Australian and New Zealand Society for Sarcopenia and Frailty Research

EARLY- AND MID-CAREER RESEARCHERS AND CLINICIANS COMMITTEE

# THE ANZSSFR WORLD SARCOPENIA DAY SYMPOSIUM 2021

**July 5, 2021**

**3PM-5.30PM AEST**

# EMCR COMMITTEE CHAIR'S WELCOME

On behalf of the organising committee, it is my pleasure to welcome you to the **ANZSSFR World Sarcopenia Day Symposium** presented by the **Early- and Mid-Career Researchers and clinicians (EMCR) committee**. The 4th of July is World Sarcopenia Day and therefore we dedicated this symposium to highlight this special day. We have an exciting online program including presentations from EMCRs across the world and the outcomes of the Delphi Process on Sarcopenia Diagnosis and Management, led by EMCRs David Scott and Jesse Zanker.

The aim of the EMCR Committee is to promote, support and engage with as many EMCRs as possible to shape the future generation of sarcopenia and frailty research. Therefore, we have 12 short presentations by EMCRs showcasing their research. We have asked the presenters to include their contact details on their slides to encourage the audience to contact the presenters to learn more about their research and encourage networking and collaboration opportunities. Please take this opportunity to be in contact with the next generation!

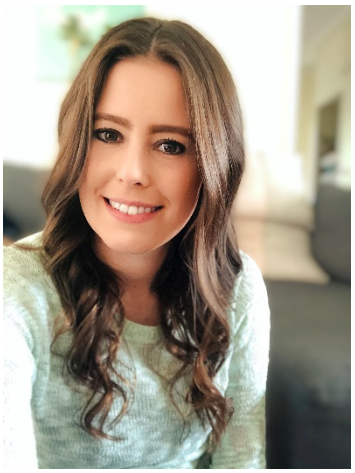
The Sarcopenia and Diagnosis Management Task Force was established by the EMCRs David Scott and Jesse Zanker. During this symposium, the outcomes of the Delphi process will be shared for the first time. This is an important step to standardise sarcopenia diagnosis and management across Australia and New Zealand. We hope to see experts and consumers attending this symposium who participated in this Delphi process, as their input was valuable to the outcomes. We also hope that the outcomes can be implemented into research and clinical practice in Australia and New Zealand.

Lastly, I would like to thank our organising committee for their time and effort in organising this event.

Enjoy the World Sarcopenia Day Symposium!

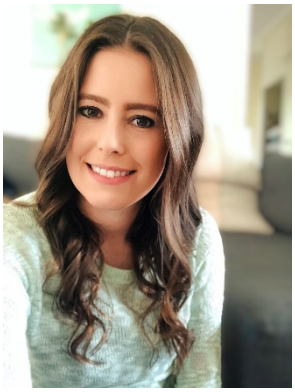
On behalf of the EMCR Committee,

Dr. Esmee M. Reijnierse



Contact details for the EMCR Committee:
emcr.anzssfr@gmail.com
https://anzssfr.org/emcr

# ORGANISING COMMITTEE



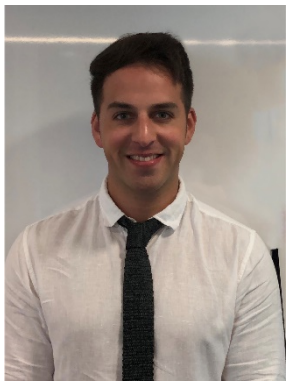
**Dr Esmee M. Reijnierse**

Department of Medicine and Aged Care, @AgeMelbourne, The Royal Melbourne Hospital, The University of Melbourne

Department of Rehabilitation Medicine, Amsterdam UMC, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences

**Dr Jack Dalla Via**

Institute for Nutrition Research, School of Medical and Health Sciences, Edith Cowan University



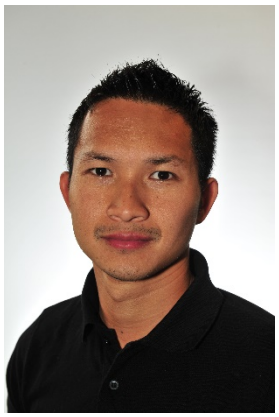
**Dr Ben Kirk**

Department of Medicine-Western Health, University of Melbourne

Australian Institute for Musculoskeletal Science (AIMSS), University of Melbourne and Western Health, VIC, Australia

**Dr Jackson Fyfe**

Institute for Physical Activity and Nutrition (IPAN),Deakin University



**Dr Marc Sim**

Institute for Nutrition Research, School of Medical and Health Sciences, Edith Cowan University

Medical School, The University of Western Australia

**A/Prof David Scott**

Institute for Physical Activity and Nutrition (IPAN), Deakin University

School of Clinical Sciences at Monash Health, Monash University


**MSc Lara Vlietstra**

Department of Medicine and School of Physiotherapy, University of Otago

**Dr Jesse Zanker**

Department of Medicine-Western Health, University of Melbourne

Australian Institute for Musculoskeletal Science (AIMSS), University of Melbourne and Western Health, VIC, Australia

Institute for Health Transformation, Deakin University, Waterfront Campus, Geelong, VIC, Australia

# PROGRAM

**All times are AEST**

| Time | Title | Presenter |
|---|---|---|
| **3:00 PM** | **EMCRC Committee Chair's Welcome**<br>Dr Esmee Reijnierse | |
| | **EMCRC Research Presentations**<br>Chairs: Ben Kirk and Jack Dalla Via | |
| **3:10 PM** | *Association between malnutrition and stages of sarcopenia in geriatric rehabilitation inpatients: RESORT* | Laure Verstraeten |
| **3:17 PM** | *Dietary protein intake and physical activity levels as determinants of sarcopenia risk* | Isobel Stoodley |
| **3:24 PM** | *Exploring the feasibility of voice-controlled intelligent personal assistants for delivery of home-based exercise snacking in older adults living alone: single-arm pilot trial* | Paul Jansons |
| **3:31 PM** | *Validating the ability of subjective global assessment to predict adverse outcomes in the critically ill* | Suzie Ferrie |
| **3:38 PM** | *Low population-specific values for skeletal muscle parameters and indices of poor health* | Sophia Sui |
| **3:45 PM** | *The effect of dose, frequency and timing of protein supplementation, on muscle mass in older adults by population: A systematic review and meta-analysis* | Jeewanadee Hettiarachchi |
| **3:52 PM** | *Differing effects of younger and older human plasma on C2C12 myocytes in vitro* | Bradley Elliott |
| **3:59 PM** | *Associations between socioeconomic status and obesity, sarcopenia, and sarcopenic obesity in community-dwelling older adults* | Anoohya Gandham |
| **4:06 PM** | *The relationship between sarcopenia, functional capacity and protein intake in patients with coronary heart disease referred to long-term cardiac rehabilitation: Preliminary findings from a cross-sectional analysis* | Emily James |
| **4:13 PM** | *Prevalence of sarcopenia and its association with anti-rheumatic drugs in middle-aged and older adults with rheumatoid arthritis: A systematic review and meta-analysis* | Thang Dao |
| **4:20 PM** | *Sarcopenia is associated with three-month and one-year mortality in geriatric rehabilitation inpatients: RESORT* | Jane Xu |
| **4:27 PM** | *Osteocalcin, muscle function and 15-year falls-related hospitalisations in older women: the perth longitudinal study of ageing women* | Cassandra Smith |
| **4:35 PM** | *EMCRC Symposium Audience Votes on Best Presentation* | |
| **Outcomes of the 2021 ANZSSFR Delphi Process on Sarcopenia Diagnosis and Management**<br>Chairs: Lara Vlietstra and Jackson Fyfe | | |
| **4:40 PM** | *The ANZSSFR Delphi Process – Background* | David Scott |
| **4:50 PM** | *The ANZSSFR Delphi Process – Methods and Outcomes* | Jesse Zanker |
| **5:10 PM** | *Discussion of ANZSSFR Delphi Process Outcomes* | |
| **5:20 PM** | **ANZSSFR President's Closing Remarks and Awards**<br>Professor Andrea Maier | |

# EMCR RESEARCH PRESENTATIONS - ABSTRACTS

**Association between malnutrition and stages of sarcopenia in geriatric rehabilitation inpatients: RESORT**

**LMG Verstraeten**[1], JP van Wijngaarden[2], J Pacifico[3], EM Reijnierse[3,4], CGM Meskers[4], AB Maier[1,3,5,6]
***Corresponding author: l.verstraeten@vu.nl***

*1. Department of Human Movement Sciences, @AgeAmsterdam, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, Amsterdam, the Netherlands*
*2. Danone Nutricia Research, Uppsalalaan 12, 3584 CT, Utrecht, the Netherlands*
*3. Department of Medicine and Aged Care, @AgeMelbourne, The Royal Melbourne Hospital, The University of Melbourne, Parkville, Victoria, Australia*
*4. Department of Rehabilitation Medicine, Amsterdam University Medical Center, Amsterdam Movement Sciences, Amsterdam, the Netherlands*
*5. Healthy Longevity Translational Research Program, Yong Loo Lin School of Medicine, National University of Singapore, Singapore*
*6. Centre for Healthy Longevity, National University Health System, Singapore*

**Background:** Malnutrition and sarcopenia coexist in older adults, yet they remain largely undiagnosed and untreated, despite available interventions. This study aimed to assess the prevalence, the coexistence of, and the association between malnutrition and sarcopenia in geriatric rehabilitation inpatients.

**Methods:** REStORing health of acutely unwell adulTs (RESORT) is an observational, longitudinal cohort of geriatric rehabilitation inpatients. The association between malnutrition, diagnosed according to the Global Leadership Initiative on Malnutrition (GLIM) criteria and sarcopenia according to the revised definition of the European Working Group on Sarcopenia in Older People (EWGSOP2) (no sarcopenia, probable sarcopenia, confirmed sarcopenia and severe sarcopenia) was determined using multinomial logistic regression analyses, adjusted for age, sex, comorbidities and cognitive impairment.

**Results:** Out of 506 geriatric rehabilitation inpatients, 51% were malnourished, 49% had probable sarcopenia, 0.4% had confirmed sarcopenia (non-severe) and 19% had severe sarcopenia.

Malnutrition and probable sarcopenia and malnutrition and confirmed/severe sarcopenia coexisted in 23% and 13% of the 506 patients respectively. Malnutrition was not associated with probable sarcopenia (OR = 0.91, 95% CI = 0.58-1.42, p = 0.674) but with severe sarcopenia (OR = 2.07, 95% CI = 1.13-3.81, p = 0.019).

**Conclusion:** The prevalence, coexistence of, and the association between malnutrition and severe sarcopenia in geriatric rehabilitation inpatients warrant diagnosis at admission. Further research into feasible and effective interventions to counteract both conditions to improve geriatric rehabilitation outcomes is needed.

**Dietary protein intake and physical activity levels as determinants of sarcopenia risk**

**IL Stoodley**[1,2], BS Berthon[1,2], HA Scott[1,2], PJ Baines[1,2], H Knox[1,2], B Paradzayi[1,2], LG Wood[1,2]
***Corresponding author: isobel.stoodley@uon.edu.au***

*1. Priority Research Centre for Healthy Lungs, Hunter Medical Research Institute, New Lambton Heights, New South Wales, Australia*
*2. School of Biomedical Sciences and Pharmacy, University of Newcastle, Callaghan, New South Wales, Australia*

**Background:** Sarcopenia is associated with an increased risk of falls, hospitalisation and mortality but can be difficult to identify in the community. Current screening measures require specialist equipment including dual energy x-ray absorptiometry (DEXA) scans and grip strength dynamometers. New criteria, which identify older adults at-risk of developing sarcopenia, may assist in correctly targeting those who would benefit from early intervention, without access to this equipment. The aim of this cross-sectional study was to determine if screening community-dwelling older adults on usual protein intake and physical activity levels could identify people at risk of developing sarcopenia.

**Methods:** Older adults (≥65 years old) participating in low-moderate physical activity (<150 minutes moderate-intensity and/or ≤1 resistance training session/week) and consuming <1g/kg body weight protein each day were classified as at risk of developing sarcopenia (n=61). Older adults who consumed more protein (≥1g/kg body weight per day) and were more active (>150 minutes of moderate-intensity and/or >1 resistance training session/week) were classified as not at risk (n=16). Body composition was measured by DEXA. Strength and function were assessed using handgrip dynamometry, usual gait speed, 30 second sit-to-stand test (30 STS) and timed up and go (TUG).

**Results:** There was no difference in muscle mass between the groups, however at risk participants had a significantly higher fat mass index [13±3.7 versus 6.9±2.1kg/m2, p<0.0001]. At risk participants had significantly lower grip strength [26(23-30) versus 34(29-44)kg, p<0.0001], slower gait speed [1(0.85-1.2) versus 1.3(1-1.3)seconds, p=0.0003], poorer 30STS result [13(11-14) versus 16(14-19)stands, p<0.0001] and slower TUG time [7(6.8-8.0) versus 5.8(5-6.6)seconds, p=0.0002].

**Conclusion:** Low usual protein intake and physical activity levels identify older adults with poorer strength and function. These criteria could be used to identify older adults at risk of developing sarcopenia in the community. These participants would benefit most from early intervention to prevent further functional decline.

**Exploring the Feasibility of Voice-Controlled Intelligent Personal Assistants for Delivery of Home-Based Exercise Snacking in Older Adults Living Alone: single-arm pilot trial**

**P Jansons**[1,2], J Dalla Via[3], RM Daly[1], J Fyfe[1], E Gvozdenko[4], D Scott[1,2]
***Corresponding author: paul.jansons@deakin.edu.au***

*1. Institute for Physical Activity and Nutrition (IPAN), School of Exercise and Nutrition Sciences, Deakin University, Burwood, Victoria, Australia*
*2. Department of Medicine, School of Clinical Sciences at Monash Health, Monash University, Clayton, Victoria, Australia*
*3. Institute for Nutrition Research, School of Medical and Health Sciences, Edith Cowan University, Perth, Western Australia, Australia*
*4. Great Australian Pty. Ltd, Keysborough, Victoria, Australia*

**Background:** The remote delivery and monitoring of an individually tailored exercise program using Voice-Controlled Intelligent Personal Assistants may be more acceptable to older adults than touch screens or other inputs. The aim of this study was to evaluate the feasibility of a Voice-Controlled Intelligent Personal Assistants to remotely deliver and monitor an individually tailored, home-based exercise program to older adults living independently and alone.

**Method:** This was a 12-week, prospective single-arm pilot study in 15 adults aged ≥60 to 90 years living independently and alone in the community. All participants were prescribed a home-based, 10-minute session (2-4 times/day) muscle strengthening, impact and balance program (4 days/week) using a Voice-Controlled Intelligent Personal Assistants. Study processes were feasibility (rate of recruitment, conversion, retention, adherence and adverse events) and changes to usability (System Usability Scale), quality of life (European Quality of Life Scale) and lower extremity function (30 second sit-to-stand).

**Results:** A total of 15 participants (mean age, 70.3 years) completed the study, rate of recruitment was 2 weeks, conversion was (15/16, 93%), retention (15/15, 100%), and mean adherence to the exercise program was 89%. There was no adverse event from 2,160 (potential 100%) completed sessions. There was no significant difference in any secondary outcomes across the 3-month follow-up.

**Conclusions:** This pilot feasibility study indicates that it is safe and feasible for community-dwelling older adults to participate in a home-based, exercise program that was delivered and monitored remotely by exercise professionals using a Voice-Controlled Intelligent Personal Assistants.

**Validating the ability of Subjective Global Assessment to predict adverse outcomes in the critically ill**

**S Ferrie**[1], N Weiss[1], M Stepniewski[1], LHY Chau[1], S Torkel[1]

***Corresponding author: suzie.ferrie@health.nsw.gov.au***

*1 University of Sydney, Sydney, New South Wales, Australia*

*2 Royal Prince Alfred Hospital, Sydney, New South Wales, Australia*

**Background:** Sarcopenia increases the risk of poor outcomes in critically ill patients. Tools for diagnosing sarcopenia have been validated in a variety of populations. A nutritional assessment tool, the Subjective Global Assessment (SGA), incorporates domains of muscle mass, adipose tissue stores, functional changes, weight changes and nutritional intake. It is considered a gold standard tool but the validity of its use in the intensive care unit (ICU) remains contested. The aim of this retrospective audit was to determine the validity of using SGA in the critically ill, by evaluating the association between SGA grade and clinical outcomes, adjusting for severity of illness.

**Methods:** The medical records of 1068 nutrition support patients admitted consecutively to the ICU between January 2017 and July 2018 were analysed to extract data on patient demographics, SGA grade, clinical outcomes, and illness severity (measured by Acute Physiology and Chronic Health Evaluation II score). Logistic regression was used to explore the association between these parameters.

**Results:** Sarcopenia was present in 36.2% of the patients and was associated with an increase in 90-day mortality (p=0.002, OR=2.321, 95% CI=1.55-4.83 and 180-day mortality (p=0.002, OR=2.31, 95% CI=1.37-4.17), fewer ventilation-free days (p=0.001) and a longer stay in ICU (p<0.0001) and in hospital (p=0.002), independent of illness severity.

**Conclusions:** Sarcopenia diagnosed by SGA was significantly associated with adverse clinical outcomes in critically ill patients. SGA appears to be a reliable and valid method for assessing nutritional status in this patient population.

**Low population-specific values for skeletal muscle parameters and indices of poor health**

**SX Sui**[1], KL Holloway-Kew[1], NK Hyde[1], LJ Williams[1], MC Tembo[1], JA Pasco[1,2,3,4]

***Corresponding author: sophia.sui@deakin.edu.au***

*1. Deakin University, IMPACT – Institute for Mental and Physical Health and Clinical Translation, Geelong, Victoria, Australia*

*2. Department of Medicine–Western Campus, The University of Melbourne, St Albans, Victoria, Australia*

*3. Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria, Australia*

*4. University Hospital Geelong, Barwon Health, Geelong, Victoria, Australia*

**Background:** We aimed to examine associations between skeletal muscle deficits and indices of poor health. Cut-points for skeletal muscle deficits were derived from Geelong Osteoporosis Study (GOS) data, the European Consensus on Definition and Diagnosis (EWGSOP2) and Foundation for the National Institute of Health (FNIH).

**Methods:** Participants (n=665; 323 women) aged 60-96yr were from the GOS. Handgrip strength (HGS) was measured by dynamometers and appendicular lean mass (ALM) by whole-body dual-energy x-ray absorptiometry. Cut-points equivalent to 2SDs below the mean young reference range from GOS were (for women and men): low ALM/height2 <5.30kg/m2, <6.94kg/m2; low ALM/BMI <0.512m2, <0.827m2; low HGS <16kg, <31kg; slow timed-up-and go (TUG) >9.3s, 9.9s. Cut-points for EWGSOP2 were ALM/height2 <5.50kg, <7.0kg/m2; HGS <16kg, <27kg; TUG≥20s. For FNIH, ALM/BMI <0.512m2, <0.789m2; HGS <16kg, <26kg. Indices of poor health included fractures, falls and hospitalisations. Low trauma fractures in the past 5 years (excluding skull, face, digits) were self-reported and confirmed using radiological reports. Falls (≥1 past 12 months) and hospitalisations (past month) were self-reported. Logistic regression models (age and sex-adjusted) were used to examine associations. Receiver Operating Characteristic curves were also applied to determine optimal cut-points for HGS, slow TUG, ALM/height2, and ALM/BMI that discriminated poor health outcomes.

**Results:** There were 59 (8%) participants with fracture, 177 (25.3%) fallers, and 48 (6.9%) hospitalised. For all cut-points, low HGS was consistently associated with falls. ALM/height2, using any cut-point, was not associated with indices of poor health. The optimal cut-offs for predicting falls were: HGS <17.5kg for women and <33.5 kg for men; TUG <8.55 s for women and 9.92s for men; ALM/height2 6.20 kg/m2 for women and 7.46 kg/m2 for men; ALM/BMI <0.61 m2 for women and 0.91 m2 for men.

**Conclusions:** Muscle strength and function performed better than lean mass for indicating indices of poor health.

**The effect of dose, frequency and timing of protein supplementation, on muscle mass in older adults by population: A systematic review and meta-analysis**

**J Hettiarachchi**[1], EM Reijnierse[1,2], N Kew[1], K Fetterplace[3,4], AB Maier[1,5,6]

***Corresponding author: jhettiarachc@student.unimelb.edu.au***

*1. Department of Medicine and Aged Care, @AgeMelbourne, The Royal Melbourne Hospital, The University of Melbourne, Parkville, Victoria, Australia*

*2. Department of Rehabilitation Medicine, Amsterdam UMC, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, Amsterdam, The Netherlands.*

*3. Department of Allied Health (Clinical Nutrition), The Royal Melbourne Hospital, Melbourne, Victoria, Australia*

*4. The University of Melbourne, Department of Critical Care, Melbourne Medical School, Melbourne, Victoria, Australia*

*5. Department of Human Movement Sciences, @AgeAmsterdam, Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, Amsterdam, The Netherlands*

*6. Healthy Longevity Program, Yong Loo Lin School of Medicine, National University of Singapore, Singapore; Centre for Healthy Longevity, @AgeSingapore, National University Health System, Singapore*

**Background:** Protein supplementation has shown to be effective on muscle mass in older adults. However, its effect may be dependent on intervention factors. The aim of this systematic review was to assess if the effect of protein supplementation on muscle mass dependent on the dose, frequency and timing in older adults, stratified by population.

**Methods:** Five databases were systematically searched up to 22/08/2020 for randomized controlled trials describing the effect of protein supplementation on muscle mass in adults aged ≥65 years. Random effects meta-analyses were performed, stratified by population. Heterogeneity was assessed using the I2 statistics.

**Results:** Twenty-eight articles were included (2621 participants, 76.5±4.3 years, 60.8% females) with 19 in community-dwelling, 7 in hospitalised and 2 in institutionalised older adults. Protein

supplementation showed a positive effect on muscle mass in community-dwelling older adults (SMD: 0.23; 95%CI: 0.09-0.38; p=0.002, I2:76.3%), but not in hospitalised and institutionalised older adults. In community-dwelling older adults, no difference was found in the effect dependent on the dose of protein supplementation (<30g vs ≥30g/ day). The effect of protein supplementation on muscle mass was dependent on the frequency with a higher significant effect for single dose of protein supplementation (SMD 0.45, 95%CI: 0.01-0.88, p=0.044, I2:75.4%) but no effect with multiple doses (SMD 0.12, 95%CI: -0.00-0.24, p=0.051, I2:5.8%). No difference was found in the effect dependent on the timing of protein supplementation relative to mealtimes. In hospitalised and institutionalised older adults, high interstudy variability and inadequate reporting of intervention characteristics were observed.

**Conclusion:** In community dwelling older adults, increase of muscle mass by protein supplementation was not dependent on the dose and timing, but the frequency of supplementation, with a single dose of protein supplementation showing the greatest effect size. Findings on hospitalised and institutionalised older adults are inconclusive with limited number of articles.

**Differing Effects of Younger and Older Human Plasma on C2C12 Myocytes in Vitro**

I Kalampouka[1,2], A van Bekhoven[1,3], **BT Elliott**[1]

***Corresponding author: b.elliott@westminster.ac.uk***

*1. Translational Physiology Research Group, School of Life Sciences, University of Westminster, London, United Kingdom*
*2. Research Centre for Optimal Health, School of Life Sciences, University of Westminster, London, United Kingdom.*
*3. Engineering and Applied Science, Hogeschool Rotterdam, Rotterdam, Netherlands*

**Background:** Ageing involves reductions in physiological function including losses in muscle mass and strength. Endocrine factors such as myostatin, activin A, growth and differentiation factor 11 (GDF11) and their inhibitory peptides influence muscle mass in health and disease. We hypothesised that myocytes cultured in plasma from older and younger individuals would show differences in proliferation and differentiation, and effects would associate with circulating factor concentrations.

**Methods:** C2C12 myoblasts were stimulated with media conditioned with 5% plasma from healthy male participants, younger (n=6, 18–35 years of age) or older (n=6, >57 years of age). Concentration of plasma myostatin (total and free), follistatin-like binding protein (FLRG), GDF11 and activin A were quantified by ELISA.

**Results:** FLRG and activin A were elevated in older individuals (109.6 and 35.1% increase, respectively), GDF11 and myostatin did not differ. Myoblasts in vitro showed no difference in proliferation rate between ages, however scratch closure was greater in younger vs. older plasma stimulated myoblasts (78.2 vs. 87.2% of baseline scratch diameter, respectively). Myotube diameters were larger in cells stimulated with younger plasma than with older at 24 and 48 h, but not at 2 h. A significant negative correlation was noted between in vivo plasma FLRG concentration and in vitro myotube diameter 48 h following plasma stimulation ($r^2 = 0.392$, $p = 0.030$).

**Conclusions:** Here we demonstrate an experimental model to examine plasma endocrine effects between different populations, using a C2C12 cell line as a reporter assay. Myoblasts and myotubes cultured in media conditioned with younger or older plasma show an ageing effect, and further this

effect moderately correlates with circulating FLRG concentration in vivo. Further work is needed to examine the effect of increased FLRG concentration on muscle function in ageing populations.

**Associations between socioeconomic status and obesity, sarcopenia, and sarcopenic obesity in community-dwelling older adults**

**A Gandham**[1], A Zengin[1], MP Bonham[2], SL Brennan-Olsen[3,4,5,6], D Aitken[7], TM Winzenberg[7], PR Ebeling[1], G Jones, D Scott[1,8]

***Corresponding author: anoohya.gandham@monash.edu***

*1. Department of Medicine, School of Clinical Sciences at Monash Health, Monash University, Clayton, Victoria, Australia*

*2. Department of Nutrition, Dietetics and Food, Monash University, Notting Hill, Victoria, Australia*

*3. School of Health and Social Development, Deakin University, Geelong, Victoria, Australia*

*4. Institute for Health Transformation, Deakin University, Geelong, Victoria Australia*

*5. Department of Medicine-Western Health, University of Melbourne, St Albans, Victoria, Australia*

*6. Australian Institute for Musculoskeletal Science, St Albans, Victoria, Australia*

*7. Menzies Institute for Medical Research, University of Tasmania, Hobart, Tasmania, Australia*

*8. Institute for Physical Activity and Nutrition (IPAN), School of Exercise and Nutrition Sciences, Deakin University, Burwood, Victoria, Australia*

**Background:** Social disadvantage may contribute to increased prevalence of sarcopenia and obesity among older adults. This study investigated if socioeconomic factors are associated with obesity (O) and/or sarcopenia (S) alone, or in combination (sarcopenic obesity [SO]), in community-dwelling older adults.

**Methods:** This was a cross-sectional analysis of data from the Tasmanian Older Adult Cohort study. Obesity was defined by fat percentage (cut-points; ≥25% for men; ≥35% women) assessed by dual-energy X-ray absorptiometry (DXA). Sarcopenia was defined as being within the lowest 20% for sex-specific cut-points of both appendicular lean mass (ALM)/height (m2) and handgrip strength. Socioeconomic factors investigated were; educational attainment (tertiary degree, secondary school, no secondary school), occupation types (high-skilled white-collar, low-skilled white-collar, or blue collar) and area of residence (Index of Relative Socioeconomic Advantage and Disadvantage (IRSAD)). Multinomial logistic regression analyses yielding odds ratios (95% confidence intervals) were performed and adjusted for potential confounders.

**Results:** 1,099 older adults (mean±standard deviation age = 63.0±7.5 years; 51.1% women) participated. Prevalence of SO (6%) and S (1%) were lower than for O (75%) and non-sarcopenic non-obesity (NSNO) (19%). Older adults with a tertiary degree were significantly less likely to have O (0.67; 0.46, 0.99) and SO (0.48; 0.24, 0.98) compared with those who had no secondary schooling, after adjusting for confounders. Similarly, older adults living in advantaged areas were less likely to have O (0.58; 0.37, 0.87) and SO (0.47; 95% CI: 0.22, 0.98) after adjusting for confounders.

**Conclusion:** Lower educational attainment and residing in a disadvantaged area, but not occupation type were associated with increased likelihood for O and SO, in community-dwelling older adults. Further research is necessary to confirm whether similar associations exist in populations with greater levels of social disadvantage in order to understand the aetiology of SO and design effective community-based interventions.

**The relationship between sarcopenia, functional capacity and protein intake in patients with coronary heart disease referred to long-term cardiac rehabilitation: Preliminary findings from a cross-sectional analysis**

**E James**[1], S Nichols[2,3], S Goodall[1], J White[4,5], A O'Doherty[1]
***Corresponding author: emily.j.c.james@northumbria.ac.uk***

*1. Department of Sport, Exercise and Rehabilitation, Northumbria University, Newcastle upon Tyne, United Kingdom*
*2. Sport and Physical Activity Research Group, Sheffield Hallam University, Sheffield, United Kingdom*
*3. Advanced Wellbeing Research Centre, Sheffield Hallam University, Sheffield, United Kingdom*
*4. Newcastle City Council, Newcastle upon Tyne, United Kingdom*
*5. British Association for Cardiovascular Prevention and Rehabilitation, London, United Kingdom*

**Background:** Coexisting sarcopenia is common in patients with coronary heart disease (CHD) and its presence increases mortality risk. Cardiac rehabilitation (CR) offers a structured environment in which targeted interventions could be implemented to treat sarcopenia. This study aimed to report sarcopenia prevalence, and its relationship with functional capacity and diet, in adults engaged in long-term CR.

**Methods:** Sarcopenia was defined according to the European Working Group for Sarcopenia in Older People-2 algorithm. We assessed grip strength (GS), appendicular muscle mass (AMM)-index, Short Physical Performance Battery (SPPB), Six Minute Walk Distance (6MWD) and dietary intake (n=19). Relationships were evaluated using Spearman's rank correlations. Differences between sarcopenic and non-sarcopenic cohorts were assessed using Mann-Whitney U (non-normally distributed) and independent t-tests (normally distributed). P <.05 indicated significance.

**Results:** Prevalence of confirmed and severe sarcopenia were 58% and 5%, respectively. Sarcopenic participants had lower GS (median [IQR]:13.5kg [11.0, 22.0] versus 32.5kg [28.9, 35.8]; U = 0.0; P <.001), sit-to-stand (+3.3s; P = .026) and SPPB (median [IQR]:12 points [10, 12] versus 12 points [12, 12]; U = 24.0, P = .033) performance, and attended exercise sessions over a longer period (median [IQR]:52 weeks [20, 60] versus 8 weeks [2, 20]; U = 15.5, P = .036). No other variables were different between groups. Protein intake <1.2 g/kg/day and <0.8g/kg/day were reported by 72% and 44% of

participants, respectively. Protein intake was associated with gait speed (r = .693, P = .001), 6MWD (r = .484, P = .042) and AMM-index (r = -.615, P = .011).

**Conclusion:** Preliminary findings show a high prevalence of sarcopenia and low protein intake in people engaging with long-term CR, suggesting that current CR provision is not adequate to treat or prevent sarcopenia. Interventions targeting increased protein intake and strength training might be beneficial in patients with CHD.

**Prevalence of sarcopenia and its association with anti-rheumatic drugs in middle-aged and older adults with rheumatoid arthritis: A systematic review and meta-analysis**

**TD Dao**[1,2], BK Kirk[1,2], SP Phu[2,3], S Vogrin[1,2], G Duque[1,2]

***Corresponding author: thang.dao.email@gmail.com***

*1. Department of Medicine-Western Health, Melbourne Medical School, University of Melbourne, St Albans, Melbourne, Victoria, Australia*
*2. Australian Institute for Musculoskeletal Science (AIMSS), University of Melbourne and Western Health, St Albans, Melbourne, Victoria, Australia*
*3. Falls, Balance and Injury Research Centre, Neuroscience Research Australia, University of New South Wales, Sydney, New South Wales, Australia*

**Purpose:** To examine the prevalence of sarcopenia and its association with anti-rheumatic drugs in adults with rheumatoid arthritis (RA).

**Methods:** This review was registered on PROSPERO and followed PRIMSA guidelines. Electronic databases were searched for studies reporting on the prevalence of sarcopenia in adults with RA using any muscle index (muscle mass, strength and/or physical performance) and cutpoints as recommended by established criteria (EWGSOP1/2, AWGS, FNIH, SDOC). The secondary objective was to investigate the relationship between RA, anti-rheumatic drugs, and sarcopenia.

**Results:** Among 2240 middle-aged and older adults with RA (mean age: 47.7 ± 5.5 to 75.0 ± 6.2 years, 83.8% women), the pooled prevalence of low muscle mass/ sarcopenia was 30.2% (95% confidence interval (CI): 24.2-36.2%; 16 studies; I2: 89.2%). Sub-group analysis showed a non-significant higher prevalence of low muscle mass alone (32.6%, 95% CI: 25.0-40.3%; I2: 87.9%) versus consensus definitions of sarcopenia (25.4%, 95% CI: 15.4-35.3%; I2: 91.2%) (p= 0.255). In adults with RA, corticosteroid use was positively associated with sarcopenia (odds ratio (OR): 1.46, 95% CI: 0.94-2.29, 7 studies; I2: 47.5%) while conventional synthetic disease-modifying anti-rheumatic drugs (csDMARDs) was inversely associated (OR: 0.70, 95% CI: 0.52-0.94; 6 studies: I2: 0.00%) with this muscle disease. No association was found for biological/targeted synthetic disease-modifying anti-rheumatic drugs (b/tsDMARDs) (OR: 0.83, 95% CI: 0.54-1.30; 6 studies: I2: 47.6%).

**Conclusion:** Sarcopenia is a common comorbidity of RA and as such, clinicians should screen for this muscle disease in adults with RA. Further longitudinal studies are needed to understand the role of anti-rheumatic drugs (particularly type, dosing, and duration) in the development of sarcopenia.

**Sarcopenia is associated with three-month and one-year mortality in geriatric rehabilitation inpatients: RESORT**

**J Xu**[1], EM Reijnierse[1], J Pacifico[1], CS Wan[1], AB Maier[1,2]
***Corresponding author: janex@student.unimelb.edu.au***

*1. Department of Medicine and Aged Care, @AgeMelbourne, The Royal Melbourne Hospital, The University of Melbourne, Melbourne, Victoria, Australia*
*2. Department of Human Movement Sciences, @AgeAmsterdam, Vrije Universiteit Amsterdam, Amsterdam Movement Sciences, Amsterdam, The Netherlands*

**Background:** Sarcopenia is highly prevalent in geriatric rehabilitation patients and can worsen prognosis. This study aimed to investigate the association of sarcopenia and components of sarcopenia with three-month and one-year post-discharge mortality in geriatric rehabilitation inpatients.

**Methods:** REStORing health of acutely unwell adulTs (RESORT) is an observational, prospective longitudinal cohort of geriatric rehabilitation inpatients. Sex-stratified Cox proportional-hazards analyses were used to associate sarcopenia (and its components) at admission, by the European Working Group on Sarcopenia in Older People (EWGSOP, EWGSOP2) and the Asian Working Group for Sarcopenia 2019 (AWGS 2019), with three-month and one-year post-discharge all-cause mortality.

**Results:** Patients (n=1406) had a median [IQR] age of 83.0 [77.4-88.2] years (58% females). Sarcopenia was significantly associated with three-month and one-year mortality in females (EWGSOP, EWGSOP2, AWGS 2019) and males (EWGSOP2, AWGS 2019). In females, low muscle mass (EWGSOP, EWGSOP2, AWGS 2019) was significantly associated with three-month and one-year mortality; low muscle strength (EWGSOP, EWGSOP2, AWGS 2019) was significantly associated with one-year mortality. For males, low muscle mass (EWGSOP2, AWGS 2019) was significantly associated with three-month and one-year mortality; low muscle strength (EWGSOP2, AWGS 2019) was significantly associated with three-month mortality. The association between physical performance with mortality was not analysed due to less than five events (death) in patients with normal physical performance.

**Conclusions:** Sarcopenia, low muscle mass and low muscle strength at admission are associated with a significantly higher risk of mortality post-discharge from geriatric rehabilitation, highlighting the need to measure muscle mass and strength in clinical practice.

**Osteocalcin, muscle function and 15-year falls-related hospitalisations in older women: the Perth Longitudinal Study of Ageing Women**

**C Smith**[1,2], JR Lewis[3,4,5], M Sim[3,5], WH Lim[5,6], EM Lim[7,8], LC Blekkenhorst[3,5], TC Brennan-Speranza[9,10], L Adams[5,11], E Byrnes[7], G Duque[2,12], I Levinger[1,2], RL Prince[5,8]

***Corresponding author: cassandra.smith3@live.vu.edu.au***

*1. Institute for Health and Sport (IHES), Victoria University, Melbourne, Victoria, Australia*

*2. Australian Institute for Musculoskeletal Science (AIMSS), University of Melbourne and Western Health, St Albans, Victoria, Australia*

*3. School of Medical and Health Sciences, Edith Cowan University, Perth, Western Australia, Australia*

*4. Centre for Kidney Research, Children's Hospital at Westmead, School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, New South Wales, Australia*

*5. Medical School, University Western Australia, Perth, Western Australia, Australia*

*6. Department of Renal Medicine, Sir Charles Gairdner Hospital, Perth, Western Australia, Australia*

*7. Department of Clinical Biochemistry, PathWest Laboratory Medicine, Queen Elizabeth II Medical Centre, Perth, Western Australia, Australia*

*8. Department of Endocrinology and Diabetes, Sir Charles Gairdner Hospital, Nedlands, Western Australia, Australia*

*9. Department of Physiology, School of Medical Sciences, Faculty of Medicine and Health, University of Sydney, Sydney, New South Wales, Australia*

*10. School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, New South Wales, Australia*

*11. Department of Hepatology, Sir Charles Gairdner Hospital, Nedlands, Western Australia, Australia*

*12. Department of Medicine-Western Health, Melbourne Medical School, The University of Melbourne, Melbourne, Victoria, Australia*

**Background:** Undercarboxylated osteocalcin (ucOC) is suggested to be involved in muscle mass maintenance and strength, at least in animal models. In humans, the ucOC to total osteocalcin (tOC) ratio, may be related to muscle function, a term that includes muscle strength and physical function. As such, the ucOC/tOC ratio may also be related to falls risk, but data are limited. We tested the hypothesis that ucOC and ucOC/tOC ratio are associated with muscle function and 15-year falls-related hospitalisations in older women.

**Methods:** Serum OC and ucOC was assessed in 1261 older women (mean age 75.2 ± 2.7 years) at year-1 of the Calcium Intake Fracture Outcome Study trial, forming the Perth Longitudinal Study of Ageing Women (PLSAW, 1998 to 2013). Timed-up-and-go (TUG) and grip strength was assessed at baseline (1998) and at 5 years. Falls-related hospitalisations over a 14.5-year follow-up was captured by the Hospital Morbidity Data Collection, via the Western Australian Data Linkage System.

**Results:** At baseline, women with higher ucOC/tOC ratio (quartile 4) had slower TUG performance compared to quartile 1 by 0.68 secs (~0.68 secs, $p<0.01$); grip strength and 5-year change in TUG and grip was not significantly different ($p>0.05$). Higher ucOC/tOC ratio was significantly associated with poorer TUG performance at baseline and 5-year change in performance (all $p<0.05$). Those with the highest ucOC/tOC had greater falls-related hospitalisations (unadjusted log rank $p=0.004$) that remained significant after adjusting for key variables (HR 1.31, 95% CI 1.09-1.57, $p=0.004$).

**Conclusions:** We identified many older women with high ucOC/tOC ratio that also have poorer physical function, including a long-term decline and increased risk of falls-related hospitalisation. This data supports the concept that quantifying ucOC/tOC ratio could be used as a predictor of these adverse outcomes, possibly enabling early intervention and minimising future fall risk. This should be explored in future.

# 2021 ANZSSFR DELPHI PROCESS ON SARCOPENIA DIAGNOSIS AND MANAGEMENT

Sarcopenia was first described over 30 years ago as the age-related decline in lean muscle mass. Its definition has since expanded to include poor muscle strength and physical performance, and several groups have proposed guidelines for sarcopenia case-finding in older patients. Sarcopenia is associated with an increased risk of falls, fractures and death and is a major public health concern. However, it is rarely diagnosed or treated in the clinical setting, which is likely explained in part by the current lack of consensus in sarcopenia definitions internationally.

The ANZSSFR established the Sarcopenia and Diagnosis Management Task Force, consisting of expert clinicians and researchers, in 2017. In 2018, we published a position statement on sarcopenia diagnosis but subsequent developments in the field motivated the Task Force to embark on a modified Delphi study to establish consensus guidelines on sarcopenia diagnosis and management in Australia and New Zealand. This modified process included a focus on canvassing consumer opinions on acceptability of sarcopenia assessments and treatments.

This Delphi study commenced in July 2020 and concluded in early 2021, and at today's symposium we will present the final outcomes from this process for the first time. The presentations will summarise the background, process and outcomes of this novel Delphi study, including accepted statements on sarcopenia prevention, assessment and management informed by consumer values and expert clinician and researcher opinion. We invite you to discuss these outcomes with us during the open panel discussion.

***Associate Professor David Scott and Dr Jesse Zanker, on behalf of the ANZSSFR Sarcopenia and Diagnosis Management Task Force***


It is our pleasure to welcome you to the 5th Annual Scientific Meeting of the Australian and New Zealand Society for Sarcopenia and Frailty Research. The Meeting will be held from 4th - 6th November 2021 at the Translational Research Institute in Brisbane, Queensland.

Sarcopenia and frailty are potentially devastating conditions that affect many people globally and present a major challenge to the functional independence and quality of life of our older population. The theme of this year's meeting is Mechanisms, Measurement and Management. We aim to bring together basic scientists, clinicians and allied health practitioners to showcase new knowledge on how these conditions originate, and how they can be measured and managed in clinical settings.

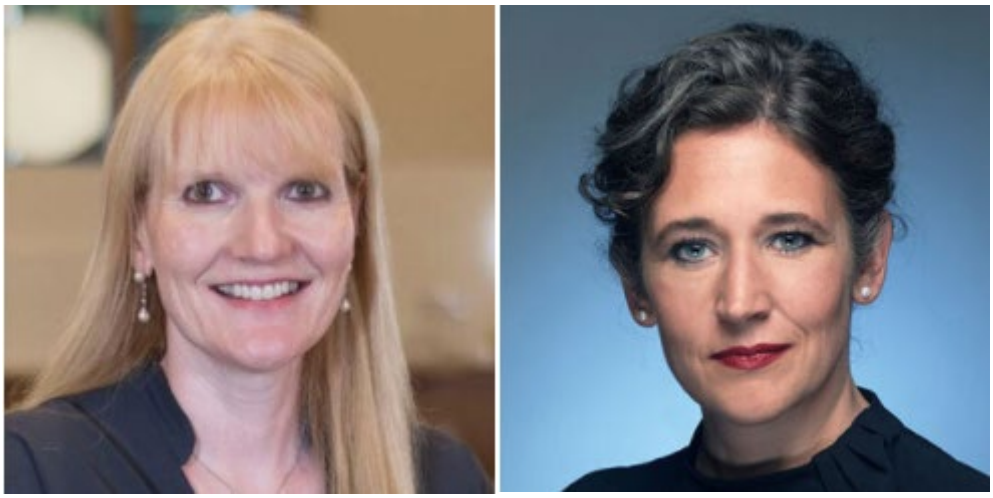
New additions this year will include pre-conference workshops and a clinical update on Thursday evening, open to a wider group of clinicians. Speakers will include local and international experts, emerging researchers and participants from across the research and practice spectrum. Our scientific program includes ample opportunities for delegates to submit abstracts for oral presentations, ECR awards and virtual poster sessions. Travel awards are also available to students for the top ranked abstracts.

This is a multi-disciplinary meeting and every year we invite scientists and clinicians from basic sciences, exercise physiology, physiotherapy, nutrition, medicine, nursing, epidemiology, health

economics, and public health to participate. There is always plenty of time for networking with colleagues to share ideas and discuss future collaborations.

On behalf of our Scientific Committee, we would like to invite you to participate in our Annual Meeting in Brisbane.

Prof Ruth Hubbard and Prof Andrea Maier



Sponsors

TRI
TRANSLATIONAL RESEARCH INSTITUTE
AUSTRALIA

Institutional Sponsor

**https://www.anzssfrmeeting.com.au/**