.36$), 0.766±0.133 g/cm^2 versus 0.805±0.120 g/cm^2 for the total hip ($p=.016$) and 0.667±0.128 g/cm^2 versus 0.693±0.095 g/cm^2 for the femoral neck ($p=0.38$). Eventually, appendicular lean mass was positively and significantly correlated with lumbar spine, total hip and femoral neck BMD (respectively, $r=0.29$, $r=0.33$, $r=0.29$, $p < 0.05$). Conclusion: Muscle mass, muscle strength and physical performance are lower in patients presenting Op, defined by a low BMD. Prospective changes in bone and muscle wasting will be investigated during the follow-up of our cohort.

P74- QUANTITY AND QUALITY OF MUSCLE MASS IN URBAN CHINESE POPULATION. X. Zhao[1], W. Chen[2], S. Ge[1], B. Dong[3] *(1. Shanghai, China; 2. Beijing, China; 3. Chengdu, China)*

Backgrounds: Skeletal muscle mass plays an important role in health and nutrition researches. Loss of muscle mass has been included into the aspect of malnutrition characters. Sarcopenia, an aging related

loss of muscle mass and function, became gerontology study focus from recent decades. There were several consensus developed for sarcopenia diagnosis. However, there is lack of data of Chinese population, and there is few data showed the prevalence of sarcopenia in China. Therefore, we conducted the cross-sectional studies to understand the distribution of muscle mass quantity and quality in urban Chinese. Methods: Two cross-sectional observational studies were conducted to understand the distribution of muscle mass and muscle strength in Chinese urban populations. Study I, 423 community living young Chinese adults aged 25- 34 years were recruited for understanding peak muscle mass distribution measured by DEXA and BIA methods. Hand grip strength and anthropometrics were also measured. Study II, 2823 community based elderly Chinese (above 60 years old, 1/3 were 60-64 years old, and 2/3 above 65 years old) were recruited from Beijing, Chengdu and Shanghai. Muscle mass was measured by both BIA and DEXA methods. Hand grip strength, gait speed, anthropometrics, and quality of life were recorded as well. Results: The cut-off points developed from these two observational trials were: Muscle mass, by Skeletal Muscle Index, were 7.25 kg/m2 and 5.49 kg/m2 in males and females by DEXA or 7.83 kg/m2 and 5.97 kg/m2 by BIA method. The lower quartile of maximal hand grip strength were 30.4 kg and 19.8 kg in male and female elderly, respectively. The lower quartile of average gait speed (6 meters walk) were 1.1 m/s and 1.0 m/s in male and female elderly. The prevalence of sarcopenia in the study population was 12.5% in males and 10.2% in females. There was a strong correlation between DEXA method and BIA method (r = 0.84 – 0.87 in young adults and r = 0.86 – 0.89 in elderly). Conclusion: The cut-off points for sarcopenia diagnosis we got from the studies were: Muscle mass, by Skeletal Muscle Index, were 7.25 kg/m2 and 5.49 kg/m2 in males and females by DEXA or 7.83 kg/m2 and 5.97 kg/m2 by BIA method; hand grip strength were 30.4 kg and 19.8 kg; gait speed (6 meters walk) were 1.1 m/s and 1.0 m/s in male and female respectively. The prevalence sarcopenia were 12.5% and 10.2% in male and female elderly. BIA might be used for sarcopenia screening as an alternative way while DEXA was not available..

P75- ESTIMATING LOW PHYSICAL ACTIVITY WITH ALTERNATIVE METHODS IN OLDER ADULTS OF AN AGRICULTURAL COHORT. N. Bustamante-Ara[1], C. Araneda[2], C. Moreno[2], M. Castillo[2], F. Paredes[1], C. Ferreccio[1] *(1. Santiago, Chile; 2. Maule, Chile)*

Backgrounds: Poor lower-limbs performance has been demonstrated in developed country to be a strong predictor of future falls, disability, hospitalization, decline in quality of life, and mortality. The poor lower limbs performance has been associated with low physical activity (PA) in frail older adults. Previous studies have shown high frailty in Latin America and difficulty to evaluate PA through questionnaires. This study is a sub sample of older adults aged 60 to 74 years from prospective population-based cohort of an agricultural community, the MAUCO cohort. Here our aims were to report prevalence of low PA for frailty using objective measurements and to detect low PA through two lower-limbs performance tests in the first older adults enrolled during 2015. This study is funded by the National Commission for Scientific & Technological Research Grant (Conicyt-Fondecyt No 3150197) and was approved by The Ethics Committee of the Pontificia Universidad Católica of Chile. Methods : Participants' inclusion criteria were: to have mini mental test ≥ 18 and be able to walk without other person's assistance. We used tri-axial accelerometer to measure PA as the gold standard; low PA was the lowest 20% of the sample in terms of minutes of moderate to vigorous PA, by sex. Lower-limbs performance tests were assessed by Time Up and Go test (TUG) and time of 5 repetitions to Sit Down in a chair (5-SD). The analysis examined the best cut-points with Youden's index and predictive capacity using ROC curve to low PA. Results : We invited 180 consecutively enrolled subjects in the MAUCO cohort with a response rate of 98%. 143 older adults with valid data (59% women), age 66±4.3 years, BMI 30.1±5.3m/kg2, 74.4±13.5 kg and height 1.6±0.1 m; 42% were obese and 41% had 2 or more chronic diseases. Frailty was 3.4% in men (mean age: 72 yr.) and 11.8% in women (mean age: 68 yr.). The cut points for 5-SD were ≥ 8.1 seconds (s) and ≥ 8.5 seconds (s), for TUG were ≥ 7.8 s and ≥ 6.7 s among woman and men respectively. The prevalence of low PA was 20.3% based on the accelerometer, PA prevalence was higher when estimated with either the 5-SD test (41.4%) or TUG test (24.3%) according to the ROC curve predicted cut points. The TUG test (K: .366; $p<0.001$) showed slightly better concordance to low PA than 5-SD (K: .317; $p<0.001$). High IMC and older age were associated with low PA, but only in women. Conclusion : These preliminary results show that predicted cut-points, 5-SD test and TUG test overestimate the low PA for frailty and have poor concordance with objective measure of PA in older adults of an agricultural community.

P76- FUNCTIONAL PERFORMANCES ON ADMISSION PREDICTS ELDERLY PATIENTS IN-HOSPITAL FALLS. C. Audet, M. Hars, F. Herrmann, J.-L. Reny, G. Gold, S. Ferrari, A. Trombetti *(Geneva, Switzerland)*

Backgrounds: Falls are a leading cause of hospital admissions in older adults. Moreover, hospitalisation itself is associated with an increased risk of falling. Indeed, falls constitute the most common adverse event during elderly patients hospitalization, with rates as high as 3-13 falls per 1'000 patient-days, and with up to 10% of falls causing serious injuries (e.g., fracture or intracranial injuries). Moreover, in-hospital falls prolong the length of stay, contribute to the risk of iatrogenic complications and increase the use of resources and costs of care. Early identification of inpatients at high risk of falls is a crucial first step toward the implementation of in-hospital proactive prevention strategies. In addition to falls history, functional tests such as the Timed Up and Go test (TUG) have been widely recommended for clinical assessment of gait/balance/muscle weakness and to identify older people at high-risk for falling in community settings. However, their predictive value has been challenged, while their potential ability to identify inpatients at high-risk for falling remains to be established. This study aimed to determine the predictive and discriminative ability of various functional tests performed at or close to admission in a geriatric hospital to identify in- hospital fallers. Methods: This prospective study was carried out in a 298-bed geriatric hospital of Geneva University Hospitals (Switzerland), was part of an ongoing quality of care improvement project started in February 2015 and designed to improve fall risk screening, assessment and management processes. We selected consecutively admitted patients who undergone a battery of functional tests administered by physiotherapists, including: Short Physical Performance Battery (SPPB) (score range 0-12, 12 best), simplified Tinetti test (Tinetti) (score range 0-7, 0 best), and TUG. Functional data were treated either as dichotomous or continuous variables based on the following cut-off points: SPPB <6; Tinetti ≥3; TUG >20 seconds. Patients were followed for falls until discharge using standardized incident report forms mandatorily completed after each fall by nurses and physicians, while demographic/clinical information were gathered from the electronic medical records. Univariate and multivariate logistic regression models were used to calculate odds ratios (OR) with 95% confidence intervals (95% CI) for in-hospital fall risk. Multivariate models included the following variables: sex, age,

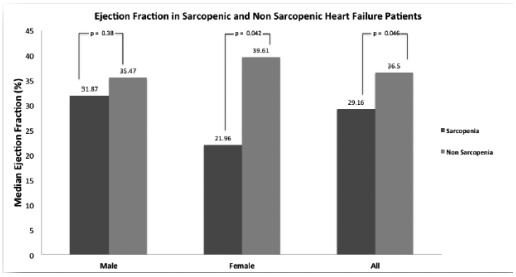
fall history in the past 6 months, fall as cause of admission, and in-hospital falls before administration of the functional assessment (i.e., covariables significantly associated with incident in-hospital falls in the univariate models). Subsequently, forward and backward stepwise linear regression models were built to predict incident in-hospital falls (p<.20 retained in models). The overall discriminative ability of each functional test to discriminate between patients with or without incident in-hospital falls was assessed by calculating the sensitivity, specificity and area under the receiver operating characteristic curve (AUC). We also developed all the above models but with functional data treated as continuous variables. Results: 527 patients underwent a functional assessment administered within 4.4±4.5 days of admission (TUG, n=508; Tinetti, n=506; SPPB, n= 465). Mean age of the patients was 84.7±7.0 years and 66% (n=348) were female. During a mean length of hospital stay of 27±22 days, 181 falls occurred in 104 subjects (19.7%). Twenty-seven falls occurred close to admission before functional assessment. Nine patients died during hospitalization. In-hospital fallers displayed significantly poorer functional performances at admission on all tests, as compared to non- fallers (SPPB, 3.2±1.7 vs 5.1±2.5, p<.001; TUG, 37.0±19.7 vs 27.9±18.0 seconds, p<.001; Tinetti, 4.6±1.7 vs 3.3±2.1, p<.001, respectively). In multivariate analysis, poorer performances on the SPPB (adjusted OR, 3.12; 95% CI, 1.19- 8.17) and Tinetti (adjusted OR, 5.28; 95% CI, 1.90-14.70) were significantly and independently associated with the odds of in-hospital falls, while no association was found with the TUG (adjusted OR, 1.10; 95% CI, 0.51-2.34). When functional performances were treated as continuous variables, all associations persisted. In both forward and backward stepwise linear regression models, only poorer performances on the SPPB and Tinetti remained significant predictors of incident in-hospital falls. Sensitivities of SPPB and Tinetti were high, 91.7% and 94.2%, respectively, with lesser specificities of 38.5% and 43.6%. ROC curves for SPPB and Tinetti performances as predictors of in-hospital falls showed the adjusted AUCs were 0.71 and 0.73, respectively, with a significant incremental predictive value of adding both (p<.001). Conclusion: Our study shows for the first time that poorer functional performances, as assessed using the SPPB or the simplified Tinetti test, are significantly and independently associated with incident in-hospital falls in patients admitted to a geriatric hospital. These data suggest that performing SPPB or the simplified Tinetti test upon admission may help to identify patients at high risk of falling during hospitalization and thereby inform strategies for preventing falls through in-hospital rehabilitation programs.

P77- GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN EJECTION FRACTION AND SARCOPENIA IN ELDERLY PATIENTS WITH HEART FAILURE. C. Velandia-Carrillo[1], C. Sanabria Miguel[1], P.A. Camacho[1], D.D. Cohen[1,2], J.F. Contreras[1], A.M. Ospina[1], P. Sánchez[1] *(1. Floridablanca, Colombia; 2. Santander, Spain)*

Background : There is substantial evidence that low muscle strength is associated with poor health outcomes and increased risk of mortality [1]. While the precise mechanism for the beneficial effect of muscle strength is not well defined, it is likely that it is via a number of direct and indirect mechanisms. In older adults, while a progressive loss of muscle strength and mass is well documented, and is expected, sarcopenia represents a state of clinically significant loss of muscle mass/strength [2]. In people with chronic heart failure (CHF), muscle loss [3] and alterations in muscle quality, including loss of mitochondria and changes in muscle fibre type, secondary to the progression of the disease are described [4]. Moreover, ejection fraction (EF), considered to be one of the most important of the prognostic variables in CHF [5], was found to be significantly lower in male CHF patients who also presented with Sarcopenia [6]. Low handgrip strength (HG), is also associated with poor peak oxygen consumption (pkVO2) [7], another important prognostic variable in these patients [5]. However, evidence suggests that HG is an independent predictor of survival in male HF patients [8]. Nevertheless, little is known regarding interactions between Sarcopenia, and prognostic variables in Latin American people with CHF. Methods: We performed a cross-sectional analysis of the study population, which comprised 51 adults aged 65 to 87 with chronic stable cardiac failure and an EF ≤ 50%. Participants were from urban and rural households attending the Geriatric outpatient unit of the FOSCAL Clínic, in Santander (Colombia), who were enrolled in the FORCE-OLD study. Anthropometric and physical measurments were taken and EF and HF assessed using echocardiogram. Peak handgrip strength (the highest value achieved from three trials in each hand) was measured using a Jamar dynamometer, and calf circumference assessed. In a Wilcoxon's Rank Sum Test. Patients gave written informed consent to participate, and the study was approved by the ethics comittee of the FOSCAL clinic. Results: Table 1 summarises the characteristics and Figure 1 shows median EF according to presence of sarcopenia. The prevalence of sarcopenia in the overall sample was 22% (3 females, 8 males). Median EF was 29.19% in sarcopenic participants, which was significantly lower than median EF (36.5%) in those without sarcopenia (p=0.046). Median EF was significantly lower in sarcopenic (21.96%) than in non- sarcopenic females (39.61%) (p=0.042). In sarcopenic males, EF was lower then in non sarcopenics (31.87% v 35.47%), but this difference was not significant 2010 European consensus guidelines [1], sarcopenia was defined as a handgrip below 30kg in males and 20kg in females combined with a calf cirumference of less 31 cm. We evaluated associations between the presence of sarcopenia and ccordance with the EF, clinical history and other factors using the (p=0.38). Adjusting for BMI and age did not alter these results (females; p=0.017, males; p=0.49). Conclusion: The present study is the first to evaluate the interaction between sarcopenia and ejection fraction in Latin American CHF patients. In this sample of 51 older HF patients, 22% were sarcopenic, similar to the prevalence reported previously in a study of CHF patients with a median age of 66.9 [5]. We found that after adjusting for age and BMI, sarcopenia was associated with a statistically significant lower ejection fraction in females, but not in males. However, in both sexes, median EF was below 35%, a clinically significant cutpoint for poor prognosis in CHF patients. Nonetheless, in males the difference in EF between sarcopenic and non sarcopenic patients was far smaller (3.6%) than in females (19.65%). These findings suggest that in people with CHF the assessment of sarcopenia usng simple and low cost measures; handgrip dynamometry and calf circumference, at least in females may provide a means to stratify for the increased risk of inadequate EF, a key prognostic marker in these patients. Due to its cross sectional nature, we cannot draw conclusions regarding the direction of causality. Sarcopenia may be secondary to the deterioration of EF and disease progression leading to reduced physical activity and a consequent loss of muscular strength and mass, as well as aerobic capacity. Indeed, in addition to lower HG, we noted a significantly higher resting heart rate, suggestive of lower aerobic fitness, and a substantially lower (but not significant) self report physical activity level in the sarcopenic patients. On the other hand, lower EF and a more rapid deterioration in these patients might be a secondary to lower physical activity, lower strength (and physical fitness per se), in which case interventions to prevent/reverse loss of muscle strength/mass, and cardiovascular fitness may improve outcomes in these patients. References : 1. Cruz-Jentoft AJ, Baeyens JP, Bauer JM, Boirie Y,

Cederholm T, Landi F, Martin FC, Michel JP, Rolland Y, Schneider SM, Topinkova E, Vandewoude M, Zamboni M, European Working Group on Sarcopenia in Older P: Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. Age Ageing 2010, 39:412–423. 2. Anker SD, Ponikowski P, Varney S, Chua TP, Clark AL, Webb-Peploe KM, Harrington D, Kox WJ, Poole-Wilson PA, Coats AJ: Wasting as independent risk factor for mortality in chronic heart failure. Lancet (London, England) 1997, 349:1050–3. 3. Bohannon RW Muscle strength: clinical and prognostic value of hand-grip dynamometry. Curr Opin Clin Nutr Metab Care. 2015 Sep;18(5):465-70. 4. Cicoira M, Bolger AP, Doehner W, Rauchhaus M, Davos C, Sharma R, Al-Nasser FO, Coats AJ, Anker SD: High tumour necrosis factor-alpha levels are associated with exercise intolerance and neurohormonal activation in chronic heart failure patients. Cytokine 2001, 15:80–6. 5. Fülster S, Tacke M, Sandek A, Ebner N, Tschöpe C, Doehner W, Anker SD, von Haehling S: Muscle wasting in patients with chronic heart failure: results from the studies investigating co-morbidities aggravating heart failure (SICA-HF). Eur Heart J 2013, 34:512–9. 6. McMurray JJ V, Adamopoulos S, Anker SD, Auricchio A, Böhm M, Dickstein K, Falk V, Filippatos G, Fonseca C, Gomez-Sanchez MA, Jaarsma T, Køber L, Lip GYH, Maggioni A Pietro, Parkhomenko A, Pieske BM, Popescu BA, Rønnevik PK, Rutten FH, Schwitter J, Seferovic P, Stepinska J, Trindade PT, Voors AA, Zannad F, Zeiher A, Bax JJ, Baumgartner H, Ceconi C, Dean V, et al.: ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart. Eur J Heart Fail 2012, 14:803–69. 7. Izawa KP, Watanabe S, Yokoyama H, Hiraki K, Morio Y, Oka K, Osada N, Omiya K: Muscle strength in relation to disease severity in patients with congestive heart failure. Am J Phys Med Rehabil 2007, 86:893–900. 8. Izawa KP, Watanabe S, Osada N, Kasahara Y, Yokoyama H, Hiraki K, Morio Y, Yoshioka S, Oka K, Omiya K: Handgrip strength as a predictor of prognosis in Japanese patients with congestive heart failure. Eur J Cardiovasc Prev Rehabil 2009, 16:21–7.

	Sarcopenic participants (n=11)	Non sarcopenic participants (n=39)	P-value
Age (yr)			
Median	77.1	79.1	*0.0275
Interquartile range	75-82	70-77	
Female sex -no. (%)	10 (25.6)	3 (27.2)	0.913
IMC			
Median	21.8	28.75	*0.0004
Interquartile range	18-25	26-30	
Mean blood pressure (mmHg)			
Systolic			
Median	123	129	0.3814
Interquartile range	108-138	113-146	
Diastolic			
Median	68	70	0.5844
Interquartile range	60-77	62-76	
Heart rate (beats/min.)			
Median	72	64	*0.0328
Interquartile range	70-80	59-72	
Exercise min/wk			
Median	116	228	0.3769
Grip strength kg			
Median	23	27	0.0573
Interquartile range	19-28	20-32	
NYHA functional class — no. (%)**			
I	3 (27.7)	13 (34)	0.8341
II	4 (36.3)	22 (58)	0.4226
III	4 (36.3)	2 (5.2)	0.4126
IV	0 (0)	1 (2.6)	-
Clinical features of heart failure			
Ischemic cardiomyopathy — no. (%)	2 (18.18)	16 (41)	0.5317
Chagasic cardiomyopathy — no. (%)	2 (18.18)	7 (17.9)	0.9927
Medical history — no. (%)			
Hypertension	7 (63.64)	19 (48.72)	0.382
Diabetes	2 (18)	6 (15.3)	0.823
Stroke	1 (10)	2 (5.41)	0.766
Atrial fibrillation	4 (40)	20 (52)	0.477



P78- THE INTERNET OF THINGS (IOT) APPLIED TO SPRINTT ICT INFRASTRUCTURE. G. Zia, F. Mocci, L.C. Feletti *(Torino, Italy)*

Backgrounds : The dedicated ICT infrastructure for Sarcopenia & Physical frailty in Older People: Multi Component Treatment Strategies (SPRINTT) was developed and implemented to support the clinical trial data gathering and management, building on the initial call requirements by the Innovative Medicines Initiatives (IMI). SPRINTT project started on July 2014 and is expected to enrol 1500 participants over 70 years old in 14 centres across 9 European Member States. Participants will adhere to a multicomponent intervention, centred on increased physical activity plus nutritional monitoring, and each individual will be followed-up over 2 years. Participants' physical activity (PA) pattern will be tracked over the whole study duration with the Adamo watch, a sensor device processing and recording accelerations, whose encrypted data are periodically transferred to remote servers to be analysed at the end of the clinical trial. Physical activity patterns plus clinical data and imaging (DXA) will constitute and progressively accrue a large database. In facts continuous, long-term clinical data gathering via non-invasive technologies represents per se an innovative feature of SPRINTT Clinical Trial. Methods :Data collection: SPRINTT ICT infrastructure is based on an electronic case report form (e-CRF) for the collection of clinical data, a Nutrition Frontend (also a clinical module), a DXA Frontend and a Participant's Home Kit that includes the wearable device, its base station and a data SIM. A Communication Hub is deployed at each participant's home. At the study site clinical and biological data are manually entered through the e-CRF, according to a paperless procedure. For DXA imaging files, the SPRINTT DXA Frontend application was specifically developed in order to avoid manual data entry. Continuous physical activity recording is ensured by the Adamo watch, a wearable device that records raw data from its sensors and process them, updating an inside data storage. No technical handling or specific interaction with the CHK is required by the participant. The device transmits every 10 minutes the processed information to the base-station placed at the participant's home via a short-range radio protocol. If the base station cannot be reached, the watch keeps on updating the monitoring parameters into its own memory and retries a new radio transmission after an extra 10 minute interval. The base station retransmits data to the CKH using the 2G mobile network (GPRS). Recorded data are automatically sent to an intermediate server that adds information exploiting further processing and updating the Clinical Knowledge Hub. A special type of SIM (M2M – machine to machine) realizes the communication between Adamo base station and the SPRINTT dedicated servers. The selected M2M SIM system (provided by TelecomItalia) is able to detect and connect to any mobile operator in Europe automatically providing the best mobile network coverage available at the participant location. Data transfer between the watch and its base-station is encrypted and encoded using the "Idea" algorithm and transferred over the European frequency band (869.2 MHz – 869.25 MHz) dedicated to

radio terminals for social alarms. Data aggregation and the Enterprise Service Bus (ESB): in our ICT infrastructure the Clinical Knowledge Hub allows to aggregate heterogeneous data from different sources (generated by DXA, Nutrition, e-CRF and Adamo) in a common database, where all data generated during the clinical trial can be retrieved. In order to meet data security, traceability and flexibility requirements a further infrastructural component has been used: the Enterprise Service Bus (ESB) that governs all communication between modules and enabling the following functions: tracking who is sending data and which data are transferred ; filtering data flow based on the user authorization profile ; managing data encryption ; governing data flow in a centralized way ; decoupling modules in order to reduce each other's dependency. Of note, the ESB allows easy update of the ICT system design, thus avoiding rebuilding the existing application when adjustments are needed or if other data should be gathered. Results: Taking advantage from the Internet of Things, several innovative technologies have been deployed in the SPRINTT ICT infrastructure thus enabling for: 1) Automatic collection of large amount of data via a friendly non-invasive communication application ; 2) Continuous collection of PA data from individual participants who directly generate their information (instead of recurring to secondary data entered by the study personnel), which represents a first step bringing the participant at the centre of the clinical trial organisation. In addition, using an Enterprise service Bus (ESB) also made feasible to build a system that integrates different source data while ensuring security, reliability and flexibility to implement possible protocol amendments. Conclusion : Clinical trials like SPRINTT may benefit from the Internet of Things and the integration of heterogeneous source data with specialized applications each dedicated to a specific function in scientific data processing. Home based communication is a first enabling step to engage more directly the elderly participant in similar programs. .

P79- PLASMA CERAMIDE LEVELS ARE ASSOCIATED WITH WORSE PERFORMANCE IN MULTIPLE GAIT PARAMETERS IN THE MAYO CLINIC STUDY OF AGING. A.M.V. Wennberg, M. Schafer, R. Savica, C.E. Hagen, N. LeBrasseur, R.O. Roberts, D. Knopman, C.R. Jack Jr., R.C. Petersen, M.M. Mielke *(Rochester, USA)*

Background: Several studies have demonstrated the importance of lipid accumulation in insulin resistance, diabetes, and frailty. Sphingolipids are lipids that have important roles in the structure of cell membranes and also act as second messengers for both intra- and inter-cellular communication. Ceramides, a keystone of sphingolipid metabolism, are involved in pro-apoptotic and pro-inflammatory signaling cascades. High levels of ceramides are associated with metabolic disorders and contribute to the development of muscle insulin resistance and muscle atrophy. In contrast, Sphingosine-1-Phosphate (S1P), a ceramide metabolite with anti-apoptotic and anti-inflammatory properties, is involved in skeletal muscle regeneration. We hypothesized that high levels of ceramides and low levels of S1P are associated with impaired gait performance, a robust marker of frailty, atrophy, and functional decline in older adults. To date, few studies have examined this association; the majority have been animal or cellular studies. Only one small study in humans examined the association between sphingolipids and sarcopenia and found that higher levels of ceramide C16 muscle content was most strongly associated with lower leg lean mass. In the present study, we sought to extend this research to examine the cross-sectional association between plasma ceramides and S1P and multiple gait parameters. Methods: Participants included 339 cognitively normal individuals, aged 70 years and older, who were enrolled in the Mayo Clinic Study of Aging and had complete gait data and plasma sphingolipid measures at the same visit. Individuals with a history of stroke, Parkinson's disease, Alzheimer's disease, vascular dementia, alcoholism, normal pressure hydrocephalous, subdural hematoma, or traumatic brain injury were excluded. Plasma ceramide and S1P levels were measured using electrospray ionization mass spectrometry. We examined the individual carbon chain lengths of ceramides, S1P, and the ratio of ceramides to S1P. All lipids were log-transformed prior to analyses to create a more normal distribution. GAITRite® instrumentation was used to measure gait parameters at an in-clinic examination. We focused on measures of continuous gait speed, cadence, stride length, and double support time. We also dichotomized gait speed at 1 m/s, the International Working Group on Sarcopenia criteria. Continuous gait measures were z-scored to make them more comparable. We used linear and logistic regression models to examine the relationship between log sphingolipids and the gait parameters. Multivariate models adjusted for age, sex, years of education, depression, medical comorbidities (i.e., diabetes, cardiovascular disease, cerebrovascular disease, renal disease, rheumatologic disease, liver disease, and cancer), body mass index, number of medications, and tumor necrosis factor-α. Results: In multivariate models, each log unit increase in ceramide C16:0 was associated with slower gait speed (B=-1.02; 95% CI -1.80, -0.247), lower cadence (B=-1.08, 95% CI -1.95, -0.208), and longer double support time (B=1.13, 95% CI 0.338, 1.92; B=0.504). Each log unit increase in ceramide C16:0 was also associated with higher odds of having gait speed less than 1 m/s (OR=18.27, 95% CI 1.62, 206.34). S1P was not significantly associated with any gait parameter after adjustment for potentially confounding variables. A log unit increase in the ceramide to S1P ratio was also associated with slower gait speed (B=-0.357; 95% CI -0.650, -0.065), lower cadence (B=-0.519, 95% CI -0.845, -0.192), longer double support time (B=0.504, 95% CI 0.208, 0.801), and greater odds of having gait speed less than 1 m/s (OR=3.00; 95% CI:1.24, 7.28). Conclusion: These results suggest that plasma ceramide levels are associated with worse gait performance across multiple parameters. As gait is a robust marker of frailty and functional decline in the elderly, these results suggest that plasma ceramides and sphingolipids may contribute to the underlying frailty phenotype. Sphingolipids, particularly C16 ceramide, in concert with other circulating markers, could be used as biomarkers for frailty prognosis. Longitudinal studies are needed to determine whether sphingolipid levels predict gait decline.

P80- TACKLING FRAILTY AT PRIMARY CARE SETTINGS: VALIDATION AND COMPARISON OF THREE IDENTIFICATION TOOLS AND USE OF HEALTH CARE SERVICES: BASELINE RESULTS. I. Vergara[1], F. Rivas-Ruiz[1,5], M. Machón[1], A. Díez[1,2], E. Contreras Fernández[6], K. Vrotsou[1], Y. de Mesa[6], A. Bueno[1,2], J. Nuñez[1,2], A. Montiel[6], I. Martín-Lesende[3], C. Saucedo[6], E. Carrasco[1], B. Aguirre[1], A. Nava[6], G. Abellan van Kan[4] *(1. San Sebastian-Donostia, Spain; 2. Renteria, Spain; 3. Bilbao, Spain; 4. Toulouse, France; 5. Marbella, Spain; 6. Málaga, Spain)*

Background: Frailty is one of the most relevant clinical expressions of ageing and a powerful indicator of the health status of older populations. Tools to identify frailty can be classified into three groups: those based on rules, like the Tilburg Frailty Indicator (TFI); those based on functional performance, such as the Gait Speed (GS) and Timed Up and Go (TUG) tests; and those based on genetic biomarkers (e.g., SOX2 expression). More advanced research is needed to assess the ability of existing tools to identify frail individuals in primary care settings. The aim of the project is

to provide insight information about the capacity of different tools to detect the presence of frailty in primary care settings and to improve knowledge of the profile of health services used by this type of patients. This abstract focuses on the description of the baseline assessment of included individuals. Method: this is a multicentric (two regions of Spain: Basque Country and Andalucia) prospective cohort study of 820 community dwelling autonomous individuals aged 70 or more at the time of recruitment. A two year follow up period is proposed. At baseline, the following variables were collected via face to face interviews: sociodemographic characteristics, frailty (TFI, GS and TUG), physical activity, lifestyle habits and health status. A blood sample was also collected to analyse frailty genetic biomarkers. During the follow up period information about the onset of dependence, death and use of clinical services will be collected by means of personal interviews and the review of clinical databases. The study has been financially supported by the Spanish Institute of Health Carlos III (grant nº PI14/01905 and PI14/01003) and authorized by the corresponding Ethics Committees. Written informed consent has been obtained from all participants. Results: Recruitment is on-going at this time and it will be completed by the time of the presentation of these results at the conference. By now, included patients have a mean age of 76 (SD5.27) ranging from 70 (inclusion criterion) to 91. Subjects were almost equally distributed considering sex. The prevalence of frailty measured by Tilburg test was 41.3%, being slightly higher among women (46.7%). Regarding the functional performance of these subjects, they presented a mean Timed up and go test values of 12.8 sc. (SD 4.12) and a mean gait speed of 0.95m/sc. (SD 0.75). Conclusions: frailty is highly prevalent in the studied sample with functional performance test poorly performed. These conditions imply a high risk of developing adverse events, like falls, fractures, dependence or hospitalization. Further data are necessary to generalize these results, but the current findings made evident the need to introduce, in a systematic way in primary care settings, assessment tools able to capture frailty.

P81- PRELIMINARY VALIDATION OF A MODEL FOR THE IDENTIFICATION OF FRAIL INDIVIDUALS IN PRIMARY CARE SETTINGS. A. Bueno[1,2], A. Díez[1,2], J. Nuñez[1,2], M. Machón[1], M. Mateo-Abad[1], I. Vergara[1] *(1. San Sebastian-Donostia, Spain; 2. Renteria, Spain)*

Background: Frailty is one of the most relevant clinical expressions of ageing and a powerful indicator of the health status of older populations. The design and validation of tools that can easily identify frail individuals in primary care is a still unsolved relevant issue around frailty. Although simple rapid screening tests have previously been developed and validated, there is still a need to explore detection tools adequate to primary care settings. Through a cohort study, a model for the identification of frail community dwelling adults suitable for its regular use in primary care settings was defined and presented at ICFSR in 2015. At this time, a preliminary internal validation of this model, so called kos-model was presented. Method: This is a three year follow up open cohort study of community dwelling elder adults, aged 75 or more at the moment of recruitment, and autonomous regarding basic daily living activities (Barthel =>90). Based on the information collected during the first two years of follow up of individuals that became dependent or died during this period a model was proposed. This model considered age, value of Timed up and go (TUG) test, and the presence of polipharmacy (4 or more drugs). The preliminary internal validation was performed applying the proposed model to those subjects that after a year of follow up (M0 for this study) were still functionally independent and in order to assess its predictive capacity, the occurrence of dependence two years later (M 1) among these subjects was assessed. The study was developed in primary care health centres pertaining to Osakidetza, the public health care provider at the Basque Country, Spain. The study was approved by the Gipuzkoa Health Region Ethics Committee. Written informed consent was obtained from all participants. Results: A total of 106 were assessed at M0 and followed up for two years until M1. These subjects had a mean age of 80.12 (SD79.33-80.90) and were mostly women 64 (60.4%). During follow up, 19.8% of subjects became dependent. The predictive model showed a sensitivity of 80 and a specificity of 75 predicting the occurrence of this event. This model showed an Area under the Curve (AUC)=0.822 . Conclusions: The proposed model identifies independent individual that will become dependent in a period of two years considering their age, the presence of polipharmacy and the value of TUG test with a high sensitivity and specificity. This model could be useful for the identification of frail individuals in primary care setting given its good metric capacities and its easy and intuitive application. Further research is needed in order to validate the model and to assess its application in a daily practice basis.

P82- THE IMPACT OF OBESITY AND OBESITY-DYNAPENIA ON SKELETAL MUSCLE FUNCTION AND MARKERS OF MITOCHONDRIAL METABOLISM IN ELDERLY MEN. N. Joffin[1,2], C.H. Pion[1], G. El Hajj Boutros[1], F. Saint-Jean-Pelletier[1], M.C. Dulac[1], M. Bélanger[1], S. Chevalier[1], J.A. Morais[1], P. Gaudreau[1], P. Noirez[1,2], G. Gouspillou[1], M. Aubertin-Leheudre[1] *(1. Montréal Canada; 2. Paris, France)*

Background: Normal aging is associated with a loss of skeletal muscle mass (sarcopenia) and function (dynapenia [DY]) and an increase in fat mass which, if excessive, leads to obesity [O]. It has been proposed that DY and O could involve age-related decline in mitochondrial content and defects in mitochondrial energetics. Studies have shown that DY is associated with physical disability and an increased risk of mortality. These deleterious consequences are further increased in obese elderly individuals. Indeed O-DY subjects exhibit poorer functional capacity (FC) than either O or DY individuals. However, the impact of O-DY on skeletal muscle mitochondria content and metabolism remains unknown. The present study therefore aims at comparing the effects of O and O-DY on skeletal muscle mitochondrial function. We hypothesized that O-DY elderly individuals would display lower skeletal muscle function, decreased mitochondrial content and altered markers of mitochondrial function as compared to O alone and non-O/non-DY old individuals. Methods: Forty-three old men (69 ± 6 years were recruited and assigned to three groups (O-DY: n=12; O: n=13 and non-O/non-DY: n=14 (control)). A knee extension strength (KES) lower than 1.53 kg/kg Leg-LM (1MR-KES; (kg)/ Leg-LM (kg)) defined DY and a body fat percentage ≥25% defined O. Total and compartmental lean mass and fat mass (LBM, FM by DXA) and KES (leg press, 1-MR) were measured. Muscle biopsies were obtained from the Vastus Lateralis to assess muscle fiber phenotype (fiber type proportion and fiber size), on muscle cross-sections. Succinate dehydrogenase (SDH) activity and intracellular Oil Red O accumulation were measured on muscle cross-sections to assess mitochondrial content and intracellular lipid content, respectively. Expression levels of key mitochondrial enzymes (Carnitine palmitoyltransferase 1 (CPT1), complex I, II, III, IV and the ATP synthase), fusion/fission proteins (Mitofusin-2 (Mfn2), optic atrophy type 1 (OPA1), Dynamin-related protein 1 (DRP1)) and the autophagy protein ATG7 were measured by immunoblotting. Mann- Whitney and Kruscall-Wallis tests were performed to compare our groups. P<0.05 were considered significant. Results: By design, total (%), leg and trunk FM (%) were

higher in O (31.08±3.51;p<0,0001; 25.42±4.52 (p=0.02); 38.29±4.06 (p<0.0001), respectively) and O-DY (30.88±3.26; p<0,0001; 26.91±4.00;(p=0.0006); 36.83±5.12;(p< 0.0001), respectively) than controls (18.93±5.73; 18.01±5.84; 21.76±7.86, respectively). Waist circumference was also higher in O (104.4±8.53;p=0.0002)) and O-DY (97.50±6.78;p=0.006)) than controls (88.32±7.78). O individuals displayed higher waist circumference as compared to O-DY (p=0.047). O had higher KES (180±38;p=0,04) as compared to controls (149±45), while O-DY had lower KES (101±15;p=0,0009) as compared to controls. Total LBM was lower in O-DY (49.52±4,08) as compared to control (53.14±3.38;p=0.02) and O (53.95±5.13;p=0.02). Arm and leg LM (%) were lower in O-DY (arm: 22.90±2.18;p=0.0006, leg: 17.54±1.71;p=0.008) compared to control (arm: 25.32±2.11, leg: 19.40±1.45). No difference in arm and leg LM (%) was observed between O-DY and O (arm: 25.04 ± 3.50, leg: 18.85 ± 2.90). Muscle fiber size (μm2) was lower in O-DY (3942±1898;p=0,05) as compared to O (5893±1289) but similar as compared to control (3765±2078). Type I (4736±1201;p=0.006), IIa (5057±1326;p=0.04) and IIx (4417±952; p=0.0025) fiber sizes (μm2) were lower in O-DY as compare to O (I: 6689±1275, IIa: 6355±1203, IIx: 6614±1191). Fiber type proportion was similar among groups. O-DY displayed lower mitochondrial content (SDH; arbitrary unit) in type IIa fibers (38.86±9.20;p=0.02) as compared to controls (53.25±14.17). The expression of mitochondrial fusion and fission proteins (Mfn2; OPA1; DRP1) and ATG7 were similar between groups. O-DY (1.03±0.60), displayed a lower expression of Complex I as compared to controls (2.72±2.03); p=0.01) and O (1.912±1.33;p=0.05). O-DY also displayed lower TFAM (0.44±0.30;p=0.05) expression (a key protein regulating mitochondrial DNA expression and replication) as compared to controls. The expression of the key enzyme regulating fatty acids uptake in mitochondria (CPT1 a) was lower in O-DY (0.46±0.08) compared to control (1.15±0.91;p=0.02) and O (1.38±1.40;p=0.05). Intracellular lipid content (oil-red- o) for each fiber type was similar among groups. Conclusions: Our results show for the first time that O-DY individuals displayed lower fiber size and lower markers of mitochondrial content and metabolism (beta-oxidation and oxidative phosphorylation) than O individuals. The expression levels of fusion/fission (Mfn2, OPA1, DRP1) and autophagy (ATG7) proteins in muscle are similar among O, O-DY and control elderly men. These results suggest that O- DY might not be a simple combination of O and DY but might have a very complex and unique pathophysiology. Further studies aiming at dissecting the implications of mitochondrial dysfunction in O-DY are now needed. Nutritional and physical activity interventions optimizing mitochondrial function might prove extremely beneficial in O-DY individuals.

P83- THE IDENTIFICATION OF FRAILTY FROM NUTRITIONAL SCREENING TOOLS IN COMMUNITY-DWELLING ELDERLY. M. Staut Zukeran, R. Ritti Dias, F. Gazelato de Mello Franco, L. Diniz Nagem Janot de Matos, M. Seabra Cendoroglo, S.M. Lima Ribeiro *(São Paulo, Brazil)*

Background: Although frailty is an important concern in elderly, its detection is sometimes difficult, due to the need of specific tool, and because it is time demanding. In turn, easy measures (e.g anthropometric parameters and mini nutritional assessment -MNA) have been used to detect nutritional status and nutritional risk. Considering the existing association between frailty and nutritional status, we hypothesize that some screening tools developed to identify nutritional status are able to point frailty with good sensibility and specificity. The aim of this study was to investigate the sensitivity and specificity of mini-nutritional assessment (MNA) and anthropometric measurements to detect frailty in community-dwelling elderly men and women. Methods: We studied individuals aged 60+ years, recruited from a geriatric outpatient clinic from São Paulo City, SP, Brazil. Evaluations: a-) frailty according to Fried's criteria (frailty defined as the presence of three or more out of the five components). b-) Nutritional status according to short-form MNA (MNA-SF) and complete form MNA (MNA-LF). The MNA scores were "malnourished", "at risk of malnourishment", and "well nourished". c-) Anthropometric measures: body weight, height, and calculation of body mass index (BMI). Data analysis: the frail and non-frail individuals were compared according to variables of nutritional status (t-test or chi-square test). Receiver Operating Curves (ROC) and its parameters (sensibility, specificity, and area under curve - AUC) were performed to identify the relationship between frailty and nutritional status. The maximum Youden index (sensitivity + specificity -1) was computed to determine the most accurate MNA cut-off to reflect frailty. Main results: The sample included more women (72. than men; men were older (77.1 years) than women (74.9 years). The nutritional risk from both MNA-LF and MNA-SF were significantly associated with frailty for both genders, while the BMI, the waist and the calf circumferences showed significant association with frailty only in men. The main results for ROC curve analysis in the detection of frailty from MNA were: a-) ROC curve for women: AUC for MNA-LF= (CI=0.639- 0.730) with p<0,001; sensitivity= 79.0% and specificity= 52.6%. The best cut-off point for frailty in the MNA-LF was ≤ 24.5. AUC for MNA-SF= CI=0.620-0.713° with p<0,001; sensitivity= 52.7% and specificity= 72.9% with ≤ 10 as the best cut-off point. b-) ROC curve for men: AUC for MAN-LF=0.820 (CI=620-0.713) with p<0,001; sensitivity=81.2% and specificity= 76.1% and best cut-off point ≤ 23.0; AUC for MNA-SF= 0.789 (CI= 0.717-0.0.851 with p<0,001; sensitivity=70.6% and specificity= 81.6% the best cut-off point of MNA-SF≤ 10.0. Conclusion: MNA is a good tool for identifying frailty in men and women, however, better prediction indicators were observed in men. Thus, the use of MNA is a feasible strategy to detect frailty. Key-words: MNA, nutritional status, frailty, predictability.

P84- DOES MIXED TRAINING-INDUCED NEUROPHYSIOLOGICAL AND MUSCULAR ADAPTATIONS DIFFERS IN ELDERLY MEN ACCORDING TO THEIR FUNCTIONAL LEVEL? C.H. Pion, G. El Hajj Boutros, F.C. Lemieux, M.C. Dulac, S. Chevalier, P. Gaudreau, G. Gouspillou, J.A. Morais, M. Bélanger, M. Aubertin-Leheudre *(Montréal, Canada)*

Background: Normal aging causes a decline in muscle strength resulting in a decrease in functional capacity. Other factors such as sedentary lifestyle and poor nutrition also contribute to the loss of muscle strength at different rates and ages, reducing functionality, which in turn, can impact muscle strength, in a vicious cycle. In order to be functional in everyday life, one must be able to develop an appropriate level of force. This involves muscular and neurophysiological factors that enable the proper activation and coordination of specific muscle groups. This proper activation depends not only on an absolute level but also on rates of activation and of force development. These imply muscle power, such that it would seem logical to suggest power training as an effective intervention to counter the loss of strength and functionality in the elderly. The aim of this study was to determine if neurophysiological and muscular adaptations in response to a mixed training differ depending on the level of functionality in elderly men. Methods: Forty-five men (> 55 years) completed a 12-week mixed training (MT; 1h, 3×/wk; consisting in 4 power and 6 functional exercises) and were divided

in tertile groups based on a functional ability (FA) score derived from 6 tests of the Senior Fitness Test and SPPB. The comparison between the lowest (LoFA group; mean lower FA-score=-0.8±0.7; n=15) and the strongest (HiFA group; mean high FA-score=0.9±0.3; n=15) groups was done before and after MT. Knee-extensor strength of the lower limb (LL) was obtained for concentric (CKES) and isometric (IKES) contractions. Total fat mass (tFM) and total, LL and right thigh (rT) lean masses (LM) were measured using DXA. Muscle strength indices were obtained by combining LM with concentric (CKES/LLLM) and isometric (IKES/rTLM) strength measurements. A neurophysiological profile was established from: the completeness of muscle activation (% of force reserve) during a maximal voluntary isometric contraction (MVC); spinal excitability; motoneuron and Ia afferent conduction velocities; median power frequency (MPF) and mean amplitude (mEMG) of the Vastus Lateralis (VL) EMG signal, electromechanical delay (ED) and co-activation during MVC. A muscular profile was obtained from: development (upslope), maintenance (plateau) and relaxing (downslope) phases of the MVC force curve; VL muscle twitches parameters (amplitude, contraction and 1⁄2 relaxation times, ED); VL muscle architecture (pennation angle, VL thickness and fiber length). Mann-Whitney tests were used for baseline and changes (post-pre intervention, in %) and non-parametric paired t-tests evaluated within group PT intervention. P< 0.05 was considered significant. Results: The LoFA and HiFA groups had similar age and body composition. Therefore, these factors could not account for a difference in functional capacity between groups. Before MT, the LoFA group had a significantly lower strength tests than HiFA individuals. Moreover, the HiFA group were able to relax more quickly than LoFA group. Despite these results, the groups had similar neurophysiological and muscle profiles. After MT, LoFA group still had significantly lower FA-score and results on all functional and strength tests than the HiFA group. The HiFA group developed force and relaxed more quickly during the MVC than the LoFA group but the MVC force maintenance was similar. Likewise, the HiFA group had a significantly higher mEMG during the MVC development phase and a higher twitch amplitude than the LoFA individuals. Finally, body composition, neurophysiological and muscle parameters were similar in the two groups. Aside from the balance test, the LoFA individuals improved on all other functional tests, FA-score, CKES and CKES/LLLM, MPF during MVC development phase, and the capacity to maintain a 2s-MVC after MT. In contrast, the changes in the functional tests were more variable in the HiFA group and improved only on the chair and stair tests after MT. HiFA individuals also improved CKES and MVC ED, increased total LM and LLLM while significantly decreasing their tFM. Also increased in the HiFA group after MT and somewhat surprisingly was twitch contraction time. Finally, LoFA group had only a significant higher percentage change due to the MT concerning the normal 4-m walking test and a lower percentage change for LLLM than HiFA group. Conclusion: In summary, the MT resulted in modest improvement of the functional status of the LoFA but not the HiFA. Most neurophysiological and muscular factors did not improve, in either group. It is possible that small changes occurred in other muscle groups not examined in this study or the MT not being optimal for healthy elderly men or too short to detect changes. As well, the training was geared towards functional exercises which may have counteracted the effects of pure power training. Both the LoFA and HiFA groups were quite functional and the lower changes observed in the HiFA group may be due to the fact that the MT simply was not sufficient to further improve their high functionality.

P85- RESTING METABOLIC RATE AND TIMED GAIT IN THE HEALTH, AGING, AND BODY COMPOSITION STUDY.

M.J. Huisingh-Scheetz[1], K. Wroblewski[1], T. Hue[2], A. Newman[3], S. Satterfield[4], T. Harris[5], D. Schoeller[6] *(1. Chicago, USA; 2. San Francisco, USA; 3. Pittsburgh, USA; 4. University of Tennessee, USA; 5. National Institute on Aging, USA; 6. Wisconsin-Madison, USA)*

Background: Prior work has suggested that advanced frailty may be associated with both depressed and elevated resting metabolic rate (RMR). The study objective was to relate RMR and timed gait in the Health, Aging, and Body Composition study among gender subgroups. We conducted a cross-sectional analysis using data from 329 (163 women, 166 men) adults aged 71-82 included in the 1999-2000 and/or aged 78-89 in the 2006-2007 energy expenditure sub-studies (421 total observations). Methods: We assessed the unadjusted, bivariate relationship between timed walk and the difference between actual and predicted RMR for men and women using lowess plots. Then, using separate generalized estimating equation linear regression models for men and women, we examined the association between timed gait and the difference between actual and predicted postabsorptive RMR while controlling for race +/- % fat-free mass (FFM) by DXA. We also tested for a nonlinear effect of the RMR difference with the inclusion of a quadratic term. Actual RMR was measured using indirect calorimetry (Deltatrac II). Predicted RMR was calculated using the Mifflin-Jeor equations: (Women) Predicted RMR = 10*weight + 6.25*height - 5*age - 161 and (Men) Predicted RMR = 10*weight + 6.25*height - 5*age + 5. Gait was assessed using a 20-meter "usual" walk. Gait was log-transformed due to non-normal distribution. Age was calculated and gender/race were self-reported. FFM was assessed using dual X-ray absorptiometry (FFM, Hologic 4500A DXA Scanner). Results: In this sample, the median time to walk 20 meters was 17.3 (men) and 18.4 (women) seconds, the mean RMR was 1376 (men) and 1124 (women) kcal/day, the mean predicted RMR was 1513 (men) and 1143 (women) kcal/day, and the mean difference between actual and predicted RMR was -137 (men) and - 20 (women) kcal/day. The comorbidity prevalence was very low. Qualitatively, the bivariate analyses revealed the relationship between timed walk and actual-predicted RMR was different for men and women (Figure 1A-B). After controlling for race, the difference between actual and predicted RMR was a significant predictor of log-transformed timed walk among men (β=-0.0002, p-value=0.01) but not women (β=0.00001, p-value=0.93) (Tables 1-2). The significance persisted among men after controlling for % FFM. The quadratic term was not statistically significant for either gender; however, qualitatively, a trend was noted among women. Conclusions: For this sample of older adults with few co-morbidities, an actual RMR that is low compared to predicted is associated with slower gait among men. This finding was not noted among women. Future work will investigate whether reduced FFM for a given height/weight would explain this finding. Limitations of this study include a low prevalence of advanced frailty in this sample.

Figure 1A-B
Lowess Plots: Timed 20-Meter Walk Versus Actual-Predicted Resting Metabolic Rate for Men (A) and Women (B).

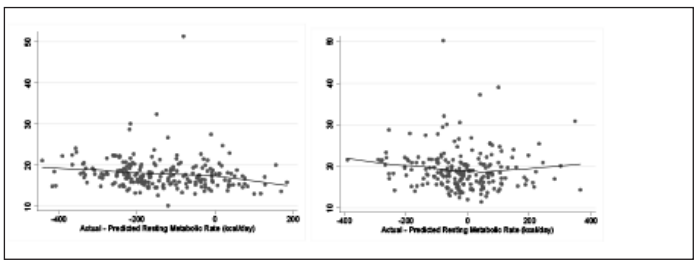


Table 1
Generalized Estimating Equation Linear Regression Model of Timed Gait (seconds, log-transformed) in Men

	Model 1 (n=215)		Model 2 (n=215)		Model 3 (n=199)		Model 4 (n=199)	
	β	p-value	β	p-value	β	p-value	β	p-value
Covariate								
Actual – Predicted RMR**	-0.0002	0.01	-0.0003	0.06	-0.0002	0.02	-0.0003	0.06
Black Race	0.05	0.05	0.06	0.05	0.06	0.01	0.07	0.01
Actual – Predicted RMR2**	--	--	-2.88e-07	0.62	--	--	-3.76e-07	0.52
% FFM	--	--	--	--	-0.0002	0.96	-0.0002	0.93

**Resting Metabolic Rate

Table 2
Generalized Estimating Equation Linear Regression Model of Timed Gait (seconds, log-transformed) in Women

	Model 1 (n=206)		Model 2 (n=206)		Model 3 (n=194)		Model 4 (n=194)	
	β	p-value	β	p-value	β	p-value	β	p-value
Covariate								
Actual – Predicted RMR**	0.00001	0.93	0.00003	0.83	0.0002	0.28	0.0002	0.26
Black Race	0.14	<0.001	0.14	<0.001	0.16	<0.001	0.15	<0.001
Actual – Predicted RMR2**	--	--	8.57e-07	0.21	--	--	8.27e-07	0.22
% FFM	--	--	--	--	-0.006	0.02	-0.006	0.04

**Resting Metabolic Rate

P86- IMPLEMENTING ASSESSMENT OF COGNITIVE FUNCTION AND FRAILTY INTO PRIMARY CARE. B. Fougère, S. Oustric, N. Tavassoli, B. Chicoulaa, J. Delrieu, B. Vellas and FAP group** *(Toulouse, France)*

Backgrounds: Aging can be affected by frailty and chronic diseases causing physical, cognitive, sensory and functional decline evolving gradually to disability. Moreover, the manifestations and complications of cognitive impairment and dementia impose a growing burden on providers of primary care. The assessment of older patients is carried out in some French hospital centers at the "Geriatric Day Hospital structures for assessment of Frailty and prevention of disability" (GDHF) and the memory clinics. However, the feasibility for all patients who have frequent mobility limitation and the cost effectiveness is questionable. In this context, another care model has been developed in Toulouse area: implementing in primary care a nurse already trained in geriatric assessment. In this paper, we describe the organization, details of the global evaluation, and provide the main characteristics of the first 150 patients evaluated during the first five months of operation. It is not a trial but an observational activity report of the geriatric evaluation into primary care. Methods: Persons aged 70 years and older were invited to undergo an evaluation at the GP's office by a Geriatric Evaluation Nurse (GEN) if the GP thought that the patient was frail or if the patient had cognitive complaint or for the two reasons. At the end of the comprehensive evaluation, the nurse gave a synthesis of the results obtained to the GP. The GP proposed orientation and recommendations with the support of a hospital geriatrician (by phone, email or telemedicine) specifically tailored to his/her needs and resources. Results: 150 patients from 14 GP's offices in Toulouse area had been assessed in 5 months (88 with frailty, 30 with cognitive complaint and 32 with both). Overall, the mean age was 81.3 (± 5.92) years old, younger if patient came for cognitive complaint (77.4 ± 5.63 years old). More than half of the study group was female (66%). The participants lived alone in one third of cases (32%). In patients with cognitive complaint, their average ADL and IADL were significantly higher than the two other groups. The average MMS was 25.2 ± 4.23 and 27% of participants had a score lower than 24/30. 16.7% were diagnosed Alzheimer's disease or other dementia. The nurse had assessed the patients with MMS greater than or equal to 24/30 with the Wechsler Memory Scale (WMS). The results highlighted 12% of Mild Cognitive Impairment (MCI). Concerning the orientation at the conclusion of the evaluation, 77.9% of patients were followed by their GP, 2.9% addressed to GDHF, 11.8% to specialized memory centre, 7.4% to geriatric consultation. Conclusion: This work foreshadows an additional ambulatory alternative in the GDHF and memory clinics adapted to the issues in the care of older persons in his/her living area. It seems adapted to the needs for population and demonstrate the feasibility to implement in primary care a nurse trained to assess older patient in GP's office. This project is a preliminary stage in the design of a study to demonstrate the interest of assessments in primary care versus GDHF and memory clinics involving several health territories and participants in largest number. **Frailty and Alzheimer's disease prevention into Primary care (FAP) group: For Department of Primary Care: Serge Ané, Marie Baillou-Découard, Elisabeth Barberan, Marguerite Bayart, Jean-Philippe Becq, Michel Bismuth, Jeremy Blanco, Odile Bourgeois, Valerie Boyer JMel, Pierre Boyer, Jean-Paul Boyes, Claude Burguier, Bruno Chicoulaa, Claude Gendre, Michel Combier, Sophie Cot, Michel Dutech, Brigitte Escourou, Christian Gaillard, Stéphane Oustric, Jean-Luc Rastrelli, Bernard Rico, Jean-Luc Souyri, André Stillmunkes, Julie Subra, Eric Vergnes, Marc Vidal. For Gérontopôle: Sandrine Andrieu, Henri Boccalon, Mattéo Cesari, Julien Delrieu, Bertrand Fougère, Christine Lafont, Christine Lagourdette, Fati Nourhashémi, Maryse Pédra, Yves Rolland, Maria Soto, Sandrine Sourdet, Néda Tavassoli, Bruno Vellas.

P87- DOES PROTEIN SUPPLEMENTATION AND RESISTANCE-TYPE EXERCISE TRAINING INFLUENCE THE BODY COMPOSITION OF SARCOPENIC OBESE OLD MEN? – A PILOT STUDY. A. Heber, E. Schulte, N. Hörner, K. Stöver, J. Latsch, K. Brixius *(Cologne, Germany)*

Backgrounds: The increasing prevalence of sarcopenic obesity in the elderly has heightened interest in identifying the most effective treatment. Physical inactivity, malnutrition and a declining anabolic response to protein intake cause a decrease in muscle mass. Progressive resistance-type exercise training is established as an effective treatment to increase muscle mass and strength in the elderly. Essential amino acids are known to stimulate protein synthesis. Whether an additonal protein supplementation affect the body composition in sarcopenic obese men while training was to investigate. Methods: Healthy sarcopenic obese men (n= 16, 70 ± 5 years) were randomly assigned to a 16 week progressive resistance-type exercise training twice a week. A group of nine supplemented 30g casein daily at bedtime and 30g whey protein after each training. The cohort was selected due to cut-off points of EWGSOP: muscle mass (skeletal muscle mass index) by bioelectrical impedance analysis (BIA), strength by hand dynanometer, performance by 4m-gait-speed and SPPB. The body composition was assessed by BIA. A seven-day dietary intake record estimated the nutrition and activity behavior

before and after the intervention. Results: There are no significant changes in the skeletal muscle mass neither in the control- nor in the proteingroup and no differences between both groups after 16 weeks of exercise. Still, there is a significant positive correlation between the skeletal muscle mass index and the protein intake (rs (9) =.827; p = .006) and a significant correlation between a decrease in body fat and increase in protein intake (rs (9) = - .802; p = .009) but no correlation in the control group. Conclusion: Neither resistance-type exercise training alone nor addtional protein supplementation increased muscle mass in elderly with sarcopenic obesity. Still, the amount of protein intake (1.55g/kg/kg body weight) had an impact on the decrease in body fat mass and therefore leads to an improvement between the relation of muscle mass and total body mass.

P88- BIA AND DEXA AGREEMENT FOR SMI EVALUATION IN SARCOPENIA DIAGNOSIS. C.H. Gonzalez-Correa, P.A. Castaño-Gonzalez, F. Marulanda-Mejía *(Caldas Manizales Colombia)*

Background: There are different definitions and criteria for diagnosing sarcopenia, however, all of them include the estimation of muscle mass. In clinical practice, this estimation can be made using techniques such as bioelectrical impedance analysis (BIA) or dual X-ray absorptiometry (DXA), among others. Since BIA is a portable and inexpensive method suitable for field studies and clinical settings, while DXA is cumbersome, more expensive and less available, the present study aimed a) to evaluate interchangeability of both techniques for Skeletal Mass Index (SMI) estimation, and b) to assess whether the two methods are comparable when using the estimation of SMI for diagnosis of sarcopenia. Methods: Thirty eight subjects aged 65- 80 years were assessed for sarcopenia using the definition of the European Working Group on Sarcopenia in Older People (EWGSOP). BIA and Dual X-ray Absorptiometry (DXA) techniques were used for skeletal muscle mass estimation. Afterwards, this estimation was expressed as skeletal muscle mass index (SMI = skeletal muscle mass/ height2). To establish the degree of agreement between the values of predictions of SMI by these two techniques, the intraclass correlation coefficient and concordance correlation coefficient were calculated. Moreover, the Bland-Altman plot was performed to evaluate the agreement. To evaluate agreement on diagnosis of sarcopenia by introducing the SMI estimation by both techniques, the Cohen's kappa test was performed. Results: The agreement between the values of SMI obtained by impedance and DXA was good when the intraclass correlation coefficient (ICC 0.7499 95% CI 0.5686 to 0.8617) was calculated, but poor when the concordance correlation coefficient was used (CCC 0.435 was calculated 95% CI 0.3003 to 0.5538). The Bland-Altman analysis showed that discrepancy between the methods is clinically unacceptable; the confidence intervals were too wide; the difference between methods tends to get larger as the average increases and the scatter around the bias line get larger as the average gets higher. The Cohen's kappa test was 0.236 (Standard error: 0.122). Conclusion: The agreement between the values of SMI obtained by BIA and DXA is weak. Translating the results into the clinical practice for the diagnosis of sarcopenia using both techniques the agreement is lower. We concluded that, in this studied population, the methods were not interchangeable.

P89- ASSOCIATION BETWEEN FRAILTY AND COGNITIVE IMPAIRMENT AMONG 50 YEAR-OLD AND OVER ADULTS WITH HUMAN IMMUNODEFICIENCY SYNDROME (HIV/ AIDS). A. Zamudio[1], J.A. Avila-Funes[1,2], P.F. Belaunzarán[1], K. Suarez[1] *(1. Mexico, Mexico; 2. Bordeaux, France)*

Backgrounds: The population of older adults living with human immunodeficiency virus (HIV) infection is growing and the evidence suggests that geriatric syndromes, as frailty, occur earlier. Frailty is associated with low cognitive performances and has been proposed as risk factor for dementia. In the same vein, HIV infection has been associated with cognitive impairment. However, it is not known if those with HIV and cognitively impaired could be more frail in comparison with those who have not cognitive impairment and just have HIV. Therefore, the objective of this study was to determine the association between frailty and cognitive impairment in elderly adults with human immunodeficiency virus (HIV). Methods: Cross-sectional study including 115 participants aged 50 or older being followed on the HIV clinic of a tertiary care, university affiliated hospital in Mexico City. Frailty was defined by the presence of at least one of the five following criteria: weight loss, weakness, exhaustion, slowness, and low physical activity. Cognitive impairment was defined according to International HIV Dementia Scale (cut-off of ≤ 10/12 points). Binomial logistic regression models were constructed to determine the association between frailty and cognitive impairment adjusting by potential confounders: age, sex, educational level, comorbidity, and depressive symptoms. Results: Mean age was 62.2 years (SD 6.9) and 80.9 % were men. The frequency of cognitive impairment was 59.1%. Prevalence of frailty was 40%. Compared with those without cognitive impairment, those cognitively impaired were younger (60.12 ± 5.4 vs. 63.6 ± 7.4; p=0.006), had more educated (13.3 ± 4.0 vs. 10.3 ± 5.8; p=0.006), had lower MMSE score (cut-off of ≤ 24/30 points)(29.0 ± 1.1 vs. 26.5 ± 3.8; p=0.000), had more disability for activities of daily living (25.5% vs. 44.1%; p= 0.042), and were more frail (25.5% vs 48.5%; p=0.13). However, there were no statistically significant differences regarding the following variables: diabetes, hypertension, dyslipidemia, CD4 cell count, or HIV viral load. The unadjusted logistic regression model showed that frailty was associated with cognitive impairment (OR =2.75, 95% CI 1.22 to 6.10; p=0.014). After adjustment for multiple covariates cited above, this association remains statistically significant (OR =2.66, 95% CI, 1.09-7.60;p= 0.040). Conclusions: Frailty is independently associated with cognitive impairment in older adults with HIV/AIDS. Probably, HIV behaves as an accelerator of aging causing that frailty (and other geriatrics syndromes) occurs earlier. However, these results must be verified with a longitudinal approach. It will be necessary that patients with HIV/AIDS be screened early to identify geriatric syndromes, which are traditionally seen in the elderly.

P90- VIT D DEFICIT NUTRITIONAL STATE AND FRIALTY IN CHILEAN OLDER PEOPLE. C. Albala, L. Lera, H. Sánchez, B. Angel, P. Arroyo, C. Marquez, M. Moya *(Santiago de, Chile, Chile)*

Background: Nutritional state and vitamin deficiency are among the key contributors to increased age-associated vulnerability and health related adverse outcomes. Objective: To study the association of frailty phenotype with nutritional state and vitamin D (vit D) deficiency in Chilean older people. Methods: Cross sectional design of baseline measurements from ALEXANDROS cohorts designed to study disability associated with obesity in community dwelling people 60y and older living in Santiago/Chile. At baseline 2099 (67% women) from 2372 participating subjects had the necessary measurements for the identification of frailty phenotype: weak hand-

grip dynamometry, unintentional weight loss, fatigue/exhaustion, five chair-stands (slow walking speed) and difficulty for walking across a room (low physical activity). From this sample 919 had vit D measurements. Vit D deficiency was defined with serum levels <50nmol/l. Nutritional state categories were defined through BMI categories as follows: BMI<20 undernutrition, BMI20-24.9 normal, BMI 25-29.9 overweight and BMI≥30 obesity.Comparison of variables was done with t test and Pearson chi2. Logistic regression were performed to study the association of frailty with vitD and nutritional state adjusted by age, gender and station of the year. Results: Prevalence of Frailty at baseline (≥3criteria) was 22,3% much higher in women than men (31.5% vs.3.8%) and the Pre-frailty prevalence (1-2criteria) was 63,7% (59,8% vs 65,7) respectively. VitD deficiency was present in 44.6% of the sample, similar in both sex. The prevalence of obesity was 33% higher in women (36.4%) than in men (25.3%), p=0.0013. Vit D deficiency was associated with nutritional state being obese the most vit D deficient. Frailty was associated with vit D deficiency (Frial 21.6%; non frail 17.9%, p<0.001) and nutritional state in a J shaped association (Frialty in underweight 20.7%; in normal 18.8%, in overweight 20.5%, in obese 27.3% p=0.002). After logistic regression analysis adjusted by season of the year, age and gender, the OR of frailty for vitD deficiency was 1.45; 95%CI 1.02- 2.06. When nutritional state was added as independent variable, besides vit D, obese category was associated with with frailty OR=1.84 95%CI 1.09- 3.10; p=0.023. No interaction between VitD and obesity was found. Conclusion: Frailty, obesity and vit D deficiency were highly prevalent in Chilean older people. Moreover frailty was associated with both conditions. Considering that vitD deficiency is also associated with obesity, the results open a window of intervention for frailty as is vitD supplementation. Funding: Fondecyt Grant 1130947.

P91- EFFECT OF WITHANIA SOMENIFERA AGAINST AGED BRAIN OF MICE. M. Lata *(Jaipur, India)*

Ageing is a complex process because it affects the deterioration of most, if not all aspects of life. Oxidative stress is the major cause of many diseases including Alzheimer, Parkinson, sarcopinia and other related neurodegenerative diseases. Neurodegenerative diseases and cognitive decline are emerging as one of the greatest public health challenges of the old age. In Ayurvedic literature, Withania somenifera is as a “rasayana” or rejuvenating drug and used this plant for enhancing longevity. Objective-The aim of the present study was to investigate the effect of Withania somenifera leaf extract on oxidative stress against brain of aged mice. Material and methods-Albino mice is used as experimental animal. Oxidative stress was measured by tissue LPO level, reduced glutathione (GSH) content and enzymatic activities of glutathione-s-transferase(GST), superoxide dismutase(SOD) and catalase(CAT).Result: Administration of Withania somenifera leaf extract caused a significant decrease in LPO level with significant increase in GSH,SOD and CAT. Conclusion: The result obtained clearly indicate that Withania somenifera has shown strong free radical scavenging activity and thus helped in improving the non enzymatic and enzymatic antioxidant in aged mice. Keyword: Withania somenifera, antioxidant.

P92- PREVALENCE OF SARCOPENIA AND ASSOCIATED FACTORS IN A SAMPLE OF OLDER ADULTS COMMUNITY-DWELLING LOCATED IN BRAZIL’S NORTHEAST. C. Dutra Pinheiro[1], J. Fernandes de Souza Barbosa[1], J. Afonso Ruaro[2], R. Oliveira Guerra[1] *(1. Natal, Brazil; 2. Paraná, Brazil)*

Background: Traditionally, the age-associated loss of MM was described as sarcopenia. The prevalence of sarcopenia is highly dependent on the diagnostic criteria. According to published reports, prevalence of sarcopenia varies between 3% and 52% depending on the study population, definition criteria, and the instruments used to assess muscle mass. Recently, the European Working Group on Sarcopenia in Older People (EWGOSP) defined criteria for sarcopenia diagnosis based on the ascertainment of lean mass (LM), muscle strength and physical performance. However, with few exceptions, studies in low income countries that evaluated the prevalence of sarcopenia using this new algorithm are rare. Thus, we aimed to estimate the prevalence and factors associated to the sarcopenia in a sample of older adults community-dwelling located in Brazil’s northeast. Methods: It is an analytical observational epidemiological and cross-sectional cohort study in which 337 elderlies have been evaluated. The elderly has been over 60 years old and from both genders. The individuals evaluation has been related to their sociodemographic characteristics (age, education, marital status, occupation and income), clinical characteristics (cognitive status, depressive symptoms, self-perceived health status and physical activity level), anthropometric characteristics (height, weight, BMI, waist and hip circumference and muscle mass) and physical performance characteristics (gait speed and grip strength). The presence or absence of sarcopenia has been verified separately for men and women, by following the classification proposed by the European Working Group on Sarcopenia in Older Adults (EWGSOP). Central tendency and dispersion measures have been used to describe the studied variables. The differences in characteristics according to the presence or absence of sarcopenia and sex have been analyzed by T-student test for continuous variables and the Qui-square test for categorical variables (p value <0.05). A logistic regression model has been used to analyze factors associated with sarcopenia in the elderly of the sample. Results: The average age of the men has been 72.49 (+7.99) years old and 70.06 (+7.06) years old for women. The prevalence of sarcopenia has been 12.3% and 11.6% respectively. The individuals who has been classified with sarcopenia were older than the individuals without sarcopenia (p <0.001) in both genders. The study showed that physical activity level of men with sarcopenia is lower than the levels of men without sarcopenia (p <0.032). The multivariate analysis has shown that the age (OR = 7.51; IC = 2.10 - 26.77) and waist girth (OR = 0.19; IC = .07 - 0.47) have been the factors which have remained associated with sarcopenia. Conclusion: The estimation of prevalence of the studied sample has been 11.8% with no differences between men and women. The advanced age and the waist circumference have been the factors associated with sarcopenia. The use of anthropometric measurements in clinical practice may estimate the development of sarcopenia in elderly population and contribute to the prescription of effective therapeutic actions related to the functional decline.

P93- EFFECTS OF ϒ-AMINOBUTYRIC ACID-ENRICHED FERMENTED SEA TANGLE ON BRAIN DERIVED NEUROTROPHIC FACTOR-RELATED MUSCLE GROWTH AND LIPOLYSIS IN MIDDLE AGED WOMEN. B.-H. Jeon, W.-C. Choi, S. Reid *(Busan, Republic of Korea)*

Backgrounds: Sarcopenia obesity (SO) is a major public health issue, characterized by a progressive loss of muscle mass

with age, coupled with high levels of adiposity. The aim of this study was to evaluate the effects of GABA-enriched fermented sea tangle (FST) on brain derived neurotrophic factor (BDNF)-related with muscle growth and lipolysis, in a sarcopenic obesity high-risk group. Methods: Twenty-one middle-aged women (53-63 yr) participated in this randomized, double-blind, placebo controlled study. Participants ingested either 1,000 mg of FST (n = 10) or a sucrose placebo (CON) (n = 11) everyday, for 8 weeks. Subjects were asked to abstain from any regular exercise. Fasting venous blood samples, body composition and muscular strength were measured before and after supplementation period. Results and Conclusion: FST demonstrated a significant between-group effect on BDNF concentrations ($p < .001$). FST ingestion also significantly reduced angiotensin converting enzyme (ACE) levels ($p < .001$). Growth hormone and IGF-1 significantly increased under the experimental condition ($p < .05$ and $p < .05$, respectively). Triglyceride levels also reduced significantly in the FST group ($p < .05$). The between groups effect on total lean mass (TLM) was significant ($p < .01$), with the FST group increasing and placebo group reducing. Total fat mass (TFM) levels were significantly reduced in the FST group ($p < .05$). Muscle strength of lower limb was shown to significantly improve in the FST group total work, knee extension and flexion at 60°/sec ($p < .05$), and peak torque normalized to body weight of knee flexion at 60°/sec ($p < .05$) (Figure 2, A, B and D, respectively). Peak torque normalized to body weight of knee extension also tended toward increasing but didn't reach significance. Collectively, we demonstrated that GABA enriched FST significantly decreased TFM and TG in body composition, as well as significantly increasing serum BDNF, ACE, HGH and IGF-1 levels accompanied by muscle growth. Furthermore, the reported improvements in muscular strength support and ergogenic effect of GABA associated with increased growth factor levels. Conclusion: The use of GABA-enriched FST, as a functional food ingredient, to elicit anti-obesity effects and stimulate the release of muscle-related growth factors with increasing serum BDNF level may provide a protective intervention for age-related degeneration such as sarcopenic obesity.

P94- THE IMPACT OF NUTRITION GUIDELINES FOR THE CARERIVERS OF THE ELDERLY ON THEIR HEALTHY LIVING IN ONDO WEST, NIGERIA. J. Abiola Olomo[1], O. Ariyo[2]
(1. Vanderbijlpark, South Africa; 2. Ibadan, Nigeria)

Backgrounds: The consumption of foods that are deficient in nutrients among the elderly causes Communicable diseases (CD) and non-communicable diseases (NCD) like, hypertension,cancer, Diabetes, stroke, etc. This is as a result of their poverty level, food insecurity and lack of socio- economic and medical facilities in their communities. The caregivers of the elderly needed nutrition guidelines to access information on nutrition education and health to provide for them in the research locations. The research paper investigated Indepth the impact of nutrition guideline for the caregivers of the elderly on their healthy living. The Research investigated the dietary intake of the elderly, their food consumption pattern and assessment of their nutritional status. Methods: Cross-sectional quantitative design of a descriptive nature was used in the research study.Structured questionnaire consisting of ; 24 hour recall questionnaire, Food frequency questionnaire,Socio- demographic and health questionnaire,nutrition education questionnaire and snack questionnaire were used in the study.The sample size consisted of 350 (200 females and 150 males) randomly Selected in the community. Descriptive statistics was used for the frequency, standard deviations and Percentages. Chi-square test was used to determine socio-demographic food consumption pattern, differences in energy and nutrient intakes.Personal interview method and physical assessment (anthropometric) were used in the study. Data was analysed using the statistical package for social Sciences (SPSS) version 17.0 computer statistical software package. Results: Cross-tabular analysis indicated that the elderly were not significantly different in age, sex and race from their participation in the programs put in place for them at the Old peoples care centres in Ondo West, Nigeria. Significant sex differences were observed for income and marital status, living arrangement and nutrition education programs participation.Only 320 of the questionnaires administered were useable.The age of the elderly range between 60-80 years. The dietary pattern of the participants confirmed thus: Majority, 320 of the participants that responded to the questions on the number of times they eat in a day, eat three times daily, 91 eat twice daily, while 35 eat more than three times daily. Discussion: In this study, majority of the elderly that participated indicated that healthy food is important to their health with the use of nutrition guidelines effectively by the caregivers .85% of the elderly agreed with the use of the information provided by the nutrition guielines and the nutrition education program. High prevalence of unhealthy eating habits was recorded among the elderly in the study. Majority of the participants reported loss of appetite while stressed. Conclusion: The study demonstrated high prevalence of unhealthy eating habits and lifestyle,together with high prevalence of overweight, obesity and hypertension among the elderly in Ondo West, Nigeria. Nutrition education, health education, focus group discussion with the use of nutrition guidelines of the elderly and other intervention will promote healthy eating habits and lifestyle in the study area.

P95- THERAPEUTIC POTENTIALS OF ECCENTRIC EXERCISES FOR AGE RELATED MUSCLE ATROPHY (SARCOPENIA). J.-Y. Lim *(Bundang, Korea)*

Background: Sarcopenia is defined as the loss of skeletal muscle mass and strength with increased age. As a result, it brings weakness, limited mobility, and increased susceptibility to injury. Recent studies have focused on the evidence based interventions to prevent mobility decline or to enhance physical performance in older adults. Several specific modalities other than traditional strengthening program have been designed to take control of age-related functional decline more effectively. The purpose of study is to look over therapeutic potentials of eccentric exercise as one of modality-specific exercise interventions for age related muscle atrophy (Sarcopenia). Methods: We performed a systematic review of literatures related to eccentric interventions published in journals indexed in international databases, excluding those that were not based on old population (over 65 years). Results: Age-related change in human skeletal muscles and its relationship with physical performance are discussed from the results of the in-vitro physiologic studies to human biomechanics studies. Sarcopenia issues are overviewed through recent consensus about diagnosis and management of sarcopenia. Mobility decline in aging population is closely linked with the change of force-velocity relationship. How to improve the f–v relationship in older adults? Specific modality interventions based on the enhancement of force-velocity relationship have been tried in many clinical or research settings. The relative preservation of eccentric strength in aging has been recognized a rationale of therapeutic potentials of eccentric exercise. Compared to the decline of concentric force, eccentric force is relatively less declined. There are various tools and techniques to make the eccentric resistances during activities and exercises. In addition, hybrid techniques (voluntary contractions combined with electric stimulation) are introduced as recent potential modality-specific interventions. Conclusion: More effective exercise interventions for older adults are to focus on enhancing force-velocity parameters. We

need to develop exercise to be performed easily and utilizing eccentric strength relatively spared in aging to improve both force and velocity.

P96- AGING AUGMENTS THE EFFECTS OF PULMONARY INFLUENZA INFECTION ON WEIGHT LOSS, MOBILITY PERFORMANCE, INFLAMMATION AND INDUCTION OF MUSCLE DEGRADATION GENES. J.M. Bartley, S. Pan, S. Keilich, J. Hopkins, G.A. Kuchel, L. Haynes *(Farmington, USA)*

Background: While influenza (flu) is a respiratory infection, myalgias and other non-pulmonary symptoms are common. In addition to a greater risk of hospitalization and death, older adults are also more likely to develop incident disability following flu infection. Given a lack of published studies, we hypothesized that in the face of flu infection aging would be associated with decreased resilience and declining mobility performance together with upregulation of skeletal muscle inflammatory and atrophy genes. Methods: Young (10 wk old) and aged (20 mo old) male C57BL/6 mice were inoculated intranasally with PR8 influenza virus (IN, 500 EID50). Open field and gait analysis (DigiGait) testing was performed at baseline, 3, 7, 11, 15, and 20 days post infection (DPI). Mice were sacrificed prior to, and 3, 7, 11, and 15 DPI. RT-qPCR was performed on gastrocnemius RNA to examine gene expression of inflammation, muscle atrophy and myogenesis pathways. Gene expression was calculated using a modified Pfaffl method, with data log-transformed and analyzed via 2-way ANOVA with Bonferroni posthoc correction. Genes were considered differentially expressed if fold changes were ≥ 2 and $p<0.05$. Lung and gastrocnemius viral titers were determined via RT-qPC. Multiple regression analysis was performed to determine if gene expression changes correlated to percent body mass. Results: Following flu infection aged mice demonstrated prolonged weight loss and elevated lung viral titers. Voluntary locomotor activity was decreased in all infected mice by 3 DPI, persisting through day 20. Aged mice were less active at 11, 15, and 20 DPI compared to young mice. All infected mice exhibited decreased stance width and midline distance, plus diminished acceleration and deceleration. These effects were more prominent in hind limbs and more so in aged mice. Moreover, gastrocnemius gene expression of interleukin (IL)-6 and IL-6 receptor alpha(IL6RA) in both young and aged mice was increased by 7 DPI while IL6RA expression remained elevated in the aged mice on 11 DPI. Furthermore, gastrocnemius expression of tumor necrosis factor (TNF) and chemokine (C-X-C Motif) Ligand 10 (CXCL10) was elevated in the aged mice compared to the young mice with a dramatic 43 fold increased expression of CXCL10 at 11 DPI in aged mice. By 7 DPI myostatin, atrogin-1, MuRF-1, Forkhead box protein O1 (FOXO1), ubiquitin B (UBB), and ubiquitin C (UBC) were also upregulated. Atrogin1, MuRF-1, and UBC were significantly greater in the aged mice compared to young mice at 11 DPI. Similarly UBB was greater in the aged mice 3, 7, 11, and 15 DPI. Thus, the lingering inflammation in the aged gastrocnemius was accompanied by increased protein degradation and atrophy gene expression. Additionally, flu decreased expression of positive regulators of muscle mass and myogenesis components. Insulin-like growth factor-1 (IGF1) expression was decreased at 7 DPI and remained decreased at 11 DPI in the aged mice only. Expression of myogenic regulatory factors (Pax7, MyoD1, and MyoG) was decreased 7 DPI in both young and aged mice and was significantly lower in aged mice. In both young and aged mice FOXO1, IL6RA, MuRF1, UBB, and UBC were significantly correlated with percent body mass where UBC accounted for the greatest variance with $R2 = 0.487$ and 0.541, respectively. Interestingly, a significant association was observed with IGF1 expression in young mice that was not evident in aged mice. Since flu induced weight loss was tightly correlated with gastrocnemius gene expression, we next examined if direct infection was the mechanism of this interaction. Gastrocnemius RNA was probed for flu Polymerase A (PA) expression and a direct muscle infection was ruled out since flu PA was not detectable in muscle. Conclusion: Influenza leads to functional impairments in locomotor activity and gait kinetics in an established mouse model of pulmonary flu infection. These effects together with weight loss and induction of inflammatory and muscle degradation genes, plus downregulation of myogenic regulatory genes are augmented and prolonged with aging. Not only does this provide a molecular link between influenza infection and increased disability in the elderly, it also illustrates the impact of aging on specific resilience mechanisms and provides future targets for sarcopenia and frailty research.

P97- IGF-1 AS CROSS-ROAD BETWEEN NUTRITIONAL AND HORMONAL PATHWAYS IN HOSPITALIZED OLDER ADULTS: AN ANCILLAR STUDY OF GLISTEN COHORT. M. Maggio[1], F. Lauretani[1], A. Fisichella[1], M. Mantovani[1], A. Ticinesi[1], F. Corica[2], F. Landi[3], S. Volpato[4], G.P. Ceda[1] *(1. Parma, Italy; 2. Messina, Italy; 3. Roma, Italy; 4. Ferrara, Italy)*

Backgrounds. The concentration and the biological action of Insulin like growth factor-1 (IGF-1) decrease with aging. Recent studies suggest that IGF-1 is a such a cross-road molecule between hormonal and nutritional pathways and a potential nutrition marker in adult-older non-hospitalized subjects. Data from the community-dwelling older subjects of InCHIANTI underline the role of IGF-1 as an independent predictor of sarcopenia while RCTs nutritional interventions conducted in older outpatients address its function as sensitive marker. However, the relationship between IGF-1 and nutritional markers and measures of body composition including skeletal muscle mass index has been poorly investigated in older patients. Thus the aim of the Study was to evaluate the relationship between IGF-1 and albumin and measures of body composition (BIA) including skeletal mass index in older hospitalized patients at hospital admission. Methods. The Study created by the Italian Working Group on Sarcopenia-Treatment, Nutrition (GLISTEN) is a multicenter epidemiological study involving 7 acute wards of Teaching-Hospitals, designed to evaluate the determinants and changes in muscle mass during hospitalization. Data presented here come from 77 women and 75 men hospitalized in the Teaching-Hospitals of Parma, Messina, Ferrara, and Rome between October 2013 and October 2014 with serum available for hormonal determination. The patients underwent a Comprehensive geriatric Assessment and blood collection at hospital admission and discharge. Muscle mass was measured by BIA using a Quantum/S Bioelectrical Body Composition Analyzer (AkernSrl, Florence, Italy). Whole-body BIA measurements were taken between the right wrist and ankle with subject in a supine position. Muscle mass was calculated using the BIA equation of Janssen and colleagues. The relationship between IGF-1 and muscle mass and albumin, was tested by multivariate regression models including age (Model 1) and age, IADL, cognitive status, multi-morbidity, and WBC (Model 2). Results. Mean Age was 79±6 and 85±6 in women and men, respectively. Medians (IQR) for IGF-1 were 65 (36) and 82 (49) ng/ml, in men and women. In Model 1, Log (IGF-1) was an independent correlate of albumin at hospital admission in older men (β±SE 0.37±0.12, $p=0.003$) and women (β±SE 0.40±0.15, $p=0.009$). After further adjustment for multiple confounders including age, IADL, cognitive status, multi-morbidity, and WBC the relationship between IGF-1 and albumin was still statistically significant in men (β±SE 0.32 ±0.15, $p=0.03$) and women (β±SE 0.37±0.15, $p=0.005$). No significant relationship was found between IGF-1 and skeletal

muscle mass in both men (β±SE -0.86±0.92, p=0.35) and women (β±SE -0.46±0.69, p=0.69). Conclusion. IGF-1 is an independent correlate of albumin, but not of skeletal mass, in older hospitalized population of both sexes.

P98- THE RELATIONSHIP OF ENDOGENOUS PLASMA B-HYDROXY B-METHYL BUTYRATE (HMB) CONCENTRATIONS TO AGE AND TOTAL APPENDICULAR MUSCLE MASS IN HUMANS. R. Kuriyan[1], D.P. Lokesh[1], S. Selvam[1], J. Jayakumar[1], G.P. Mamatha[1], S. Shreeram[2], A.V. Kurpad[1] *(1. Bangalore, India; 2. Singapore)*

Background: The maintenance of muscle mass and muscle strength is important for the reducing the risk of chronic diseases. The age related loss of muscle mass and strength is associated with adverse outcomes of physical disability, frailty and death. β-Hydroxy β-Methyl Butyrate (HMB), a metabolite of leucine, has been shown to have beneficial effects on muscle mass and strength under various catabolic conditions. The objectives of the present study were to determine if age-related differences existed in endogenous plasma HMB levels, and to assess if HMB levels correlated to total appendicular muscle mass and forearm grip strength.Methods: Anthropometry, dietary and physical activity assessment, and the estimation of fasting plasma HMB concentrations, muscle mass and handgrip strength were performed on the 305 subjects (children, young adults and elderly). Results: Mean plasma HMB concentrations were significantly lower with increasing age groups, with children having highest mean HMB concentration ($p<0.01$) followed by adults and elderly. Female subjects (across all ages) had significantly lower plasma HMB concentrations. A significant positive correlation between HMB concentrations and appendicular muscle mass normalized for body weight (% appendicular muscle mass; $r=0.54$, $p<0.001$) was observed in the adult group and the elderly ($r=0.29$, $p<0.01$). Handgrip strength was positively associated with plasma HMB concentrations in adults ($r = 0.58$; $p<0.01$) and the elderly group ($r= 0.28$; $p <0.01$). Conclusions: The findings of the present study suggest that there is an age related decline in endogenous HMB concentrations in humans and the HMB concentrations were positively correlated with appendicular muscle mass and hand grip strength in adults and elderly group.

P99- AGE-RELATED LOSS OF MUSCLE QUALITY: IMPACT OF VOLUNTARY PHYSICAL ACTIVITY. M.C. Dulac, C.H. Pion, G. Gouspillou, G. El Hajj Boutros, S. Chevalier, M. Bélanger, M. Plourde, R.T. Hepple, J.A. Morais, M. Aubertin-Leheudre *(Montréal, Canada; Sherbrooke, Canada)*

Background: It is believed that normal aging is associated with a progressive loss of muscle mass, strength and quality thereby reducing quality of life and increasing the risk of falls, fractures and functional disabilities in the elderly. The increasing number of persons aged > 65 years old worldwide imposes a high burden on health care services and costs. Hence, we sought to find a strategy that could limit loss of muscle mass, strength and quality (muscle function) during aging. One of these strategies is throughout practicing physical activity to reduce or at least stabilize decline of muscle function. A previous study with master athletes has shown that muscle function could be preserved during aging. In this study, we investigated whether muscle function is preserved in old men but practicing regular voluntary physical activity. Thus, the aim of this study is to investigate the role of voluntary and regular physical activity on muscle function in elderly active men compared to young active men. Methods: Eleven young (means ± SD: 24 ± 3 years) and 10 old (means ± SD: 72 ± 4 years) active men were recruited. Participants were practicing regular physical activity for the last 5 years (young: 218 ± 180 versus old: 308 ± 195 minutes/week; $p = 0.287$). The types of voluntary physical activity included, but were not restricted to aerobic, resistance, body and mind (e.g. Tai-Chi) activities. It should be noted that there was no difference in the type of physical activity practiced between young and old men respectively. Lean body mass and fat mass (LBM and FM by DXA) and knee extension strength (KES; leg press 1-MR) were assessed. Muscle composition was assessed by MRI (Cross-sectional area [CSA] and volume estimated for the quadriceps at 1/3 of the distance from the superior border of the patella). Muscle quality indexes (KES/LegLBM, KES/quadriceps volume and KES/quadriceps CSA) were then calculated. Muscle biopsies were collected in the Vastus Lateralis to assess fiber size and type (Type I, IIa, IIx), as well as intracellular lipid infiltration (Oil Red O) and lipid content (saturated, monounsaturated and polyunsaturated fatty acids by gas chromatography) and mitochondrial activity (succinate dehydrogenase [SDH] and citrate synthase [CS]). Neuromuscular factors such as twitch contraction and half relaxation times were estimated during maximal voluntary contraction (EMG). T-tests were performed to compare our groups (SPSS 22.0). Results were significant when p value ≤ 0.05. Results: Both groups had the same level and type of physical activity but the absolute VO2max were 29,8% lower in the older group than in the younger group ($p < 0.001$). However, it is important to note that when expressed relatively to the age, both groups are considered in the "excellent" condition. Total, leg LBM and appendicular (legs + arms), quadriceps muscle volume and quadriceps CSA were lower in the elderly compared to young adults young adults ($p < 0.05$). Similarly, knee extension strength was also lower in the elderly compared to young adults ($p < 0.05$). However, there was no difference in relative muscle strength and muscle quality indexes between our two groups (KES/LegLBM; $p = 0.539$, KES/quadriceps volume; $p = 0.573$ and KES/quadriceps CSA; $p = 0.917$). For muscle phenotype, total fiber size was lower in old versus young adults ($p = 0.046$) due to the difference in type IIx fiber size ($p = 0.025$) but there was no difference for type I and IIx fiber size between our two groups ($p = 0.111$ and 0.212 respectively). There was also no difference in fiber type proportion (Type I, IIa, IIx ; in %) between our two groups ($p > 0.05$). Old participants had a higher FM percentage ($p = 0.003$), but there was no difference for intracellular lipid infiltration and lipid content between our two groups ($p > 0.05$). Finally, the neuromuscular factor (contraction and half relaxation times; $p > 0.05$) were similar in both groups. Conclusion: Our results indicate that muscle quality and its related observed factors are maintained with age, except for absolute muscle mass and strength. As previously stated in numerous studies muscle quality indexes are considered as the best predictors of functional capacity in the elderly. Therefore, our results support that adopting a lifestyle that includes regular physical activity (an average of 308 min/week) for at least 5 years could counteract muscle function decline during aging.

P100- IMPACT OF A MEDICATION REVIEW TO OPTIMIZE PRESCRIPTIONS IN PRIMARY CARE. E. Magre, C. McCambridge, C. Cool, S. Qassemi, I. Recoche, F. Farbos, P. Cestac, S. Sourdet, B. Vellas *(Toulouse, France)*

Backgrounds: The Geriatric Frailty Clinic (G.F.C) for Assessment of Frailty and Prevention of Disability was created to identify the specific causes of frailty and to design a personalized preventive plan of intervention against disability. Medication review is performed daily in the G.F.C both by clinical pharmacists and geriatric physicians. This review aims to identify Potentially Inappropriate Drug Prescribing (PIDP) according to explicit and implicit criteria,

and then to propose optimizations to the general practitioner (GP). Methods: Explicit criteria were based on the Summary of Product Characteristics, on the Laroche List, and the guidelines of the French Health Agencies. Implicit criteria were based on patients' clinical and biological data. A drug prescription was qualified as potentially inappropriate if at least one of the following criteria was observed : drug with an unfavorable benefit-to-risk ratio; drug with questionable efficacy; absolute contraindication; significant drug-drug interaction; pathology without any treatment; drug without any indication and inappropriate dosage. The main objective of this study was to assess the impact of the medication review on the optimization of the GP's prescriptions after a three-month period. The rate of acceptance was determined after interviewing community pharmacists and GPs. Results: The results indicated that, among the 191 patients included, 69% had at least one PIDP (0-9). The median of acceptance rate by the GPs was 57%. Almost one out every two optimizations was applied for each patient. Most of time, the propositions were related to drugs with an unfavourable benefit-to-risk ratio (56.5% of the patients), and drugs that were prescribed without any indication (26% of the patients). In instances where the GPs had not applied our proposals, it involved agents from the cardiovascular system (20%), nervous system (17.7%) and alimentary tract and metabolism (12%). The main reasons given were that they did not want to change the prescription of a specialist (15% of the patients), or that the drug was, to the best of their knowledge, correctly indicated (11%), or that any previous attempt to terminate the drug was unsuccessful (9%). Conclusion: Our work suggests that numerous patients have a PIDP and this situation could be optimized using the knowledge of clinical pharmacists in collaboration with physicians. The hospitalisation of the patients in the G.F.C would appear to be an efficient system to improve prescriptions in primary care.

P101- STANDARDIZED FRAILTY PHENOTYPE CRITERIA: SHORT TERM PREDICTIONS. THE TOLEDO STUDY. B. Contreras[1], J.A. Carnicero[2], C. Alonso-Bouzón[1], F.J. García-García[2], L. Rodriguez-Mañas[1] *(1. Madrid, Spain; 2. Toledo, Spain)*

Background: Recent studies have shown that frailty transitions could be modulated by several factors. Besides this, some interventions have been developed to improve clinical outcomes in frail patients. Both facts, in the face of a high prevalence of this syndrome make frailty an important target to address older adults in clinical settings. Actually, to improve clinical tools to detect frailty is a priority. Frailty Phenotype is the most used tool but large differences in the prevalence of frailty were found between countries. Some authors have suggested that these differences could be due to phenotypic diversity. Large studies have assessed the performance of the original Frailty Phenotype Criteria, as validated in Cardiovascular Health Study, and the standardized version according to the characteristics of the population. However, none studies has evaluated the effect of this standardization in the Frailty Phenotype Criteria predictive ability. Methods: Data were taken from the Toledo Study for Healthy Aging (TSHA), a population-based study conducted on individuals over 65. The study was approved by the Clinical Research Ethics Committee of Complejo Hospitalario de Toledo. Frailty was assessed in two ways: Frailty Phenotype Criteria (FPC) using the cut-offs estimated in the CHS and Standardized Frailty Phenotype Criteria (S-FPC) using like cut-off points fitted to the characteristics in our study sample. Main outcomes were: death for all causes and hospitalizations. Statistical analysis included all participants who completed the frailty scale. Descriptive statistics were made to summarize the data and construct the cutoff points for S-FPC. X- square statistic was used to compare frailty prevalences. Kaplan-Meier curves evaluated the raw risk of mortality and hospitalization according to time of follow-up. Log Rank Test was applied to Kaplan Meier curves to assess their statistical difference. Results: 1645 individuals were included in the analysis. Of them 729 were men (44'3%). Median age was 74 (IQR 71-78) years. The prevalence of frailty and prefrailty using the FPC was 18.4% and 62.2% respectively; and 11.06% and 44.56% when we used S-FPC ($p<0.01$). Kapplan Meier curves were created. For both versions of the criteria Log-rank test were statistically significant. Moreover we analyzed the minimum time of follow-up necessary to obtain statistical differences between frailty status: S-FPC predicted for death and hospitalization at shorter times than FPC. For exemple comparing frails and robusts FPC has a statiscally difference in their risk at week 60 for death while using S- FPC the time for significant event is reduced to 26 weeks. For hospitalization, FPC ontained a statistically significant difference at week 13 and using S-FPC at week 3 ($p<0.05$). Conclusions: These findings race the necessity of standardizing Frailty Phenotype Criteria according to the characteristics of the population in order to improve their predictive ability. This study was support by contracts RETICEF (RD06/0013 and RD12/0043) and FRAILTOOLS.

P102- ASSOCIATION BETWEEN MYOCYTE QUALITY CONTROL SIGNALING AND SARCOPENIA IN OLDER HIP-FRACTURED PATIENTS. E. Marzetti, M. Lorenzi, A. Menghi, F. Landi, R. Calvani *(Rome, Italy)*

Backgrounds: Hip fracture is a devastating event for older people. Sarcopenia is proposed to be a potentially amenable factor impacting the clinical outcome of hip fractured elderly. However, a better understanding of the signaling pathways responsible for age-related muscle decline is necesary to design targeted interventions. The present study was undertaken to explore the association between alterations in myocyte quality control signaling and sarcopenia in elderly hip-fractured patients. Methods: Twenty-five older hip-fractured patients (20 women and 5 men; mean age 84.9±1.65 years) were enrolled in the study. Intraoperatory biopsies from the vastus lateralis muscle were obtained and assayed for the expression of a set of quality control signaling proteins. The presence of sarcopenia was established according to the European Working Group on Sarcopenia in Older People (EWGSOP) criteria. Whole-body fat-free mass was estimated via bioelectrical impedance analysis (BIA). Muscle strength was assessed by means of handgrip strength testing. Differences in the expression of myocyte quality control signaling proteins between sarcopenic and non-sarcopenic patients were assessed by independent samples t-test or Newman-Keuls test, as appropriate. Results: Sarcopenia was identified in 12 subjects (48%). Expression of mitochondrial fusion protein mitofusin 2 (Mfn2) and the autophagic mediators lysosomal associated membrane protein-2 (LAMP-2) and microtubule-associated protein 1 light chain 3 beta (LC3B) was lower in older subjects with sarcopenia relative to non-sarcopenic patients (all p values <0.05). No differences between groups were observed for the other mediators investigated (fusion proteins Mfn1 and Opa1, fission protein Fis1, the regulator of mitochondrial biogenesis PGC-1α and the pleiotropic transcription factor FoxO3a). Conclusions: Data from this exploratory study show that reduced mitochondrial fusion and disrupted autophagic signaling are associated with sarcopenia in older hip-fractured patients. Future larger-scale studies are needed to corroborate these preliminary findings and determine whether myocyte quality control pathways may be targeted to improve muscle trophism and function recovery in older patients with hip fracture.

P103- AGE-RELATED TRAJECTORIES OF MUSCLE MASS AND FUNCTION IN ITALIAN COMMUNITY-DWELLERS VISITING MILAN EXPO: RESULTS FROM THE VIP STUDY. M. Tosato, R. Calvani, E. Marzetti, G. Savera, A. Collamati, A. Sisto, E. Ortolani, A.M. Martone, F. Landi *(Rome, Italy)*

Backgrounds: Declining muscle mass and function is a hallmark of the aging process. Preservation of muscle trophism may protect against various negative health outcomes, including cardiometabolic diseases, functional and cognitive decline, disability and early all-cause mortality. Age- and sex-specific curves of muscle mass and strength using data from a large sample of "true" free-living people has yet to be established. Methods: The VIP (Very Important Protein) Study, conducted during EXPO 2015 in Milan, consisted in a population survey aimed at assessing the prevalence of health metrics with a special focus on the relation between animal protein intake and muscle mass and function. For the study, 2800 adult persons (53% women, 47% men, mean age 51 years) were enrolled. A brief questionnaire exploring lifestyle habits, dietary preferences and consumption of selected foods. Muscle mass was estimated by mid-arm muscle circumference (MAMC) and calf circumference of the dominant side. Muscle strength and function was assessed by handgrip strength testing and repeated chair stand test. Results: Both muscle strength and function declined significantly across decades (p for trend <0.0001) irrespective of sex and body mass index. This pattern was more evident in females (33% reduction in handgrip strength for females vs 25% in males). Muscle mass assessed either by MAMC or calf circumference was similar across age groups. Muscle quality of the upper extremities, expressed as handgrip strength divided by MAMC, declined significantly with aging (p<0.0001). Conclusions: Muscle mass and strength curves may be used to extract reference values for subsequent use in research as well as in the clinical setting. The analyses of trajectories of muscle parameters may help identify cutoffs for estimation of risk of adverse events.

P104- ASSESSING SARCOPENIA IN OLDER HOSPITALIZED PATIENTS. FEASIBILITY AND PREVALENCE ESTIMATES OF THE EWGSOP ALGORITHM. F. Landi[1], R. Calvani[1], P. Abete[2], G. Belelli[3], M. Bo[4], A. Cherubini[5], F. Corica[6], M. Maggio[7], M. Zamboni[8], S. Volpato[9] *(1. Rome, Italy; 2. Naples, Italy; 3. Monza, Italy; 4. Torino, Italy; 5. Ancona, Italy; 6. Messina, Italy; 7. Parma, Italy; 8. Verona, Italy; 9. Ferrara, Italy)*

Backgrounds: Even though the term "sarcopenia" is commonly used in the literature, there is no agreement on the diagnostic definition. Consequently, the prevalence of sarcopenia varies greatly depending upon the criteria used and the study setting. We investigated the feasibility of the European Working Group on Sarcopenia in Older People's (EWGSOP) algorithm assessment in hospitalized older adults and analyzed the prevalence and clinical correlates of sarcopenia. Methods: We used data (660 participants) from the multicenter Italian Study conducted by the Gruppo Lavoro Italiano Sarcopenia – Trattamento e Nutrizione (GLISTEN) in 11 Acute Care Wards (Internal Medicine and Geriatrics) of University Hospitals across Italy. This study was designed to determine the prevalence of sarcopenia at hospital admission and the change in muscle mass and strength during hospitalization. A hospital stay of more than 48 hours in the emergency department before being admitted to the acute care unit involved in the project was considered an exclusion criterion. A positive diagnosis for sarcopenia was given to all participants who had a low skeletal mass index (Kg/m2) and who either had low handgrip strength or low walking speed (EWGSOP criteria). Skeletal muscle mass was estimated using bio-impedance analysis. Results: Of the 660 patients (age 81.1±6.9 years; women 51.8%) enrolled in the study, 275 (41.7%) were not able to perform the 4-meter walking test and 57 (8.6%) did not perform the handgrip test because of medical problems. After excluding 14 patients with missing data in both handgrip and walking speed tests, the overall prevalence of sarcopenia (35.0%; CI 95% 31.3-38.7%) steeply increased with age (p<0.001). Patients with sarcopenia were more likely to have congestive heart failure, cerebrovascular disease, dementia, and severe ADL disability. Conclusions: Based on EWGSOP criteria, the prevalence of sarcopenia is extremely high among acutely ill older adults. The EWGSOP algorithm, however, might not be suitable for routine clinical use in patients admitted to acute care wards because many patients are not able to perform the 4-meter walking test.

P105- ANIMAL-DERIVED DIETARY PROTEIN, MUSCLE MASS AND FUNCTION IN COMMUNITY-DWELLERS VISITING MILAN EXPO: RESULTS FROM THE VIP STUDY. R. Calvani, E. Marzetti, M. Tosato, G. Savera, A. Collamati, A. Sisto, E. Ortolani, A.M. Martone, F. Landi *(Rome, Italy)*

Backgrounds: The loss of muscle mass and function with aging (sarcopenia) is associated with numerous adverse health events. Behavioral factors, including protein intake, influence the quantity and quality of skeletal muscle. Methods: The VIP (Very Important Protein) Study, conducted during EXPO 2015 in Milan, consisted in a population survey aimed at assessing the prevalence of health metrics with a special focus on the relation between animal protein intake and muscle mass and function. For the study, 2854 adult persons (53% women, 47% men, mean age 51 years) were enrolled. A brief questionnaire exploring lifestyle habits, dietary preferences and consumption of selected foods. Muscle mass was estimated by mid-arm muscle circumference (MAMC) and calf circumference of the dominant side. Muscle strength and function was assessed by handgrip strength testing and repeated chair stand test. Results: Both muscle strength and function declined significantly with age (p<0.0001). Muscle mass assessed either by MAMC or calf circumference was similar across age groups. The average daily consumption of animal derived protein in the study population was 21.9 g. The nadir of animal protein consumption was found in 50-60 years age group. Persons in the highest tertile of protein consumption (over 30 g/day) showed better performance both at the handgrip strength (p<0.0001) and chair stand tests (p<0.005) than those in the lowest tertile. The same results were found for MAMC (p<0.0001) and calf circumference (p<0.001). Conclusions: The results of the VIP survey suggest that in the oldest age group, protein consumption from animal sources, albeit not lower than in younger participants, might not be sufficient at supporting muscle health. This observation corroborates the paradigm of muscle anabolic reistance in old age and suggest that an increased amount of animal derived high-quality protein may be required to preserve muscle trophism in late life.

P106- ISOKINETIC MUSCLE STRENGTH IN FRAIL AND NON FRAIL OLDER ADULTS AND ITS ASSOCIATION WITH FRAILTY PHYSICAL CRITERIA. E. Ferriolli, F. Pessanha, N. Alves, K. Pfrimer, L. Marques, M. Angeluni, N. Iosimuta, R. Junior, J. Moriguti, N. Lima, D. De Abreu *(São Paulo, Brazil)*

Background: Decrease in muscle strength is considered as one of the predictors of frailty syndrome. Interventions to increase muscle strength showed benefits in reversing and preventing the syndrome but, in most cases, the evaluation is based only on the strength of the knee extensor muscles. The aim of this study was to evaluate differences in muscle strength of different muscle groups, measured

by isokinetic in frail (F) and non frail (NF) older adults and to verify the possible correlation between muscle strength and physical criteria for the diagnosis of frailty (Handgrip Strength- HS and Gait Speed-GS). Methods: Twenty-six community-dwelling older adults aged ≥ 60 years were evaluated. Frailty classification was performed according to Fried et al criteria. For this analysis those who did not show any positive criteria for the frailty syndrome were considered NF, and those with one or more criteria pre-frail (PF)/frail. Isokinetic muscle strength (Peak Torque - PT) was evaluated by the isokinetic dynamometer Biodex-System 3 Pro (Biodex Medical Systems, Inc, Nova Iorque, EUA). Different muscle groups were studied: elbow, trunk, knee and ankle flexors and extensors, and hip abductors and adductors. Except for the hip and trunk groups angular velocity was measured at 600/s and 1800/s. To analyze the data and to compare groups the Independent T-Test and Mann-Whitney U test were applied according to the normality of the variables found on the Kolmogorov-Smirnov test. The Spearman correlation test was used to verify the association between variables, as appropriate. Results: 15 older adults were classified as PF/F and 9 as NF. Differences were found in isokinetic strength between groups for trunk flexors (50.9±30.9; 84.9±34.9) and extensors (71.4±47.2; 119.7±73.7), hip adductors (17.8±12.1; 27.9±12.9), elbow flexors at 600 (16.3±8.1; 25.2± 9.3) and knee flexors at 600 (19.7±10.8; 32.3±16.7) and 1800 (14.8±9.3; 24.1±12.2) in PF/F and NF respectively. In PF/F the elbow extensors (600) (ϱ=0.67) and flexors (1800) (ϱ=0.71), knee extensors (ϱ=0.73) and flexors (600) (ϱ=0.68), and ankle flexors (600) (ϱ=0.75) showed moderate or strong positive correlation with HS. In the NF group the elbow flexors (600) (ϱ=0.69; ϱ=84), the ankle flexors (600) (ϱ=0.76; ϱ=0.72), and knee flexors (600) (ϱ=0.82; ϱ=0.74) and extensors (1800) (ϱ=0.74; ϱ=0.63) showed moderate or strong positive correlation with HS and GS ($p \leq 0.05$). Conclusions: PF/F older adults had lower strength of different muscle groups compared to NF. In PF/F, PT of knee, elbow and ankle muscles were positively correlated with HS, while in NF knee and elbow muscle groups correlated positively with HS and the GS. In this study, HS was associated with peak torque of various muscle groups, and not only with lower extremity groups in frail and non-frail persons, while GS was associated with three muscle groups in NF volunteers only. Trunk muscles function was not associated with physical frailty criteria. Funding: This study was partially funded by FAPESP, São Paulo Research Foundation, process number 2011/50768-7.

P107- MONITORING MOVEMENT JERKINESS AND MOTOR PLANNING DEFICITS USING PORTABLE TOOLS: A PRELIMINARY RESULT. S. Amano, L. Clark, T.D. Law, R. Clift, S.L. Hong, B.C. Clark *(Athens, USA)*

Background: Increased fall risk and mobility limitations are cardinal problems for older adults. More than 30 percent of community dwelling elders experience a fall annually, often resulting in serious injuries. Data from video captures of real-life falls of older adults indicate that deficient motor planning and weight shifting are key factors associated with falling. The Four Square Step Test (FSST) is a common clinical test for fall risk that requires individuals to remember and execute a timed motor sequence, involving motor planning and weight-shifting. Unfortunately, the typical outcome measure of the FSST is the time to complete the test, which does not necessarily provide detailed insight into underlying problems of motor planning per se. To overcome this limitation, we believe concomitant measures of stepping patterns to quantify the degree of 'jerkiness' during the FSST would provide greater insight into motor planning deficits. Accordingly, the goal of this study is to assess whether movement jerkiness is associated with poor performance on the FSST. Additionally, we examined whether jerkiness during the FSST test was associated with poor performance on a common measure of mobility in the elderly [i.e., the 4-meter walk test (4MWT)]. Methods: Nine community-dwelling older adults (86±7 years; 155.1±9.4cm; 64.9±11.9kg; 2 males, 7 females) without overt neurological disorders performed the FSST and 4MWT. During the FSST, two wireless accelerometers were placed on the participant's ankles (over the lateral malleolus) and acceleration patterns in the anteroposterior (AP), mediolateral (MP), and vertical directions were recorded. Movement jerkiness was measured from the time derivative of acceleration in each direction. Pearson's correlation coefficients were used to examine associations between outcomes. Results: Selected outcomes of movement jerkiness were associated with the time to complete the FSST. Specifically, jerkiness of the movements of the dominant foot in AP direction ($r=0.67$, $p=0.05$) and the non-dominant foot in all three directions (AP: $r=0.66$, ML: $r=0.65$, and vertical: $r=0.70$; all $p<0.05$) were associated with the time to complete the FSST. The association between the time to complete the 4MWT and the time to complete the FFST was not significant ($r=-0.64$, $p=0.06$). Additionally, no significant association was observed between the time to complete the 4MWT and any jerkiness scores obtained from the FSST (all $p>0.05$). Conclusion: Our preliminary results suggest that decline in motor planning capacity (as indicated by higher jerkiness) and the slowing of movement (time to complete the FSST and 4MWT) are separate dimensions. Moreover, our results suggest that the decline in motor planning is more prominent on the non-dominant side. Future work is needed to address whether this new test paradigm has sufficient sensitivity to detect subtle declines in poor motor planning that are not solely associated with motor slowing as well as whether a measure of jerkiness would increase the sensitivity of the FSST to better identify fall risk. Acknowledgements: This work was funded by a grant from the National Institute on Aging/National Institutes of Health's (R01AG044424 to BC Clark).

P108- A MULTI-FACETED INTERVENTION TO SLOW FRAILTY IN PRIMARY CARE: THE TRIAGE (TARGETING, REFERRING, INTERVENING TO PROMOTE HEALTHY AGEING) STUDY. C. Kennedy, L. Lamarche, A. Papaioannou, D. Oliver, G. Ioannidis, S. Radcliffe, R. Valaitis, L. Dolovich *(Hamilton, Canada)*

Background : Although the importance of screening for and managing frailty is recognized, more studies are needed to determine how we can proactively prevent, delay or reverse the course of frailty. The effectiveness of a multi-faceted frailty intervention within a geriatric/rehabilitation specialty service has been demonstrated, however, whether a similar intervention is transferable and effective within a primary care setting is not well known. Little attention has been given to the concept of managing frailty in primary care despite the opportunity to implement preventative measures before the tipping point of frailty has been reached. Strategies that leverage other members of interdisciplinary care teams may be resource efficient and alleviate some of the need for referral to geriatric specialists. The aim of the TRIAGE study is to examine the feasibility of implementing a multi-faceted frailty intervention in community-dwelling seniors who have been identified as vulnerable or frail by family health teams. Methods : TRIAGE is a feasibility study utilizing a single-arm, pre- and post- intervention design. The study is underway and aims to recruit approximately 36 participants, age 70 years and older, from the Health TAPESTRY cohort. Health TAPESTRY is a primary care initiative centred on meeting a person's health goals via information technology, interprofessional family health teams, trained community volunteers, and improved system navigation and community linkages.

Individuals who have been identified as pre-frail or frail (Edmonton Frail Scale) or flagged as "at risk" for nutrition, social isolation, or physical activity (information gathered by volunteers and embedded directly into the electronic medical record) are eligible for the study. Primary clinical outcomes are being collected at baseline and 24-weeks; feasibility outcomes are tracked throughout. Multi-faceted Intervention: The TRIAGE intervention incorporates five key components for managing frailty: 1) goal-focused exercise program/ coaching, 2) protein-caloric support, 3) vitamin D supplementation, 4) reduction of polypharmacy, 5) psychosocial support, and we hypothesize that it is the synergistic effect of these strategies that will produce meaningful change. Exercise/Cognitive-behavioural support: At baseline, a goal setting discussion is conducted to identify goal areas related to health, nutrition and physical activity. Participants are followed up at the end of the study to evaluate the level of goal attainment for each goal. A tailored, goal-focused home-based exercise program is developed by the TRIAGE registered Kinesiologist, incorporating endurance, resistance, and balance training. Cognitive behavioural support occurs at monthly home visits with topics including goal setting, self-monitoring, overcoming barriers, use of social support, stimulus control, decision balance, and reinforcement management. Trained Health TAPESTRY volunteers form an integral part of supporting and monitoring the intervention and provide weekly "check-in" phone calls. Vitamin D: All participants receive 1000 IU/day Vitamin D3 for the duration of the study. Protein-caloric support: After a dietitian consultation and assessment at the family health team clinic, tailored protein supplementation is provided to study participants to reach daily targets for healthy older adults undergoing an exercise program (e.g., 1.2 g protein per kilogram of body weight). Polypharmacy reduction: Participants receive a home-based visit to review medications and symptoms and are followed up at a clinic appointment by a pharmacist and primary care physician. Psychosocial support: The EU-GENIE tool is used to help identify psychosocial supports in the community and is administered by the trained volunteers. A personalized map of services and supports that are located in the individual's circle of care and community is provided to participants. Results : Feasibility outcomes include recruitment and retention rates, adherence to intervention components, patient acceptability, sensitivity of tools, and resource use. Clinical outcomes include change in frailty (Frailty Index, Fried Phenotype), mobility (short performance physical battery), and quality of life (EQ-5D). The Senior's Fitness Test is utilized to create tailored exercise programs and monitor progressive changes during the intervention phase. Qualitative methods will examine the experience of TRIAGE participants with the multi-faceted intervention. Conclusion : Proactively managing or slowing frailty, particularly upstream, may alleviate some of the burden on our health system including referrals to geriatric services and unnecessary emergency room visits. The TRIAGE study will assess whether a multi-faceted intervention targeting frailty can feasibly be implemented within a primary care setting and generate preliminary data regarding the effectiveness of this approach. Our results could be used to guide larger scale studies with the potential to be developed into a model of care that is implementable in other sites across Canada.

P109- THE RELATIONSHIP BETWEEN T-CELL RESPONSES TO CYTOMEGALOVIRUS (CMV), CIRCULATING MARKERS OF INFLAMMATION, AND FRAILTY IN HIV- AND HIV+ MEN IN THE MULTICENTER AIDS COHORT STUDY (MACS). J.B. Margolick, J.H. Bream, T. Nilles, H. Li, S. Langan, S.X. Leng *(Baltimore, USA)*

Background: Many people with chronic CMV infection exhibit strong anti-CMV T-cell responses. Chronic CMV infection is highly prevalent in the general elderly population and in men who have sex with men (MSM). HIV-infected MSM demonstrate high levels of inflammation and immune activation, which are not entirely resolved even with suppression of HIV replication to clinically undetectable levels by antiretroviral therapy (ART). We and others have shown that HIV-infected people receiving ART experience frailty, an important age-related syndrome, and other manifestations of aging, at earlier ages than similar HIV-uninfected people. In the general HIV-uninfected elderly populations, these outcomes are strongly associated with chronic systemic inflammation. Therefore, we hypothesized that in MSM, whether HIV-infected or –uninfected, immune responses stimulated by CMV could contribute to chronic immune activation. To test this hypothesis, we studied the relationship between T-cell reactivity to CMV, markers of systemic inflammation, and frailty in men followed in the MACS. We have previously reported that most T cells respond to CMV genes other than those encoding the CMV proteins pp65 (UL83) and IE-1 (UL123), particularly for CD4 T cells and for interleukin 2-producing cells (Li et al, 2014). Methods: The MACS has followed HIV-infected and –uninfected men in four US cities since 1984, and has assessed the Fried Frailty Phenotype (FFP; Fried et al, 2001) at each semiannual study visit since 2007. Here, we studied 42 men (20 HIV-, 22 HIV+) at the Baltimore-DC MACS site who had known frailty status and stored serum and viable peripheral blood mononuclear cells (PBMC) available for study. Frailty was defined as expression of the FFP at two consecutive study visits (frail (F) group, n=22) and non-frailty as not expressing the FFP at two consecutive visits (non-frail (NF) group, n=20). All HIV+ men were virologically suppressed (plasma HIV RNA <50 copies/ml). T-cell responses to CMV were assessed by stimulating thawed PBMC with overlapping peptide pools covering the 21 CMV genes that elicit the greatest responses in CD4+ and CD8+ T cells (Sylwester et al, 2003), followed by flow cytometric analysis of cell surface markers (CD3, CD4, CD8, CD38, HLA-DR) and intracellular cytokine staining (ICS; interferon (IFN)-γ, tumor necrosis factor (TNF)-α, and IL-2). Serum levels of 15 proinflammatory cytokines and chemokines (IL-1β, IL-2, IL-6, IL-8, IL-10, IL-12p70, IFN-γ, TNF-α, GM-CSF, MCP-1, MCP-4, MIP1β, eotaxin, IP-10, and TARC) were measured by multiplex electrochemiluminescence, and C-reactive protein (CRP) by nephelometry. Correlations among measurements were assessed by Spearman's correlation coefficient. Results: All men studied had detectable T cell responses to CMV peptide pools. When subjects were stratified by HIV status only, there were no strong correlations between percentages of CMV-directed cytokine-producing T cells and any measure of immune activation (cellular or serologic) for any cytokine or for either CD4 or CD8 T cells. However, when the subjects were stratified by both HIV status and frailty status (i.e., four HIV-frailty groups), strong positive correlations (r= 0.6 to 0.9) were observed within some HIV-frailty groups between the summed CD4 T cell IL-2 response to all CMV genes (which ranged from 0.1 to 5.2% of CD4 T cells) and markers of activation. This was particularly true for HIV-, non-frail men: e.g., for CRP (r=0.61), for activated CD8 T cells (r=0.65 for CD8, r=0.56 for CD4,), and several chemokines (r= 0.6 to 0.85). Some strong correlations were seen in HIV+ non-frail men (e.g., r=0.65 for activated CD4 cells and 0.71 for activated CD8 cells), and, to a lesser extent, HIV+ frail men r=0.62 for CRP). As expected, T cell responses to individual CMV genes, including UL83 and UL123 alone or combined, did not show any strong correlations with serum inflammatory markers, except that within HIV+ frail men CRP was highly correlated to the summed CD8 IL-2 response to CMV UL123 (r=0.83). Conclusions: These data, though preliminary, suggest that CMV-induced T cell production of IL-2, were correlated with chronic inflammation and immune activation in HIV- men and possibly virologically suppressed HIV+ men who are non-frail. These

relationships appeared to be weaker in frail men. CMV-derived antigens could help stimulate immune activation, or their production may be a result of immune activation. Further studies are needed to address this question and the contribution of CMV-induced responses to the inflammation that is associated with aging. These results indicate that future studies should take into account the frailty status of the study population.

P110- PHYSICAL FRAILTY, COGNITIVE FRAILTY, AND THE RISK OF DEMENTIA IN THE GAIT AND BRAIN STUDY. M. Montero-Odasso[1], B. Barnes[1], M. Speechley[1], S. Muir-Hunter[1], T. Doherty[1], G. Duque[2], K. Gopaul[1], A. Islam[1], L. Sposato[1], A. Casas-Herrero[3], M. Borrie[1], R. Camicioli[4], J. Wells[1] *(1. London, Canada; 2. Melbourne, Australia; 3. Pamplona, Spain; 4. Edmonton, Canada)*

Background: The frailty phenotype, one of the most accepted frailty models, focuses on five purely physical criteria: unintentional weight loss, weak hand strength, slow walking speed, physical inactivity, and exhaustion. Although physical and cognitive impairment frequently overlap in older adults, cognition is not included in the frailty phenotype. An international consensus proposed "cognitive-frailty" as a distinctive entity defined as the presence of both physical frailty (e.g. at least three of the five criterion) and cognitive impairment, in the absence of dementia. However, the predictive ability for future dementia of te cogntive-frailty construct remains to be explored. Our objective was to examine the relationship between physical frailty, cognitive status, and gait performance as predictors of cognitive decline and incident dementia. Methods: Prospective cohort study of 252 community-dwelling older adults free of dementia at baseline. After consent was obtained, participants underwent a comprehensive baseline evaluation as well as biannual assessments during a maximum of 5 years of follow-up. For this analysis, participants were required to have at least two biannual assessments, including baseline visit. Inclusion criteria were community-living adults aged 65 years and older, English speaking, and reported being able to ambulate one city block. Exclusion criteria included diagnosis of a terminal illness, life expectancy less than 12 months, nursing home placement pending, hip or knee joint arthroplasty within the preceding six months, Parkinsonism, neurological diseases with residual motor deficits (e.g. stroke), diagnosis of major depression, and diagnosis of dementia as ascertained by using DSM-V criteria. Sociodemographic characteristics, co-morbidities, chronic medications, physical activity level, history of falls, and basic and instrumental activities of daily living were collected using standardized and validated questionnaires. Cognition was assessed using the Montreal Cognitive Assessment (MoCA), and the Mini-Mental State Examination (MMSE). When objective cognitive impairment was detected at baseline, defined as a MoCA score below 26, the global rating of Clinical Dementia Rating (CDR) scale was performed. Gait velocity (cm/s) during normal pace was evaluated using an electronic walkway with embedded pressure sensors (GAITRite® System, 600cm long). Participants were asked to walk on the walkway at their usual pace in a quiet well-lit room wearing comfortable footwear. Physical frailty was defined using the previously mentioned validated phenotypic criteria. Cognitive-frailty was defined as the simultaneous presence of physical frailty with objective cognitive impairment, defined as a MoCA score below 26 and a CDR of 0.5, and absence of concurrent dementia. Therefore, for the cognitive-frailty status, six categories were obtained: nonfrail/cognitively normal, nonfrail/cognitively impaired, prefrail/cognitively normal, prefrail/cognitively impaired, frail/cognitively normal, frail/cognitively impaired. The main outcome measure was all-cause dementia, based on Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) criteria. The independent variables were physical frailty, cognitivefrailty, and the individual physical frailty criteria with and without cognitive impairment. Multiple regression models examined the association between baseline individual physical frailty components and future dementia. Cox Proportional Hazards models were used to estimate the risk of cognitive decline and dementia for frailty, cognitive-frailty, and gait and cognition models. Results: During follow-up, 53 participants experienced cognitive decline and 27 participants progressed to dementia, with an overall incidence rate of 73 per 1000-persons year. Twenty-three progressed to AD dementia, two to Lewy body dementia, one to Vascular dementia, and one to Fronto-Temporal Dementia, behavioural variant. From those who progressed to dementia, 17 participants had a drop in MoCA of at least 2 points between baseline and their final visit, six participants had no change or dropped 1 point and four participants showed a mean increase of two points. Older adults with physical frailty had a higher prevalence of cognitive impairment (77%) compared to those without (54%, p = 0.020) but the risk of progression to dementia was not significant. Adding cognitive impairment to the frailty phenotype, operationalized as cognitive-frailty, did not predict progression to dementia. Incidence rate for frailty was 61 per 1000 person-years and for and cognitive-frailty, 80 per 1000 person-years. The combination of slow gait and baseline cognitive impairment was associated with the highest risk of progression to dementia (HR: 35.9, 95%CI: 4.0–319.2; p = 0.001) with an incidence of dementia of 12% incidence rate of 130 per 1000 person-years). Conclusions: The combination of slow gait with objective baseline cognitive impairment was the strongest predictor of incident dementia as opposed to frailty and cognitive-frailty models. Our results suggest that common mechanisms, probably affecting brain function, are underlying gait and cognitive impairments before dementia. Mechanistically, studying the functionality and integrity of common brain networks which control gait and regulate cognitive processes will clarify the primary mechanism within frailty and cognition associations. Combining a simple measure, such as gait velocity, with a reliable cognitive test like the MoCA seems superior than frailty and cognitive-frailty constructs to detect high-risk individuals for dementia.

P111- 1H NMR AND ULTRASTRUCTURAL STUDIES OF SKELETAL MUSCLE FROM ELDERLY PATIENTS WITH OSTEOARTICULAR AND DEGENERATIVE PATHOLOGY. C.R. Revnic, C. Pena, S. Prada, F. Revnic, G. Prada *(Bucharest, Romania)*

Background: Muscular senescence is a functional progressive loss of muscular groups and is variable between anatomical entities The neural factors that contribute to muscle senescence result in a progressive denervation, partially compensated by collateral reinervation and hence a reduced number of motor unit size. Motor axon loss exceeds the fibre number reduction. An inevitable consequence of central nervous tissue neural plasticity is that movement patterns leading to a remodeling of motor control neural circuits resulting in a desyncronisation of recruitment which contributes to neural fatigability or peak strength. Muscular tissue remodeling also includes vascular and connective tissue changes of lesser importance compared to other muscular senescence processes. In neuromuscular senescence,a general trend reflects a set of underlying mechanisms at very different organizational levels. The aim of our study was related with the investigation of subcellular mechanisms of excitation-contraction as well as their associated changes at the ultrastructural level in skeletal muscle of aging patients with degenerative osteoarticular pathologies. Material and methods: Quadriceps muscle biopsy(100mg each) from elderly patients with

osteoarticular pathology admitted in University Hospital,Ortopedics Clinique for surgical intervention for hip fractures has been used for investigation of contraction and relaxation of sarcomeres in relation to water state modification. 1H NMR method has been used with an AREMI`78 Spectrograph at a fixed frequency of 25MHz on solid samples with 1H and 1cm3 volume, at pH 7 of working solutions. Musle ultrastructure has been investigated with Phylips 200 electron microscope at 80KV. Results:Our data have pointed out modifications at the molecular level in contractile capacity of skeletal muscle in aging patients with osteoarticular pathologies accounted for an increase in proton transverse relaxion times (T2 short) in contraction. That means that in contraction water changes from proximate vicinity of myofibrils a release of H+ occurring at the same time from the level of polar groups of contractile proteins.The H+ release is quantitatively higher in muscle with intact membranes as compared to glycerinated muscle.The decrease in stability of biological muscle structure pointed out by 1 H NMR studies were associated with ultrastructural modification in skeletal muscle arhitecture (disorganization of myofibrils which are fragmented with loss of crosstriations, the number and shape of mitochondria are modified as well as the other signs of aging are present such as: autophagic vacuoles and the presence of lipofuscin. Conclusion: At the level of senescent muscle,cell could adopt an altered pattern of intracellular biochemical and biophysical communication,by reducing signal production or an adequate transduction of effector response and their effect on tissue architectural changes could be exploited.

P112- 1 H NMR STUDIES CONCERNING THE BEHAVIOUR OF HEXAGONAL LATTICE OF MYOFILAMENTS DURING CONTRACTILE ACTIVITY IN RAT HEART MUSCLE OF DIFFERENT AGES. C.R. Revnic, C. Pena, S. Prada, F. Revnic, G. Prada *(Bucharest, Romania)*

Background: 1H NMR(Nuclear Magnetic Resonance) method offers a significant advantage for non invasive diagnosis of cardiovascular disease.Aims of study: In order to obtain new data concerning muscle contraction at the molecular level,the interrelation water-contractile proteins has been investigated by means of 1 H NMR Spectroscopy.Material and method:Rat heart muscle from 6 and 37 months old rats has been used for proton transverse relaxation time measurements in Ri,Co and Re. at different [ATP].The distribution of negative charges in contraction and relaxation has been measured by exposing glycerinated muscle from 6 to 37 months old rats to different [Mg+2].Results:Our data have pointed out the existence of two proton relaxation times:T2s and T2l accounted for two water compartments. The modification in water state are related with modifications in contractile activity.The elongation of proton transverse relaxation times is associated with a decrease in the degree of water molecules aggregation. The elongation of T2s and T2l proton transverse relaxing times in Ri,accounts for a a modification in the quantity and quality of dissociable groups of contractile apparatus proteins. T2s and T2l are correlated with a reduction in muscle hydration ,contraction being a function of ions binding to the protein sites.These sites are implicated in determination of protein hydration state. The decrease in charge density upon contractile proteins from old rat heart in Ri and Co accounts for the fact that a certain proportion of crossbridges are no longer functionally efficient due to conformational modifications at the level of S2 subfragment of myosin tail which carries 1/3 of the negative charge. The tail cannot be tilted at 45o angle toward filament axis, therefore, long range forces responsable for muscle shortening, during contraction, are no longer achieved. Conclusion:These data may be accounted for as molecular basis for the decrease in contraction capacity of heart sarcomeres in aging myocardium.

P113- FRAILTY BY SOF CRITERIA AND CACHEXIA: DATA FROM SARCOPENIA IN OLDER ADULTS WITH HEART FAILURE - SACI STUDY. A. Frisoli Jr, F. Martin, A.C. de Camargo Carvalho *(São Paulo, Brazil)*

Background: Frailty and Cachexia present common etiology factors and clinical manifestations, however, until this moment it is not clear if there is any association between them. We hypothesized that frailty is strongly associated with Cachexia, pre frail is intermediate and robust is neutral, secondly, we believe that all frailty criteria are more prevalent in Cachexia group than in frailty group. Methods: Cross-sectional analysis of Longitudinal study of Sarcopenia in Older adults with Heart Failure-SACI study. A epidemiological study of Sarcopenia and frailty in regard to hospitalization, falls, disability and death in outpatients older adults with Heart Failure from Cardiology Division from Federal Sao Paulo University. Exclusion criteria: moderate/severe dementia, cancer, Parkinson ´s diseases, and assistant advice use. Variables: demographic data, medications, cardiovascular parameters, cognitive tests, body composition and muscle performance. Frailty was classified By SOF criteria (weight loss of ≥5% during the preceding year; an inability to rise from a chair five times without using the arms, and an answer of 'no' to the question 'Do you feel full of energy. The presence of 2 or more was considered frailty, one prefrail and none robust). All patients were undergone by DXA analysis for all bone sites and total body. Cachexia was diagnosed by Consensus on Cachexia Definitions -2010. Results: 251 patients were randomized, 55.4% were female mean age 78.3 (6.2) yo, and 80.2 (7.3) yo for men. Prevalence of frailty was 18.1%, pre frailty 41.8% and robust 40.2%. Cachexia occurred in 7.1 % (n=15) of the sample, among them, frailty was prevalent in 46.7 Vs 11.7%, pre frail in 46.7vs 39.8% and 6.7 vs 48.5% in robust subjects (<0.001). In logistic regression analyses for Cachexia, frailty presented OR: 6.15 (1.94-19.42; 0.002), and there was not significant difference after adjust for female and age. Between frailty and Cachexia groups, only loss of weight criteria was higher (39 vs 75%; <0.001) in Cachexia group, while "No energy" (87 vs 25%; <0.001) and "Inability to rise from a chair" (73.9 vs 25%; <0.001) were higher in frailty group. Conclusion: Frailty by SOF criteria was strongly associated with Cachexia. Contrary to our hypothesis, only loss of weight was more prevalent among Cachexia group than others Frailty criteria, suggesting that loss of weight may be an important predictor of Cachexia in frailty patients.

P114- THE INVESTIGATION OF SARCOPENIA STILL REQUIRES MUCH DEBATE. N. Aparecida Grande de França, B. Santarosa Emo Peters, P. Couceiro Santos, M. Menah de Sousa Lima, E.B. Curatella, R.M. Fisberg, L. Araújo Martini *(São Paulo, Brazil)*

Backgrounds: The current definitions of sarcopenia include not only the loss of the muscle mass, but also the impairment of its strength and function, leading to higher risk of adverse outcomes. However, there is a lack of consensual definition related to the methodology, cutoffs, and flowchart of investigation. Two operational definitions have been widely applied in literature, one developed by the European Working Group on Sarcopenia in Older People (EWGSOP), and other by the Foundation for the National Institutes of Health Sarcopenia Project (FNIH). The aims of this investigation were evaluate 1) the prevalence of "sarcopenia" (i.e.: low muscle mass and strenght) according to EWGSOP and FNIH; 2) the relationship among the components of the operational criterias; 3) the relationship between the components among both criterias (crosswise). Methods: The population of the present investigation is derived

from the Health Survey – Sao Paulo 2014 (Inquérito de Saúde de base populacional no Município de São Paulo – ISA Capital 2014), a cross-sectional study conducted in Sao Paulo City, Brazil. The present investigation was conducted with partial data of the study, with participants from 50 years, with no mental or physical disability. Body weight and height were measured, and body mass index (BMI) was calculated by dividing the total body weight (kg) by height squared (m2) and classified according to the World Health Organization for participants under 60 years, and according to the Pan American Health Organization for those aged from 60 years old (the cutoff to elderly). Body composition was obtained by total body dual-energy X-ray absorptiometry scan (Lunar iDXA Advance; GE Healthcare, Madison, WI, EUA) using standardized protocol. Fat mass was classified by applying the Fat Mass Index (FMI – total fat mass by height squared). Muscle mass was evaluated from appendicular lean mass (ALM), the sum of arms and legs lean mass (kg). For FNIH classification ALM was devided by BMI, and for EWGSOP, by height squared (m2). The quality of muscle mass was investigated by handgrip strenght and gait speed. Grip strength was measured by a handheld dynamometer (Jamar). The average of 3 repetitions from both hand was analyzed (kg), and classificated according to the FNIH and EWGSOP cutoffs. Usual gait speed was defined as the length of the walking course (4 m) divided by the time to conclude the course at their usual pace. The average of 2 gait speed tests was used (m/s). All classifications were conducted separately by gender. Normality of continuous variables was assessed by the Kolmogorov–Smirnov test, followed by a log transformation of the variables with non-normal distribution. Pearson's correlation was conducted followed by a chi-square test. The analyses were performed using the SPSS software, v20.0 (SPSS, Chicago, IL, USA). The significance was set at P<0.05. Results: A total of 132 participants (65.2% female) were included in the present study. They had a mean age of 64.6 ± 7.4 years (50 – 84y; 78.6% elderly) and BMI value of 28.5 ± 5.3 kg/m2 (9.8% underweight, 36.4% normal range, 16.7% pre-obese, 37.1% obese), with 76.5% classified with "excessive body fat" by FMI. In the evaluation of muscle mass, it was observed a low lean mass and strength in 9.1% and 52.3%, respectively, when applied the EWGSOP's criteria, and 19.7% and 28% with the FNIH, resulting in a prevalence of "sarcopenia" of 6.8% using EWGSOP and 7.6% when it was used the FNIH cutoffs. 35.6% of the participants had gait speed under the cutoff (≤0.8m/s). Pearson's correlation showed an inverse relationship between age and gait speed (r= -0.369; P =0.000) and muscle strength (r= -0.262; P = 0.002). Positive correlations were observed between muscle strength and total (r= 0.628; P = 0.000) and appendicular lean mass (r= 613; P = 0.000), and strenght and gait speed (r= 0.289; P = 0.001). In chi-square test, 68.1% those with low gait speed had also low muscle strenght (P = 0.005). Such result was only significant when applied the EWGSOP cutoff to the handgrip test. The other significant result in chi-square test was observed among strenght and ALM in a crosswise way. 81.8% those classified with low strenght by FNIH showed normal lean mass according EWGSOP (P = 0.016), and 73.9% of those with low strenght by EWGSOP had normal values of lean mass by FNIH (P = 0.031). Conclusions: The prevalence of "sarcopenia"(i.e: low muscle mass and strenght) was distinct when applying EWGSOP and FNIH criterias among the sample. There was a positive correlation between muscle strenght and gait speed and lean mass (total and appendicular). Low muscle strenght was observed when also low gait speed only using the EWGSOP cutoffs for handgrip test. However, those with low muscle strenght by FNIH showed normal lean mass according EWGSOP and those with low muscle strenght by EWGSOP had normal values of lean mass by FNIH.

P115- OBESE BUT NOT SARCOPENIC BODY COMPOSITION PHENOTYPES OCCURRING IN EFFECTIVELY TREATED HIV MALES ARE ASSOCIATED WITH INCREASED FRAILTY OVER TIME. J. Falutz[1], L. Rosenthall[1], C. Prado[2], A. Malagoli[3], S. Zona[3], T. Brothers[4], S. Kirkland[4], K. Rockwood[4], G. Guaraldi[3] *(1. Montreal, Canada; 2. Edmonton, Canada; 3. Modena, Italy; 4. Halifax, Canada)*

Background: Body composition abnormalities, including obesity and sarcopenia (low muscle mass), occur in treated HIV patients (pts). In the general population these specific phenotypes negatively impact functional status and may contribute to the development of frailty. Subjects with both sarcopenia and obesity may be at higher risk of poor health outcomes than with either phenotype alone. Frailty, diagnosed using either the frailty phenotype (FP) or frailty index (FI) classification, occurs in both treated and untreated HIV pts, and is an independent risk factor for mortality or AIDS. The etiology of frailty in HIV pts is multi-factorial, including the increased presence of age-related comorbidities and possibly body composition abnormalities. We investigated whether effectively treated HIV males classified as having obesity-related body composition phenotypes, and who were less frail, were likely to become more frail during follow-up compared to those without increased adiposity. Methods: This was a retrospective analysis of routinely obtained clinical and laboratory data collected during regular follow-up visits of males followed at the Modena HIV Metabolic Clinic (MMHC). We restricted the analysis to males due to sample size considerations in females. Sarcopenia was defined using commonly accepted cut-points of DXA-derived total appendicular skeletal muscle index [ASMI {kg/m2}] <7.26 for males. Obesity was defined arbitrarily as the highest quartile of CT-determined visceral adipose tissue (VAT [> 181 cm2]). Using these cut-points patients were characterized as belonging to one of the following 4 body composition phenotypes: normal (N [non-obese and non-sarcopenic]); non-sarcopenic obese (O); non-obese sarcopenia (S); and sarcopenic-obese (SO). Frailty was defined using the cumulative deficits model represented by the FI. This is calculated as the proportion of health deficits present in a pt out of the total number of clinical and laboratory variables collected during a routine MMHC visit. The baseline visit was defined as the first MMHC visit at which all data and the calculated FI were available. The last visit was defined as the latest MMHC visit at which all data and the FI were available. Since frailty as defined by the FI is usually represented on a continuous scale rather than by a specific cut-point we arbitrarily defined patients with ≤ the cohort's median FI as less-frail and pts with ≥ median FI as more-frail. Follow-up intervals (months [m]) between baseline and last visit, and the FI were determined for each phenotype group. The FI is reported as the median (± 95% CI). We compared the proportions of less-frail pts at baseline who became more-frail at the last visit between phenotype groups using Chi-square analysis. To allow for robust analysis, pts with either N or S and O or SO phenotypes were pooled as both the respective FIs and proportion whose FI worsened were similar. Results: Results were available for analysis in 894 stable, treated males with a median age of 47 (range 26-76) whose baseline visits occurred from 2006-13. The known duration of HIV infection was 16 ± 7 years. The mean absolute nadir and current CD4+ T-helper cell counts for the entire cohort were 207 ± 162 and 612 ± 272 respectively; 91% had undetectable HIV viral load, consistent with an effective immuno-virologic response. The cohort's median VAT was 133 cm 2 (127,139). Overall 63% had an N phenotype, 11% were S, 25% were O and 1.5% were SO. The entire cohort's median FI was 0.33 (0.32, 0.33). At baseline 60 % of N, 56 % of S, 39 % of O and 31 % of SO pts were less frail. The median FI at baseline of the less-frail pts with N, S, O and SO was

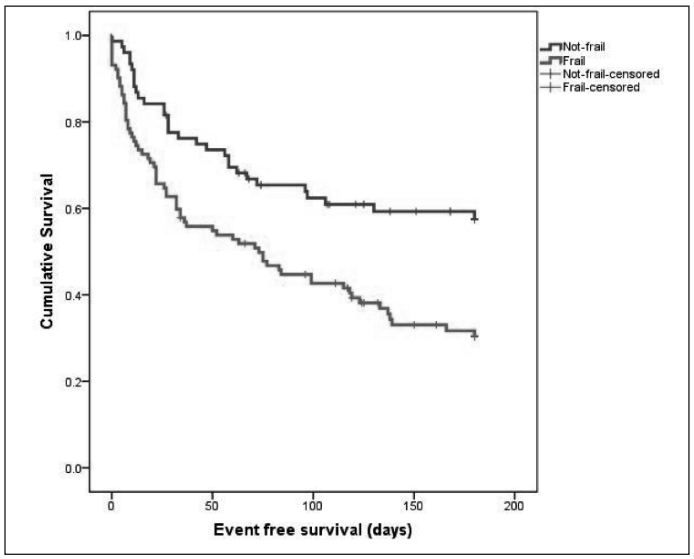
0.27, 0.30, 0.27 and 0.27 respectively. The median interval between baseline and last visits for the entire cohort was 43m (range 11-88). The interval between visits for the less-frail pts with N, S, O and OS was 40m, 26 m, 46m, and 38m. Although the baseline FI of most pts in all phenotypes improved during follow-up, an increase in the FI, suggestive of a greater number of accumulated health deficits, occurred in 29% of N, 30% of S, and 44% of O pts. Sarcopenic pts did not become frail more often than N pts. Overall, of 398 less-frail and non-obese pts at baseline 29% became more frail during follow-up, compared to 44% of 86 less-frail and obese pts, p=0.0077. This represents a 50% higher progression to increased frailty in obese pts. Conclusions: The health status of most of these pts improved over time, as determined by a decreasing FI. However, significant visceral obesity, present in over 25 % at baseline, was associated with a 50% increased risk of becoming more frail compared to pts without obesity after almost 4 years of follow-up. Efforts to identify and manage risk factors for both obesity and frailty are important for the successful care of treated HIV patients.

P116- IRON OVERLOAD REDUCES LONGEVITY AND INCREASES FRAILTY IN KNOCK-OUT HFE MICE. P. Noirez, D. Haidar, R. Thomasson, F. Desgorces, D. Vitiello, J.F. Toussaint *(Paris, France)*

Backgrounds: Iron is an essential component, implied in many metabolic reactions and physiological functions. Hepcidin is the central regulator of iron metabolism. In athletes, hepcidin level might be increased. Hemochromatosis is characterized by an iron overload and an inhibition of hepcidin production. The main cause of hemochromatosis is the mutation of HFE gene. The iron in excess in the blood can settle in the heart and induces dysfunctions. Indeed, the systolic blood volume is increased in the left ventricle in patients with homozygous HFE mutation. In addition, myocardial injury and an ischemic heart disease have been reported in hemochromatosis patients linked to HFE mutation. These patients are more likely to develop cardiomyopathy. Our objective is to evaluate the effects of age and HFE mutation on frailty and longevity in homozygous HFE-/- (KO), heterozygous HFE+/- (Hete) and HFE+/+ (WT) mice. Methods: 25 male sedentary mice (8 KO, 8 Hete, 9 WT) were measured regularly by magnetic resonance (Bruker, Germany) for their lean and fat mass and by echocardiography for their cardiac function during 17 months. Their performance were evaluated at 20 months on a one-way-treadmill equipped with calorimetric system (Phenomaster, TSE, Germany). They were compared with a second group of 24 male sedentary 7-month-old mice (8 KO, 8 Hete, 8 WT). The protocol consisted in increasing the speed by 1 cm.s-1 every 15s; VO2 peak was determined as the highest value of VO2 reached over 15s. Vmax represented the best speed reached during this test. Results: A Kaplan-Meier survival analysis confirms shortened life span in the KO mice. The percentage of survival after 24 months was 25% for KO mice and 89% for WT mice ($p<0.01$). End-diastolic and end-systolic volume were bigger in KO mice compared to WT respectively from month 14 (0.21±0.04 vs 0.13±0.02mL, $p<0.05$) and 7 (0.43±0.01 vs 0.20±0.01mL, $p<0.001$). Ejection fraction was reduced at any age (7 months: 72.3±3.4 vs 81.0±1.4%, $p<0.05$; 20 months: 58.5±4.4 vs 72.1±4.5%, $p<0.01$). The end-diastolic diameter of the left ventricle was increased in KO mice at month 14 (+ 5mm) and the end-systolic diameter was increased at any age (+ 7mm). VO2 peak relative to lean mass (ml.h-1.g-1) only in KO (7.2±0.6 vs 9.4±0.4) were decreased in the first group at 20 month compared to the second group of 7 months old mice ($p<0.01$). Vmax was also decreased with age but in all phenotype. Conclusion: Lower survival rate in HFE-/- KO mice compared to WT mice was observed (but not in Hete). The invalidation of the HFE gene leads to heart failures associated with premature and late structural modifications of the myocardium. HFE-/- KO mice presented a decrease in oxygen uptake and a reduced capacity in performance with age. The observed metabolic modifications could be explained by a dysregulation of heart and liver metabolism in response to iron overload.

P117- FRAILTY IN HOSPITALISED HEART FAILURE PATIENTS PREDICTS DEATH AND REHOSPITALISATION AT 6 MONTHS. J. McDonagh[1], C. Ferguson[1], S.R. Jha[1], S.E. Ivynian[1], C.C.J. Crossley[1], E. Montgomery[1], C. Hwang[1], S.C. Inglis[1], G. Singh[1], P.M. Davidson[2], P. Macdonald[1], P.J. Newton[1] *(1. Sydney, Australia; 2. Baltimore, USA)*

Background: Frailty can be described as a syndrome characterised by an increased vulnerability to stressors and is associated with loss of independence, poor health outcomes and high mortality rate. It is hypothesised that heart failure (HF) and frailty share common pathophysiological mechanisms. This study aimed to assess the prevalence of frailty in a cohort of people with HF and determine their event free survival (all-cause hospitalization or death) at six months. Methods: Frailty data from two single centre prospective cohort studies was combined. Both studies were undertaken at a quaternary HF referral hospital in Sydney, Australia. 178 patients had their frailty assessed at baseline using the SHARE (Survey of Health, Ageing and Retirement in Europe) Frailty Index. Patients were followed up at six months post initial discharge from hospital. Results: This cohort of 178 patients was mostly male (127 Male: 51 Female; p=0.023) and relatively young (age 67 ± 16); 102 patients (57%) were classified as frail. Adjusting for age, sex, sodium, potassium, estimated glomerular filtration rate, albumin, haemoglobin New York Heart Association class, left ventricular function and Charlson Comorbidity Index, frailty was the only independent predictor (HR 1.8; 95% CI 1.1-3.1) of worse outcomes (death or rehospitalisation) (Figure 1). Conclusions: Frailty is highly prevalent among hospitalised persons with HF and is an independent predictor of worse outcomes. There exists a strong potential for frailty assessment to independently risk-stratify patients with HF.



P118- HORMONAL DETERMINANTS OF HAND GRIP STRENGTH IN OLDER HOSPITALIZED PATIENTS: ANCILLARY STUDY OF GLISTEN. M. Maggio[1], F. Lauretani[1], A. Fisichella[1], M. Mantovani[1], A. Ticinesi[1], F. Corica[2], F. Landi[3], S. Volpato[4], G.P. Ceda[1] *(1. Parma, Italy; 2. Messina, Italy; 3. Roma, Italy; 4. Ferrara, Italy)*

Background : The current definition of sarcopenia in the elderly emphasizes the role of muscle strength in the assessment of physical performance. Handgrip strength is also independently associated with functional recover in the older individual after femur fracture. Anabolic hormones, such as testosterone, IGF-1 and vitamin-D, positively influence muscle strength in older community-dwellers. However, the role of anabolic hormones in determining muscle strength in elderly hospitalized subjects is still debated, due to methodological issues affecting reliable assessment of both parameters in this particular setting. Aim of the Study: It was to evaluate the relationship between anabolic hormones (testosterone (T), IGF-1, and Vitamin D) and hand grip strength at hospital admission and discharge in older hospitalized patients. Methods: To assess the variations of muscle strength and mass during hospitalization, the GLISTEN Group (Gruppo di Lavoro Italiano Sarcopenia-Trattamento, Nutrizione) designed a multi-center epidemiologic study involving 7 Geriatrics units in teaching hospitals across Italy. The present analysis involved 77 females and 75 males acutely hospitalized in teaching hospitals of Parma, Messina, Ferrara and Rome from October 2013 to October 2014. All participants underwent a comprehensive geriatric assessment (CGA) and full blood tests at admission and discharge. Muscle strength was measured through a manual dynamometer. FNIH definition was used to identify individuals with weak muscle strength (cut-off: 26 Kg for males and 16 Kg for females). Total Testosterone (T) and Vitamin D were measured through the LC-MS/MS technique at the BRAC Laboratory in Boston (USA). The association between anabolic hormones and muscle strength was assessed through linear regression after adjustment for age (Model 1) and multiple potential confounders including age, weight, IADL, cognitive performance, depressive state, multimorbidity, hemoglobin, albumin and white blood cells (Model 2). Results: Mean age ± SD was 85±6 in males and 79±6 in females. Median (IQR) blood T levels were 21.0 (12.1-34.5) and 216.0 (92.8-385.0) ng/dL, while median (IQR) vitamin D levels were 6.4 (3.7-10.4) and 7.3 (5.0-13.9) ng/mL for females and males, respectively. Median (IQR) levels of IGF-1 were instead 64.7 (49.7-85.4) and 81.9 (49.7-85.4) ng/mL in females and males respectively (Table 1). At an age-adjusted statistical model, log(T) resulted as an independent factor influencing muscle strength at admission in both men (β±SE 2.06±0.93, p=0.03) and women (β±SE 1.33±0.60, p=0.03). No significant association was found between log(IGF-1) (p=0.32 and p=0.71), log(Vitamin D) (p=0.65 and p=0.88) and muscle strength in both genders. In females, at a multivariate statistical model, log(T) was associated with muscle strength at the limit of statistical significance (1.04±0.62, p=0.09), while log(IGF-1) and log(Vitamin D) were not (respectively, 0.36±1.50, p=0.79, and 0.21±0.82, p=0.79). In males, log(T) resulted as independently associated with muscle strength (2.17±1.06, p=0.04), while log(IGF-1) and log(Vitamin D) were not (p=0.62 and p=0.30 respectively). At hospital discharge 47/75 males and 65/77 females had an absolute value of muscle strength below the FNIH cut-off for considering patients as weak. Muscle strength at admission was the only independent predictor of muscle strength at discharge, in both females (0.92±0.07, p<0.001) and males (0.87±0.12, p<0.001). Subjects categorized as weak had serum T levels at discharge significantly lower than patients not categorized as sarcopenic according to the FNIH definition (214±190 vs 307±181 ng/dl, p=0.04). Conclusion: Testosterone represents in both genders a positive and independent determinant of muscle strength at hospital admission in older individuals. Males categorized as weak according to the FNIH definition of muscle strength show serum levels of testosterone significantly lower at discharge, compared with the group with normal muscle strength.

P119- HEALTH PROTECTIVE FACTORS MITIGATE THE RISKS OF MORTALITY AND DEFICIT ACCUMULATION IN AGING. Z. Yang, X. Song *(Canada)*

Background: The frailty index (FI) based on the accumulation of deficits has been validated as a state variable to model the heterogeneity of health trajectories in older individuals. Recent research has suggested that protective factors may have a positive impact on the dynamics of health transitions. In this study we investigated the possible summative impact of several protective factors on mortality and health transitions in a community-based sample. Methods: Data from three waves of Canadian Study of Health and Aging (CSHA) were applied in the analysis. Older adults (men=3,620; women=5,310) aged 65 years and over at baseline were followed at 5 and 10 years. The FI was constructed for each individual at each wave using 31 variables. Additional 9 factors that each has been associated with a positive effect of outcome (e.g. healthy lifestyle, higher levels of education, urban dwelling professional occupation) were combined in a protection index (PI). A multi-state transition model was used to analyze the probabilities of mortality and health transitions in relation to FI and PI. Results: Over 10 years, 1,875 men and 2,156 women died; 1,197 men and 2,063 women remained in the study. The mean FI values differed significantly among people who survived and those who died (men: 0.11±0.07 vs. 0.17±0.10; women: 0.14±0.08 vs. 0.24±0.12) and increased over time with age advances in the survivors (0.11±0.07 vs. 0.13± 0.09 in men; 0.14±0.08 vs. 0.21±0.12 in women). The baseline PI values at also differed by the survivor status (men: 0.59±0.16 vs. 0.53±0.17; women 0.49±0.17 vs. 0.42±0.16). A percentage increase of the FI was associated with an increased risk of 10-year mortality and of health worsening, whereas the risks were lowered by an increased of the PI. Conclusion: Our study demonstrates that health protective factors mitigate the risks of mortality and deficit accumulation in aging, suggesting the interplay of biological and environmental factors in determining health outcomes.

P120- PERFORMANCE OF OLDER ADULTS WITH FRAILTY SYNDROME IN THE TIMED UP AND GO TEST. P. Giusti Rossi, J. Hotta Ansai, A.C. Silva Farche, L. Pires de Andrade, A.C. de M. Takahashi *(São Paulo, Brazil)*

Background: The frailty syndrome has been described as an important geriatric syndrome and it associated with an increased risk of functional decline, falls, institutionalization, hospitalization and death. In this scenario is important to evaluate the impact of this syndrome on mobility. An instrument widely used in clinical practice to evaluate mobility is the Timed Up and Go Test (TUGT). The clinical potential of TUGT comes from the analysis of several basic functional abilities, like sit, stand, turn around and walk. The objective of this study is to compare the TUGT performance of frail, pre-frail and non-frail older adults. Method: The older adults were divided equally into three groups according to the frailty phenotype. Sixty tree 63 adults (21 per group) performed an anamnesis and TUGT. The variables recorded from TUGT were execution time, number of steps and number of stops during the test. The chi-square test was used to analyze the normality of the data related to sex and age. One-way ANOVA test with Tukey post hoc was performed to

analyze time and number of steps. It was adopted significance level at 0.05. Results: Most of the elderly assessed were female (73.0%) and the mean age was 78.6 years (±28.6). There were no statistical differences in age or sex between the groups. Regarding the time to perform TUGT, the average time of non-frail group was 12.1s (±3.17); pre-frail 14.4s (±4.57) and frail 19.5s (±8.18). There was a statistically significant difference between non-frail and frail groups (p=0.000); and pre-frail and frail groups (p=0.014). Regarding the number of steps to perform the TUGT, non-frail group used a mean of 16.3 steps (±3.96), pre-frail used 18.7 steps (±5.28) and the frail used 22.4 steps (±7.15). There was a statistically significant difference between the non-frail and frail groups (p=0.002). Conclusion: Frail elderly showed lower performance in the TUGT when compared to pre-frail and non-frail elderly. This confirms the reduction in mobility caused by the frailty syndrome. Financial support: National Council for Scientific and Technological Development (CNPq) 479769/2013-3; Higher Education Personnel Improvement Coordination (CAPES).

P121- SIX-MINUTE WALK TEST PERFORMANCE IN FRAILTY SYNDROME. A.C. Silva Farche, P. Giusti Rossi, J. Hotta Ansai, A. de Almeida Pena Júnior, A.C. de M. Takahashi *(São Paulo, Brazil)*

Background: The frailty syndrome is described as a clinical state of stress vulnerability and is related with a deficit to maintain the organism in homeostasis, leading to hospitalizations, falls and death. This syndrome brings functional repercussions and the fact that physical activity is considerate as an important way to treat this syndrome, there would be an important to evaluate the exercise submaxim capacity of this population in a functional test like the six minute walk test (6MWT). The 6MWT is a field test widely used to evaluate the ability of a person to realize a functional activity, and a performance bellow 400m have been used to characterize a reduced mobility. The objective of this study is to compare the walking distance in 6MWT and the number of stops during the test in frail, pre frail and non-frail. Methodology: There were evaluated 60 older adults divided in three groups Frail (F) pre-frail (PF) and non-frail (NF), in according with the phenotype suggested by Fried et al (2001). The volunteers realized anamnesis, rest electrocardiogram and the 6MWT after the American Thoracic Society (2002). Moreover, the walking distance and the number of stops were registered. Komolgorov-Smirnov was used to test the normality of the data. To compare the characteristic of the persons (age, weight, height, body mass index and the number of comorbidities), as well the walking distance in 6MWT and the number of stops, it was used the Anova One Way test with a post hoc of Tukey. The test of chi-square was used to check the difference between genders intergroup. The significance level was 5%. Results: The media and the standard deviation of the age in the evaluated persons was 77.4±5.2; 76.1±6.4 e 74.0±6.2; for the groups F, PF e R, respectively. No differences were found in the age or other anthropometrics characteristics between the 3 groups. The number of comorbidities showed a significant difference in the frail individual when it is compared to the other groups (F: 4.2±1; PF: 1.8±1.4 and NF: 1.6±1). The frail group presented shorter walking distance than the other groups (F: 197.8±137; PF: 441.2±119 and NF: 568.3±145.2). Besides, none of the frail older adults complete 400m and 57% stopped at least one time during the test. The other groups realized the test without stops. Conclusion: The frail group showed a lower performance in the 6MWT in relation to pre-frail and non-frail groups featuring a reduced mobility in these older adults. Financial support: Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), Process: 2014/24163-9; CNPq: 479769/2013-3.

P122- THE DEVELOPMENT OF A FRAILTY ASSESSMENT INSTRUMENT SPECIFIC FOR CHINESE OLDER ADULTS. N. Ge[1,2], D. Ding[2], J. Schrack[1], Y. Song[2], J.D. Walston[1] *(1. Baltimore, USA; 2. Sichuan, China)*

Background: Despite the vulnerability observed in frail older adults, effective identification and intervention strategies for frailty have not been widely studied in China. This is in part because there is lack of population data on the functional measurements in older adults necessary to develop a standardized frailty tool specific to Chinese older adults. If such validated and standardized tool would become available for such assessment in older Chinese adults, appropriate preventive and treatment strategies could be more readily developed. This in turn would help to decrease the risk of adverse health outcomes and health care costs. One of the most commonly utilized methods to assess frailty uses measures of physical activity, grip strength, walking speed, weight loss, and fatigue. However, the lack of standardized population measures of walking speed, grip strength, and physical activity levels specific for populations of Chinese older adults have hampered the development of a frailty clinical phenotype specific. Collection of Chinese population data for older adults has been challenging because of the lack of large standardized studies of functional measurements and physical activities across the country. Methods: All participants will be recruited from 6 six districts in Chengdu, capital of Sichuan Province. Internal Review Board (IRB) approval was obtained from West China Hospital, Sichuan University IRB. All subjects described below will undergo the following process: 1. Informed consent, 2. Collection of general information: age, gender, marital status, and education degree, 3. Height, weight, waist circumference and blood pressure, 4. CDPA questionnaire survey at the beginning of the visit and again 2 weeks later. As a first step to establish the needed data, we have developed a novel physical activity scale for the Chinese population – Chengdu Leisure Time Physical Activity Questionnaire (CDPA)--based on Chinese cultural background. In order to validate this novel tool, we have developed a cross-section study to assess the effectiveness and feasibility of the CDPA questionnaire. 100 healthy older adults aged 65 years and older will be recruited for this part of the study. Eligibility criteria includes lack of acute illness, stable stage of chronic disease and ambulatory in the community without walker or cane. The study will be validated using by oxygen consumption as measured by bicycle ergometry, DEXA scanning that measures body fat percent, spirometry for FEV1, and short physical performance battery (SPPB). In addition, in order to collect Chinese specific population data on grip strength and walking speed necessary to approximate population norms, we will recruit 500 older adults from the same outpatient centers. Subjects will be equally distributed among 3 age groups, age 65-70, 71-80, and 81-90 plus and gender will reflect population averages per age group. Grip strength will be measured using a Jamar Hand Dynamometer and a timed walking speed over 4 meter will be measured by trained investigators using a hand held stopwatch. The average of 3 measurements will be taken and utilized in the data analysis. Once the Chinese population data is aggregated, specific cut off points will be determined and a frailty phenotype assessment specific for Chinese older adults will be developed based on the frailty phenotype model described by Fried L, et al in the Journal of J Gerontol A Biol Sci Med Sci. 2001 Mar;56(3):M146-56. Statistical Analysis: Validity is evaluated using the Pearson product-moment coefficient of correlation between MET calculated from CDPA questionnaire and the VO2max, body fat percent, FEV1 and grip strength, walking speed. Correlations are hypothesized to be of a moderate ($r \geq 0.5$) magnitude with positive correlations expected between the CDLTPAQ and the VO2max, FEV1, grip strength and

negative correlations with age and body fat percent. Retest reliability of the CDPA questionnaire is calculated using intraclass correlation coefficient (ICC1, k). Intraclass correlation coefficients above 0.75 are indicative of good reliability. Results: To date, 120 participants have been recruited for this study (63 men and 57 women) between the ages of 65 and 85 years (mean 72.3 years). 30 individuals have undergone physical activity assessment and validation exam. The study is expected to be completed by February, 2016 with analysis completed by April 2016. Conclusion: We have identified a need for a frailty assessment instrument specific for Chinese older adults. We have developed a study first collect Chinese population data relevant to develop this tool, and are actively recruiting older adults in order to validate a physical activity questionnaire, and collect the grip strength and walking speed data necessary to build a physical frailty assessment tool relevant to Chinese older adults. After it is developed and validated, this tool can be utilized to identify those older adults at risk of adverse health outcomes, and to help to develop novel preventive and intervention strategies needed to improve health and well-being of older adults in China.

P123- DOES SARCOEPNIA AFFECT THE MASS AND STRENGTH OF SUPRAHYOID MUSCLES? N. Machida, H. Tohara, S. Minakuchi *(Tokyo, Japan)*

Background: Sarcopenia causes the decrease of the swallowing muscle mass and strength. There were a few reports about the effect of sarcopenia on tongue pressure, but there were no reports about suprahyoid muscles. Mylohyoid muscle is one of suprahyoid muscles and is involved in both jaw-opening and elevating hyoid bone during swallowing. In this study, we conducted how sarcopenia affects the mass and strength of mylohyoid muscle. Methods: 30 elderly men (80.0±5.5years) were enrolled in this study. Participants who had dementia and neurodegenerative diseases were not included. According to the Asian Working group for sarcopenia, participants were divided into a sarcopenia group and a non-sarcopenia group. We compared mylohyoid muscle mass and strength between 2 groups. The muscle mass was defined by the thickness by using an ultrasound(SONIMAGE P3) and the strength was measured by using a jaw-opening sthnometer. The data was analyzed by using Mann-Whitney Utest. Results: The average muscle thickness and strength were6.0±1.1mm and6.5±1.8kg (non-sarcopenia group) and 4.8±0.1mm and 4.0±1.3kg (sarcopenia group). Both of the mass and strength were significantly lower in sarcopenia group ($p<0.05$). Conclusion: This study shows that sarcopenia can cause the decrease both of the mass and strength of mylohyoid muscle. Ultrasound was an innovative and portable method. It will be a useful method for measuring swallowing muscle mass near future. This study was preliminary. Future studies are needed whether sarcopenia also decreases the mass and strength of other swallowing muscles, and clarify the association between the mass and strength.

P124- A COMPARISON OF FRAILTY INDEXES FOR THE PREDICTION OF DISABILITY AND HOSPITALIZATION IN OLDER PATIENTS ADMITTED TO A GERIATRIC DAY HOSPITAL. S. Mori Lin, R.F. Barcelos, J. de Araújo Melo, S. de Queiroz Fortes Filhos, S.M. Elmadjian, M.J. Romero Aliberti *(São Paulo, Brazil)*

Background: Although being an important clinical condition in the elderly people, frailty diagnosis is not fully implemented in daily clinical practice. This may be in part due to the complexity of some used diagnostic methods. Several studies have proposed simpler replacing measurements involving community–dwelling older people, but they showed lack of accuracy. Acute care facility would demand a simpler index for frailty diagnosis. The aim of this study was to compare the ability of the Study of Osteoporotic Fractures (SOF) with the Cardiovascular Health Study (CHS) to predict disability and hospitalization risk within six months in older adults admitted to a geriatric day hospital. Methods: A prospective cohort study with participants aged 60 or more admitted to a geriatric day hospital (GDH) for acute illness or chronic disease relapsing in a tertiary public hospital in São Paulo, Brazil. All patients consecutively referred from May 19, 2014 till May 18, 2015 were screened for inclusion. The exclusion criteria were: patients critically ill demanding immediate medical intervention, in exclusive palliative care, scheduled hospitalization in six months, severe dementia (scores < 10 in the Folstein Mini-Mental State Examination MMSE), unavailable to telephone contact or refusal to participate. This research was carried out in compliance with the Helsinki Declaration, written informed consent was obtained from the patient or relatives. A comprehensive geriatric assessment was initially performed by a multidisciplinary team. Collected data were: sociodemographic data (age, sex, race, schooling level and family income), previous diseases (Charlson comorbidity index), medication use and basic activities of daily living (ADL) according to the Katz index. Cognition was evaluated using MMSE. Frailty indexes were assessed: SOF (weight loss, inability to rise from a chair and poor energy) and CHS (unintentional weight loss, weakness, exaustion, slowness, and low physical activity). Participants were classified as robust, pre-frail and frail (SOF=0, 1 and 2-3 and, CHS=0, 1-2 and 3-5, respectively). Monthly follow-up telephone interviews were conducted in the next six months. The end points were disability (≥ 1 new impairments in performing ADL) and hospitalization (admission ≥ 24 hours in a health service). Statistical analyses were performed using Stata 14.0 software (Stata Corp). Continuous variables are reported by mean and standard deviation, categorical variables with absolute and relative frequencies. The ability of the frailty indexes to predict disability and hospitalization was assessed using the area under the receiver operating characteristic curve (AUC). Kaplan-Meier survival curves were drawn, for each frailty index grade (robust, pre-frail, frail). Associations of the two frailty indexes with disability and hospitalization within six months were examined using multivariate Cox regression models adjusted for sociodemographic data, multimorbidity and number of medications. Results were reported as hazard ratios (HRs) and 95% confidence intervals (95% CI). A p value < .05 was considered for statistical significance. Results: During the recruitment, 412 elderly were referred to the GDH; 36 had no acute problem and 42 had at least one exclusion criterion. The final cohort has 334 participants. The mean (SD) age was 79.3 (8.2) years (60 to 99), 68% were female and 64% were Caucasians. The mean schooling (SD) of 5.2 (4.7) years and mean (SD) per capita monthly income is 1.6 (1.2) Brazilian minimum wage (approximately 350 US dollars).They had a mean (SD) of 2.5 (1.9) points in the Charlson index and a mean (SD) of 9.1 (3.8) drugs in use. The main reasons for referral were: uncontrolled diabetes (23%), diagnostic investigation (23%), anemia (11%) and decompensated heart failure (11%). The SOF classified 30% as robust, 37% as pre-frail and 33% as frail. For CHS these rates were 10%, 47% and 43%, respectively. There was moderate agreement (weighted kappa = 0.58) between these indexes. The mean (SD) follow-up was 176 (28) days. During observed period, 80 (25%) participants had any disability for ADL and 93 (28%) were hospitalized. There were 29 (9%) deaths. The comparison of the AUC showed no differences between CHS and SOF, respectively, in discrimination disability (0.72 and 0.69, p=0.24) and hospitalization (0.61 and 0.60, p=0.69). Kaplan-Meier's curves demonstrated decrease in free time of both outcomes among the three subgroups (p<0,001). In the adjusted model, Cox

regressions showed that frail elderly had an independent risk for disability (CHS = HR 4.8, 95% CI 1.5 to 15.8; p<0.01 and, SOF = HR 4.6, 95% CI 2.2 to 9.3; p<0.001) and hospitalization (CHS = HR 4.5, 95% CI 1.4 to 14.8; p = 0.01 and, SOF = 2.4; 95% CI 1.3 to 4.4; p<0.01). Participants classified as pre-frail by SOF, but not by CHS, also presented an independent risk for both outcomes. Conclusion: In our study, SOF index presented a similar accuracy to predict functional loss and risk for hospitalization within six months in elderly patients with acute ilness, when compared to CHS. As a simpler method, it could be an alternative index for frailty diagnosis.

P125- EFFECT OF SARCOPENIA ON THE METABOLIC COST OF WALKING AMONG OLDER ADULTS. D.B. Corbett, A.A. Wanigatunga, V. Valiani, E.M. Handberg, C.M. Janelle, T.M. Manini *(Gainesville, USA)*

Background: Sarcopenia, defined as the age-associated loss of skeletal muscle mass and function, is an important indicator of overall health status and life expectancy among older adults. Common characteristics of sarcopenia include muscle weakness, fear of falls, falls and subsequent fractures leading to mobility impairment, loss of functional independence, and reduced life expectancy. Since sarcopenia is a hallmark indicator of the aging process, it is important to understand its contribution to the metabolic cost of performing daily activities among older adults. Therefore, the purpose of this study was to investigate the effect of sarcopenia on the metabolic cost of walking, a major component of functional independence, among older adults. We hypothesized those participants who were sarcopenic would have significant metabolic deficits compared to non-sarcopenic individuals. Methods: This analysis utilized data collected from an observation study named CHORES XL, with the primary aim to examine the effect of aging on metabolic costs of common daily activities. Two of the activities included observations of participants walking for 5 minutes at two different exertions from the Borg Categorical-Ratio 10 scale (CR10): RPE 1 - "very weak" and RPE 5 - "strong". Walk speed was calculated by dividing the distance travelled by time, and expressed as meters per second (m/s). Metabolic intensity was measured as oxygen consumption (VO2) using a portable metabolic system (Cosmed K4b2) worn during the activities. Rating of perceived exertion was assessed by study staff immediately following each activity using the Borg CR10 scale. We examined sarcopenia operationally defined using both the Baumgartner (appendicular learn mass / height2) and The Foundation for the National Institutes of Health (FNIH) Sarcopenia Project (appendicular learn mass / body mass index) methods with both definitions yielding the same prevalence. Results: Twenty non-sarcopenic adults (73.3±6.4 yrs, 75.7±16.2kg, 16 female) and 8 sarcopenic adults (71.4±6.7 yrs, 86.3±12.8 kg, 3 female) were included in the analysis. During the RPE 1 walk, non-sarcopenic individuals walked at 0.86±0.23 m/sec, while sarcopenic individuals walked at 0.92±0.21 m/sec (p = 0.487). During the RPE 5 walk, non-sarcopenic individuals walked at 1.22±0.35 m/sec while sarcopenic individuals walked at 1.18±0.22 m/sec (p = 0.787). There were also no differences in the metabolic cost of walking between non-sarcopenic and sarcopenic older adults for walking at both RPE 1 (p = 0.407) and RPE 5 (p = 0.307), nor within non-sarcopenic (p = 0.914) and sarcopenic (p = 0.940) older adults for walking at RPE 1 and RPE 5, respectively. There was no observed association between the metabolic cost of walking at RPE 1 (r = -0.169) and RPE 5 (r = -0.203) when using the Baumgartner definition of sarcopenia. There was also no observed association between the metabolic cost of walking at RPE (r = 0.144) and RPE 5 (r = 0.157) when using the FNIH definition of sarcopenia. Conclusion: This study showed that sarcopenic older adults have no deficit in the metabolic cost of walking when compared to their non-sarcopenic counterparts. Our findings suggest that sarcopenia has no effect on the metabolic cost of walking among older adults.

P126- PREVALENCE OF DYNAPENIA, SARCOPENIA AND SARCOPENIC OBESITY AND FALL RISK IN ELDERLY MEXICANS. W. Rodríguez-García, L. García-Castañeda, L. Castillo-Martínez, M. Ruiz-Ramos, V. Mendoza-Núñez *(Mexico)*

Background: Recent studies have suggested determine the prevalence of different syndromes involved with physical function: dynapenia and sarcopenia. In Mexico, due to the high prevalence of obesity, we propose to determine also the prevalence of sarcopenic obesity and associate these with the risk of falls in older people of Mexico City using cut-off points for muscle mass, strength mass and BMI proposed by the literature. Methods: Cross sectional study. A sample of 712 adults (>60 years) from Mexico city were included (212 men and 506 women). Personal data, anthropometric measurements, handgrip strength with dynamometer (Jamar), body composition by bioelectrical impedance (RJL) and risk falls by Tinetti score were collected. Muscle mass was calculated and normalized by height and termed skeletal muscle mass index (SMMI=skeletal muscle mass index/body mass*100). The cut-off points for dynapenia were (≤20 kg for women and ≤30 kg for men), for sarcopenia diagnosis we used low muscle mass (≤6.75 kg/m2 for women and ≤10.75 kg/m2 for men proposed by Janssen) plus low muscle strength. Sarcopenic obesity was determined with low muscle mass plus BMI >30kg/m2. Pearson's correlation was used to study the association of SMMI with muscle strength, BMI, calf circumference and muscle mass. Results: The mean age was 67 ± 7 to 66 ± 7 for women and men respectively. The prevalence of dynapenia using handgrip strength was 54.9% (278) in women and 24.5% (52) in men. The prevalence of sarcopenia was 17% (85) in females and 19.9% (42) in men and sarcopenic obesity was 18.8% (102) in women and 6.4% (14) in men. According to those diagnosis, the risk of falls by Tinetti score was: with dynapenia (RM 3, 95% CI 1.6-5.59), sarcopenia (RM 2.024, 95% CI 1.102-3.718) presarcopenia (RM 1.69, 95% CI 0.956-3.004) and sarcopenic obesity (RM 1.526, 95% CI 0.877-2.654). SMMI had a significant positive association with muscle mass (r=0.691, p<0.001), muscle strength (r=0.592, p<0.001), calf circumference (r=0.432, p<0.001) and BMI (r=0.276, p<0.001). Conclusion: Determine the prevalence of different syndromes is critical to associate with the risk of falls. According to this study, SMMI correlates with muscle mass, strength, calf circumference and BMI; however dynapenia (by handgrip strength) turned out to be the greatest predictor of risk for falls compared with sarcopenia, sarcopenic presarcopenia and obesity in this study. Therefore considerer the loss of muscle strength would be decisive to prevent falls in older adults.

P127- THE ROLE OF PHYSICAL TRAINING UPON HPA AXIS MODULATION, MUSCLE PHYSIOLOGY AND SEXUAL FUNCTION IN ELDERLY MEN. C.R. Revnic[1], G. Prada[1], A.S. Nica[1], C. Pena[1], F. Revnic[1], S. Voinea[1], B. Paltineanu[2] *(1. Bucharest, Romania; 2. Mures Romania)*

Background:With rapidly growing geriatric population and with the improvement in quality of life, sexuality is becaming an increasingly aspect of aging. Objective: Investigation of of the role of physical training program of moderate intensity on endocrine modulation,muscle strength, amelioration of depression and sexual function in elderly men. Material and methods: Material and method: Our study has been done on 42 patients aged 60-82 years old.: 21 active (groupA) and 21 sedentary (group B) admited in

Rehabilitation Clinique of The National Institute of Physical Medicine and Rehabilitaion for different osteo-articular and postraumatic pathologies. Standard physical training program of moderate intensity was applied for 16 weeks15 min/day, 5 days/week, consisting of aerobic exercises, room bicycle, strength training of 4 kg weight lifting according to the appropriate published protocol (Revnic,C.R.et al.Arch.of Gerontol&Ger.Suppl.(2007). hTSH,T3,T4, HGH, Testosteron and Cortisol have been evaluated before and after training with1234 DELFIA Research Spectrofluorimeter using Eu+ labbeled kits purchased from Pharmacia.The results have been processed with a Multicalc program.Evaluation of muscle efficieny has been done before and after training with Schwartzer Picker 2000 EMG Results:70% patients from group A were euthyroid, HGH, Testosteron and Cortisol were in normal range ,with a positive atitude towards sexual life.56% sedentary patients of group B presented hTSH values >6I.U/ml corresponding to hypothyroidism with elevated levels of Cortisol and low levels of HGH and Testosteron. They exhibited anxiety with the following symptoms:irritability, exagerated fear for the future, tiredness, difficulty in communication, sleep disorders and a negative atitude towards sex. After training, a decrease in Cortisol and an increase in Testosteron and HGH in group B has been recorded with a positive consequence upon affectivity (interest in sex). Conclusion: Physical training with its multiple aspects (cognitive, mental and socio-afective) had a great impact upon reorganisation of hypothalamo-pituitary-thyroid- adrenal-gonadal axis in elderly men connected with changes in many effector hormones secretion with a positive impact upon muscle strength, emotional well being, mental health and an increase in desire for sexual life *, Corneliu Zeana, Floarea Revnic,Vlad Voiculescu UMF"Carol Davila",**Emergency Hospital,***NIGG"Ana Aslan". The aim of our study was related with investigation of clinical and paraclinical manifestations of voluntary intoxication with Digoxin as well as in elderly patients with Digoxin overdosage.Our comparative study has been done on 38 patients aged between 20-78 years old divided into two groups:group A (18 patients:15 male and 3 female) voluntary intoxicated with Digoxin on healthy heart and group B(20 elderly patients with long term treatment with Digoxin with different associated pathologies. Digoxinemia as well as Beta2 Microglobulinemia (for renal function) have been evaluated with DELFIA 1234 research spectrofluorimeter and FIA program using Eu+ labbeled Digoxin and Beta2 Microglobulin kits purchased from Pharmacia.Both groups were characterised by a complex symptomathology represented by dyspeptic symptoms,visual as well as neuropsychic perturbations besides the cardiovascular ones. In group A,severe conduction perturbations have been recorded while in group B are included rhythm perturbations. In group A EKG modifications appear long time after disapearance of clinical signs(sometimes after two weeks) The main couse of Digoxin overdosage has been related with renal inssuficiency with fixed nitrogen retention unknown by the patient and because of nonadjustement of Digoxin dose in accordance with kidney functional state.An increase in plasma K+ and Mg++ has been recorded in group A and in group B hypoK+ and hypoMg++ lowers serum level of Digoxinemia at which toxic phenomenons appear.Overdosage manifestations being non specific, Digoxin estimation can clarify the origin of some perturbations contributing to a correct diagnosis establishment.

P128- POOR SATELLITE CELLS IMPAIR MUSCLE REGENERATION DURING OSTEOPOROSIS AND SARCOPENIA. E. Piccirilli, J. Baldi, M. Scimeca, E. Bonanno, E. Gasbarra, U. Tarantino *(Rome, Italy)*

Backgrounds: osteoporosis is one of the most common diseases of musculoskeletal system and it is strongly associated with sarcopenia and muscle fiber atrophy. Sarcopenia is characterized by an histological deterioration of muscle tissue and by an important functional impairment due to poor structure and performance in the elderly. Methods: in this study we analyzed vastus lateralis muscle biopsies (20 biopsies of osteoarthritic women who underwent a Total Hip Arthroplasty (THA) and 20 biopsies from osteoporotic women with a cervical femoral fragility fracture) in order to demonstrate that in osteoporotic patients the regenerative properties of muscle stem cells are related to the same factors that could influence poor bone resistance. In particular, thanks to immunohistochemistry, transmission electron microscopy and immuno-gold labeling we investigated the role BMP-2 in muscle stem cells activity. In addition, we set up an in vitro experiment on primary cell culture in order to strengthen both morphological and molecular data about relationship between BMP-2 expression and satellite cells activity. In particular, we selected satellite cultures of three osteoporotic patients, three osteoarthritic patients and three controls. Each satellite cells culture was characterized by immunohistochemical studies and transmission electron microscopy (TEM) analysis. Results: in patients with osteoporosis both immunohistochemistry and transmission electron microscopy allowed us to note a lower number of CD44 positive satellite muscle cells forming syncytium. Moreover, the expression of BMP-2 assessed by in situ molecular characterization trough immune-gold analysis both in the peri-nuclear area and in the fiber body of satellite cells syncytia suggest a very strict correlation between BMP-2 expression and muscle regeneration capability. Our immunohistochemical data clearly demonstrated the association between BMPs expressions and myotube formation. We observed a poor number of myotube close to areas with low BMP-2 expressions. Moreover, thank to TEM analysis, we note that satellite cell cultures of osteoporotic patients were often characterized by small rounded cells that do not form satellite cells syncytia. Conversely, cell cultures of both osteoarthritic and control groups showed several myotube with sarcomeric structure and satellite cells syncytia. Conclusion: all together our data suggest that degeneration observed in the skeletal muscle tissue of osteoporotic patients is characterized by low or absent expression of BMPs, loss of satellite cells and loss of their ability to differentiate in myotube. On a clinical point of view, the control of physiological BMP-2 balance between bone and muscle tissues may be considered as a potential pharmacological target in bone-muscle related pathology.

P129- SARCOPENIA IN OLDER PEOPLE WITH NON-END STAGE CHRONIC KIDNEY DISEASE. C. Quiñonez-Olivas, R. Salinas-Martínez, G. Guajardo-Álvarez, C. Beltrán, A. Arredondo, E. Hernández *(Nuevo León, México)*

Backgrounds: The progressive deterioration of muscle mass, strength and a poor physical performance is called sarcopenia.(1) An adult over 50 years without chronic kidney disease (CKD) should expect a loss of muscle mass reaching 1% per year. But, muscle wasting in CKD patients are observed earlier compared to their peers. (2) Uraemic sarcopenia is common with an overall prevalence of ~50% in dialysis patients. Few studies have examined the relationship between early stages of CKD and sarcopenia. (3) The aim of this study is determine the factors associated to sarcopenia in older people with non-end stage CKD. Methods: An observational, comparative

and transversal pilot study, include adults over 60 years of age with CKD defined as a glomerular filtration rate (GFR) <60ml / min / 1.73m2 calculated with serum creatinine (SCr) by berlyn initiative study equation (BIS1) validated in older people (4) or urinalysis with proteinuria over 30mg/dl; were attended on division of Geriatrics outpatient from Hospital Universitario «Dr. José Eleuterio González», Monterrey, Nuevo Leon, Mexico, from March 2015 to September 2015. The study was approved by the medical ethics committee from Universidad Autonoma Nuevo Leon. After signing the informed consent, participants underwent comprehensive geriatric assessment (CGA), using validated scales: Katz index (KI) and Lawton-Brody index (LBI), Mini-Mental State Examination (MMSE), Yesavage Geriatric Depression Scale (GDS) and Mini Nutritional Assessment (MNA). Performance was measured by Short physical performance battery (SPPB), handgrip strength (HG, w/dynamometer) and gait speed in m/s (GS, 4m course). Anthropometric measurements of height, weight, body mass index (BMI), waist-hip index (WHI) and calf circumference (CC) was held. Bioimpedance analysis (BIA) estimated fat mass (FM), muscle mass (MM) was calculated using (5): Muscle mass (kg) = [(height 2 / R * 0.401) + (3.825 * gender) + (age -0.071 X)] + 5.102 Height= centimeters, R = resistance in ohms (by BIA), constants: Male: 0,Female:1. Also body mass index (BMI) and skeletal muscle mass index (SMI)= muscle mass (Kg)/ height squared (m) was calculated. Finally the diagnosis of sarcopenia is performed based on the algorithm of the EWGSOP, cutpoints HG 30 and <18Kg, GS <0.8 and <0.6m/s (Data taken from the 2012 ENSANUT and MHAS), (6) SMI ≤8.87 and ≤6.42 kg/m2, in men and women, respectively were selected to denote sarcopenia. (7, 8) Results: 84 subjects was total sample with mean age of 76 years (± 7.5), 62% women and 38% men. Prevalence of 51% (43 subjects) with sarcopenia, 60% female and 40% male; 49% (41 subjects) non sarcopenic, 63% female and 37% male. The comparison of the results between group without sarcopenia and sarcopenia for continuous variables are expressed as mean±SD or median (~interquartile range): Age 72.9±7.1 and 79.4±6.6years, KI 6 (~0.5) and 6 (~0.5) points, LBI 5 (~2) and 3 (~2) points, MMSE 22.9±4.2 and 22.3±3.9 points, GDS 4(~6) and 5 (~4)points, MNA10.3±2.2 and 9.4±2.2 points, Weight 74.6±16.1 and 60.3±11.8 kg, Height 157±10.5 and 154±9.2 cm, BMI 30.4±5.1 and 25.2±3.6kg /m2, CC 35 (~5.4) and 32 (~4)cm, GS 0.77±.25 and 0.63±.25m/s, SPPB 7.6±2.8 and 6.7±2.7 points, HG 23.4±9.5 and 17.6±5.9Kg, FM 23.4±9.2 and 19.4 ±6.2Kg, MM19.3±6.6 and 15.5±4.6Kg, SMI 7.89±1.9 and 6.1±1.0kg/m2, WHI 0.98±.07 and 0.94±.08, SCr 1.2 (~0.8) and 1.1 (~0.4)mg/dl, TFG 44.4 (~19) and 48.5 (~23)ml/min/1.73m2. Statistically significant differences were found on Age p = .000 (95% CI 3.5 -9.4) , LBI p = .000(95% CI -2.0 - -.64), BMI p = .000 (95% CI -7.1- -3.3), Cc p = .000(95% CI -7.4 - -2.9), WHI p= 0.35 (95% CI -.07 - -.002), FM p = .024 (95% CI -7.3 - -.53), MM p = .002 (95% CI -6.3 - -1.4), SMI p= .000 (95% CI -2.4 - -1.1) and SCr p = 0.046 (95% CI -.7094 - .000); to identify independent factors associated with sarcopenia were adjusted performed multivariate logistic regression analysis result in statistically significant LBI (OR 0.574; 95% CI 364 - 905, p = .017), BMI (OR 0.463; 95% CI 231-931, p = .031) FM (OR 1.41 95% CI 1019-1949, p = .038) Age (OR 1.16 95% 1315 1,026, p = .018). Conclusion: The present study demonstrated 51% prevalence of sarcopenia in CKD older subjects, To our knowledge, there is very little work that has examined this relationship and has not been previously described in Mexican population. This findings show that age, fat mass, BMI, LBI, calf circumference, waist-hip index, muscle mass, skeletal muscle mass index and serum creatinine were factors associated with sarcopenia. But after adjustments the independent factors associated with sarcopenia are age, fat mass, LBI and BMI in Mexican older people with non-end stage CKD.

Reference: 1. Domanski M, Ciechanowski K. Sarcopenia: a major challenge in elderly patients with end-stage renal disease. Journal of aging research. 2012;2012:754739. 2. Souza VA, Oliveira D, Mansur HN, Fernandes NM, Bastos MG. Sarcopenia in chronic kidney disease. Jornal brasileiro de nefrologia : 'orgao oficial de Sociedades Brasileira e Latino-Americana de Nefrologia. 2015;37(1):98-105. 3. Fahal IH. Uraemic sarcopenia: aetiology and implications. Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association. 2014;29(9):1655-65. 4. Elke S. Schaeffner, MD, MS*; Natalie Ebert, MD, MPH*; Pierre Delanaye, MD, PhD; Ulrich Frei, MD; Jens Gaedeke, MD. Two Novel Equations to Estimate Kidney Function in Persons Aged 70 Years or Older. Ann Intern Med. 2012;157:471-481. 5. Ian Janssen, Steven B. Heymsfield, Richard N. Baumgartner and Robert Ross. Estimation of skeletal muscle mass by bioelectrical impedance analysis. J Appl Physiol 89:465-471. 6. L.M. Gutiérrez-Robledo, M. T. López-Teros, E. Cruz-Arenas, L. Robles-Jiménez. P6- Cut-off values for gait speed and handgrip strength in mexican older adults. JFA 2015, sup.1,(4):47 7. Cruz-Jentoft AJ, Baeyens JP, Bauer JM, Boirie Y, Cederholm T, Landi F, et al. Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. Age and ageing. 2010;39(4):412-23. 8. Chien MY, Huang TY, Wu YT. Prevalence of sarcopenia estimated using a bioelectrical impedance analysis prediction equation in community-dwelling elderly people in Taiwan. Journal of the American Geriatrics Society. 2008;56(9):1710-5.

P130- DEVELOPMENT OF THE FIRST FUNCTIONALLY MATURE IN VITRO HUMAN MUSCLE MODEL: A NEW PARADIGM FOR FUNDAMENTAL RESEARCH AND DRUG DISCOVERY. J. Michaud, Y. Margaron, M. Fernandes, P. Menager, P. Poydenot, S. Degot *(Grenoble, France)*

Background: Muscle waste can result from a large panel of dysregulations in muscle physiology. It is present systemically in the elderly (sarcopenia); it can result from acute or chronic illness (cachexia), or appears in various muscular genetic diseases such as dystrophies. During the last 15 years, extensive research has led to a better understanding of the signaling pathways implicated in the loss of muscle mass (atrophy) and offered promising drug targets. However, to date, the muscle is the last undrugged organ. This is mostly due to the fact that muscle is also the last organ for which no relevant in vitro human model has been established. In this context, we developed and characterized the first in vitro human myotube model, MyoScreenTM, compatible with High Content Screening (HCS). Methods: MyoscreenTM model is based on a tight control of the microenvironment thanks to micropattern that guides the differentiation of human primary myoblasts into myotubes. Differentiation and maturation levels of normal or drug-treated myotubes were determined with dedicated image analysis algorithms and muscle specific markers. Results: Myotubes formed on micropatterns present a high level of maturation and functionality compared to standard culture condition (striation, clustering of AChRs, inducible contraction) together with a highly standardized morphology. Based on high content analysis, we showed that the MyoScreenTM model responds to reference compounds known to induce either atrophy or hypertrophy in a robust and reproducible way (Z' factor>0.5). Then, we developed an HCS assay for muscle wasting correction, by modeling muscle waste condition with an atrophy inducer. To do so, atrophy was first induced on a healthy MyoScreenTM model using reference compounds known to lead to muscle loss or to impair its renewal through various molecular

mechanisms (inflammatory cytokines, myostatin, glucocorticoids). Then, we screened for molecules that could counteract the induced atrophy phenotype, testing hypertrophic candidates and specific inhibitors of muscle catabolism pathways. Interestingly, IGF-1 and Trichostatin A were capable of rescuing the induced atrophy to the level of the control or higher depending on the dose. These results validated our muscle wasting model and demonstrated its compatibility with screening approaches. Conclusion: Altogether, we developed the first fully mature and functional in vitro human muscle model compatible with HCS. MyoScreenTM can be used to study the mechanisms controlling muscle physiology, to model disease, and to identify potential drug candidates. By combining a higher physiological relevance and a phenotypic screening compatibility, MyoScreenTM offers new avenues for increasing our understanding of the molecular pathways driving muscle wasting. It also represents a new paradigm to perform large scale screening campaigns leading to the discovery of potential cures for several muscle wasting disorders.

P131- ARE PREDICTORS OF FUNCTIONAL CAPACITY IMPROVED FOLLOWING A POWER TRAINING IN OBESE AND DYNAPENIC-OBESE OLDER MEN? L. Pinheiro Carvalho[1,2], C.H. Pion[2], F.C. Lemieux[2], G. El Hajj Boutros[2], A. Borghi-Silva[1], P. Gaudreau[2], S. Chevalier[2], M. Bélanger[2], G. Gouspillou[2], J. Morais[2], M. Aubertin-Leheudre[2] *(1. Sao Carlos, Brazil; 2. Montreal, Canada)*

Backgrounds: In the coming years, the elderly population will represent almost 20% of the world's population. Ageing is usually accompanied by loss of muscle mass and strength (dynapenia) and gain of fat mass (obesity), which lead to decreased functional capacity, autonomy and quality of life. Previous studies suggested that dynapenia-obesity induces more deleterious effects on functional capacity than either obesity or dynapenia alone. It has been proposed that age, BMI, fat mass, muscle function (muscle strength, mass and quality) and aerobic fitness [VO2peak and/or performance from exercise testings, such as the six-minute walking test (6MWT)] could predict the loss of functional capacity in obese and in dynapenic elderly individuals. However, it is unclear if these predictors play more important roles when dynapenia is combined to obesity. In addition it is recognized that non-pharmacological interventions, such as exercise programs could prevent or reverse this phenomenom. Recent findings suggest power training (PT) as the best intervention to improve muscle mass, strength and quality in elderly individuals. However, the effects of PT on aerobic capacity and body fat, especially in obese and dynapenic-obese elderly people, are still unknown. Thus, the aims of this study were: 1) to investigate, in a functional and aerobic perspective, what are the implications of being dynapenic-obese rather than being obese alone; 2) to investigate to what extent PT would be beneficial to improve strength and aerobic capacity, which are predictors of functional capacity; and compare the effects on both groups. Methods: Thirty-nine inactive obese men aged 60 and over were recruited and completed a 12-week power training (PT) intervention. Subjects were grouped as non dynapenic-obese (NDO, n=21) and dynapenic-obese (DO, n=18). Men were considered dynapenic if they had a muscle strength index (DI) [handgrip(N). body weight(kg)-1] lower than 4.9. Obesity was defined by a total FM (in % of weight) ≥25% with an upper limit BMI of 35 kg.m-2. No sarcopenic individuals according to the Baumgartner's criteria (Appendicular Lean Mass Index ≤7.26 kg.m-2) were included in this study. Body composition (fat and lean mass by DXA), maximal handgrip strength (HS, hand-dynamometer), aerobic capacity (6MWT): achieved (AD) and percentage of predicted distance (PD); estimated maximal oxygen uptake (eVO2peak)], and functional capacity [Time Up and Go at normal (TUGn) and fast (TUGf) gait speed, 4-meter walk test at normal (4mWTn) and fast (4mWTf) gait speed and stair test (ST)] were measured pre and post intervention. Potential confounders, such as total energy expenditure (TEE in kcal), dietary intake (total kcal/day), protein intake (g/kgBW/d) and pulmonary function (forced expiratory volume/forced vital capacity) were also evaluated. PT consisted of a fast velocity weight training, functional and balance exercises. It was performed weekly on 3 non-consecutive days. The 1-maximal repetition (1MR) was evaluated at weeks 0 and 6 in order to adjust load (80%1MR). Elderly men who completed less than 80% of the training sessions were excluded. T-Test for baseline characteristics, mixed ANOVA for PT and group effect and its interactions, and stepwise multiple linear regression analyses were applied. Statistical significance was set as $p<0.05$. Results: No difference was observed between DO and NDO at baseline for age (mean±SEM, 67±1 vs 70±1y), total FM and LBM, TEE, dietary intake, and pulmonary function. Baseline aerobic capacity was poorer in DO compared to NDO according to 1) AD-6MWT (550±19 vs. 626±20m, $p<0.01$, 2) eVO2peak (17.6±0.4 vs. 19.3±0.5 mL.kg.min-1 , $p=0.009$) and, 3) PD-6MWT (87.5±3.3 vs. 95.9±2.7%, $p=0.02$). Likewise, DO had worse scores of functional capacity than NDO in the TUGf (7.0±0.2 vs. 6.5±0.2 sec, $p=0.03$), 4mWTn (3.0±0.1 vs. 2.6±0.1 sec, $p=0.02$) and ST (29±1 vs. 33±1 n, $p=0.02$). Furthermore, AD-6MWT and FM explained 31% and 49% of the variance in DI at baseline and after PT, respectively. All functional and strength outcomes as well as aerobic capacity increased in both groups after PT whereas FM decreased ($p<0.01$). Significant treatment-by-group interactions indicated that HS increased more ($p=0.006$) and FM decreased less ($p=0.03$) in DO than in NDO. Finally, of particular clinical interest, before PT 46.15% (n/nt=18/39) were dynapenic and 56.4% (n/nt=22/39) had a poor aerobic capacity according to a 95% cutoff of PD-6MWT. After PT, this proportion decreased to 35.9% (n/nt=14/39) and 36.8% (n/nt=8/39), respectively. In addition, 17.9% (n/nt=7/39) of the subjects, initially obese, became non-obese after intervention ($p<0.05$). Conclusion: Our data showed that dynapenia combined with obesity is associated with poorer functional and aerobic capacities than in obesity without dynapenia. Additionally, power training could be considered effective to enhance strength and aerobic capacity and to decrease FM in DO and NDO elderly men. As a result, functional capacity improved after PT. These findings are important since muscle strength, but also aerobic fitness and fatness, are considered the best predictors of functional capacity. Thus, PT should be recommended to counteract physical disability and obesity in elderly people, factors which are highly related to health and social costs worldwide. *FAPESP-Grant process number 2015/12751-6, São Paulo Research Foundation

P132- VES-13, GAIT SPEED AND GERIATRIC ASSESSMENT DOMAINS AS PREDICTORS OF COMPLICATIONS DURING TREATMENT ELDERLY CANCER PATIENTS. M. Oswaldo Cadena Sanabria[1], J.H. Lopez Ramirez[2] *(1. Bucaramanga, Colombia; 2. Bogota, Colombia)*

The aim of this study was to evaluate the instrument VES-13, gait speed and domains of geriatric assessment as predictors of complications in the treatment of patients over 65 years, with cancer, who began treatment in Bogotá. Methods: cohort study, between December 2011 and June 2012, with a 3-month follow-up (pilot). Outcomes assessed: death, functional decline, hospitalization and treatment suspension. Results: 30 patients, with median age of 73.3 years (65-95 years), Karnofsky Index average of 80 and ECOG performance status of 2 or less in 78% of cases. Gastrointestinal tumors were of more frequent. There was a VES-13 score greater than

or equal to 3 in 60.7% of patients. 64% were dependent in instrumental activities and 32% had moderate to severe functional dependence in basic activities of daily living (Barthel less than 60). 39% of patients had functional decline, 28% had stopped treatment after 3 months. Mortality in the cohort was 7.1%. Factors that were associated with increased risk of complications were: Barthel <60, VES-13 greater than 3 (RR 3.23 95% CI 1.2-8.6), Mini nutritional Assessment (MNA) less than 12, MMSE less than 24 points (RR 2.6 95% CI 1.23 5.32), Body Mass Index (BMI) less than 22 and Gait Speed of less than 0.6 m / sec (RR 2 95% CI 1.29-3.1). Conclusion: the comprehensive geriatric assessment and application of VES-13 instrument can document factors that predict an increased risk of complications, which would otherwise be omitted with functional assessment is normally undertaken in oncology units. Is ideal a geriatric assessment in interdisciplinary team this patients.

P133- IMPACT OF PHYSICAL ACTIVITY IN THE GAIT SPEED AND MUSCLE STRENGTH IN SARCOPENIC PATIENTS OLDER THAN 65 YEARS. J. Nemerovsky, M. Leal, C. Mariñansky, C. Carrazana, M. Valerio, J. Herrera, G. Zarebski, J. Greco *(Caba, Argentina)*

Background: Sarcopenia is defined by the European Working Group on Older People in sarcopenia as the loss of muscle mass, muscle strength and speed. In this context sarcopenia influences directly on the functionality of the elderly generating state of frailty. Sarcopenia is usually associated with disability. Frailty is a concept designed to define the state of loss of adaptation to physical and functional changes and stressors from prevalent pathologies in older people. Frailty affects the quality of life of this group. Substantial potential exists to prolong active life expentancy and functional independence in older people through interventions designed to prevent or treat sarcopenia. Physical activity and nutrition act on sarcopenia changing the state of frailty of the elderly. Objectives: Determine the impact of physical activity on the gait speed, muscle strength and nutritional status in sarcopenic patients older than 65 years. Methods: Quantitative, descriptive, interventional and longitudinal study. We evaluated 8 sarcopenic seniors who participated in a program of physical activity (PA) during 28 days. The PA was performed 2 times per week. Each session was 20 minutes of physical warm-up, 25 minutes of aerobic activity and flexibility exercises, 15 minutes of breathing and back to calm exercises. At the beginning and end of the intervention anthropometric weight, height and bioimpedance (BIA 101 type, with software in Spanish) were evaluated; the risk of malnutrition was assessed through screening questionnaire from Mini Nutritional Assessment. The examination of fitness was performed through the Get Up and Go Test timer, measures of muscle strength (hand grip), walking speed and walking. For data analysis the SPSS 20 was used. Results: The mean age was 74.39 ± 6.94 years. After 28 days, no differences were observed in the diagnosis of nutritional status (50% normal weight start and end) ($p = 0.99$) and the MNA for screening (75% normal start and end) ($p = 0$, 41). Of the 3 parameters referred to diagnose sarcopenia significant difference in walking speed ($p = 0.0017$) being 12.5% at the beginning of fall risk and the end of a 100% risk (0, 89 ± 0.11 vs. 1.09 ± 0.16 starting end). The deficit as palmar force unchanged, though their absolute values showed differences (17.56 ± 6.72 vs. 20.87 ± 5.08 start end) ($p = 0.089$). While the rate of skeletal muscle mass was not modified ($p = 0.77$), but fat mass decreased significantly ($p = 0.036$). One patient diagnosis of severe sarcopenia migrated to sarcopenia. .

P134- AGE-RELATED CHANGES IN UPPER LIMB SENSORIMOTOR SYNCHRONIZATION FOR GERIATRIC FRAILTY APPLICATIONS. X.Y. Chong, S. Geoffrey, Y. Ge, D. Wu, D. He, W. Lye, Y.S. Ng *(Singapore)*

Background: Sensorimotor synchronization (SMS) is a test of motor control that involves the coordination of movement in synchrony to an external rhythm, and is a test of timing. Performing SMS tasks involves the primary sensorimotor cortex, supplementary motor area, premotor cortex, basal ganglia and cerebellum. Apart from the sensorimotor cortex, these areas are also the main regulators of gait. As gait analysis is emerging as a promising marker of frailty, we hypothesize that performance in SMS tasks is also a potential marker of frailty. Unlike strength tests (e.g. Grip strength) or gait analysis, SMS tests are less dependent on gender, BMI, operator or equipment. Furthermore, they are generally safe for the elderly. Using SMS principles, we developed a novel arm movement exercise and investigate if there is a difference in timing variability between the elderly and the young. Methods: 2 groups of participants aged 21-40 ($n = 42$) and aged >65 ($n = 39$) were recruited from the community. Mean asynchrony and variability (standard deviation of the asynchronies) measures were collected using our novel device at 50, 65 and 80 beats per minute. Two sets of data for each tempo were collected. Montreal Cognitive Assessment (MOCA) test scores and grip strengths were also recorded. To investigate the relationship between MOCA, grip strength and variability, participants in the elderly group with grip strength < 20kg were selected for subgroup analysis using the Pearson's Correlation Test. Results: The elderly showed greater variability than the younger group for 50, 65 and 80 beats per minute (BPM) ($p < 0.001$). There was no significant difference in mean synchronies between the young and the old. There was also no significant difference in the variability between 50, 65 and 80 BPM. In the subgroup analysis with elderly participants of grip strength <20kg, a negative correlation was found between variability and MOCA for one out of the two data sets at two tempos, 65 BPM ($r = -0.648$, $p = 0.012$) and 80 BPM ($r = -0.793$, $p = 0.001$ for 80 BPM). Conclusions: The novel tapping test was designed to assess comprehensively aspects of motor control including the integration of perception (proprioception and stimuli recognition), cognition (timing and spatial coordination) and action (strength and power). At lower grip strengths, there is possibly a linear correlation between hand tapping variability and MOCA, suggesting that the novel test is indeed an integrated test of these aspects. Age related changes of these aspects can be detected through hand tapping variability but not mean asynchrony measurements obtained using our novel arm exercise. To further ascertain if our novel arm exercise is suitable as an independent screening tool for frailty in the elderly, studies focusing on variability changes in healthy and frail elderly would be necessary.

P135- HEPCIDIN MODULATES RUNX2A GENE EXPRESSION TO REGULATE BIOMINERALIZATION OF BONE IN ZEBRAFISH. Y. Jiang *(Suzhou, China)*

Backgrounds: Iron overload as a risk factor for osteoporosis can result in up-regulation of Hepcidin, and Hepcidin knockout mice display bone microarchitecture defects. Molecular and genetic mechanisms underlying Hepcidin deficiency-derived bone loss, however, are still unclear. Methods: We showed that knockdown of zebrafish hepcidin using Morpholino leads to iron overload. Then, we used CRISPR-Cas9, a versatile genome-editing tool, to generate a zebrafish hepcidin mutant. We carried out a series of research on this new animal model which was first reported in the world. Results: Iron overload and mineralization loss in early intramembranous bones

were observed in hepcidin-/- larvae zebrafish, which can be partially restored with microinjection of hepcidin mRNAs. Quantitative real-time PCR analyses showed down-regulation of osteoblast-specific genes runx2a, runx2b, alp, and sp7 in homozygous hepcidin mutant zebrafish. Luciferase reporter assays showed that Bmp2a enhances runx2a expression but iron overload represses its expression through bmp2a independent of hjv. High-throughput transcriptome analysis of hepcidin-/- larvae zebrafish revealed multiple pathways in osteoblast metabolism. Conclusion: These findings showed that iron overload derived from Hepcidin deficiency represses bone formation possibly through the Bmp pathway and affecting runx2 in zebrafish.

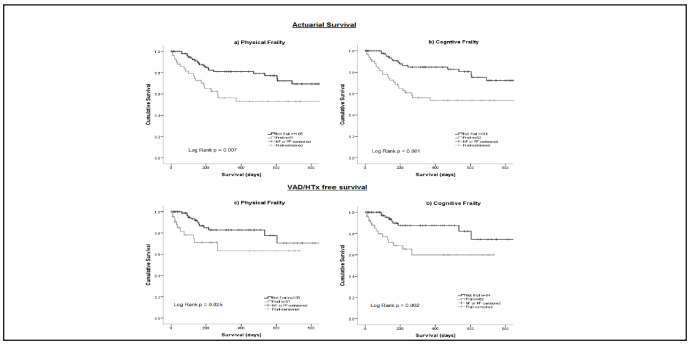
P136- A DOSE-RANGING STUDY OF THE NATURAL MYOSTATIN REDUCING AGENT, FORTETROPIN® IN YOUNG ADULT MALES AND FEMALES. M.H. Sharp[2], R.P. Lowery[2], E.O. de Souza[2], N.D. Padliya[1], R.J. Hariri[1], M. Dariani[1], J.M. Wilson[2] *(1. Cedar Knolls, USA; 2. Tampa, USA)*

Background: Reducing plasma concentration of myostatin can prevent skeletal muscle loss and improve muscle health both of which are clinically important for addressing sarcopenia and frailty syndrome. Fortetropin® is a natural myostatin reducing agent prepared from fertilized egg yolk [1] that has been evaluated in double blind, placebo-controlled clinical study [2]. In that study, a daily dose of 6.6 g or 19.8 g of Fortetropin for 12 weeks in combination with moderate resistance training, lowered plasma concentrations of myostatin in human subjects and resulted in significantly more lean muscle mass relative to the placebo group. The purpose of the current study was to evaluate the action of Fortetropin® as a myostatin reducing agent in humans at doses below 6.6 g (placebo, 2.0 g and 4.0 g). Methods: Eighty males and females, ages ranging between 18 and 22 arrived at the laboratory following a 10 hour overnight fast on day 0 for a blood draw via venipuncture in order to have their serum myostatin concentration levels assessed. Afterwards, subjects were stratified and then randomized into four groups in such a way that no significant difference in serum myostatin concentration existed between groups (placebo dose = 4.0 ± 1.4 ng/mL; 2.0 dose = 4.1 ± 1.6 ng/mL; 4.0 g dose = 4.1 ± 2.0 ng/mL; 6.6 g dose = 4.1 ± 1.2 ng/mL). Following assignment to one of the four groups, blood samples were again collected from all subjects to establish baseline values. Afterwards, subjects consumed their respective daily dose of Fortetropin® or placebo for 1 week. On Day 7, blood samples were collected at 10 hours following supplementation and again on Day 8, 24 hours following supplementation. All analyses for serum myostatin levels were assayed at the same time following all blood samples collection in order to avoid intra-assay variance. A two-way ANOVA with repeated measures was performed assuming time (baseline and day 7) and dose (placebo, 2.0 g, 4.0 g and 6.6 g) as fixed factors. Whenever a significant F-value was observed, a post-hoc test with a Bonferroni's correction for multiple comparisons was performed. In addition, the mean, upper and lower limit values of confidence intervals of the absolute differences (C.I.diff) were determined. Finally, within-group effect sizes (E.S.) (pre-to-post changes) were calculated using Cohen´s d. The significance level was previously set at $p < 0.05$. All results are presented as means ± standard errors. Results: A repeated measures analysis revealed a significant main effect of time ($p < 0.0001$), (placebo: -7.1%, E.S.: -0.20; 2.0 g: -13.1%, E.S.: -0.32; 4.0 g: 19.4%, E.S.: -0.39; 6.6 g: -22.4%, E.S.: -0.79). Using the C.I.diff analysis revealed that the 4.0 g and 6.6 g doses significantly reduced the myostatin serum concentrations relative to baseline, 95% C.I.diff : mean = -0.799 ng/mL, lower limit = -0.058 ng/mL, upper limit = -1.539 ng/mL, and 95% C.I.diff : mean = -0.936 ng/mL, lower limit = -0.193 ng/mL, upper limit = -1.677 ng/mL, respectively. Conclusions: We conclude that both 4.0 and 6.6 g/day doses of Fortetropin® consumed over a period of 1 week did lead to significant decreases in serum myostatin concentrations. Consumption of the placebo and 2.0 g/day dose did not significantly reduce myostatin. These results demonstrate that Fortetropin® is effective as a myostatin reducing agent at daily doses of 4.0 and 6.6 g/day. References: 1. Wilson, J., Lowery, R., Mobley, C., Healy, J., Thompson, R., Ashton, R., Dariani, M. and Roberts, M., 2015. The Effects of Fertilized Egg Yolk Isolates on Anabolic and Catabolic Signaling in Skeletal Muscle. The FASEB Journal, 29(1 Supplement), pp.819-1. 2. Sharp, M., Lowery, R., Mobley, C. et al. The Effects of Fortetropin Supplementation on Body Composition, Strength, Power in Humans and Mechanism of Action in a Rodent Model. Journal of The American College of Nutrition, in press. .

P137- THE ADDITION OF COGNITIVE IMPAIRMENT TO PHYSICAL FRAILTY IMPROVES SURVIVAL PREDICTION IN HEART-TRANSPLANT REFERRED PATIENTS. S.R. Jha[1], J. McDonagh[1], M.K. Hannu[1], K. Gore[1], S. Chang[1], P. Newton[1], K. Wilhelm[1], C.S. Hayward[1], A. Jabbour[1], E. Kotlyar[1], A. Keogh[1], K. Dhital[1], E. Granger[1], P. Jansz[1], P.M. Spratt[1], E. Montgomery[1], M. Harkess[1], P. Tunicliff[1], P.M. Davidson[1,2], P.S. Macdonald[1] *(1. Sydney, Australia; 2. Baltimore, USA)*

Aim: The aim of this study was to identify whether the addition of cognitive impairment (CI) to the assessment of physical frailty (PF) better enhanced mortality prediction in heart-transplant referred patients. Methods: Since 2013, all patients referred to our transplant center were consecutively assessed for physical frailty using an adapted version of Fried's Phenotype. A patient was classified as frail if ≥3/5 domains were present. Assessment of cognitive impairment (Montreal Cognitive Assessment - MoCA) was also conducted at the time of frailty assessment. A patient was classified as 'cognitively frail' if ≥3/6 domains were present. Results: 156 patients (109M:47F; age 53±13 years, range 16-73; LVEF 27±14%) underwent frailty assessment. Prevalence by physical frailty was: Frail 51 (33%) and 105 (67%) non-frail. Prevalence by cognitive frailty was: Frail 62 (40%) and 94 (60%) non-frail. Frailty, either physical or cognitive, was associated with lower BMI, NYHA class IV, hypoalbuminaemia and anaemia ($p < 0.01$). Cognitive frailty was additionally associated with increased right arterial pressure and lower cardiac index ($p < 0.05$). Actuarial survival curves are shown in figure 1 for physical (a) and cognitive (b) frailty. Survival adjusted for bridge-to-transplant ventricular assist device (BTT-VAD) and heart transplant (HTx) are also shown in figure 1 (c)/(d). Conclusion: Cognitive frailty was highly prevalent and the addition of CI to PF, provided a better predictor of early mortality in transplant referred patients.

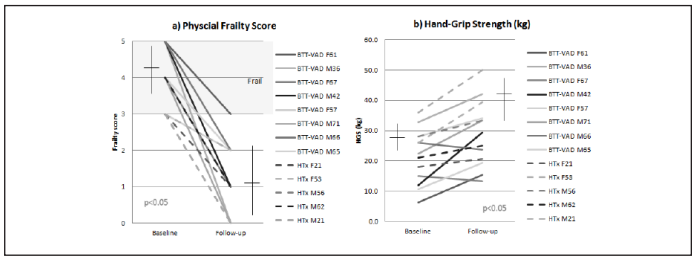
Figure 1
Actuarial and VAD/HTx-free kaplain-meier survival curves for physical and cognitive frailty



P138- REVERSIBILITY OF FRAILTY IN HEART TRANSPLANT LISTED PATIENTS. S.R. Jha[1], J. McDonagh[1], M.K. Hannu[1], K. Gore[1], S. Chang[1], P. Newton[1], K.Wilhelm[1], C.S. Hayward[1], A. Jabbour[1], E. Kotlyar[1], A. Keogh[1], K. Dhital[1], E. Granger[1], P. Jansz[1], P.M. Spratt[1], E. Montgomery[1], M. Harkess[1], P. Tunicliff[1], P.M. Davidson[1,2], P.S. Macdonald[1] *(1. Sydney, Australia; 2. Baltimore, USA)*

Aim: The aim of this study was to evaluate the reversibility of frailty in advanced heart failure (AHF) patients undergoing bridge-to-transplant ventricular-assist-device (BTT-VAD) implantation and heart transplantation (HTx). Methods: Since 2013, all AHF patients referred to our center were assessed for physical frailty (Fried phenotype, FP > 3/5 = frail) and a single-item measure of frailty (hand grip strength (HGS)) pre and post BTT-VAD/HTx. Results: 156 patients (109M:47F; age 53±13 years, range 16-73; LVEF 27±14%) were assessed for frailty. Prevalence was: frail 51 (33%) and not-frail 105 (67%). During listing, 31 patients underwent BTT-VAD implantation and 46 patients were transplanted. 8 frail pre-VAD patients and 5 frail pre-HTx patients were assessed at follow-up (avg. 17 days post-VAD and avg. 50 post- HTx). Frailty was significantly reversed in all patients who were classified as frail pre-intervention (Figure 1.a). A corresponding improvement in increased HGS was also seen for the majority of patients (Figure 1.b). Conclusion: Frailty is reversible in selected patients after BTT-VAD or HTx. Despite frailty being predictive of increased mortality in transplant-listed patients, de-listing on this basis may not be warranted as interventions such as BTT-VAD implantation and HTx have the potential to ameliorate AHF-induced frailty.

Figure 1
Changes in frailty and hand-grip strength pre-post VAD/HTx



P139- MEDIUM INTENSITY RESISTIVE TRAINING FOR COMBATING SARCOPENIA: EFFECTS ON OXIATIVE STRESS, MUSCLE SIZE, MORPHOLOGY, STRENGTH AND POWER. A. Vezzoli[1], M. Montorsi[1], S. Mrakic-Sposta[1], S. Moretti[1], S. Porcelli[1], P. Vago[1], F. Cereda[1], S. Longo[1], M. Narici[2] *(1. Milano, Italy; 2. Derby, United Kingdom)*

It is generally accepted that free radicals or reactive oxygen species (ROS) play a primary role in the ageing process, especially in those tissues in which their generation is more pronounced, such as skeletal muscle (Fulle, et al. 2004). With aging a reduction in the cellular antioxidant buffering mechanisms (Hepple et al. 2003) and an increase in ROS generation due to mitochondrial dysfunction result in an increase in the oxidative stress to which cells are exposed (Barreiro et al., 2006). This results in damage to muscle components including myofibrilar proteins. Although the etiology of sarcopenia is still under investigation, reduced physical activity and oxidative stress have been found to play an important role (Jang et al. 2010; Argilés et al. 2015). Sarcopenia should then be fought through specific training designed to reduce the loss in muscle mass while minimizing ROS production. In this respect, exercise can induce antioxidant adaptation thereby balancing oxidative stress and damage in aging skeletal muscle (Ji, 2001, 2002). Hence the present study aimed at testing the hypothesis that an innovative medium-intensity (60% 1RM) resistive exercise program would be effective in increasing muscle mass and strength while minimizing ROS production and oxidative stress in older sarcopenic individuals. Methods: Twenty six older individuals (mean age 73.3±5.3 yr, n=14 ♂, n=12 ♀) were admitted to the training protocol consisting of 3 sessions per week for 12 weeks. Pre-training, all participants were diagnosed as sarcopenic on the basis of their skeletal muscle index (SMI, %) value obtained by bioelectrical impedance analysis (BIA). According to Janssen et al (2002), cut-off levels for normal SMI, class I, and class II sarcopenia were set as: men, greater than 37%, 37% to 31%, and less than 31%; women, greater than 28%, 28% to 22%, and less than 22%. Pre-training 19 (73%) individuals were classified as type I sarcopenic and 7 (27%) as type II sarcopenic. The training protocol included a 6-8 min warm-up on an aerobic ergometer (treadmill or bike, according to individual preference) followed by 3 series of 14-16 repetitions of chest press, vertical row, shoulder lateral raise and horizontal leg-press exercises performed at 60% 1RM, with a one-minute rest between series and muscle group. Muscle strength (1RM) and stair climbing power (Sartorio et al. 2001) were measured before and after training. Vastus lateralis (VL) muscle thickness and pennation angle were measured using B-mode ultrasound according to Narici et al. (1996). Blood and urine samples were collected before (PRE) and immediately after the end (POST) of training period. Total antioxidant capacity (TAC) and protein carbonyl (PC), thiobarbituric acid-reactive substances (TBARS), 8-isoprostane (8-iso PGF2α) and 8-OH-2-deoxyguanosine (8-OH-dG) were assessed by immuno-enzymatic assays. ROS production was determined by Electron Paramagnetic Resonance. Results: After the 12-wk training intervention, the prevalence of sarcopenia decreased by 20% with respect to pre-training, 4 were classified as type II sarcopenic, 17 as type I and five as non-sarcopenic. VL muscle thickness and pennation angle increased by 6% (P<0.001) and 12% (P<0.001) respectively after training. Consistent with these findings, muscle strength (1RM) increased by 86% (P<0.001) in the lower limbs (leg press) and on average by 95% (range 89-101%, P<0.001) in the upper limbs. Also, stair climbing power increased by 9.7% (P<0.004) after training. Before training, all oxidative stress biomarkers were significantly higher (P<0.001) and TAC values significantly lower (P<0.001) in the sarcopenic participants when compared to a population of healthy older controls (CTRLs) (n=15 ♂, n=12 ♀). After training, in the sarcopenic subjects a significant (P<0.001) reduction of blood ROS production rate (- 21%), PC (-27%), TBARS (-30%), 8-OH-dG.creatinine-1 (-38%), 8-iso PGF2α. creatinine-1 (-26%) was observed. At the same time, an increase of TAC (+25%), was found between PRE and POST. Conclusion: These novel findings show that a programme of medium-intensity (60% 1RM) resistance training is highly effective for decreasing oxidative stress, improving skeletal muscle morphology, size and function in older sarcopenic individuals. Furthermore, these results seem to rebut the previously reported differences in oxidative stress balance between older healthy controls and sarcopenic individuals. References: Argilés JM, Busquets S, Stemmler B, Lopez-Soriano FJ. Current Opinion in Pharmacology 2015, 22:100–106; Barreiro, E., Coronell, C., Lavina, B., Ramirez-Sarmiento, A., Orozco-Levi, M., and Gea, J. (2006). Aging, sex differences, and oxidative stress in human respiratory and limb muscles. Free Radic. Biol. Med. 41, 797–809; Fulle S., Provasi F., Di Tano G., Pietrangelo T., Beltramin A., Boncompagni S., Vecchiet L., Fanò G. The contribution of reactive oxygen species to sarcopenia and muscle ageing Exp. Gerontol 39: 17-24, 2004; Janssen I, Heymsfield SB, Ross R. Low relative skeletal muscle mass (sarcopenia) in older persons is associated with

functional impairment and physical disability. J Am Geriatr Soc. 2002 May;50(5):889-96.; Ji, L.L. Exercise at old age: does it increase or alleviate oxidative stress? Ann. NY Acad. Sci. 928, 236–247, 2001; Ji, L.L. Exercise-induced modulation of antioxidant defense. Ann. NY Acad. Sci. 959, 82–92, 2002; Jang YC1, Lustgarten MS, Liu Y, Muller FL, Bhattacharya A, Liang H, Salmon AB, Brooks SV, Larkin L, Hayworth CR, Richardson A, Van Remmen H. Increased superoxide in vivo accelerates age-associated muscle atrophy through mitochondrial dysfunction and neuromuscular junction degeneration. FASEB J. 2010 May;24(5):1376-90.; Narici MV, Binzoni T, Hiltbrand E, Fasel J, Terrier F & Cerretelli P. (1996). In vivo human gastrocnemius architecture with changing joint angle at rest and during graded isometric contraction. J Physiol 496 (Pt 1), 287-297; Sartorio A, Lafortuna CL, Conte G, Faglia G, Narici MV. Changes in motor control and muscle performance after a short-term body mass reduction program in obese subjects. J Endocrinol Invest. 2001 Jun;24(6):393-8.

P140- BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) IN NORMAL HEALTHY AND HEMODIALYZED POPULATIONS. E. Cavalier, A.S Carlisi, F. Watar, S. Kovacs, C. Beaudart, F. Buckinx, O. Bruyère, J.Y. Reginster *(Liège, Belgium)*

Introduction: BDNF is a member of the neurotrophin family also produced in the skeletal muscle that acts as a muscle promoter. It is indeed involved in development and differentiation of myoblasts and muscle fibers as well as in the regulation of motoneuron survival [1]. Exercise has an important influence on BDNF levels and the well-known anti-inflammatory effects of exercise may be linked to the activation of the BDNF/TrkBK pathway. As it plays a role in fat oxidation, in immunity and in inflammation regulation but also maintains the integrity of the trophic interactions between motor neurons and muscle fibers, BDNF could play a role in sarcopenia. In this study, we aimed to establish the reference range in a normal healthy population and compared the values obtained with a population of hemodialyzed patients. Material and methods: We used the BDNF Quantikine ELISA Kit from R&D. The Company claims a CV<10% and a recovery not different from 100%. The range of values observed in an apparently healthy population (n=33) was 6.1-42.6 ng/mL, but no reference range was provided. We established the reference range in a healthy population of 62 young individuals (27 males, 35 females, 29.0±5.6 yo) and compared them to the levels observed in a population of 10 hemodialyzed (HD) patients. Results: The mean BDNF level observed in the healthy population was 25.2±7.3 ng/mL. There was no gender difference. Hence, the reference range calculated in the healthy population was 10.0 – 39.3 ng/mL. The mean level observed in the HD patients was significantly (p=0.0007) lower and was calculated at 17.4±4.1 ng/mL. Conclusions: In this study, we established the reference range of BDNF, a promising marker of sarcopenia and compared the results obtained in a young and healthy population with a HD one. The values observed in our healthy population are compatible with the range proposed by the manufacturer on a smaller subset of individuals. Our results show that BDNF was decreased in HD patients. Zoladz et al have shown that a single HD session decreased BDNF levels[2]. Since this decrease was accompanied by elevated Isoprostanes and decreased plasma total antioxidant capacity the authors suggested that the cause could be the enhanced oxidative stress induced by hemodialysis. Our findings confirm that chronic HD patients, that are a model of oxidative stress, present lower levels of BDNF. If the sensibility of BDNF to oxidative stress is confirmed, this increases the interest of BDNF in sarcopenia. 1. Kalinkovich A, Livshits G: Sarcopenia – The search for emerging biomarkers. Ageing Res Rev 2015;22:58–71. 2. Zoladz J a, Śmigielski M, Majerczak J, Nowak ŁR, Zapart-Bukowska J, Smoleński O, et al.: Hemodialysis Decreases Serum Brain-Derived Neurotrophic Factor Concentration in Humans. Neurochem Res 2012;37:2715–2724.

P141- OLFACTORY DEFICIT AND APOE GENOTYPE: EARLY DIAGNOSIS OF IADL-DEPEDENCY IN OLDER PEOPLE. Y.S. Handajani, Y. Turana, N.T. Widjaja *(Jakarta, Indonesia)*

Backgrounds The number of people surviving into old age is increasing, and it has now become a global phenomenon. This resulted in substantial increase in the numbers and proportion of older adults. Aging is characterized by loss of function and prevalence of chronic diseases and older peoples are among the most sedentary (physically inactive) segment of society. In many respects the increased life expectancy now appears to be exceeding our ability to maintain function and functional independence. A large proportion of older adults may live perilously close to important thresholds of physically ability that may render them dependent. There are many factors are known to contribute to disability in the older population. This study investigated the relationship between instrumental activities of daily living (IADL) and APOE ε4 risk allele, olfactory impairment, cognitive and mental decline in the older people. Methods : We evaluated 237 of the 575 subjects ≤ 60 years who participating in Atma Jaya Cognitive and Aging Research and met inclusion criteria. The Mini Mental State Examination (MMSE) and The Geriatric Depression Scale (GDS) are used to assess cognitive and mental status. Olfaction was measured using the Brief Smell Identification Test (B-SIT). Results : The majority of subjects were female(71.3%), 65±7.8 years, had undertaken formal education for less than 6 years(86.5%). Cognitive and mental decline were found on 58.2% and 3.4% of subjects. Moreover the APOE ε4 and olfactory impairment were detected in 34.3% and 38.8% of subjects. Further analysis showed there were a significant relationship between APOE ε4(p= 0.03; OR: 1.7; 95 % CI : 1.27-2.03) and olfactory impairment (p= 0.006:OR:6.8; 95% CI: 1.41-32.8) with IADL-Disability. Conclusion. Presence of the APOE ε4 allele and deficit of olfactory were associated with increased risk of IADL-disability in older people. Early diagnosis of olfactory deficit and the APOE ε4 could help to prevent of IADL-disability in later life.

P142- PHYSICAL FRAILTY CONDITION OF ELDERLY AND FITNESS FOR DRIVING MOTOR VEHICLES. M.A. Binotto, M.H. Lenardt, C. Cechinel, N. Hammerschmidt Kolb Carneiro, T.M. Lourenço *(Paraná /Curitiba, Brazil)*

The significant growth of the world population of people over 60 instigates the search for knowledge and to propose specific actions directed to this population in different contexts and involving different areas of knowledge. Since the last decade, researchers geriatrics and gerontology have devoted efforts in trying to propose, develop and implement preventive interventions against conditions that determine/ leading to disabling conditions of older people. Thus, the fragility has been recognized in the scientific literature as a geriatric syndrome, for presenting symptom complex, has high prevalence in the elderly and is the result of various diseases and multiple risk factors, and detecting and identifying this syndrome in the elderly driving becomes important. The aim of the study was to investigate the association between physical frailty condition of the elderly and the physical and mental fitness for driving motor vehicles. It is a quantitative cross-sectional study. The study was conducted in the transit clinics in a /PR. The clinics were chosen at random, and its inclusion were based on established criteria. The elderly inclusion criteria in the

study: the person must be 60 years of age or older; being scheduled for the rehab tests in one of the research performing clinics and present cognitive and physical abilities to perform the tests. The sample consisted of 172 elderly, in the sample period from 31 January 2015 to 31 July 2015. The data were collected through structured instruments, ranges application and physical tests, which compose the physical frailty (Fried et al, 2001): low levels of physical activity, self-reported fatigue/exhaustion, loss of unintentional weight, decreased grip strength and reduced gait velocity. The elderly who have three or more of these characteristics is considered frail, who have one or two characteristics is characterized as pre-frail and the elderly who do not have any of the characteristics mentioned is considered non frail. Data were analyzed using descriptive statistics, and more univariate analysis using the chi-square test and Cochran considering the level of statistical significance p <0.05, using Statistical Package for Social Sciences (SPSS) version 20.0. The results show elderly people with an average age of 67.73 ± 6.55, and (70.67%) were male, and the distribution of the groups was 0 (0%) fragile, 97 (56.40%) pre-frail and 75 (43.60%) did not fragile. There was a significant association between physical frailty and marital status (p = 0.0327), use of alcohol (p = 0.0417), number of kilometers traveled (p = 0.0222), accidents (p = 0.0165) and restrictions imposed in the license (p = 0.0313). As the result of vehicular license 43 (25%) were able 118 (68.60%) fit with restraint and 11 (6.40%) temporary unfit. There was no statistical association between physical fragility and the outcome of the license test (p = 0.8934). Although the prevalence of elderly drivers in the older-younger age group, the data show that 66% is in pre-fragility condition. This condition points to the indispensability of management of physical frailty in this group of drivers, as its management contributes to delay and mitigate the functional decline and consequently to a safer direction.

P143- PROTEIN INTAKE, PROTEIN SUPPLEMENTATION, LEAN BODY MASS AND RESISTANCE EXERCISE IN COMMUNITY DWELLING OLD ADULTS. A. Ramel, O.G. Geirsdottir, P.V. Jonsson, I. Thorsdottir *(Reykjavik, Iceland)*

Introduction: Aging is associated with a decrease in lean body mass (LBM), which accelerates after the age of 60 years and is a contributor to sarcopenia, functional impairment, frailty and disability. Resistance exercise and increased protein intake have been suggested to delay or prevent the age-related loss of LBM. Objectives: In this study we investigated the associations between protein and LBM in in community dwelling old adults. The aim was twofold: to investigate whether dietary protein intake is associated with LBM in community-dwelling older adults (in a cross sectional manner); and, whether protein supplementation results in greater increases in LBM during 12-weeks of resistance exercise when compared to isocaloric carbohydrate supplementation (intervention study). Method / Design: Participants (N=236, 73.7±5.7yrs, 58.2% female) participated in a supervised 12-week resistance exercise program (REP) involving dietary supplementation and a 12-week resistance exercise program, designed to increase muscle mass and strength of all major muscle groups. Participants exercised 3 times a week and received either 20 grams of whey protein (n = 83), milk protein (n= 75) or isocaloric carbohydrate (n = 78) in liquid form immediately after each workout. Body composition (DXA) and food intake were measured before and after the REP. Food intake was estimated with three days weighed food diary. Associations of change in LBM with energy intake, macronutrient, muscular strength and physical function after the REP were investigated using multivariate statistics. Results : At baseline protein intakes (quartiles) were Q1= 0.63 ± 0.08 g/kg; Q2 =0.85 ± 0.05 g/kg; Q4 = 1.36 ± 0.19 g/kg). Protein intake was associated with LBM (kg), i.e., the differences in LBM were 2.3 kg (P < 0.05) and 2.0 kg (P = 0.054) between the 4th vs. the1st and the 4th vs. the 2nd quartiles, respectively. Only a minor part of this association was explained by increased energy intake which follows an increased protein intake. Consecutively, 211 (90.3%) participants completed REP. Total dietary intake did not change due to supplementation and thus type of dietary supplementation did not affect gains in lean body mass or appendicular muscle mass (AMM) (0.74±1.74 kg and 0.53±0.72 kg, respectively). However, not everybody gained AMM. Gainers (n=169) increased AMM (0.8±0.6kg), but losers (n=42) decreased AMM(- 0.3±0.3 kg). No significant difference between the two groups was found in age, BMI, LBM, strength or physical function at baseline. Participants who lost AMM had significant lower energy intake, 1551 kcal/day vs. 1724 kcal/day (p=0.046) and lower protein intake both as total protein (p<0.001) and as protein per kg, body weight, 0.86 g protein/body weight vs. 0.98 g protein/body weight (p=0.009). Conclusions: Our study shows that dietary protein intake is positively associated with LBM in community dwelling older adults with a mean protein intake higher than the current recommended daily allowance of 0.8 g/kg per day. It further shows that energy and dietary protein intakes were positively associated with the increase in AMM in older adults participating in REP. Postexercise supplementation with protein did not increase total protein or energy intake and thus did not affect gains in LBM in our study population.

P144- CHANGES IN THE ORGANISM'S FUNCTION DURING AGING. N. Prokopenko *(Kiev, Ukraine)*

Backgrounds. The aging is a natural result to vital activity of the human organism. However process of the aging can come of different intensity depending on conditions of the life, vital activity and genetic factor. The goal of the study is to reveal effects of changes in the organism's function during aging on the cognitive processes. Methods. Age-related changes of the cardiovascular, neuromuscular and respiratory system and their role in the development of cognitive disturbances were investigated in 123 workers of intellectual labour aged 20-79 and 75 long-living subjects using psychophysiological testing. The level of cognitive impairment in long-living subjects was determined with the MMSE test (mini mental state examination). Results. The periods of decrease of organism's adaptive capacities (50-59 years for men and 40-49 and 60-69 for women) were revealed based on the data of age-related changes in the index of cardiovascular activity (ICVA); they serve a prognostically unfavourable sing of development of cognitive disturbances. The differentiation of long-living subjects based on results of MMSE test revealed an increased diastolic arterial blood pressure in persons with moderate cognitive disturbances vs. patients with age-dependent decrease of memory. Between ICVA values and MMSE test data there is a nonlinear dependence of the form y=a+bx+cx2, i.e. mild cognitive impairment as an intermediate state between the age-related changes in the brain and the clinical dementia occurs due to lower cardiovascular activity. Conclusion. Evaluation of age-related changes of the functional state of the cardiovascular system has allowed to identify the most sensitive periods of human life, both in terms of adaptive capacity, and from the point of view of the risk of cognitive impairment. The study of cognitive impairment due to the state of the cardiovascular system in long-living subjects confirmed our hypothesis about the role of autonomic dysfunction as an indicator of possible changes in the intellectual sphere. So, we can assume that the long-term and stable stress of regulation systems can produce functional changes, which are expressed in the gradual transition of prenosological states in pathological. Such activation of the cardiovascular system should be viewed as a adverse prognostic factor for decrease of the adaptation

capacities and development of cognitive disturbances.

P145- CUSHING SYNDROME AS A MODEL FOR SARCOPENIC OBESITY. M. Drey, R. Schmidmaier, C. Berr, J. Fazel, M. Reincke *(München, Germany)*

Backgrunds: Obesity is discussed to be a major risk factor for sarcopenia ending in sarcopenic obesity. Cushing`s syndrome (CS) is known to be associated with obesity and muscle atrophy. The German Cushing Registry studies phenotypic and biochemical characteristics of Cushing's syndrome. We used the registry data of body composition and physical performance of patients with CS and obese controls (OC) to test the hypothesis that Cushing`s syndrome could be a model for sarcopenic obesity. Methods: 48 patients with active CS and 102 controls were analysed. By propensity score matching 48 controls were selected by BMI and gender as OC. Fat mass and muscle mass were measured by bioelectrical impedance analysis. Further, chair rising time and hand grip strength were assessed. Multiple regression analysis was used to investigate differences in fat mass, muscle mass and physical performance adjusted for gender and age between the groups. Results: After matching, mean BMI in the CS group was 29.3kg/m²and 29.8kg/m² in the OC group respectively. No differences in muscle mass and fat mass adjusted for age and gender were detected. However, CS patients showed significantly lower hand grip strength (35.6kg versus 31.2kg, p=0.007) and greater chair rising time (7.3s versus 9.5s, p=0.008) adjusted for gender and age. Conclusions: Low physical performance in CS patients seems not to be based on low muscle mass. Data suggest that CS patients suffer from low muscle quality. Inter- and/or intramyocellular fat mass could be responsible for this phenomenon. CS seems to be an interesting model in ageing research for sarcopenia and sarcopenic obesity to study metabolism and muscle physiology.

P146- A PILOT STUDY OF DIETARY FISH OIL TO ENHANCE MUSCLE FUNCTION & INJURY RESISTANCE IN YOUNG AND OLD RATS. D.W. Russ[1], S.M. Garvey[2], S. Herman[1], T. Hawks[1] *(1. Athens, USA; 2. Columbus, USA)*

Background: Falls are the most common mechanism of injury in older adults. Though focus is typically on fracture in such cases, falls can result in contusion injuries that exacerbate age- related weakness, increasing the risk of subsequent falls. Dietary fish oil (FO) may positively affect several muscle impairments shared by aging and injury, including oxidative injury, increased inflammation. Thus, dietary FO may improve muscle function following contusion injury, and this effect might be. Accordingly, we evaluated the effects of dietary FO on muscle function following contusion injury in a rat model of aging. Methods: Adult (8-9 months) and aged (22-23 months), Sprague-Dawley rats were assigned to control (Ctl) or experimental (Exp; supplemented with ~1.12 g/kg FO) diets for 8 weeks (7 adult; 6 aged rats/group). Forelimb grip strength was assessed before and after the dietary intervention. A standardized contusion injury was delivered to the right medial gastrocnemius (MG) at 8 weeks. Two days later, in situ twitch and tetanic (100 Hz) forces were assessed in both MGs. Both muscles were harvested and weighed following contractile testing. Animal use and all procedures were approved by the Ohio University Institutional Animal Care and Use Committee, and the "Principles of Laboratory Animal Care" (NIH Publication No. 86-23, revised 1985), were followed throughout the study. Data were analyzed by 2 X 2 ANOVA (age X dietary group), except for grip strength, which was assessed using a repeated measures ANOVA, with time (i.e., pre- and post-intervention) as the repeated factor. Results: Body mass and food consumption were comparable across all 4 groups over the course of the dietary intervention. Aged animals exhibited reduced MG mass and cross-sectional area (CSA) (both $P = 0.001$) and MG force, though the effect was more pronounced for twitch than tetanic force ($P = 0.071$ and 0.003, respectively). Contusion injury reduced both twitch and tetanic force production relative to the uninjured MG for all groups (all $P < 0.001$). Contrary to our hypothesis however, the magnitude of injury (% difference in force between injured and uninjured MG) exhibited no significant main effects or interactions of age and diet (all $P > 0.200$) for either twitch (mean ≈ 41.5%) or tetanus (mean ≈ 36.5%). Interestingly, tetanic force was significantly greater (13.39 ± 0.74 vs 11.91± 0.69); $P = 0.046$) in animals on the experimental diet, though twitch force was not ($P = 0.262$). No effect of diet or age X diet interaction was present for either MG mass or CSA. However, twitch and tetanic muscle quality exhibited a significant diet X age interaction ($P = 0.027$) and a strong trend ($P = 0.051$) for an effect of diet, respectively. There was also a significant age X diet interaction ($P = 0.003$) for the ratio of twitch to tetanic force (Tw:Tet), due to the fact that the Tw:Tet of the aged, control-diet group was lower than that of all other groups. Conclusions: Dietary FO did not affect acute functional impairment of muscle following contusion injury. This does not rule out the possibility that FO may increase the rate of recovery from injury. Further studies involving longer-post-injury recovery times are needed to assess this possibility. Dietary FO did enhance of uninjured muscle contractility, regardless of age. However, the FO did not increase size, and thus improved muscle quality, rather than quantity. These data suggest that FO may be a useful intervention for improving muscle function, alone or in conjunction with interventions that do increase muscle size. Further studies are needed to identify mechanisms underlying these promising early results on the response to dietary FO.

P147- EFFECT OF A THREE MONTH POST-HOSPITAL NUTRITIONAL INTERVENTION ON FUNCTIONAL PERFORMANCE IN FRAIL AND MALNOURISHED OLDER ADULTS – A RANDOMIZED CONTROLLED STUDY. L. Otten, J. Kiselev, K. Franz, E. Steinhagen-Thiessen, U. Müller-Werdan, R. Eckardt, D. Spira, K. Norman *(Berlin, Germany)*

Background: Malnutrition at hospital discharge is a common problem in frail older adults contributing to a higher morbidity, loss of function and an increased hospital readmission rate. We investigated the effect of a three month nutritional supplementation compared to dietary counselling at discharge on strength, mobility, functional limitations and quality of life in frail malnourished old patients. Methods: Malnutrition was identified with the Mini Nutritional Assessment – Short Form (MNA-SF) and frailty was evaluated with the Fried Criteria (1). Patients were randomized at discharge to receive either dietary counselling (DC) or DC and oral nutritional supplements for three months (ONS). Mobility was assessed with the Timed Up&Go Test (TUG), grip strength and knee extension strength were measured using dynamometry and quality of life was evaluated with the EuroQol visual analogue scale (EQ-VAS). Self-reported functional limitations were assessed with the Longitudinal Amsterdam Aging Study (LASA) questionnaire. Results: From the 89 patients included, 71 patients completed the study (78.2 ± 6.8 years; 56.3% women) and were analyzed according to intention-to-treat. While nutritional status and hand grip strength increased significantly in both groups, knee extension strength, TUG, functional limitations and quality of life only improved significantly in the intervention group (Table 1). Conclusion: The results of this interim analysis suggest that an intervention with oral nutritional supplements improves functional and strength parameters, as well as quality of life in frail older adults

during the vulnerable period after hospital discharge. 1. Fried LP, Tangen CM, Walston J, et al. Frailty in older adults: evidence for a phenotype. The journals of gerontology Series A, Biological sciences and medical sciences 2001;56(3):M146-56.

Table 1
Changes in strength and functional parameters during the 3 month study period

Parameter	DC (n=34)			ONS (n=37)		
	Baseline	3 Months	p Value	Baseline	3 Months	p Value
MNA-SF (points)	7.4±2.2	11.0±2,7	<0.0001	6.8±1.9	10.8±2.5	<0.0001
Weight (kg)	67.9±13.7	68.3±14.2	0.549	60.7±10.1	62.5±10.8	0.010
Frailty (score)	7.2±1.0	6.8±1.3	0.134	7.4±1.4	6.6±1.2	0.003
Hand grip strength (kg)	24.4±7.0	25.7±7.6	0.018	21.9±6.2	24.1±8.2	0.006
Knee extension strength (kg)	17.9±6.7	20.0±7.2	0.141	14.3±5.7	17.8±6.3	0.015
Timed Up&Go (sec)	19.8±7.2	16.2±6.1	0.055	23.6±10.9	18.6±6.7	0.020
Functional limitations (score)	3.6±2.0	3.3±2.0	0.196	4.1±1.7	3.3±1.9	0.002
EQ-VAS (%)	53.5±23.7	53.2±23.0	0.943	50.0±18.1	60.8±20.7	0.011

P148- SKELETAL MUSCLE DENSITY, NOT MUSCLE MASS, ROBUSTLY PREDICTS ADVERSE OUTCOMES IN BOWEL RESECTION. W. Yin, R.G. Tauscher, K. Idrees, H.J. Silver *(Nashville, USA)*

Backgrounds: Bowel resection is a common treatment for early stage colorectal cancer and severe inflammatory bowel disease. Having a high body mass (BMI) is associated with surgical complications and adverse outcomes. With advances in imaging technology, studies using CT images have shown that low skeletal muscle mass (i.e., sarcopenia) is also associated with adverse surgical outcomes. Few studies have been conducted investigating postoperative outcomes in U.S. patients, including those who have high BMI and low muscle mass (sarcopenic obesity). Methods: CT scans were acquired within 3 months of surgery from 984 adults who underwent colectomy from 2006 to 2013. The L3 vertebral slice was used to quantify skeletal muscle, subcutaneous adipose tissue, visceral adipose tissue, and skeletal muscle density with an automated version of Slice-O-matic clinical imaging software. To assess muscle density we used mean attenuation (Hounsfield units), with low HU indicating lower density and greater fatty infiltration of muscle. Sarcopenia was categorized using standard cut-points and indexed to height: ≤38.5 cm2/m2 for women, ≤52.4 cm2/m2 for men. Surgical outcomes (hospital LOS, ICU admission, ICU LOS, postoperative complications, and recurrence) were determined from electronic medical records. Statistical testing was performed using SPSS (version 23) with $\alpha = 0.05$. Results: The 984 patients had a mean age of 53.3 ± 16.6 years and mean BMI 26.9 ± 6.6 kg/m2 with 56% overweight or obese. Those with sarcopenia (48.7% of patients) were slightly older (mean difference 2.2 years, P =0.04) and more likely to be Caucasian (vs African American, P =0.001). Rather than skeletal muscle mass, low skeletal muscle density (range 3.3 – 65.7 HU) was associated with increased hospital LOS, ICU admissions, ICU LOS, and postoperative complications (all Ps <0.01). Skeletal muscle density was the only body composition variable to retain significance as an independent predictor for these outcomes in multivariate analysis. Moreover, when bowel resection was due to malignancy (N=400), each HU lower in skeletal muscle density was associated with 5% increased odds for recurrence (CI: 1.01-1.09, P =0.01). Conclusion: Low skeletal muscle density was associated with hospital LOS, ICU admission, ICU LOS, surgical complications, and colorectal cancer recurrence. These data suggest that skeletal muscle density is a more robust indicator of muscle quality and function than skeletal muscle quantity in surgical patients undergoing bowel resection. Measurement of skeletal muscle density from routinely acquired CT scans could be used to identify patients at high risk for adverse outcomes, and thus, improve patient management. .

P149- NUTRITIONAL RISK AND FRAILTY IN INSTITUTIONALIZED ELDERLY IN RIO DE JANEIRO, BRAZIL. R.B.A. Oliveira, J.F. B. Salles, M.J. Medeiros *(Rio de Janeiro, Brasil)*

Background: Elderly nutritional prognosis is closely related to the development of frailty, which seems to be more prevalent in the institutionalized elderly compared to individuals living in the community. Maintaining a good nutritional status is seen as a way to prevent the development of frailty, however, this is a challenge in this context. Mini Nutritional Assessment (MNA) is already being used as a protocol in many Brazilian health services, while the evaluation of frailty is not a routine clinical practice yet. The aim of this study was to associate nutritional status and frailty in institutionalized elderly in a city of Rio de Janeiro, Brazil. Methods: It was conducted with elderly residents in two long-term care facilities in Macaé. It was investigated socio-demographic assessment, nutritional and frailty. We used the full version of Mini Nutritional Assessment (MNA) and Edmonton Scale (ED). Exploratory data analysis was performed using descriptive statistics and the association between the scales was verified using the Spearman correlation coefficient in free software PSPP version 0.8.4. The present study is supported by the "Interdisciplinary Program of Health Promotion" of the university. Results: There were 92 elderly, being 63% female, 57.6% were caucasian and 32.6% were african descent. Most have 0-3 years of formal education (35.9%), followed by 4-7 (26.1%). The mean age was 80.2 years old ± 10.3, weight was 56,1kg ± 17.6, height 1,54m ± 0.1 and BMI 23.5 kg/m2 ± 6.9. Dividing by sex, the mean age for women was 81.7 ± 9.9 and BMI 23.9 ± 8.1, while for males were 78.2 ± 10.4 and BMI 22.8 ± 4.3. The MNA score ranged from 10 to 28 (mean 19.5 ± 4.5) and ED scale ranged 4 to 14 (mean 9.4 ± 2.2). The distribution of the elderly according to the degree of fragility according to the Edmonton Scale was 1,2% presents no fragility, 8,4% apparently vulnerable, 22,9% mild weakness, frailty moderate 43,4%, 24,1% severe weakness. Regarding the group with mild degree of frailty, there is a greater number of malnutrition risk cases (47,4%), and also 15,8% of malnutrition. In moderate frailty group, half the population was classified at risk of malnutrition and 30,6% were malnourished. Those with severe frailty, the frequency of malnutrition and risk of malnutrition were 45% and 55%, respectively. The Spearman correlation coefficient was - 0.4. Conclusions: Our findings demonstrate that the institutionalized is mostly caucasian, with low formal education, high mean age, BMI borderline for women and pointed low weight for men. We conclude important nutritional risk and moderate frailty of the elderly. The instruments showed a negative and weak correlation. These results confirm there is no close association between frailty and nutritional status in this group. Otherwise, there is a tendency of a reduction in the number of eutrophic individuals and an increase of cases classified as risk of malnutrition or malnourished as frailty degree increases. A deep understanding of the interdependence of these two constructs will form the basis for successful diagnosis. The assessment of nutritional status of institutionalized elderly population of Macaé seems to presume hypothetical information about suspected frailty.

P150- COGNITIVE IMPAIRMENT MODERATES THE EFFECT OF FRAILTY ON MORTALITY. Y. Lee, J. Kim, H. Kwon Lee *(Suwon, Republic of Korea)*

Backgrounds: Frailty and cognitive impairment in late life increase the risk of mortality. Physical frailty is also closely associated with cognitive decline. The aim of the study was to examine the effect of frailty on mortality and investigate the moderating effect of cognitive impairment in the frailty-mortality relationship. Methods: Adults aged 65 years and older (n=12,087) in the 2008 Living Profiles of Older People (LPOPS) were followed for 3 years during which 832 deceased (6.9%). Frailty status was categorized using the Fried's phenotype model. Cognitive impairment was defined as more than 1.5 standard deviation below the age-, gender-, and education-specific norm of the Korean version of the Mini-Mental State Examination (MMSE-KC). Cox proportional hazards model was used to analyze the mortality risk by frailty status, and interactions between frailty and cognitive impairment were assessed. All analyses were performed using Stata 13.1, taking into account the complex sampling design. Results: Among the sample 50.4% were prefrail and 7.9% frail, with 25.1% being cognitively impaired at baseline. Those with higher levels of frailty tended to be more cognitively impaired, with 18.3% in the nonfrail, 28.1% in the prefrail, and 43.0% in the frail group having cognitive impairment. Compared with the nonfrail, those who were prefrail (hazard ratio [HR] = 1.38, 95% CI: 1.09-1.75) or frail (HR = 1.80, 95% CI: 1.29-2.51) demonstrated higher mortality risks. Cognitive impairment was also associated with increased mortality (HR = 1.26, 95% CI: 1.02-1.54). The interaction term of frailty and cognitive impairment was significant ($p < 0.001$). Among the cognitively normal, those who were frail had a 1.8 times higher mortality risk than that of the nonfrail group. Among the cognitively impaired, compared with the nonfrail counterpart, those who were prefrail had a 2.8-fold, and those who were frail had a 3-fold, elevated mortality risk. Conclusion: Frailty was a significant predictor of 3-year mortality in community-dwelling older adults, with the association being moderated by baseline cognitive status. The relationship was more prominent among the cognitively impaired than those who were not. Taking cognitive function into account may better predict the adverse outcomes of frailty in later life.

P151- FALLS-ASSOCIATED PARAMETERS IN A COHORT OF 641 ELDERLY- THE TREND STUDY. S. Hasmann[1,2], M. Hobert[1], J. Staebler[1], G. Eschweriler[2], D. Berg[1], M. Drey[1], W. Maetzler[1] *(1. Tuebingen, Germany; 2. Munich, Germany)*

Background and aim: In an ageing society falls are a common personal, occupational, social and economic burden. It results in functional impairment, reduced quality of life and increased mortality. Understanding factors associated with falls is a prerequisite of preventing them. Method: Potential parameters associated with falls, as well as occurrence of and frequency of falls during the last 12 months were assessed in 641 individuals between the age of 50 and 80 years in the frame of the baseline assessment of the TREND study (www.trend-studie.de). Parameters were then exploratively compared between non-fallers, single fallers and multiple fallers with correction for age and gender. Results: Five hundred fifty-eight participants reported to experience no fall in the last 12 months, 46 to experience one, and 37 more than one fall during this period. Compared to non-fallers, multiple fallers had a higher walking speed (13.4 vs. 12.4 sec for 20 meters, p=0.010), lower grip strength (26 vs. 31 kg, p=0.0006) a higher Beck's Depression Inventory (BDI) score (12.2 vs. 7.7, p<0.0001), answered more regularly the question "Are you out of breath while taking stairs" with yes (53% vs. 28%, p=0.002), as well as the statement "It is much harder for me to cope with everyday life than before" with yes (40.5% vs. 21.5%, p=0.009),and reported more often to suffer from Rem Sleep Behaviour Disorder (11% vs. 22%, p=0.004). Inclusion of all factors in a model explained 10% of the difference, BDI alone 6%. Individuals experiencing one fall during the last year showed comparable values to non-fallers. No significant differences between the cohorts were observed for the parameters/scores/diagnoses: gender, age, weight, height, BMI, visual acuity, pallaesthesia, MiniMental State Examination, Trail Making Test, motor part of the Unified Parkinson's Disease Rating Scale, intima-media-thickness and physical activity, actual intake of benzodiazepines, neuroleptics, alcohol and drugs, as well as medical history for coronary artery and other heart diseases, stroke, mild cognitive impairment, arterial hypertension, diabetes, hyperlipidemia, hypercholesterolemia, smoking, thyroid dysfunction, arthrosis, arthritis, musculoskelal dysfunction, bone fractures. Conclusion: In this cohort of healthy elderly, high BDI was the strongest predictor of falls. With frailty associated parameters like lower grip strength and shortness of breath were associated with more falls. Curiously the fallers had a higher walking speed which might be explained as a compensative strategy. Diversity of factors that are significantly associated with frequency and occurrence of falls, and the relatively low influence of all of them on the overall model are in line with existing hypotheses that risk of falling in elderly is multi-dimensional and includes factors that are currently not assessed in longitudinal cohort studies.

P152- FUNCTIONAL REACH PERFORMANCE AND FALL PREDICTION IN A COHORT OF 1102 ELDERLY – THE TREND STUDY. S.E. Hasmann[1,2], S. Kormeier[1], M.A. Hobert[2], K. Maier[1], S. Heinzel[1], J. van Uem[1], D. Berg[1], M. Drey[2], W. Maetzler[1] *(1. Tuebingen, Germany; 2. Munich, Germany)*

Background: The objective of this investigation was to assess the predictive value of the Functional Reach test on future falls during a 2-year –observation period in a large cohort of healthy community-dwelling elderly. Falls are associated with increased mortality and morbidity, as well as with functional impairment and reduced quality of life. The value of the functional reach (FR) test to predict future falls has been proposed by small studies in elderly, however, to the best of our knowledge, has never been confirmed in a large cohort study. Methods: Approximately 1100 non-demented individuals between the age of 50 and 83 years were assessed in the frame of the TREND study (www.trend-studie.de) with the Functional Reach Test. FR distance was determined by asking all participants to reach with their right arm forward as far as possible. Two years later, falls history over the last 24 months was assessed. Individuals who reported more than one fall within two years were classified as Fallers (N=65), whereas individuals with no fall were categorized as Non-Fallers (N=753). Based on literature, a FR distance <25cm was defined as being associated with increased fall risk. The relative risk of falling was calculated with a 2-by-2-table. Results: In our cohort, 65 study participants reported ≥2 falls during the observation period of 24 months, with a mean falls frequency of 3.4 (2.4). 753 participants reported no fall. A FR distance <25cm predicted Fallers with a relative risk (RR) of 1.84 (confidence interval 1.12-3.02). Conclusion: This study shows that a FR <25cm is associated with an almost 2-fold increased risk for repetitive falling in the course of the following 2 years in a non-demented older adults. This finding underlines the usefulness of the FR as a tool for fall risk assessment. The FR may have a particular value in balance assessment batteries that do not only focus on single balance systems, but try to cover the whole range of balance deficits potentially occuring in older adults.

P153- PRIORITIZING FRAILTY CRITERIA TO ASSESS THE VALUE OF NUTRITIONAL INTERVENTIONS FOR THE PRE-FRAIL ELDERLY. M. Wallace[1], M. Hummel[1], H. Broekhuizen[2], M. IJzerman[2] *(1. Amsterdam, the Netherlands; 2. Enschede, the Netherlands)*

Background: With an ageing population comes a growing burden of disease and an increased susceptibility to frailty. The adverse outcomes of frailty can significantly decrease quality of life and increase healthcare expenditures. Nutritional interventions hold high promises in interfering early in the process of becoming frail, and to prevent or to reduce the adverse health outcomes of frailty. However, targeting and assessing the development of the right nutritional compounds and healthcare interventions requires a better understanding of the clinical criteria used to describe frailty as well as the importance of these criteria in preventing the adverse outcomes of frailty. Therefore, the aim of this study is to prioritize frailty criteria according to their importance in preventing the adverse outcomes of pre-frail elderly still living at home. Prioritization of these criteria can guide evidence-based research to study the value of nutritional interventions in preventing or delaying hospitalization and institutionalization of (pre)frail elderly. Methods : Criteria indicating frailty were identified through a literature study about validated screening tools for frail elderly. Frailty criteria were identified that related to physical, mental and medical outcomes. A preliminary validation of the selection of frailty criteria was performed by interviewing eight healthcare professionals in the field of gerontology, as well as six community-dwelling elderly persons. Subsequently, an international expert panel, including three clinicians and five health policy makers with expertise in frailty, geriatrics, primary care and health outcomes research, extensively discussed and prioritized the frailty criteria. Priorities were calculated by means of MACBETH, a validated technique for multi-criteria decision analysis. Results: Based on the literature review and interviews we selected a preliminary set of the frailty criteria, including diverse disease-related symptoms, mental frailty indicators and physical frailty indicators. Considering the high degree of co-morbidities in frail elderly, the various disease-related symptoms were captured during the expert panel session into one comprehensive disease-related criterion: burden of disease. The number and duration of hospitalizations was used to operationalize this concept. The results showed that burden of disease (mean priority = 0.23) was ranked first according to its importance in preventing the adverse outcomes of frailty. Next in rank were cognition (0.17), balance (0.15), mobility (0.14), energy (0.13), and undesired weight loss (0.12). Depression (0.07), and grip strength (0.01) were considered to be relatively less important in reducing the risk for adverse outcomes. At the mean group level, the rank order of these frailty criteria was highly robust. At the individual level, the experts differed most in opinion about the relative importance of balance. Conclusion: Our method for multi-criteria decision analysis supported the experts in discussing and judging the importance of these frailty criteria in preventing the adverse outcomes of frailty in pre-frail elderly. Insight in the differences in judgments efficiently guided the discussions in the multidisciplinary expert panel. Our study showed that disease-related, mental and physical frailty are all relevant aspects of frailty. Namely, burden of disease, cognition, balance and mobility were considered to be most important in reducing the adverse outcomes of frailty. As a whole, burden of disease was thought to impact physiological reserves and to make elderly more vulnerable for the adverse health outcomes of frailty. Health economic analysis is recommended to prioritize those (combinations of) diseases that have the highest impact on health-related quality of life of (pre-)frail elderly and health expenditures. The priorities of the frailty criteria are relevant in guiding evidence-based research on the value of nutritional compounds for the pre-frail elderly. Our research proposed relevant frailty criteria and accompanying outcome measures to apply in the clinical assessment of new nutritional interventions. The outcomes are applicable to prioritize research on other interventions apart from nutritional interventions, such as exercise-based interventions. Since our first selection of frailty criteria excluded social frailty criteria, the outcomes are not applicable to prioritize social interventions that aim to intervene in the social circumstances, facilities and social skills of elderly.

P154- PREVALENCE OF OSTEOSARCOPENIA AND IMPLICATIONS FOR AGE- RELATED CARDIAC MUSCLE SARCOPENIA IN NONAGENARIANS FROM THE LOUISIANA HEALTHY AGING STUDY. E. Poggiogalle[1,2], S. Kim[3], A. Pellett[3], D.A. Welsh[3], S.M. Jazwinski[3], E. Ravussin[1] *(1. Baton Rouge, USA; 2. Rome, Italy; 3. New Orleans, USA)*

Background. The aging process is characterized by deleterious changes in body composition including declines in lean body mass (LBM) and bone mineral density (BMD), with a concurrent increase in relative fat mass (FM). The combination of different body composition phenotypes has not been explored in the oldest old population. The aim of the present study was to assess the prevalence of sarcopenia, osteopenia/osteoporosis and osteosarcopenia in nonagenarians. Methods. Participants aged >89 years old were randomly sampled from the CMS enrollment database and recruited in the Louisiana Healthy Aging Study. Body composition was assessed by DXA. Sarcopenia was defined as the appendicular lean mass to body mass index ratio (ALM/BMI)<0.789 in men and <0.512 in women [1]. Low BMD, including osteopenia and osteoporosis, was defined as T-score of femoral neck or lumbar spine (L1-L4)<-1, and obesity as body fat >30% in men or >40% in women [2]. In a subset of 69 participants left ventricular mass (LVM) was assessed by echocardiography according to the Devereux formula [3], and was divided by body surface area (BSA). Results. 103 participants (men, n=48; women, n=55) were included. Participants with only sarcopenia (but normal bone: S; n=3) were excluded from the statistical analysis due to small sample size; nonosteo-nonsarcopenic (NONS), osteopenic/osteoporotic (OO), and osteosarcopenic (OS) groups were compared. Characteristics of study participants and prevalence of body composition phenotypes are summarized in Table 1. ALM and total LBM were lower in OS and in OO subjects than NONS group (all p=0.001). Body fat and truncal fat were higher in OS subjects than OO individuals (p<0.05). BMD of femoral neck and lumbar spine was lower in OO and OS subjects than NONS individuals (all p<0.05), and a lower total femur BMD was observed in OS compared to OO group. LVM and LVM/BSA ratio were decreased in OS nonagenarians with respect to NONS and OO subjects (p<0.05). ALM and ALM/BMI were negatively associated with total body fat percentage (r=-0.33, p=0.01, and r= -0.48, p= 0.005), and positively associated with femoral neck BMD (r=0.52 and r=0.42, respectively, all p<0.001). Lumbar spine was positively associated with ALM only (r=0.23, p=0.02). LVM and LVM/BSA were negatively associated with body fat percentage (r=0.27, p=0.03, and r=0.32, p<0.01), and positively correlated with LBM, ALM, and ALM/BMI (all p<0.05). No significant association emerged between LVM or LVM/BSA and femoral or lumbar BMD. Conclusion. In this community-based cohort of nonagenarians, 17.5% were nonosteo-nonsarcopenic, whereas the remaining were osteosarcopenic (20.4%), osteopenic/osteoporotic (59.2%) or sarcopenic only (2.9%). In presence of excess fat in the trunk and decreased LBM, osteosarcopenic nonagenarians exhibited a more severe decline of BMD at the femur and a decreased LVM

compared to osteopenic/osteoporotic individuals. Such data indicate a need for prevention programs to reduce the onset of body composition alterations in late life. 1. Cawthon PM et al.J Gerontol A Biol Sci Med Sci.2014;69:567-75. 2. Ilich JZ et al.Ageing Res Rev.2014;15:51-60. 3. Devereux RB et al.Circulation.1977;55:613-8.

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Table 1
Characteristics of study participants

		NONS (n=18)	OO (n=61)	OS (n=21)	p	
Demographics	M/F (n)	7/11	19/42	20/1	*
	Ethnicity-W/AA/O (n)	16/-/2	52/2/7	20/1/-	ns
	Age^(years)	92 ± 2	92 ± 2	92 ± 3	ns
Anthropometrics	Weight (kg)	68 ± 12.5	65.2 ± 12.1	65.1 ± 9.7	ns
	Height^(m)	1.68 ± 0.07	1.66 ± 0.11	1.58 ± 0.08	b,c
	BMI^(kg/m2)	25.2 ± 4.6	24.2 ± 3.8	26 ± 2.2	ns
	Waist^(cm)	94.5 ± 12.3	89.8 ± 10.6	92.4 ± 8.8	ns
Body composition: soft tissues	Total body fat (%)	30.4 ± 9.6	29.8 ± 7.5	36.7 ± 5.3	*,b,c
	Total FM^(kg)	25.6 ± 13.1	20.4 ± 8	24 ± 6	ns
	Total LBM^(kg)	55.3 ± 11.2	47.3 ± 9.7	40.8 ± 5.3	*,a,b,c
	ALM^(kg)	24.6 ± 6.1	20.4 ± 4.8	16.3 ± 2.3	*,a,b,c
	ALM/BMI^	1 ± 0.32	0.85 ± 0.18	0.63 ± 0.8	*,a,b,c
	Truncal FM^(kg)	12.2 ± 7.5	9.7 ± 4.6	10.9 ± 3.2	*,a
	Truncal fat (%)	29.2 ± 10.6	28.3 ± 8	33.6 ± 6.1	*,c
Body composition: bone	Femoral neck BMD^(g/cm2)	0.89 ± 0.14	0.6 ± 0.1	0.55 ± 0.1	*,a,c
	Total femur BMD (g/cm2)	1.1 ± 0.12	0.77 ± 0.16	0.68 ± 0.12	*,b,c
	L1-L4 BMD (g/cm2)	1.25 ± 0.2	0.97 ± 0.2	0.96 ± 0.2	*,a,c
Cardiac muscle	LVM^(g)#	241 ± 80	226 ± 83	167± 56	*,b,c
	LVM/BSA^(g/m2)	133 ± 44	131 ± 52	93 ± 34	*,b,c
Prevalence	Body composition phenotype (%)	17.5	59.2	20.4	*
	Obesity (%)	44.4	27.9	33.3	ns
	Osteopenia-femoral neck (%)	-	65	47.6	*
	Osteoporosis-femoral neck (%)	-	33.3	52.4	*
	Osteopenia-L1-L4 (%)	-	29.5	23.8	*
	Osteoporosis-L1-L4 (%)	-	16.4	14.3	*

Data are mean±SD. M:males; F:females; W:White Americans; AA:African-Americans; O:Other ethnicities;#n=69;*p<0.05 between groups; a, OO vs. NONS, and b, OS vs. OO, and c, OS vs. NONS, all p< 0.05, ns: not statistically significant; ^log transformed variables (not normally distributed).

P155- IMPACT OF POLYPHARMACY ON ANTIRETROVIRAL PRESCRIPTION IN PEOPLE LIVING WITH HIV. M. Menozzi[1], A.R. Silva[1], S. Zona[1], C. Stentarelli[1], A. Malagoli[1], C. Muss[1], C. Mussini[1], S. Khoo[2], M. Cesari[3], G. Guaraldi[1] *(1. Modena, Italy; 2. Liverpool, United Kingdom; 3. Toulouse, France)*

Background : The rising prevalence of multimorbidity (MM) as a consequence of prolonged survival of HIV patients has increased the burden of polypharmacy (PP). The interaction between antiretroviral therapy (ART), multiple chronic illnesses and PP is poorly studied. Here, we sought to evaluate the relationship between PP and ART, delivered as conventional multi-tablet three-drug regimens (MTR) or Single Tablet Regimens (STR) as well as Less Drug Regimens (LDR; using simplified mono or dual therapies). Methods: This is a cross sectional analysis of electronic data from the prospective Metabolic Clinic cohort study at the University of Modena and Reggio Emilia School of Medicine in Modena, Italy. We included last clinical observation for each patient from January 2006 to December 2015. Polypharmacy was defined as the use of 5 or more medications (excluding ART), classified according to high level ATC codes (ie by therapeutic class and subgroups). MM was classified as the presence of 2 or more of Non Infectious Comorbidities (NICM) in the same individual, including cardiovascular disease, end-stage kidney disease, cancer, osteoporosis, hypertension, type 2 diabetes mellitus, liver cirrhosis, and chronic obstructive pulmonary disease. All patients attending for review had a frailty index calculated based on the established deficit accumulation approach: this comprised 37 variables spanning multiple systems but no HIV- or NICM-related factor. Factors associated with different ART regimens were analysed using multivariable multinomial logistic regression analyses with MTR therapy as base outcome. Results: A total of 2944 patients (33.7% females) were included in the analysis. Median duration of HIV infection was 19 years (IQR 12.5–23.7), median CD4 cell counts was 638 (460–830), with nadir of 192 (80–290) and 2,853 patients had undetectable HIV VL (96.9%). MTR was present in 2025 (68.8%) patients , STR in 464 (15.8%) and LDR STR in 455 (15.4%) patients. Within the STR group 350 patients were on Atripla®, 100 on Eviplera® and 14 on Stribild®. MM was present in 313 (10.6%) patients and PP was present in 301 (10.2%) patients. A significant association was found between ART regimens and both FI and PP. To explore their independent contribution to the outcome variable, we built different multinomial logistic regression analysis comparing LDR with standard MTR and STR with MTR. PP was negatively associated with STR regimen (RRR=0.48, CI: 0.28; 0.81) independently from Frailty (RRR=0.68, CI: 0.59; 0.78), after correction for age, gender, HIV infection duration, CD4 nadir, current CD4 cell count, and calendar year. This association was not found comparing MTR and LDR. Discussion: This study identified an independent association of PP and FI with regards to STR prescriptions compared to MTR. These results may increase knowledge on ARV treatment with particular regards to older, multimorbid and frail patients more likely to present medication toxicity and benefit from certain organ-sparing treatments. Specifically the role of tenofovir disoproxil fumarate, included in all STR regimens, need to be accurately studied given its renal and bone toxicity. The balance between treatment tailoring, prevention fo drug-associated toxicity and reduction in number of pills need to be prospectively studied in order to provide the best approach to ageing HIV-patients.

P156- EFFECTS OF A PROGRESSIVE RESISTANCE TRAINING PROGRAM ON SARCOPENIA PROFILE AND FUNCTIONAL PERFORMANCE OF COMMUNITY-DWELLING ELDER WOMEN: EVIDENCE FROM A QUASI-EXPERIMENTAL STUDY. L. Paccini Lustosa, J. Ude Viana, J.M. Domingues Dias, P. Parreira Batista, L. Souza Máximo Pereira, R. Corrêa Dias, S. Lanziotti de Azevedo Silva, L. Paccini Lustosa *(Minas Gerais, Brazil)*

Background: Muscle mass loss related to aging has been studied for many years, but only recently researchers have focused attention on its relationship to muscle function (strength and performance). This syndrome was then coined sarcopenia and adverse outcomes such as disabilities, risk of falls, hospitalization and mortality have been shown in many studies. Because of the magnitude of the adverse outcomes on the elder's independence and quality of life and the increased burden on health systems, diverse strategies to prevent and/or treat sarcopenia have been developed along the years. Morphological and functional adaptations to resistance exercise have been well described in literature and progressive resistance training is supposed to improve muscle mass, strength and performance in older adults. Thus, the objective of the present study was to evaluate the effects of a progressive resistance exercise program on lean mass, muscle strength and functional capacity of sarcopenic community-dwelling elder women. Methods: Eighteen sarcopenic community-dwelling elder women were enrolled to a progressive resistance exercise program (PREP). Sarcopenia was diagnosed according to the European Working Group on Sarcopenia in Older People (EWGSOP) (Gait speed -GS- equal or lower than 0.8m/s, handgrip strength-HGS- < 20Kgf and lean body mass <6.47Kg/m2 assessed by dual x-ray absorptiometry-DXA). To enter the study subjects must be 65 years or older and not engaged in resistance training programs in the prior three months at least. Exclusion criteria were: cognitive impairment, physical disabilities that could interfere on functional tests performance, neurological sequelaes of Encephalic Vascular Accident or Parkinson's disease, rheumatic diseases, recent hand surgery, cancer or chemotherapy treatment and in use of corticosteroids. Muscle strength of knee extensors was evaluated by an isokinetic dynamometer, Biodex System 4 Pro®, at angular velocities of 60º/s (5 repetitions) and 180º/s (15 repetitions) and functional performance by the Short Physical Performance Battery (SPPB). The progressive resistance exercise program (PREP) was conducted over a period of 12 weeks, three sessions/week and duration of an hour with small groups of 4 or 5 elder under the guidance of trained physical therapists. The sessions were divided in 3 stages: the first ten minutes of lower limbs stretching exercises, 40 minutes of strengthening exercises focusing on hips and knees muscles and the last stage of 10 minutes cool down exercises. Exercises for knees flexors and extensors were performed using 75% of the subject's maximal load and were reassessed each two weeks according to a previously published protocol. Results: The eighteen elder women had on average 75.11 (± 3.67) years old, 55.6% of them were widows and 61.1% mixed race. The most prevalent chronic diseases were cataract (61.1%), hypertension (55.6%) and osteoarthritis (35.3%). At baseline all subjects were classified as sarcopenic being 4 out of 18 severe sarcopenic. After intervention 10 (55.6%) elder become non sarcopenic and none remained at the category of severe sarcopenic (p= 0.000; power=1.00). In relation to muscle strength there was a significant increase in mean handgrip strength. All variables (total work, power, peak of torque and fatigue) measured by the isokinetic dynamometer have improved at both angular speed (60º/s e 180º/s), although not statistically significant. Lean mass measured by DXA showed significant (p=0.003; power= 0.90) improvements of about 0.51 kg/h2 after the PREP, changes also seen for SPPB scores, indicating that the progressive resistance training program was able to positively change functional capacity status (p= 0.001; power= 0.97). Conclusion: The PREP was able to change sarcopenia status as well as its variables related to lean mass, strength and performance, showing that resistance exercise is still one of the best alternatives to prevent or improve sarcopenia aspects in elderly women.

P157- RESISTANCE AS A TOOL FOR CHANGING SARCOPENIA, FRAILTY AND FUNCTIONAL STATUS IN COMMUNITY-DWELLING ELDER WOMEN FROM BRAZIL: DATA FROM A QUASI EXPERIMENTAL STUDY. L. Paccini Lustosa, J. Ude Viana, J.M. Domingues Dias, P. Parreira Batista, L. Souza Máximo Pereira, R. Corrêa Dias, S. Lanziotti de Azevedo Silva, L. Paccini Lustosa *(Minas Gerais, Brazil)*

Background: Frailty and sarcopenia are considered geriatric syndromes because of their high prevalence, complexity and great onus to healthcare systems. Geriatric syndromes are the result of incompletely understood interactions of diseases and age on multiple systems producing a wide range of signs and symptoms. Both conditions are related to disabling outcomes such as incident falls and fractures, worsening mobility, activities of daily living (ADL) disability, hospitalization, poor quality of life and death. Many studies confirm that transitions between frailty and sarcopenia occur because of modifiable factors such as body composition and physical activity. There is growing consensus that progressive resistance exercise is one of the best alternatives to prevent or improve these syndromes. Therefore, the objective of this study was to evaluate the effectiveness of a 12 week period of progressive resistance exercise on the improvement of frailty, sarcopenia and functional status of sarcopenic elder women. Methods: This quasi experimental study consisted of 18 community-dwelling elder women who were assisted at an elder Reference Center of the Universidade Federal de Minas Gerais/Brazil. Subjects were 65 years or older, must have sarcopenia diagnosis according to the European Working Group on Sarcopenia in Older People (Gait speed -GS- equal or lower than 0.8m/s, handgrip strength-HGS- < 20Kgf and lean body mass <6.47Kg/m2 assessed by dual x-ray absorptiometry) and not engaged in resistance training programs in the prior three months at least. Exclusion criteria were: cognitive impairment, physical disabilities that could interfere on functional tests performance, neurological sequelaes of Encephalic Vascular Accident or Parkinson's disease, rheumatic diseases, recent hand surgery, cancer or chemotherapy treatment and in use of corticosteroids. Frailty criteria followed Fried et al phenotype definition and physical function measured by the Short Physical Performance Battery test. The progressive resistance training program (PREP) was conducted over a period of 12 weeks, with 3 sessions/week and duration of an hour with small groups of 4 or 5 elder under the guidance of trained physical therapists. The sessions were divided in three periods: the first 10 minutes of lower limbs stretching exercises, 40 minutes of strengthening exercises focusing on hips and knees muscles and a final part with 10 minutes cool down exercises. Exercises for knees flexion and extension were performed using 75% of the subject's maximal load and were reassessed each two weeks according to a previously published protocol. Results: This study included 18 sarcopenic elder women with mean age of 75.11 (± 3.67) years old, most of them considered themselves mixed race and 83.3% were retired. The most prevalent comorbidities were cataract (61.1%), followed by hypertension (55.6%) and osteoarthritis (35.3%). At baseline 16.7% of the elder were considered frail and 61.1% pre frail and after intervention 5.6% were frail and 50% pre frail. The percentage of those considered robust reduced for the half after the

PREP (p=0.014; power=0.85). In relation to frailty variables post intervention significant chances were seen for HGS (p= 0.01, power = 0.49) and the number of frailty items (p=0.008, power = 0.81). Sarcopenia status had also changed positively. At baseline 14 (77.8%) elder were classified as sarcopenic and 4 (22.2%) were considered severe sarcopenic but after intervention, 10 (55.6%) changed status for non sarcopenic and only 8 remained sarcopenic. No severe sarcopenic individuals were found anymore (p= 0.00; power=1). A significant increase in DXA values were also noticed (p=0.003; power= 0.90). After intervention, sarcopenia and frailty showed a significant moderate correlation (p=0.002; r= 0.68; power= 0.99) and before the PREP the significant correlation remained (p=0.009; r= 0.60; power= 0.99) indicating that both syndromes are convergent and improved after intervention. Conclusion: The PREP is probably one of the best strategies to prevent frailty and sarcopenia disabilities and improve their status, but this results should be interpreted with caution and future RCT are needed to ascertain the relationship between these two syndromes and the establishment of prevention strategies to avoid adverse outcomes that can influence elder's quality of life and increase health care burden.

P158- USING THE ALGORITHM PROPOSED BY EWGSOP AND SPPB TO IDENTIFY SARCOPENIA IN BRAZILIAN ELDERLY COMMUNITY. L. Paccini Lustosa, P. Parreira Batista, T. de Oliveira Ennes, L. Freitas Hoelzle, G. Amorim Ribeiro-Samora, L. Souza Máximo Pereira *(Minas Gerais, Brazil)*

Background: Sarcopenia is defined as the progressive loss of mass and/ or strength and/ or muscle function related to aging. Early diagnosis is necessary because this syndrome is associated with loss of function, disability and decreased autonomy in the elderly. However, there is still no consensus about the best way to identify, despite the European Working Group on Sarcopenia in Older People (EWGSOP) have proposed an algorithm for the identification of those in 'risk of sarcopenia'. Objective: To compare the diagnostic criteria of algorithm of the EWGSOP and the Short Physical Performance Battery (SPPB). Methods: Participants were women aged 65 years or more, without distinction of race and/ or social class. Those unable to walk were excluded; as well as those with a history of neurological diseases; cancer; acute musculoskeletal diseases; labyrinthitis; last year fracture and cognitive impairment detected by the Mini-Mental State Examination according to schooling. All carried out, at random, walk tests of 4m (WT); the Short Physical Performance Battery (SPPB) and handgrip strength (HGS), by manual dynamometer Jamar®. The cut-off points suggested by EWGSOP were used to identify elderly at «risk of sarcopenia» - walking speed ≤ 0.8 m/s and/ or HGS < 20kg/f. Regarding the SPPB the cut-off point used was <9 to identify those at «risk of sarcopenia.» The two forms of tracking were compared using the chi-square test, with significance level of 5%. This study was approved by the committee of ethics in research of the Federal University of Minas Gerais. Results: A total of 53 elderly were evaluated. Seventeen were classified as non sarcopenic and 36 as «risk of sarcopenia», according to the EWGSOP. When SPPB was used, 38 elderly were classified as non sarcopenic and 15 as «risk of sarcopenia.» There was a significant difference (p = 0.009) between the diagnostic criteria. Conclusion: These results demonstrate that the identification of elderly women in «risk of sarcopenia» according to the algorithm proposed by EWGSOP is different from the one used by SPPB with the cut-off point of 9. Despite the SPPB be an appropriate tool for functional assessment and infer on the muscle strength of the lower limbs, further studies should be conducted to verify the applicability of SPPB in the identification of sarcopenia and the best cut-off point to be considered in this condition.

P159- FATIGUE INDEX OF THE KNEE EXTENSOR MUSCLE AND MUSCLE PERFORMANCE MEASURES IN PRE-FRAIL ELDERLY. L. Paccini Lustosa, P. Parreira Batista, T. de Oliveira Ennes, L. Freitas Hoelzle, J. Ude Viana, L. Souza Máximo Pereira *(Minas Gerais, Brazil)*

Background: Fatigue is a universal symptom, subjective, often in the elderly. This phenomenon is influenced by multiple factors (biopsychosocial and / or behavioral) and has a negative impact on the health condition, functionality and mortality. Efforts have been used to establish reliable and valid measures to measure fatigue, either in the physical domain or covering multiple dimensions. The fatigue index, obtained by isokinetic dynamometer, is an objective measure and is related to the variation in ability to generate muscle strength and the decline of the work along the test run. Objective: To analyze the association between fatigue index of the knee extensors and muscular performance measures, in the angular velocities of 60°/s and 180°/s, of pre-frail elderly. Methodology: Participants were women aged 65 years or more, without distinction of race and / or social class. Those unable to walk were excluded; as well as those with a history of neurological diseases; cancer; acute musculoskeletal diseases; labyrinthitis; last year fracture and cognitive impairment detected by the Mini-Mental State Examination according to schooling. All carried out the muscle performance measures of knee extensors in 60/s and 180°/s in isokinetic Biodex 3. The fatigue index (FI) was calculated at the velocity of 180°/s, in 15 repetitions. Association analyzes were done using Spearman correlation test, with significance level of 5%. This study was approved by the committee of ethics in research of the Federal University of Minas Gerais. Results: 53 elderly were evaluated classified as pre-frail according to the phenotype of Fried et al. The mean age was 71.8 (± 4.2) years and body mass index was 29.6 (± 5.6) kg/m2. There was a low correlation, significant between IF and peak torque (PT) at 60º/s (rho = 0.34, p = 0.01); total work (TW) at 60°/s (rho = 0.38, p = 0.01); power (POW) at 60º/s (rho = 0.32, p = 0.02). In the same way, there was a low correlation, significantly, between the IF and PT at 180°/s (rho = 0.32, p = 0.02); TW at 180º/s (rho = 0.31; p = 0.02); POW at 180°/s (rho = 0.28, p = 0.05). Conclusion: The IF of knee extensors (at 180°/s) correlated with muscle performance measures at 60º/s and 180º/s. The IF being a quantitative measurement, reliable, associated with other performance measures, can be considered an indicator of muscle performance variability in this specific population.

P160- HAND GRIP STRENGTH AND MUSCLE PERFORMANCE MEASURES IN PRE-FRAIL ELDERLY. L. Paccini Lustosa, P. Parreira Batista, T. de Oliveira Ennes, L. Freitas Hoelzle, D. Aparecida Gomes Pereira, L. Souza Máximo Pereira *(Minas Gerais, Brazil)*

Background: Hand Grip strength has been used as a predictor of many health outcomes in the elderly. Studies show that the decline of this measure infers in reducing overall muscle strength in this population. With aging, there is a decrease in muscle mass and strength, accompanied by a decrease in muscle power, which can be associated with loss of function and increased dependency. These changes can be determinants in sarcopenia. Objective: To analyze the association between hand grip strength and muscle performance measures of knee extensors, 180°/s, of pre-frail elderly. Methods: Participants were women aged 65 years or more, without distinction of race and/ or social class. Those unable to walk were excluded; as well as those with a history of neurological diseases; cancer; acute musculoskeletal diseases; labyrinthitis; last year fracture and cognitive impairment detected by the Mini-Mental State Examination according

to schooling. All performed the measurement of hand grip strength (HGS) by manual dynamometer Jamar®. The isokinetic Biodex 3 Pro was used for muscle performance measures of knee extensors, 180°/s. Association analyzes were carried out using Spearman correlation test, with significance level of 5%. This study was approved by the committee of ethics in research of the Federal University of Minas Gerais. Results: 53 elderly were evaluated classified as pre-frail according to the phenotype of Fried et al. The mean age was 71.8 (± 4.2) years and body mass index was 29.6 (± 5.6) kg/m2. The average HGS was 20.9 (± 4.6) kg/f. Compared to the average of muscle performance measures, peak torque (PT) was 48.1 (± 13.7) Nm, fatigue index (FI) was 8.3 (± 31.2)%, the Total work (TW) was 600.2 (± 173.2) J and power (POW) 62.7 (± 19.3)W. There was a weak and significant association between the HGS and the PT (rho = 0.29, p = 0.04); of HGS and TW (rho = 0.28; p = 0.04) and between the HGS and POW (rho = 0.33; p = 0.02). There was no association between the HGS and the FI (rho = 0.17, p = 0.23). Conclusion: HGS was associated with the power measurements, peak torque and work of the knee extensors, signalling that this may be a measure to predict the muscle performance in elderly, whereas, especially the muscular power measures are related with functionality. On the other hand, the fatigue index, isokinetic variable related with the decline in muscle work, indicated no association with HGS in the sample studied. These results reinforce the need to use the HGS measure in clinical practice in order to identify, early on, the muscle performance changes.

P161- THE MORPHOLOGICAL ADAPTATIONS OF HUMAN SKELETAL MUSCLE TO ECCENTRIC AND CONCENTRIC RESISTIVE TRAINING ARE REGION-SPECIFIC. M.V. Franchi[1], R.J. Ellis[2], J.I. Quinlan[1], C.N. Maganaris[3], B.E. Phillips, P. Greenhaff[2], N. Szewczyk[1], P.J. Atherton[1], K. Smith[1], M.E. Batt[2], M.V. Narici[2] *(1. Derby, United Kingdom; 2. Nottingham, United Kingdom; 3. Liverpool, United Kingdom)*

Background: We recently described human skeletal muscle contraction-specific adaptations to eccentric (ECC) vs. concentric (CON) training (1,2). While similar hypertrophic responses were observed between the two exercise paradigms in terms of vastus lateralis (VL) muscle volume and thickness, distinct architectural remodeling patterns were identified from US images acquired from the mid-portion of the VL muscle. We now report new findings obtained using Extended Field of View (EFOV) ultrasonography, which enables the visualisation of the entire muscle in the plane of scanning, showing regional changes in muscle architecture in response to ECC and CON resistive training (RT) paradigms matched for relative intensity. Methods : Eleven healthy male volunteers were randomized into 3 groups: Eccentric (ECC) (n=4), Concentric (CON) (n=4) or Control (CTRL) (n=3). CON and ECC groups underwent 8 weeks RT at 60% of either CON or ECC one repetition maximum (1RM), respectively. EFOV images were collected from the right VL at baseline and at 8-wks time points in order to assess Fascicle Length (Lf), Pennation Angle (PA) and Muscle Cross-Sectional Area (CSA) at 0-20%, 20-40%, and 40-60% of muscle length (Lm), where 0 corresponds to the distal myotendinous junction (MTJ. Results were analysed with two-way ANOVA and statistical significance was set at P<0.05. Data are presented as means±SD. The investigation was approved by the local Ethics Committee and each participant gave informed consent to the study. Results: After 8 weeks of ECC training, VL CSA increased at all three muscle sites but more so distally, near the MTJ (0-20% Lm) compared to the mid-portion (20-40% Lm) and to the proximal region (40-60% Lm) p (7.3±3% vs. 4.8±1.6% vs. 5.3±1.8%, respectively); no significant changes were observed for CON and CTRL groups at any muscle regions. PA increased after both CON and ECC training, but the increase was greater for the CON group at all muscle regions: 22.7±10.0% at 0-20% Lm (P<0.05), 11.7±6.0% at 20-40% Lm (P=0.06) and 6.0±3.5% at 40-60% Lm (P<0.05). Instead for the ECC group, the increases were 11.0±4.0% at 0-20% (N.S.) Lm, 6.0±4.0% at 20-40% Lm (N.S.) and 7.0±3.0% at 40-60% Lm (P<0.05). Fascicle length also increased after training, but only in the ECC group and more so in the distal and central regions, 8.0±1.0% at 0-20% Lm (P<0.01) and 7.5±3.5% at 20-40% Lm (P<0.05), of the VL compared to the proximal regions, 3.0±3.0% at 40- 60% Lm (N.S.). Instead, a tendency for a decrease in Lf was found for the CON group. No changes in CSA, PA and Lf were found in the CTRL group. Conclusions: The present findings show that human skeletal muscle responds very differently to eccentric and concentric training, matched for relative load, and that its morphological adaptations are muscle region-dependent. The observation that, in response to a training load of 60% 1RM, muscle hypertrophy only occurred with ECC loading, strongly suggests that one of the most important stimuli for hypertrophy was muscle stretch (3), while this intensity was not sufficient to induce hypertrophy with CON loading. The unprecedented observation that fascicle length and pennation angle increase more in the distal than in the proximal regions suggest that the distal parts of the VL are more sensitive to mechanical loading. This contention is supported by our recent finding that the activity of mechano-sensitive protein focal adhesion kinase (FAK) was greater at a region close to the MTJ compared to mid muscle belly (4). Hence the present data provide unprecedented evidence that the morphological adaptations of human skeletal muscle to eccentric and concentric loading are region-specific. Funding by BBSRC (grant no BB/K019104/1) is acknowledged. References: 1) Franchi MV, Wilkinson DJ, Quinlan JI, Mitchell WK, Lund JN, Williams JP, Reeves ND, Smith K, Atherton PJ, Narici MV. Early structural remodeling and deuterium oxide-derived protein metabolic responses to eccentric and concentric loading in human skeletal muscle. Physiol Rep. 2015;3. pii: e12593. 2) Franchi MV, Atherton PJ, Reeves ND, Flück M, Williams J, Mitchell WK, Selby A, Beltran Valls RM, Narici MV. Architectural, functional and molecular responses to concentric and eccentric loading in human skeletal muscle. Acta Physiol. 2014 Mar;210: 642-54. 3) Moore DR, Phillips SM, Babraj JA, Smith K, Rennie MJ. Myofibrillar and collagen protein synthesis in human skeletal muscle in young men after maximal shortening and lengthening contractions. Am J Physiol Endocrinol Metab. 2005 Jun;288(6):E1153-9. 4) Franchi MV, Ruoss S, Smith K, Atherton PJ, Narici MV, Flück M. Load-induced tyrosine 397 phosphorylation of focal adhesion kinase with resistance training is muscle region and contraction-type specific. Abstract submitted for European College of Sport Science (ECSS) 2016 Congress, Vienna, Austria, abstract number: 2010.

P162- FEASIBILITY, SAFETY AND OUTCOMES OF PLATING NINTENDO WII FITTM FOR FRAIL ELDERLY: A PILOTY STUDY. G.C.V. Gomes, S.M. Lin, M.D.S. Simoes, J.M.R. Bacha, L.A.P. Viveiro, E, Varise, J.W. Jacob-Filho, J.E. Pompeu *(São Paulo, Brazil)*

Background: Frailty is characterized by increased vulnerability to stressors that puts older subjects at risk of developing adverse outcomes, including hospitalization, disability, and mortality. Several evidences suggest that exercise interventions can be used to restore and/or maintain functional independence in older adults and prevent, delay or reverse the frailty process. Virtual Reality (VR) is a computer generated technology that promotes interaction between users and virtual environments, where tasks are performed at a high-intensity stimulation provided by augmented visual, sensory and auditory feedback. Some studies suggest that VR exercises in elderly patients

promote improvements in mobility, muscular strength, cognition, balance control, reaction time and falls prevention. Methods: Four frail elderly, mean ages of 80 (±5) years, diagnosed with Frail Syndrome according to the criteria of Fried, without neurological and orthopedic diseases that cause inability to maintain standing position and walk. Patients were assessed by a blinded examiner pre, post 14 training sessions and 30 days of follow-up. Each session lasted 60-minutes and was performed twice a week. Elderly practiced 10 games, five games per session. The main outcome was safety, assessed by the number of adverse events during the intervention. Secondary outcomes were: feasibility (performance of patients in the games), postural control, assessed by Mini Balance Evaluation Systems Test (Mini BESTest), gait assessed by Functional Gait Assessment (FGA), cognition assessed by Montreal Cognitive Scale (MoCA) and depression assessed by GDS-15. Results: No adverse events were reported. Patients improved their scores on games over 14 sessions. There was improvement of Mini BESTest, FGA and MoCA after training. In the Mini BESTest the mean (SD) in the pre, post and follow-up sessions were 18,75 (1,89),27,25 (2,62), 26,5 (1,73) respectively, in the FGA were 16,5 (3,10), 23,25 (5,31) and 25,5(4,79) respectively, Moca were 21,75 (2,98), 25,25 (1,70) and 23,75 (2,06) respectively, and GDS were 5,75 (1,70), 5,25 (2,21) and 5,75 (2,87) respectively. Conclusion: Motor training using Wii FitTM was safe and feasible to frail elderly. Patients improved their scores in all 10 games. No adverse events occurred during the training. The results showed improvement in the postural control, gait, cognition and depression.

P163- DAILY CONSUMPTION OF A SPECIFIC ORAL NUTRITIONAL SUPPLEMENT HIGH IN VITAMIN D FOR 6 MONTHS IMPROVES VITAMIN D STATUS AND DOES NOT SHOW ANY SIGNS OF HYPERVITAMINOSIS AMONG SARCOPENIC OLDER ADULTS. S. Verlaan[1,2], J. Bauer[3], L. Mikusova[1], S. Wijers[1], T. Cederholm[4], C. Sieber[5] for the PROVIDE *(1. Utrecht, The Netherlands; 2. Amsterdam, The Netherlands; 3. Oldenburg, Germany; 4. Uppsala, Sweden; 5. Nürnberg, Germany)*

Backgrounds: Sufficient dietary intake of protein, calcium and vitamin D has been proposed as a means to attenuate musculoskeletal health deterioration. Vitamin D supplementation of 800IU a day is recommended for older people to maintain 25-hydroxyvitamin D (25(OH)D) levels >50nmol/L. The aim of this research was to evaluate the impact of 3-6 month consumption of a vitamin D and calcium enriched oral nutritional supplement (ONS) in sarcopenic older adults. Methods: Older sarcopenic adults (mean age±SD: 77±7 years; n = 380) were randomly assigned to consume either a vitamin D (800 IU), calcium (500 mg) enriched ONS or an iso-caloric control twice/day for 13 weeks (NTR2329). 233 subjects participated in an open label extension for an additional 13 weeks receiving either 1-2 servings of ONS. Serum samples of 25(OH)D, parathyroid hormone (PTH), calcium, and albumin were collected at weeks 0, 13, 26. Results: Serum concentrations of 25(OH)D increased significantly following ONS supplementation (median (Q1-Q3) increase of 25.0 (14.0-39.0) nmol/L; p<0.001), reducing vitamin D insufficiency (<50nmol/L) from 53% of participants at baseline to 8% at 13 weeks. Only 3% of active group participants had serum 25(OH)D concentrations ≥125nmol/L at week 13. The concentration of 25(OH)D in the control group decreased over time, increasing the percentage of vitamin D deficient participants from 51 % at baseline to 66 % at week 13. After 13 weeks of continued supplementation, serum levels of vitamin D remained stable. The proportion of participants with hypercalcemia (serum calcium adjusted for albumin >2.55mmol/L) did not differ between groups or within groups over time. No disturbance in PTH and calcium homeostasis was indicated. Conclusion: 13-week supplementation with a vitamin D and calcium enriched ONS improved vitamin D status, while 25(OH)D levels reached a plateau after extended 13 week supplementation. Furthermore, this intervention among sarcopenic older adults did not show any signs of hypercalcemia, the most common clinical manifestation of hypervitaminosis D.

P164- HIGH PROTEIN SUPPLEMENTATION DOES NOT ALTER RENAL STATUS AMONG SARCOPENIC OLDER ADULTS OVER 6 MONTHS. S. Wijers[1], J. Bauer[2], L. Mikusova[1], S. Verlaan[1,3], T. Cederholm[4], C. Sieber[5] for the PROVIDE study group *(1. Utrecht, The Netherlands; 2. Oldenburg, Germany; 3. Amsterdam, The Netherlands; 4. Uppsala, Sweden; 5. Nürnberg, Germany)*

Backgrounds: Adequate intake of dietary protein is one of the factors supporting musculoskeletal health in older adults. However, older adults may have impaired kidney function and be unable to process higher protein loads. Therefore, the aim of this work was to evaluate the effect of 3-6 month consumption of an high protein whey-based oral nutritional supplement (ONS) on renal status of sarcopenic older adults. Methods: Sarcopenic older adults (age mean±SD: 77±7 years; n=380) were randomly assigned to consume either a vitamin D and leucine enriched whey protein (21g protein, 800IU vitamin D) ONS or an iso-caloric control twice/day for 13 weeks (NTR2329). 233 subjects participated (after re-assessing informed consent), in an open label extension for 13 weeks randomised to 1 or 2 servings of the protein product. Serum creatinine samples were collected at weeks 0, 13, 26 to calculate glomerular filtration rate (eGFR) with CKD-EPI formula. Subjects with eGFR<30 were excluded. Normally distributed data were analysed using t-test (two sample and paired t-test for between and within group differences respectively). For not normally distributed data, Mann-Whitney test was used for between group differences and Wilcoxon Signed Rank test for within group changes. Results: Supplementation with the protein product led to a significant increase in mean total protein intakes from 1.0g/kg/BW to 1.5g/kg/BW, with no change in the control group during the RCT period. The studied population had a median (Q1-Q3) eGFR of 77 (63-87) mL/min/1.73m2 at baseline, which is considered an age-specific normal value. Supplementation during 13 weeks led to a small improvement of 1.0 (-2.8-4.2) mL/min/1.73m2 in eGFR levels in the protein group (p=0.013) versus no change in the control group (-1.1 (-4.9-2.8) mL/min/1.73m2, p=0.067, p=0.002 between groups), thus not giving any indication of adverse effects of the protein supplementation on the participants' kidneys function. No change in eGFR was shown during the study extension within any of the groups. There were no differences in reported adverse events between groups. Conclusion: High protein supplementation for 26 weeks with a leucine and vitamin D enriched whey protein oral nutritional supplement did not show any clinically relevant alteration of the renal status in older adults with sarcopenia and did not give any indication for safety concerns.

P165- RELATIONSHIP BETWEEN GAIT FUNCTION AND SKELETAL MUSCLE QUANTITY OR QUALITY ASSESSED BY ULTRASONOGRAPHY AND ECHO INTENSITY IN HEALTHY OLDER MEN. Y. Yamada[1], Y.Watanabe[1], Y. Fukumoto[2], K. Yokoyama[1], T. Yoshida[1], E. Yamagata[1], M. Yamada[1], M. Kimura[1] *(1. Tokyo, Japan; 2. Kobe, Japan)*

Backgrounds: Sarcopenia is defined as age-related loss of skeletal muscle mass, strength and function. However, quantity of skeletal muscle per se is just a weak contributor of mobility disability. In addition the correlation between age and skeletal muscle mass is weaker than that between age and skeletal muscle strength or power.

Therefore, it is important to explore qualitative aspects of skeletal muscle in older adults. We previously indicated that the echo intensity of ultrasonography is related to aging and muscle strength in middle-aged and older people. The purpose of this cross-sectional study is to examine the degree of contribution of quadriceps muscle thickness (MT) and echo intensity (EI) to gait function in healthy older men. Methods: Quadriceps muscle thickness and echo intensity of 121 community-dwelling healthy older men aged 65 to 91 yrs (mean ± SD, 74.7 ± 5.7 yrs; height, 163.5 ± 6.7 cm; weight, 62.3 ± 10.3 kg; BMI, 23.2 ± 3.4 kg m-2) who participated the measurement between Mar 18th and 23th, 2012 were analyzed. Gait function was assessed by 10-m normal walking speed, timed-up and go test (TUG), and 10-m dual task walking speed. Isometric knee extension muscle strength (KES) was also measured. Stepwise regression analyses were conducted with gait function as a dependent variable and EI, MT, KES, age, height, and weight as independent variables. Results: The 10-m normal walking time was moderately correlated with EI ($r = 0.401$, $P<0.001$), KES ($r = –0.409$, $P<0.001$), and age ($r = 0.466$, $P<0.001$). The MT was just weakly correlated with the 10-m normal walking time ($r = –0.186$, $P=0.04$). Age (standardized $\beta = 0.293$, $P=0.001$), EI (standardized $\beta = 0.242$, $P=0.004$), and KES (standardized $\beta = –0.193$, $P=0.032$) were selected as significant predictors of the 10-m normal walking time by stepwise regression analysis. The 10-m dual task walking time was also moderately correlated with EI ($r = 0.323$, $P<0.001$), KES ($r = –0.389$, $P<0.001$), and age ($r = 0.301$, $P=0.001$), but not with MT ($r = –0.106$, $P=0.25$). The EI (standardized $\beta = 0.219$, $P=0.01$), and KES (standardized $\beta = –0.317$, $P<0.001$) were selected as significant predictors of the 10-m dual task walking time by stepwise regression analysis. In addition, the TUG time was moderately correlated with EI ($r = 0.342$, $P<0.001$), KES ($r = –0.337$, $P<0.001$), and weakly with age ($r = 0.284$, $P=0.002$) and MT ($r = –0.261$, $P=0.004$). The EI (standardized $\beta = 0.264$, $P=0.004$), and KES (standardized $\beta = –0.256$, $P=0.032$) were selected as significant predictors of walking time by stepwise regression analysis. Conclusion: Quadriceps muscle quality assessed by EI is an independent predictor of gait function from muscle strength, mass, age, height, and weight in community-dwelling healthy older men.

P166- MUSCLE STRENGTH IS REDUCED IN PREMENOPAUSAL OBESE WOMEN WITH RELATIVE SARCOPENIA. E. Poggiogalle, C. Lubrano, L. Gnessi, S. Mariani, S. Migliaccio, C. Marocco, L. Di Lazzaro, G. Merola, B. Ciccantelli, C. Mancini, A. Lenzi, L.M. Donini *(Rome, Italy)*

Backgrounds: In recent years, a wealth of studies focused on sarcopenia and its functional consequences in the elderly. Hormonal derangements occurring in the menopause precipitate body composition changes in women. Alterations in body compartments and their impact on physical functionality are poorly explored in the nongeriatric population. The aims of our study were to investigate the presence of sarcopenia and to evaluate muscle strength in premenopausal women with obesity. Methods: Participants were recruited among subjects referring to the CASCO High Specialization Centre for the Care of Obesity, at the Sapienza University, Rome, Italy. Inclusion criteria were: age >18 and <55 years, body mass index (BMI)≥ 30 Kg/m2, premenopausal state, ethnicity: Caucasian Italian subjects. As exclusion criteria, we considered: any malignant disease during the last 5 years, any inflammatory or autoimmune disease, corticosteroids for systemic use, any medication potentially affecting body weight or body composition, syndromic obesity, participation in a reducing- weight program in the last three months, renal failure, heart failure, any type of diabetes, history of viral or autoimmune liver disease or any other chronic liver disease, excessive alcohol intake (>140g/ week for men and 70g/ week for women). Fat mass (FM) and lean body mass (LBM) were assessed by dual-energy-X-ray absorptiometry (DXA). Appendicular skeletal muscle mass (ASMM) was evaluated by DXA and calculated as the sum of lean soft tissue masses of arms and legs. Sarcopenia was defined as ASMM/ weight less than two standard deviations below the sex-specific mean of a young healthy reference Italian population (20-39 years), and the cutoff for ASMM/ weight < 0.2347 for females was considered. Muscle strength was assessed as handgrip strength using a dynamometer (DynEx). Muscle quality was considered as handgrip strength adjusted for LBM. Vitamin D and high sensitivity C-reactive protein (hs-CRP) levels were measured. Results: A total of 75 premenopausal women with obesity were enrolled. 18 women (24%) were classified as sarcopenic obese (SO). Age was not different in SO women compared to nonsarcopenic obese (NSO) subjects (43±11 vs. 40±9 years, p=0.15). BMI and waist circumference were higher in the SO group than in NSO participants (41.5± 4.3 vs. 36.1± 6.1 kg/m2, and 123.2±13.2 vs. 109.5±15.7 cm, respectively, all p<0.001). Total body fat and absolute FM were significantly higher in SO women than their NSO counterparts (43.4±3.1 vs. 37.9±4.8 %, and 45.9±7.6 vs. 36±9.7 kg, respectively, all p<0.001), with increased truncal fat in SO participants (21.3±6.1 vs. 16.3±5.2%, p<0.001). Conversely, total LBM and ASMM were not significantly different between SO and NSO subjects (57.1± 6.1 vs. 56± 9 kg, p=0.73, and 23.3±2.9 vs. 24.1±4.3 kg, p=0.58, respectively). ASMM/weight ratio was significantly lower in SO women (0.22±0.02 vs. 0.26±0.02, p<0.001). SO women exhibited reduced handgrip strength (18.3±4.8 vs. 21.5±5.9 kg, p=0.03), with significantly lower muscle quality when handgrip strength was adjusted for total LBM (p<0.05), than NSO women. Vitamin D levels were not significantly different between groups (17.2±7.1 in SO vs. 17.9±8.6 ng/ml NSO women, p=0.76), whereas higher levels of hs-CRP were observed in SO subjects than NSO participants (7888±4214 vs. 4873 ±4963 ug/l, p=0.03). Conclusion: Even though absolute LBM was not different between SO and NSO premenopausal women, in presence of increased adiposity, handgrip strength and muscle quality were reduced in obese women with relative sarcopenia; also increased inflammatory marker levels were found in SO women. Disproportion between body compartments may precipitate functional decline in obese women even in the early stages of the aging process. Our data need to be confirmed in larger cohorts of adults with obesity. Prevention strategies should be adopted, in order to delay the onset of disability.

P167- A HOME-BASED STRENGTH TRAINING AND NUTRITIONAL PROGRAM EFFECTIVELY IMPROVES HANDGRIP STRENGTH AND PHYSICAL PERFORMANCE IN PREFRAIL AND FRAIL OLDER ADULTS, EVEN WHEN CARRIED OUT BY LAY VOLUNTEERS. S. Haider, E. Luger, A. Kapan, C. Lackinger, K. Schindler, T.E. Dorner *(Vienna, Austria)*

Backgrounds: Frailty is a geriatric syndrome, characterized by a decrease in biological functions. As sarcopenia and malnutrition contribute to the development of frailty, strength training, in combination with nutritional intervention, is an effective therapeutic approach. The effects of strength training carried out by health care professionals have already been proven. Some studies have also shown the effects of added nutritional supplementation, with mixed results. However, to our knowledge, there has been no trial investigating the effects of strength training in combination with nutritional support, provided by trained lay volunteers. Therefore, the aim was to examine the effects of home-visits, conducted by trained lay volunteers, on handgrip strength, physical performance and skeletal muscle mass of prefrail and frail persons still living in their own homes. Methods:

This randomized controlled trial was conducted between September 2013 and July 2015 in Vienna (Austria, Europe). In this study, 80 individuals assessed as being prefrail or frail according to the 'Frailty Instrument of the Survey of Health, Ageing' or at least being at risk of malnutrition according to the 'Mini Nutritional Assessment Short-Form', were included. All persons were visited at home by trained lay volunteers twice a week. The physical training and nutrition group (PTN, n=39) performed two sets of six strengthening exercises with 15 repetitions until muscular exhaustion and discussed nutritional themes (e.g. fluid intake, protein and energy intake). The social support group (SoSu, n=41) only received home visits without strength training and without discussion of nutrition. In order to measure the effects of the intervention, the following parameters were assessed at baseline and after 12 weeks: Handgrip strength, which was the primary outcome, was measured with a dynamometer. Physical performance was assessed with the Short Physical Performance Battery and appendicular skeletal muscle mass was measured with bioelectrical impedance analysis. Differences within groups were calculated using the paired T-test and differences between groups with ANCOVA for repeated measures, adjusted for sex, age and baseline values. Furthermore, logistic regression analyses were performed to assess baseline variables predicting an improvement in handgrip strength. Results: The mean age of the participants was 82.8 (SD: 8.0) years. 84% were female. 64% were frail, 35% were prefrail and 1% was robust. Moreover, 51% were normally nourished, 45% were at risk of malnutrition and 4% were malnourished. The mean handgrip strength was 16.8 (SD: 7.1) kg. Over time, the PTN group increased handgrip strength significantly by 2.1 (95%-CI: 0.7 to 3.6) kg. The SoSu group also tended to improve it by 1.0 (95%-CI: -0.2 to 2.2) kg. However, in this group, no significant change was seen. Further results showed that the changes in handgrip strength did not significantly differ between the groups. People in the PTN group increased physical performance significantly by 1.2 (95%-CI: 0.3 to 2.1) points; the SoSu group had a tendency towards improvement by 0.5 points (95%-CI: 0.1 to 0.9) with no significant change. In addition, the ANCOVA results showed that individuals in the PTN group increased physical performance by 1.0 (95%-CI: 0.0. to 2.0) point more than the SoSu group. Over time, no change was seen in appendicular skeletal muscle mass in either the PTN or the SoSu group. The results from the logistic regression analysis showed that people with lower baseline handgrip strength (OR=0.92; 95%-CI: 0.85 to 0.98; p=0.016), a higher frailty status (OR=1.68; 95%-CI: 1.06 to 2.66; p=0.031) were more likely to improve handgrip strength. Conclusion: Home visits with physical training and nutritional intervention carried out by trained lay volunteers are an effective way to improve handgrip strength and physical performance in frail and prefrail persons. The outcome is comparable to effects achieved by health care professionals. Individuals with low health status particularly benefit from the intervention.