Journal of Frailty, Sarcopenia and Falls

Proceedings

Communications to the International Sarcopenia Translational Research Conference 2023

5-6 October 2023, Newcastle upon Tyne, UK

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ORAL PRESENTATIONS

O2. SENESCENCE-ASSOCIATED SECRETORY PHENOTYPE FACTORS ARE ASSOCIATED WITH SARCOPENIA IN THE CARE75+ COHORT

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Background: Cellular senescence is both a biomarker of ageing and a causal mechanism within the ageing process. The senescence-associated secretory phenotype (SASP) is secreted by senescent cells and can be measured in serum. Schafer demonstrated that circulating SASP factors are associated with both advanced chronological age and biological age and Fielding demonstrated an association of SASP with physical function. We hypothesised there is also an association between SASP and physical frailty and sarcopenia.

Methods: SASP was determined using multiplex technology on 448 serum samples from the Care75+ cohort with associated clinical phenotyping. Data were analysed using Spearman's correlation coefficients and Spearman's partial correlations, and independent samples median test.

Results: We confirmed that SASP factors correlated with chronological age (GDF-15, TNFR1, CCL4, FAS, CCL3, TNFα, IL-6) and frailty index when controlling for age (GDF-15, TNFR1, FAS). We also demonstrated a correlation when controlling for age between SASP and: frailty phenotype (GDF-15, OPN, TNFR1), muscle mass (GDF-15, IL-6, TNFR1, FAS), walk time (GDF-15, CXCL1, TNFα) and sex adjusted grip strength (GDF-15, OPN, IFNγ). There was a statistically significant increase in GDF-15 (no sarcopenia: 1115.1, confirmed sarcopenia: 1212.9, severe sarcopenia: 2149.8; p<0.001) and TNFR1 (no sarcopenia: 1324.8, confirmed sarcopenia: 1499.5, severe sarcopenia: 1740.0; p=0.14) through the severity categories of sarcopenia using EWGSOP2 criteria.

Conclusions: We have demonstrated a relationship between sarcopenia and its components with circulating SASP factors and confirmed a relationship between SASP and chronological and biological age, and physical function. Our data supports the theory that senescent cells and SASP contribute to both sarcopenia and the resulting functional limitations. It suggests that interventions targeting senescence could improve outcomes in older adults with sarcopenia. Interestingly, the effect of metformin as a geroprotector drug is thought to be partially mediated through the manipulation of GDF-15 expression which in our data is repeatedly associated with sarcopenia, physical function and frailty.

The published abstracts are those accepted to the ISTRC 2023 conference that have not been previously published, either in abstract form or as a full scientific paper. Abstract numbers are taken from the abstract list presented at the conference and are therefore not consecutive.

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03. SARCOPENIA IS NOT A RISK FACTOR TO INCIDENCE OF FALLS, FRACTURES AND MORTALITY IN RHEUMATOID ARTHRITIS: A PROSPECTIVE COHORT STUDY

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Background: Rheumatoid Arthritis is a systemic autoimmune disease characterized by inflammation that leads to articular and extra-articular manifestations. RA patients may have sarcopenia, ranging from 24% to 30%. Despite that, there are very few longitudinal studies, all of short duration, assessing incidence and impact of sarcopenia in RA patients. Therefore, our objective was to assess sarcopenia in a long-term cohort of RA patients.

Methods: The present prospective cohort study included participants 5 years or older with RA enrolled from the 2015-2016 through 2022-2023. Disease activity was evaluated by DAS28-CR. Physical Function was assessed by HAQ-DI. Muscle strength was measured by handgrip (Jamar hydraulic dynamometer/kg). Appendicular Skeletal Muscle Mass Index (ASMI/Kg/m^2) was measured by dual-energy X-ray absorptiometry (DXA). Sarcopenia was assessed by diagnostic criteria of EWGSOP2. The descriptive analysis, pairwase Student's t test and chi-square test, independent-samples Kruskal-Wallis Test and Kaplan–Meier survival curve were performed (accepted at p≤0.05).

Results: A total of 90 RA patients were included with median follow-up period 6.4 (range 5.8-7.0) years. At baseline, the mean age was 56.5±7.3 years; median disease duration was 8.5 (IQR 3.0–18.0) years; the median DAS28-CRP was 3.0 (IQR 1.0–3.0); the mean HAQ-DI 1.1±0.9. At baseline, we found one patient (1.1%) with severe sarcopenia and six patients with sarcopenia (6.7%). After 6.4 years of follow-up, DAS28-CRP and HAQ-DI did not change (p>0.05). In addition, there was new diagnosis of sarcopenia. Baseline sarcopenia was not associated with fall and fractures (p>0.05) after 6.4 years of follow-up. In survival analyses, mortality was not associated with low muscle strength, low muscle mass and sarcopenia (p>0.05).

Conclusions: Our findings demonstrate that in RA patients under treatment, sarcopenia prevalence was stable. Baseline sarcopenia was not a risk factor for falls, fractures and mortality.

04. AGE-RELATED DECLINE IN SKELETAL MUSCLE EXCITABILITY CORRELATES WITH TETANIC FORCE

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Background: Age-related decline in skeletal muscle excitability is a potentially tractable mechanism of sarcopenia that warrants further exploration.

Methods: Muscle Velocity Recovery Cycles (MVRCs) and 30Hz Frequency Ramp are specialist electromyography techniques that can be used to examine skeletal muscle excitability and ion channel function in vivo. They were performed on young adult (13 to 26 weeks, n=25 muscles), middle aged (43 to 70 weeks, n=17 muscles) and old (91+ weeks, n=17 muscles) C57/BlJ6 mouse tibialis anterior (TA) whilst under anaesthesia. Soleus tetanic force was also measured in a subset of old animals.

Results: A single conditioning stimulus was followed by a transient increase in conduction velocity in every muscle tested regardless of age. In response to 5 conditioning stimuli, 1 out of 25 young, 1 out of 17 middle aged and 6 out of 17 old muscles showed no increase in conduction velocity at all (Fisher's exact test p=0.01). Old TA also showed greater reduction in the amplitude of the compound muscle fibre action potential (CMAP) during 30Hz frequency ramp (young 85.55% ± 5.92, n=22; middle-aged 97.26% ± 4.26, n=13; old 63.77% ± 7.69, n=14; ANOVA p=0.004) and incomplete amplitude recovery following 30Hz frequency ramp (young 96.39% ± 4.19, n=22; middle-aged 104.8% ± 3.15, n=13; old 80.02% ± 4.85, n=14; ANOVA p=0.002). The extent of recovery of amplitude following a 30Hz frequency ramp correlated with the force of soleus tetanic contraction in the same animal (Pearson's r=0.89; n=4).

Conclusion: Mouse skeletal muscle excitability parameters change with age and these changes may explain some of the variability in muscle strength between old male C57/BlJ6 mice.

05. MYOGENIC-RELATED ADAPTATIVE RESPONSE TO EXERCISE TRAINING IS DEFECTIVE IN COPD COMPARED TO HEALTHY INDIVIDUALS

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Background: Myogenesis is associated with the expression of SPARC (secreted protein acidic and rich in cysteine), an extracellular matrix (ECM) protein also known as osteonectin. SPARC is a myokine which loss of expression is associated with muscle atrophy by regulating atrongin1 and catabolism. We investigated whether attenuated training-induced myogenesis in COPD patients is partially explained by blunted expression of this ECM.

Methods: Vastus lateralis muscle biopsy was obtained from COPD (FFMI: 17.3 Kg/cm^2, n=29) and healthy individuals (FFMI: 19.4 Kg/cm^2; n=18) before and after a 10-week interval exercise training programme. SPARC muscle protein and mRNA expression was quantified using ELISA (R&D Systems) and Real-Time PCR (ThermoFisher), respectively.

Results: At baseline, mean muscle fibre cross sectional area (CSA) in COPD (4100±106.9 μm^2) was lower ($p<0.005$) compared to healthy (4582±155.6 μm^2). SPARC muscle mRNA expression was downregulated by 6.0-fold in COPD patients compared to healthy individuals ($p=0.0012$). The magnitude of post exercise training-induced change in mean fibre CSA was 7% lower in COPD patients compared to healthy individuals. In healthy individuals, exercise training increased SPARC protein expression by 50% ($p<0.001$) compared to baseline. However, in COPD patients exercise training did not induce a change in SPARC protein expression.

Conclusions: SPARC is a physical activity-induced myokine, so the lower muscle baseline levels of SPARC expression in COPD compared to healthy participants may reflect the sedentary profile in COPD. Likewise, absence of a significant change in SPARC expression with exercise training in COPD compared to healthy may justify reduced myogenesis in COPD.

06. TOFACITINIB TREATMENT IN RHEUMATOID ARTHRITIS IS ASSOCIATED WITH INCREASED LOWER LIMB MUSCLE VOLUME: THE RHEUMATOID ARTHRITIS AND MUSCLE (RAMUS) STUDY

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Background: Approximately 1 in 4 people with rheumatoid arthritis (RA) have sarcopenia. Pooled data from studies investigating tofacitinib for the treatment of RA demonstrated small increases in serum creatinine (SCr). SCr levels are influenced by muscle mass, raising the possibility that tofacitinib has an anti-sarcopenia effect.

Methods: The RAMUS study was an observational, single-arm study of RA patients commencing tofacitinib as standard care. Enrolment criteria included >1 of low appendicular lean mass index, raised CRP, low grip strength or prolonged sit-to-stand test time. Assessments were conducted at baseline, 1 and 6 months. The primary outcome was lower limb muscle volume determined by MRI. Whole body composition was measured by DXA. Statistical significance was assessed with repeated measures one-way ANOVA (parametric data) or Friedman's test (non-parametric data).

Results: 15 participants (87% female) aged 41–73 years (mean 60 years) were enrolled and all completed the study. Median BMI was 31.8 kg/m^2. Median disease duration was 3.1 years (range 1.5–24.8). At 6 months, increases in mean leg muscle volume (6.86L to 7.10L, $p=0.009$), SCr (62.5 to 68.1 μmol/L, $p=0.011$) and Rapid Assessment of Physical Activity score (3.5 to 4.5, $p=0.035$) were observed. The Disease Activity Score (28 joints) improved from 1 month (5.14 to 4.05, $p=0.011$). Muscle volume increased significantly in the thigh but not in the calf. The muscle compartment fat fraction did not change. Grip strength, gait speed and fat mass index did not change. Muscle volume correlated with grip strength ($r_s=0.725$, $p=0.003$) at baseline.

Conclusions: Increased muscle volume may have resulted from a direct effect of tofacitinib on skeletal muscle, reduced systemic inflammation, increased physical activity

or a combination. These data merit further investigation to test whether the improvements are specific to tofacitinib and whether combining with resistance exercise yields greater benefits.

07. SARCOPENIC OBESITY, SYSTEMIC INFLAMMATION AND DEPRESSION: A NEXUS BETWEEN PHYSICAL AND MENTAL HEALTH

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Background: The risk for depression conferred by low skeletal muscle mass coupled with obesity, a composite state known as sarcopenic obesity (SO), is under-studied. We aimed to determine women's risk of major depressive disorder (MDD) in relation to SO phenotypes characterised by levels of circulating high-sensitivity C-reactive protein (hsCRP).

Methods: This retrospective population-based cohort study comprised 808 women (ages 20-84 years) recruited in 1994-7 and followed for a median 16.1 years (IQR 11.9-16.8). At baseline, body fat and fat-free mass were measured by whole body dual-energy x-ray absorptiometry (DXA). SO referred to a high ratio fat mass/fat-free mass (≥0.80) as this threshold delineates health risks associated with excessive fat (which confers metabolic load) coincident with diminished muscle (which confers metabolic capacity). Systemic inflammation was operationalised as serum hsCRP concentration in the upper tertile (>2.99 mg/L). SO phenotypes were: nonSO+lowCRP, nonSO+highCRP, SO+lowCRP, and SO+highCRP. During follow-up, the Structured Clinical Interview for DSM-IV-TR (SCID-I/NP) was used to identify lifetime history of MDD and age of onset. Poisson regression models were used to estimate the MDD rate for each SO phenotype during follow-up. Demographic, health and lifestyle factors were tested as potential confounders.

Results: During 11,869 participant-years of follow-up, 161 (19.9%) women experienced an MDD episode. SO was identified in 237 (29.3%) participants. SO phenotypes numbered 435 (53.8%) for nonSO+lowCRP, 136 (16.8%) for nonSO+highCRP, 104 (12.9%) for SO+lowCRP and 133 (16.5%) for SO+highCRP. MDD rates were 11.9 (95%CI 9.5-14.9) per 1000 participant-years for nonSO+lowCRP; 13.5 (95%CI 9.3-19.7) per 1000 participant-years for nonSO+highCRP; 14.2 (95%CI 9.2-21.7) per 1000 participant-years for SO+lowCRP; and 18.6 (95%CI 13.4-25.8) per 1000 participant-years for SO+highCRP.

Conclusions: Women with metabolically unhealthy SO characterised by systemic inflammation were at increased risk for MDD over a 16-year period. These data suggest that targeting the pro-inflammatory state of SO (through lifestyle or medication approaches) might help reduce the incidence of MDD.

08. HAEMODYNAMIC FACTORS UNDERLYING THE RELATIONSHIP BETWEEN SARCOPENIA AND ORTHOSTATIC HYPOTENSION IN OLDER ADULTS

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Background: Sarcopenia and orthostatic hypotension are two age-associated conditions increasingly recognised as drivers of adverse outcomes in older adults. Previously we reported an association between sarcopenia, confirmed with bioelectrical impedance analysis (BIA), and delayed blood pressure (BP) recovery from standing in older adults. The present study explored whether orthostatic changes in cardiac output (CO) and total peripheral resistance (TPR) could be significant in this association.

Methods: Attendees to a falls and syncope clinic aged 50 years and older underwent an active stand test with beat-to-beat BP measurement. Hand grip strength and time to perform 5 chair stands were measured. BIA was performed, and the European Working Group on Sarcopenia in Older People guidelines were used to classify participants into robust, probable sarcopenia and sarcopenia groups. Mixed effects models with linear splines were used to model the effect of sarcopenia status on both CO and TPR after standing while controlling for potential confounders.

Results: In 107 participants, mean age was 70 years with 57% women, the prevalence of probable sarcopenia was 31% and sarcopenia 15%. Probable sarcopenia and sarcopenia were associated with an attenuated rise in CO in the 0-10s period after standing (β -0.07, -0.08, p<0.001) and attenuated recovery of CO in the 10-20s period (β 0.07, 0.09, p<0.001). Both probable sarcopenia and sarcopenia were also associated with attenuated recovery of TPR in the 10-20s period (β -0.02, -0.03, p<0.001).

Conclusions: Probable sarcopenia and sarcopenia were associated with both an attenuated peak and recovery of CO after standing along with an attenuated recovery of TPR. This suggests that the association between sarcopenia and delayed BP recovery after standing may be mediated via both the cardiac and skeletal muscle pump.

O9. EVALUATING ROUTINE DIETETIC INTERVENTIONS IN GERIATRIC REHABILITATION: IMPLICATIONS TO ADDRESS MALNUTRITION, SARCOPENIA AND UNDERWEIGHT

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Background: Although diagnosing and treating malnutrition, sarcopenia and underweight are recommended to be embedded and sustained within nutritional care, it is unknown if that is facilitated in geriatric rehabilitation. This study determined the proportion of geriatric rehabilitation inpatients with malnutrition, sarcopenia or underweight receiving dietetic interventions as part of routine clinical care and if these patients have greater improvements in body weight and composition compared to patients not receiving dietetic interventions.

Methods: Geriatric rehabilitation inpatients from the observational REStORing health of acutely unwell adulTs (RESORT) cohort were included (n=971, median age 83.2 [77.7-88.8] years, 58.5% (n=568) females). Malnutrition, sarcopenia and underweight were defined by the Global Leadership Initiative of Malnutrition, European Working Group on Sarcopenia in Older People 2 and age-specific body mass index cut-offs. Data on dietetic interventions initiated by dietitians as part of clinical care was extracted from the centralised hospital database. Changes in body weight (kg), skeletal muscle mass (kg, %), and fat mass (kg, %) from admission to discharge were determined using linear mixed models.

Results: Dietetic interventions were received by 306 (62.0%), 138 (71.5%) and 153 (76.9%) of patients with malnutrition (n=493), sarcopenia (n=193) and underweight (n=199). Duration and frequency of dietetic interventions were higher in patients with malnutrition, sarcopenia or underweight compared to patients without those conditions. There were no differences in body weight/composition changes in patients with malnutrition, sarcopenia or underweight receiving dietetic interventions compared to those not receiving interventions.

Conclusions: One-third of geriatric rehabilitation inpatients with malnutrition, sarcopenia or underweight are not receiving dietetic interventions and therefore the referral and diagnostic process require improvements. Patients with malnutrition, sarcopenia or underweight receiving dietetic interventions had no greater improvements in body weight/composition compared to those who did not receive interventions. Tailoring dietetic interventions for malnutrition, sarcopenia and underweight diagnosis may improve patient outcomes.

O11. CHRONIC ORAL ADMINISTRATION OF THE mTOR INHIBITOR RAPAMYCIN TO OLDER PEOPLE IS SAFE AND DOES NOT LIMIT RESISTANCE EXERCISE-INDUCED MUSCLE STRENGTH GAINS

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Background: Altered muscle protein turnover, regulated by mechanistic target of rapamycin (mTOR) signalling, contributes to sarcopenia. The mTOR pathway becomes hyper-active with ageing leading to impaired responsiveness to nutrition, exercise and dysregulated autophagy. Drugs targeting this pathway may have therapeutic potential, with the mTOR inhibitor rapamycin enhancing lifespan in pre-clinical models and attenuating healthspan declines. In humans, the muscle and immunobiological consequences of rapamycin administration are unknown. Therefore, we assessed the effects of 8-weeks rapamycin treatment in older people on safety and the interaction with exercise-induced muscle growth.

Methods: Thirteen healthy males were randomised to take a sub-clinical dose of Rapamune (Sirolimus 1mg daily; n=7, 62±6y) or a matched placebo tablet orally (n=6, 66±6y) for 8 weeks. Blood samples were obtained weekly to determine blood sirolimus concentrations via liquid chromatography-mass spectrometry and for blood biochemistry. Following a 2 week tablet adjustment period, unilateral resistance exercise training (RET) was performed at 75% 1-repetition maximum (1-RM) 3-times per week for 6-weeks; 1-RM was determined before and following the training period. Two-way ANOVAs were performed with significance of $P<0.05$.

Results: Blood sirolimus concentrations were non-detectable

in both groups at baseline but increased in those taking Rapamune to 3.45±1.83 ng/ml at 8-weeks. No side-effects were reported from Rapamune administration and white blood cell counts remained within normal range (baseline vs. 8 weeks, Drug: 5.18±1.45x10^9/L vs 5.77±1.19x10^9/L; Placebo: 4.92±1.10x10^9/L vs 5.29±1.41x10^9/L). Strength in the trained leg increased to a similar extent in both groups after 6-weeks of RET (time-effect p<0.0001; Drug:45.4±12.0 kg vs 56.7±14.6kg; Placebo: 43.8±8.2 kg vs 54.9±8.8 kg).

Conclusions: This ongoing clinical trial (NCT05414292) demonstrates low-dose Rapamune is bioavailable and safe. Contrary to the notion of mTOR dependent exercise-induced muscle growth, Rapamune did not limit strength gains to RET. We conclude that administration of this life/health-span promoting compound is safe in older humans, does not prevent strength gains, and shows no evidence of immunosuppression.

POSTER PRESENTATIONS

P2. SYSTEMATIC REVIEW: SARCOPENIA IN PAEDIATRIC INFLAMMATORY BOWEL DISEASE

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Background: Low skeletal muscle mass (MM) and deteriorated function (sarcopenia) can be a frequent complication in paediatric inflammatory bowel disease (IBD). Our aim is to conduct a systematic review of the paediatric IBD literature on skeletal muscle function and mass and identify interventions that could affect them.

Methods: Systematic searches (EMBASE, Medline, Cochrane library central for registered control trials and Web of Science) were conducted using the terms 'lean body mass' (LM), 'fat free mass' (FFM) or 'MM' and 'IBD'.

Results: Fourteen studies were included, presenting data from 439 Crohn's disease (CD), 139 ulcerative colitis (UC) and 2 IBD-unclassified participants compared with healthy matched or unmatched groups or reference populations. Six out of 14 studies reported lower LM, whilst 7 studies observed lower MM and FFM in CD patients compared to healthy controls. Research in UC patients reported lower LM in 3 studies, lower MM in 3 studies and lower FFM in 4 studies. Three prospective studies measured the impact of enteral feeding and showed improvement on disease activity and LM or FFM, while one retrospective study did not show any impact on LM.

Conclusions: Despite the variety of experimental approaches and methods used to assess sarcopenia, most studies showed reduction in MM, LM and FFM in IBD. Nutritional intervention may have a positive effect on LM and FFM. Future research should focus on standardizing the terminology and methodologies used in assessing body composition and investigating sarcopenia in diseased and matched healthy control cohorts in adequately powered studies with a longitudinal design.

P3. SARCOPENIA AND SARCOPENIC OBESITY AMONG COMMUNITY-DWELLING PERUVIAN ADULTS: A CROSS-SECTIONAL STUDY

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Background: Sarcopenia and sarcopenic obesity (SO) have emerged as significant contributors to negative health outcomes in the past decade. However, there remains a lack of consensus on the criteria and cut-off thresholds for assessing sarcopenia and SO. Moreover, limited data are available on the prevalence of these conditions in Latin American countries. Thus, we aimed to estimate the prevalence of probable sarcopenia, sarcopenia, and SO in a community-dwelling population of 1151 adults aged ≥55 years in Lima, Peru.

Methods: This cross-sectional study was conducted

between 2018 and 2020 in low-resource settings in Lima. Sarcopenia was defined as the presence of low muscle strength (LMS) and low muscle mass (LMM) according to European (EWGSOP2), US (FNIH) and Asian (AWGS) guidelines. We measured muscle strength by maximum handgrip strength; muscle mass using a whole-body single-frequency bioelectrical impedance analyzer, and physical performance using the Short Physical Performance Battery and 4-meter gait speed. SO was defined as a body mass index ≥30 kg/m^2 and sarcopenia.

Results: The participants had a mean age of 66.2 years (SD 7.1), 621 (53.9%) were men, and 41.7% were classified as obese (BMI ≥30.0 kg/m^2). The prevalence of probable sarcopenia was estimated to be 22.7% (95%CI: 20.3-25.1) using the EWGSOP2 criteria and 27.8% (95%CI: 25.2-30.4) using the AWGS criteria. Sarcopenia prevalence, assessed using skeletal muscle index (SMI), was 5.7% (95%CI: 4.4-7.1) according to EWGSOP2 and 8.3% (95%CI: 6.7-9.9) using AWGS criteria. The prevalence of sarcopenia based on the FNIH criteria was 18.1% (95%CI: 15.8-20.3). The prevalence of SO, considering different sarcopenia definitions, ranged from 0.8% (95%CI: 0.3-1.3) to 5.0% (95%CI: 3.8-6.3).

Conclusions: Our findings reveal substantial variation in the prevalence of sarcopenia and SO when using different guidelines, underscoring the necessity for context-specific cut-off values. Nevertheless, the prevalence of probable sarcopenia and sarcopenia among community-dwelling older adults in Peru remains noteworthy.

P4. THE CLINICAL UTILITY OF MUSCLE MASS ASSESSMENT IN PATIENTS WITH HIP FRACTURE: A SYSTEMATIC REVIEW

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Background: In the current European guidelines, sarcopenia is diagnosed on the basis of low muscle strength, with low muscle mass used to confirm diagnosis. The added value of measuring muscle mass is unclear. We performed a systematic review to assess whether muscle mass was independently associated with adverse outcomes in patients with hip fracture.

Methods: The systematic review protocol was registered on the PROSPERO database (CRD42021274981). Electronic databases (MEDLINE, EMBASE, CENTRAL, CINAHL, Clinicaltrials.gov) were searched for observational studies of patients with hip fracture aged ≥60 years who had muscle mass or strength assessment perioperatively. Two reviewers independently screened titles/abstracts for inclusion. The association of muscle mass or strength with postoperative outcomes (mortality, Barthel Index, mobility, physical performance measures, length of stay, complications) was recorded. Risk of bias was assessed using the AXIS or ROBINS-I tool as appropriate. Due to the degree of study heterogeneity, data were analysed by narrative synthesis.

Results: The search strategy identified 3007 records. Ten studies were included (n=2281 participants), containing 27 associations between muscle mass assessment and hip fracture postoperative outcomes. Four studies had intermediate risk of bias; 6 studies had high risk of bias. Lower muscle mass was associated with higher mortality and worse physical performance measures in univariate analyses but there was no significant association between muscle mass and mobility, length of stay and postoperative complication scores in any included study. Six studies assessed both muscle mass and strength. Muscle mass was not a significant independent predictor of any adverse outcome in any included study after adjustment for muscle strength and other predictor variables.

Conclusions: Data on the clinical utility of muscle mass measurement in patients with hip fracture are limited in volume and quality, but available studies suggest muscle mass does not offer additional prognostic benefit to muscle strength measures.

P5. WHAT SUGAR HAS TO DO WITH IT: GLYCAEMIC MEASURES AND CHANGE IN MUSCLE STRENGTH IN ADULTS WITHOUT PREVALENT DIABETES IN UK BIOBANK

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Background: Skeletal muscle weakness indicated by low grip strength (GS) is a key component of sarcopenia. Understanding risk factors for sarcopenia is critical for treatment and prevention. Evidence from observational studies shows weaker GS in adults with a diagnosis of diabetes, however less is known about how glycaemic measures (glycated haemoglobin [HbA1c], random glucose) influence muscle strength in those without diabetes. We used

data from UK Biobank to explore gender- and age-stratified associations between glycaemic measures and GS in middle-aged and older adults without prevalent diabetes.

Methods: Analytic sample consisted of 382,108 participants (54.7% women) aged 38–73 years without diabetes and with complete measures for GS, HbA1c, and glucose at baseline. Regression analyses were used to examined gender- and age-stratified associations between each glycaemic measure, GS, and probable sarcopenia (low GS). Change in GS over 9 years was characterised by four patterns (decline, stable low, stable high, or reference [no change or increase]) in 36,250 participants (51.8% women) and their associations with baseline glycaemic measures investigated using multinomial regression.

Results: In men, higher concentrations of HbA1c (mmol/mol) and glucose (mmol/l) were associated with weaker GS (B [SE]= -0.08 [0.01] kg, and -0.19 [0.03] kg), and increased odds of probable sarcopenia (OR [95% CI]: 1.02 [1.01–1.02] and 1.06 [1.03-1.09]), respectively across the age groups. In women, HbA1c but not glucose was associated with weaker GS (B [SE]= -0.03 [0.003] kg) and greater odds of probable sarcopenia (OR [95% CI]: 1.01 [1.003-1.01]). In all participants, higher baseline HbA1c but not glucose was associated with greater odds of stable low GS pattern (OR [95% CI]: 1.02 [1.01-1.03]) and decreased odds of stable high GS pattern (0.98 [0.97-0.99]) 9 years later.

Conclusions: Data suggest that having higher HbA1c without prevalent diabetes is negatively associated with GS in men and women a decade later.

P6. ASSOCIATIONS BETWEEN PHYSICAL ACTIVITY VOLUME AND INTENSITY AND KEY COMPONENTS OF SARCOPENIA: FINDINGS FROM THE MASS LIFECOURSE STUDY

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Background: The relationship between physical activity (PA) and skeletal muscle structure and function remains unclear. This may be related to the methods used for quantifying PA via accelerometry, which typically reports time spent in specific intensity categories. An alternative approach to describe PA involves two continuous population-independent metrics: average acceleration (indicative of the volume of activity; ACC) and intensity gradient (indicative of the intensity distribution; IG). We aimed to examine associations between ACC and IG with key components of sarcopenia.

Methods: Participants aged 45-85 years were recruited via primary care. Grip strength, time taken to complete 5 chair stands (converted to speed [stands/sec]), and appendicular lean mass index (ALMI: kg/m^2) were measured. Participants were asked to wear a wrist-worn triaxial accelerometer (GENEActiv) for 7 days with PA quantified via ACC and IG. We used linear regression to examine sex-specific associations of ACC and IG with grip strength, chair stand speed and ALMI. Data are presented as mean ± standard deviation (SD).

Results: Analyses included 63 men (67±10 years) and 81 women (63±10 years). Participants achieved reasonably high volumes of activity (mean ACC: men 28.4±7.3 mg; women 29.2±7.9 mg) but were generally accumulating more time in low-to-mid range intensities (IG: men -2.52±0.19; women -2.58±0.19). There was no evidence of associations between either ACC or IG and grip strength or ALMI. There was weak evidence of a modest association between IG and chair stand speed in women (difference in mean chair stand speed per 1 SD increase in IG = 0.04 stands/s; 95% CI 0.00-0.08, p=0.04).

Conclusions: Evidence for associations between PA volume and intensity with key components of sarcopenia was limited. Even though these participants were generally achieving high levels of PA, they may not be engaging in PA behaviours which benefit skeletal muscle structure and function.

P7. SCREENING SARCOPENIA IN COMMUNITY-DWELLERS ELDERLY IN CAMEROON

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Background: As the proportion of older population is growing in sub-Saharan Africa countries, the burden of geriatric conditions including sarcopenia is expecting to increase. Our study aims to determine the prevalence of sarcopenia among people aged 60 and over in our setting.

Methods: We carried out a cross-sectional study in Yaounde, the capital of Cameroon, from May to July 2022. We included patients aged 60 and over seen during various activities organised by elderly people's associations in the community. Sarcopenia was assessed measuring the handgrip strength using a Jamar dynamometer and the Short Physical Performance Battery (SPPB). Patients with low handgrip strength and SPPB ≤9 were considered as having probable sarcopenia.

Results: Overall, 108 older people were included of whom

65% were female. The median age was 69.5% (IQR 66-75). The main comorbidities were hypertension (51.9%), osteoarthritis (41.7%), obesity (20.4%), diabetes mellitus (20.4%) and low physical activity (47.2%). Sarcopenia was present in 50 (46.3%) of whom 28 (56%) were women and 22 (44%) were men. The SPPB showed that 37 (34.3%) of the participants had severe sarcopenia. Associated factors were age between 70-79 years (OR 7.3; 95% CI 1.3–6.9; p=0.006), osteoarthritis (OR 9.7; 95% CI 0.1–0.6; p=0.002) and low physical activity (OR 9.3; 95% CI 0.1–0.6; p=0.002).

Conclusions: Sarcopenia is highly prevalent in this urban area in Cameroon. Public health strategies have to be put in place to limit the impact on the health of elderly.

P8. RESPONSE AND REPRESENTATIVENESS IN THE MASS LIFECOURSE STUDY

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Background: MASS Lifecourse is a deep phenotyping study designed to improve understanding of the underlying biological processes of muscle ageing and the development of sarcopenia across the adult life course. It combines clinical and physiological assessments including muscle biopsy, epidemiological assessment of life course and environmental factors, and discovery science. Data are thus of value to a range of scientific disciplines but must deliver valid, generalisable data for each discipline. This work aims to understand better the characteristics of this unique study population.

Methods: Participants for the MASS Lifecourse study were recruited through GP practices in the Newcastle area. Invitations with postage-paid reply forms were mailed to potential participants with a request to provide name, address and an indication of whether they were interested in participating in the study. Interested respondents underwent telephone screening to assess suitability for inclusion. Those who were eligible and agreeable following discussion, were recruited into the study.

Results: To date, GP practices have mailed out 2419 invitations and 557 (23%) responses have been received. Of these respondents, 306 (55%) expressed an interest in participation. Of those not interested, 109 (43%) gave reasons which included disinclination towards the muscle biopsy and lack of time due to other commitments. Amongst those who were interested, 52 (17%) declined following discussion at their telephone screening, and 37 (12%) were excluded for medical reasons. The difference between respondent and GP surgery index of multiple deprivation decile was calculated for 338 respondents; the median difference was 0 for both interested and not interested groups.

Conclusions: Understanding patterns of response to invitations to participate provides valuable insights into the representativeness of the MASS Lifecourse study participants. This supports a fuller understanding of the study's scope and limitations and informs the extent to which results can be generalised.

P9. SARCOPENIA SCREENING IN OLDER COMMUNITY-DWELLING ADULTS: FINDINGS FROM SOUTHAMPTON LONGITUDINAL STUDY OF AGEING (SaLSA)

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Background: The SARC-F questionnaire can be rapidly implemented by clinicians to identify patients with probable sarcopenia. A score ≥4 is predictive of sarcopenia and poor outcome. We sought to identify the prevalence and demographic correlates of probable sarcopenia (SARC-F score ≥4) in community-dwelling older adults.

Methods: 480 participants (219 men, 261 women) identified from Primary Care completed a questionnaire ascertaining demographic, lifestyle factors, comorbidities, nutrition risk score (DETERMINE) and SARC-F score. Participant characteristics in relation to probable sarcopenia were examined using sex-stratified logistic regression. Age was included as a covariate.

Results: The median (lower quartile, upper quartile) age was 79.8 (76.9, 83.5) years. 12.8% of men and 23% of women had probable sarcopenia. Self-reported walking speed strongly associated with probable sarcopenia (men: odds ratio (OR) 10.39 (95% CI: 4.55, 23.72), p<0.001; women: 11.42 (5.98, 21.80), p<0.001 per lower band). Older age was associated with probable sarcopenia in both sexes (p=0.01) as was higher DETERMINE score (men: 1.30 (1.12, 1.51), p=0.001; women: 1.32 (1.17, 1.50), p<0.001 per unit increase). Among men, being married or in a civil partnership or cohabiting was protective against probable sarcopenia (0.39 (0.17, 0.89), p=0.03) as was reporting drinking any alcohol (0.34 (0.13, 0.92), p=0.03)

while in women generally similar relationships were seen though these were weaker. Higher BMI (1.14 (1.07, 1.22), p<0.001 per unit increase) and presence of comorbidities (1.61 (1.34, 1.94), p<0.001 per extra medical condition) were also associated with probable sarcopenia in women. All associations were robust after adjustment for age.

Conclusions: Probable sarcopenia (SARC-F score ≥4) was common in older adults living in their own homes. As expected, self-reported walking speed was highly predictive of probable sarcopenia. In addition to advancing age and malnutrition, socio-demographic factors were also important. Identifying these factors in clinical practice should trigger sarcopenia screening in older adults.

P10. MINERAL STATUS AND ITS ASSOCIATION WITH SARCOPENIA: THE NEWCASTLE 85+ STUDY

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Background: Data are lacking on nutritional mineral status and their association with sarcopenia in very old populations. Nutritional minerals are important in a multitude of biological functions such as protecting against oxidative damage which is important in sarcopenia pathogenesis. The aim of this study was to explore this association in 85-year-olds living in the Northeast of England by assessing concentrations of serum selenium, iron, zinc and copper.

Methods: Mineral status was assessed using standard laboratory techniques in 757 participants. Sarcopenia was defined according to the EWGSOP cut-offs. The associations between the mineral status and sarcopenia and severe sarcopenia status were explored using binary logistic regression. Linear mixed models explored associations between mineral status and time on the prospective, 3-year changes in sarcopenia. Covariates included sex, BMI, physical activity, cognition, total calorie, protein and alcohol intake, self-rated health, medications and smoking status.

Results: Cross-sectionally there were no significant associations of minerals on sarcopenia status (Selenium Exp(B) 1.005 (0.993-1.016), p=0.417; Copper Exp(B) 1.000 (0.999-1.001), p=0.407; Iron Exp(B) 1.001 (1.000-1.001), p=0.067; Zinc Exp(B) 1.000 (0.998-1.002), p=0.956). Over 3 years, serum iron status (β -9.819E-5±1.859E-5, p<0.001) was negatively associated with the change in prevalence of sarcopenia, however there was no association with serum selenium, copper or zinc status.

Conclusions: In this UK cohort of very old adults, serum iron status was associated with the change in prevalence of sarcopenia over 3 years. This is important to consider especially as anaemia is common in older adults and would warrant further research in its association with sarcopenia pathogenesis.

P11. HANDGRIP STRENGTH AS A PREDICTOR OF POST-OPERATIVE OUTCOMES FOLLOWING HIP FRACTURE

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Background: Sarcopenia is common in patients with hip fracture, but few studies have examined whether assessment of sarcopenia improves prediction of adverse post-operative outcomes. We examined whether sarcopenia, diagnosed using hand grip strength (HGS), could predict outcomes after hip fracture.

Methods: Routinely collected data from the National Hip Fracture Database were combined with locally collected HGS data from a high-volume orthopaedic trauma unit. Patients aged ≥65years with surgically managed hip fracture and grip strength measured on admission were included. The European Working Group on Sarcopenia in Older People (EWGSOP2) thresholds were used to identify patients with or without sarcopenia; those unable to complete grip strength testing were also included in analyses. Outcomes examined were 30-day and 120-day mortality, residential status and mobility, prolonged length of stay (>15 days) and post-operative delirium. Binary logistic regression models were used to examine prognostic value of HGS, and discriminant ability for the Nottingham Hip Fracture Score (NHFS) alone and on adding sarcopenia status were compared using c-statistics.

Results: We analysed data from 282 individuals; mean age 83.2 (SD 9.2) years; 200 (70.9%) were female. 99

(35.1%) patients had sarcopenia and 109 (38.7%) were unable to complete testing. Sarcopenia predicted higher 120-day mortality (OR 13.0, 95%CI 1.7-101.1, p=0.014), but not 30-day mortality (OR 1.5, 95%CI 0.1-16.9, p=0.74). Patients unable to complete HGS testing had higher 30-day mortality (OR 13.5, 95%CI 1.8-103.8, p=0.012) and 120-day mortality (OR 34.5, 95%CI 4.6-258.7, p<0.001). Sarcopenia status did not significantly improve discrimination for mobility but improved prediction of 120-day residential status (c-statistic 0.89 [95%CI 0.85-0.94] for NHFS + sarcopenia vs 0.82 [95%CI 0.76-0.87] for NHFS alone) and post-operative delirium (c-statistic 0.91 [95%CI 0.87-0.94] vs 0.78 [95%CI 0.73-0.84]).

Conclusions: Sarcopenia assessment via HGS testing may provide additional prognostic information to existing risk scores in older patients with hip fracture.

P13. A CROSS-SECTIONAL STUDY TO ASSESS THE PREVALENCE OF POOR SARCOPENIA SPECIFIC QUALITY OF LIFE IN MID-LIFE ADULTS

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Background: The European Working Group on Sarcopenia in Older People (EWGSOP) states that further research is needed to identify signs of sarcopenia earlier in life, and that interventions should focus on quality of life as well as clinical outcomes. Older adults with and without sarcopenia, according to the EWGSOP diagnostic thresholds, completing the Sarcopenia and Quality of Life Questionnaire (SarQoL) have been shown to record similar scores when comparing upper and lower percentiles respectively. It is therefore proposed that low SarQoL scores not only indicate reduced quality of life but could be an indicator of increased risk of developing sarcopenia.

Methods: A cross-sectional design was used. SarQoL data were collected during workplace health screening sessions. Participants were considered to have a sarcopenia risk factor if they scored lower than the 75th percentile of previously reported SarQoL scores of sarcopenic individuals. Prevalence was reported as a percentage of the study population.

Results: 73 participants (29 males, 44 females) with a mean age of 51.14 (±6.94) were recruited for this study. Participants that scored lower than the 75th percentile of sarcopenic individuals in total, and across 6 out of 7 domains (D7 Fears excluded) were as follows: Total score: 1/73, 1.36%, D1 Physical and Mental Health: 2/73, 2.73% D2 Locomotion: 5/73, 6.84%, D3 Body Composition: 5/73 6.84%, D4 Functionality: 1/73, 1.36% D5 Activities of Daily Living: 2/73, 2.73% D6 Leisure Activities: 56/73 76.71%.

Conclusions: Total SarQol scores, and scores in 6 of the 7 domains of the questionnaire by mid-life adults overlap with sarcopenic individuals. This suggests that the SarQoL could be used to identify individuals with reduced quality of life, and potentially at risk of developing sarcopenia. However, a larger sample size and longitudinal data would be needed to confirm these findings.

P16. PERFORMANCE OF INDIVIDUAL SARC-F SCORE COMPONENTS FOR IDENTIFICATION OF SLOW WALK SPEED AND LOW GRIP STRENGTH AMONG PATIENTS ATTENDING AN OLDER PEOPLE'S MEDICINE DAY UNIT

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Background: Previous studies have reported variable sensitivity and specificity of the total score derived from the five-question SARC-F screening questionnaire in identifying patients with sarcopenia. We explored whether individual SARC-F components could be used to more effectively identify patients with either slow walk speed or low grip strength.

Methods: Anonymised electronic clinical data from the Newcastle SarcScreen project, collected from an Older People's Medicine Day Unit, were used for this analysis. Patients with complete data for total SARC-F, individual SARC-F component scores and walk speed and/or grip strength were included. The sensitivity and specificity of the total SARC-F score and individual SARC-F components to identify patients with slow walk speed (≤0.8m/s) and low grip strength (<27kg men, <16kg women) were calculated.

Results: Five hundred and fifty-six patients (360 [65%] women, mean age 80.2±7.6 years) were included. 416 (75%) had a SARC-F score ≥4, 404 (88%) had a slow walk speed and 424 (77%) had low grip strength. Sensitivity and specificity of SARC-F score ≥4 for identifying a slow walk speed was 0.78 and 0.69, and for identifying low grip strength was 0.78 and 0.35. Individual SARC-F components did not show substantial benefits over the total score. For

slow walk speed, the best single questions (high sensitivity and moderate specificity) were 'difficulty lifting or carrying 10 lbs' with a sensitivity and specificity of 0.85 and 0.53, and 'difficulty climbing a flight of 10 steps' with a sensitivity of 0.82 and specificity 0.62. For low grip strength, the best single question was 'difficulty lifting or carrying 10 lbs' with a sensitivity and specificity of 0.84 and 0.31.

Conclusions: Individual SARC-F components do not give an advantage over the total SARC-F score in identifying slow walk speed or low grip strength in a patient group with a high prevalence of sarcopenia.

P17. IMPAIRMENTS IN CELLULAR GROWTH IN C2C12 SKELETAL MUSCLE CELLS TREATED WITH *EX VIVO* SERUM FROM ADULTS LIVING WITH RHEUMATOID ARTHRITIS EXPERIENCING MODERATE-TO-HIGH DISEASE ACTIVITY

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Background: Loss of muscle mass, strength and function (sarcopenia) is a common condition associated with rheumatoid arthritis (RA). However, the mechanisms which contribute to sarcopenia progression in RA remain unclear. Therefore, we aimed to investigate the influence of RA disease activity on sarcopenia progression with an *in vitro* model utilising *ex vivo* human serum from adults living with RA across the spectrum of disease activity.

Method: Fasted blood samples were obtained from 24 adults living with RA. Participants were divided into 4 clinically defined groups (n=6) based upon their Disease Activity Score-28 erythrocyte sedimentation rate (DAS28-ESR); 1: remission (<2.6), 2: low (≥2.6- <3.2), 3: moderate (≥3.2-5.1), 4: high (≥5.1). C2C12 myotubes were treated with serum from participants for 24 hours. After 24 hours a subset of cells was starved for 1-hour in *a*MEM, and subsequently treated with essential amino acids (EAA) for 30-minutes. Myotube diameter was assessed using fluorescent microscopy. Muscle protein synthesis (MPS) was measured using the surface sensing of translation (SUnSET) technique, and the protein content of anabolic and catabolic pathways were measured via Western Blot.

Results: Myotube diameter was reduced in myotubes treated with moderate and high DAS28-ESR, RA serum in comparison to both remission and low RA serum ($p<0.05$). A significant main effect for MPS was identified within groups after EAA treatment vs. fasted serum ($p<0.05$). In response to EAA treatment, a significant increase in Akt phosphorylation was identified within all groups ($p<0.03$). No change in the protein content of anabolic and catabolic markers were identified between groups in the absence of EAA.

Conclusion: We show myotube atrophy in myotubes conditioned with serum from adults experiencing moderate and high RA disease activity. This work provides an experimental platform to further probe the intracellular pathways which may contribute to sarcopenia in RA.

P18. EXPLORING ASSOCIATIONS BETWEEN THE GUT MICROBIOME AND SKELETAL MUSCLE IN THE MASS LIFECOURSE STUDY

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Background: Dysbiosis of the gut microbiome has been hypothesised to contribute to the development of sarcopenia, but studies to date have been equivocal. We aimed to explore associations between the gut microbiome and skeletal muscle in community-dwelling adults.

Methods: MASS Lifecourse study participants aged 45-85 years were recruited via primary care. Participants underwent detailed assessments including grip strength, gait speed, time to complete 5 chair stands, and appendicular lean mass index (ALMI) via dual-energy x-ray absorptiometry. Faecal samples were collected using OMNIgene GUT kit, with DNA extraction undertaken using QIAGEN powerlyzer powersoil DNA extraction kit. V4 16S rRNA gene sequencing was performed to obtain gut microbiota data. Associations between taxa relative abundance and bacterial diversity with grip strength, chair stand time, gait speed, and ALMI were investigated.

Results: Faecal samples from 34 men, median age 64 years (IQR 58, 76), and 44 women, median age 59 years (IQR 53, 68), were analysed. According to European Working Group on Sarcopenia in Older People 2 thresholds, 5 participants (6.4%) had low grip strength, 12 (15.4%) slow chair stand times, 3 (3.8%) slow gait speeds and 7 (9.0%) low ALMI. Increased alpha diversity was associated with older age (R^2 0.11, p=0.007), and males and females had significantly different microbiota profiles (R^2 0.058, p= 0.005). A higher Shannon's diversity index was associated with low ALMI (p=0.023), but on adjustment for sex the association did not persist. No other statistically significant associations were observed between measures of muscle structure and function and the gut microbiome.

Conclusion: In a community-dwelling study population, consistent associations between the gut microbiome and muscle measurements were not observed. This study provides an example of how deep-phenotypic information within MASS Lifecourse can be utilised to advance the understanding of the relationship between skeletal muscle and other biological systems.

P19. AGE-RELATED DIFFERENCES IN THE TRANSLOCATION OF ANABOLIC SIGNALLING INTERMEDIATES IN HUMAN SKELETAL MUSCLE FIBRES FOLLOWING EXERCISE AND PROTEIN FEEDING

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Background: Ageing results in dysregulated nutrient and mechanical loading-induced signal transduction within skeletal muscle, resulting a gradual decline in muscle mass. Age-related impairments may be concealed in peripheral interactions between intermediates of the mechanistic target of rapamycin (mTOR) within muscle fibres. Immunofluorescence microscopy holds the potential to determine mTOR-mediated trafficking in specific fibre-types, which would enhance our understanding of age-related muscle atrophy.

Methods: Vastus lateralis muscle biopsies were taken at rest and 1h-post resistance exercise and protein feeding (ExFed) from eight healthy young males (YM; 24±4 years) and seven older males (OM; 67±5 years). Samples were embedded in OCT, frozen in liquid nitrogen-cooled isopentane, and cut 7 µm thick. Mounted cryosections were incubated in primary antibodies and contrasting secondary antibodies for MHC-I (Type I fibres), WGA (fibre membrane) and mTOR, and regulatory mTOR intermediates: Rheb, TSC2 and Sestrin2. Images were captured at 20x using EVOS M5000 immunofluorescent microscope. A 5.5µm border from each fibre perimeter was drawn to compare central to peripheral abundance.

Results: In OM, a significant ExFed increase in peripheral type I fibre TSC2 (12%, p=0.007) was observed with no effect in YM (p=0.975). Similarly, type I peripheral mTOR was increased ~14% in OM (p=0.005), with no effect in YM (p=0.575). However, in YM, the putative leucine sensor, Sestrin-2, was increased ~24% post-ExFed (p=0.023), no effect in OM (p=0.408). Lastly, following ExFed, type I peripheral Rheb decreased by ~6% in YM (p=0.043), with no effect in OM (p=0.319).

Conclusions: ExFed translocation of mTOR-mediated signalling to the cell periphery was more apparent in type I than type II fibres and divergent between YM and OM. The absence of significant changes in type II fibres may be due to the biopsy timings and/or available sample size, whilst the age-related divergence is consistent with 'anabolic resistance' that drives sarcopenia progression.

P20. MUSCLE LOSS IN COPD: HOW MUCH OF A ROLE DOES SYSTEMIC INFLAMMATION PLAY?

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Background: Muscle loss occurs in chronic diseases in which there is a systemic inflammatory component. The relative contribution of inflammation to muscle loss compared with reduced physical activity is debated. We hypothesised that any inflammation contribution to atrophy would be identifiable in the muscle transcriptome of patients with different COPD severities.

Methods: We quantified physical activity (triaxial accelerometery), fat-free mass index (FFMI), and inflammatory cytokine levels in controls (n=30), mild COPD (n=37) and severe COPD (n=77). Circulating cytokine levels were compared with muscle gene expression profiles for patients with microarray data (n=79). Gene-set enrichment analysis was used to identify gene-sets associated with individual cytokines.

Results: Patients had lower activity (mins/day: mild COPD=47.5 [38, 73], severe COPD=37.0 [21.5, 64.5]) than controls (95.0 [61.0, 133.0], p<0.001), but activity did not differ between the patient groups. FFMI was not different between mild COPD and controls but was lower in severe COPD (FFMI [kg/m^2] control=16.5 [15.3, 20], mild COPD=17.0 [15.5, 18.2], severe COPD=15.3 [14.3, 16.7], p<0.001). Severe COPD showed 1.8-fold enrichment for TNFα stimulated gene-set in muscle compared to mild COPD (p<0.001). Multiple inflammatory gene-sets associated showed strong positive enrichment with pro-inflammatory

cytokines (e.g. IL-1β) in severe COPD (>2-fold, p<0.001) but not in mild COPD. In mild COPD these gene-sets showed equivalent negative enrichment with anti-inflammatory cytokines (e.g. IL-10). In the whole cohort IL6/JAK/STAT signalling associated with worsening lung function. In this gene-set receptors and adaptor proteins showed the strongest associations.
Conclusions: Our data suggest that reduced activity does not account for muscle loss in COPD and the muscle inflammatory response differs between patients with mild and severe COPD. In severe COPD the pro-inflammatory response predominates whereas in mild COPD the anti-inflammatory response is stronger. This difference is likely to be due to relative expression of pro-inflammatory receptors and adaptor proteins.

P21. IL-18 BINDING PROTEIN: FRIEND OR FOE IN MUSCLE WASTING?

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Background: IL-18 binding protein (BP) binds and inactivates the pro-inflammatory cytokine IL-18. In previous work, we found that IL-18BP increased following surgery and associated with loss of strength at 7 days implicating IL-18 in strength loss after surgery. As pro-inflammatory cytokines can promote muscle loss, we hypothesised that higher IL-18BP concentrations would associate with greater strength in individuals with sarcopenia.
Methods: Data from 129 individuals (68 women) recruited to the LACE trial (of leucine and ACE inhibitors for sarcopenia) were included in the analysis. IL-18BP was quantified by ELISA in plasma samples taken at baseline and 12 months. Muscle strength was measured as grip strength and quadriceps maximal voluntary contraction (QMVC) at baseline and 12 months. Baseline SARC-F score was obtained as a measure of physical capability in daily life.
Results: Contrary to our hypothesis, in men IL-18BP was negatively associated with grip strength at baseline (r=-0.314, p=0.014) and at 12 months (r=-0.446, p=0.001). Associations were stronger when grip strength was normalised for arm muscle mass. Similar associations were seen with QMVC. No significant associations with either grip strength or QMVC were seen in women. In the whole cohort IL-18BP also associated with SARC-F score (r=0.232, p=0.009), again this association was present in men (r=0.389, p=0.003) but not women (r=0.060, p=0.61); men with above median IL-18BP had higher SARC-F scores than those with below median IL-18BP. Re-investigation of our SOMAscan data in presurgical patients showed similar inverse associations of IL-18BP with strength. Comparison of circulating IL-18BP with the muscle transcriptome in these patients showed negative enrichment for mitochondrial genes suggesting that basal IL-18BP inhibits mitochondriogenesis or maintenance.
Conclusions: Our data suggest that IL-18BP may reduce muscle strength in men with sarcopenia, probably by reducing mitochondrial gene expression. These data are consistent with known effects of IL-18 on the maintenance of mitochondrial function.

P22. H19 CONTROLS THE SENSITIVITY OF MUSCLE TO INFLAMMATION BY BINDING Let-7 miRNAs

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Background: H19 expression associates with muscle mass in sarcopenia and in disease. The mechanism by which H19 contributes to muscle loss is not clear. H19 is a multifunctional long non-coding RNA that is both the source of microRNAs (miR-675) and a sponge for miRNAs (including the Let-7s). In cancer cells and in aortic smooth muscle cells H19 has been shown to regulate myc expression and activity by binding to Let-7 miRNAs
Methods: Muscle H19 expression of muscle mass in disease and healthy individuals was compared with the transcriptome from published studies and from one study of 18 individuals about to undergo aortic surgery using bi-weight mid-correlation followed by Gene-set Enrichment Analysis using the Hallmark gene sets. Myc, H19, IL6 and MCP-1 RNAs were quantified in TNFα treated C2C12 myoblasts transfected with locked nucleic acids designed to inhibit Let-7 binding to H19.
Results: In all human gene expression studies H19 expression was associated with the epithelial mesenchymal transition and myc target gene sets and with gene sets associated with inflammation. In older individuals there was a stronger association with inflammatory gene sets in particular IL-2 and interferon gene sets than in middle aged individuals. We developed locked nucleic acid that would bind to H19 and displace Let-7 miRNAs. Transfection of these miRNAs into C2C12 cells suppressed the expression of H19, c-myc and MCP-1. They also inhibited TNFα induced expression of IL-6 mRNA.
Conclusions: Our data suggest that individuals with higher expression of H19 have greater sensitivity to inflammatory signalling. Furthermore, they suggest that inhibiting the interaction between H19 and Let-7 miRNAs reduces

inflammatory signalling in muscle cells. Blocking Let-7 activity may provide a mechanism to reduce muscle wasting in response to inflammatory signalling.

P23. GROWTH DIFFERENTIATION FACTOR 15 (GDF-15) SINGLE NUCLEOTIDE POLYMORPHISMS AND MUSCLE PERFORMANCE IN SARCOPENIA

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Background: Circulating growth differentiation factor 15 (GDF-15) is negatively correlated with muscle mass and strength in disease and in healthy older adults. Previous studies have suggested that variation in circulating GDF-15 concentrations could be due to polymorphic variation in the GDF-15 locus. We tested the associations between circulating GDF-15 concentrations, GDF-15 polymorphisms and muscle performance in a population of older people with sarcopenia.

Methods: The Leucine and ACE inhibitor (LACE) trial enrolled 145 participants aged ≥70 years with low grip strength and low gait speed. Baseline visit GDF-15 concentrations and genotypes for variants rs1227731 and rs749451 were measured in 131 individuals and correlated with muscle performance measures (quadriceps strength, six-minute walk [6MW], short physical performance battery [SPPB] and SARC-F score) using Pearson's or Spearman's correlations and Mann-Whitney or Kruskal-Wallis tests where appropriate.

Results: Higher baseline GDF-15 concentrations correlated with greater age (r=0.246, p=0.005), with lower 6MW (r=-0.18, p=0.041 at baseline; similar correlations at 6 and 12 months), and with higher SARC-F (r=0.242, p=0.005). There was no significant correlation with SPPB, or with grip and quadriceps strength when split by sex. Both polymorphisms were in Hardy-Weinberg equilibrium with the expected allele frequencies. For SNP rs1227731, the major GG genotype (compared to combined AA/AG) had reduced quadriceps strength normalised to leg muscle mass (0.87 vs 1.12 kg/kg, p=0.024) in all participants, and lower SPPB scores (7.0 vs 9.0; p=0.038) among women, but not men. For SNP rs749451, individuals with the TT genotype had higher GDF-15 concentrations than CC individuals (CC=676 pg/ml TT=815 pg/ml CT=708 pg/ml; p=0.009). There were no differences in any strength or performance tests between CC and TT genotypes.

Conclusion: GDF-15 concentrations were negatively correlated with 6MW and SARC-F. Genotypic variation at two GDF-15 related SNPs is related to differences in GDF-15 concentrations but only for the rs1227731 SNP did these translate into differences in muscle strength.

P25. IS SARCOPENIA LINKED TO AN INCREASED RISK OF POLYPHARMACY AND NUMBER OF MEDICATIONS? A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Polypharmacy in older adults is associated with a variety of unfavourable outcomes that may impair muscle performance, regardless of the existence of medical issues. The goal of this systematic review and meta-analysis was to gain insight at the relationship between sarcopenia and polypharmacy and an increased intake of medications.

Methods: From inception until June 2022, a systematic literature search of observational studies was undertaken utilising the PubMed, Web of Science, Scopus, and Cochrane

Library databases. A meta-analysis employing a random-effects model was performed to compute the pooled effects to assess if sarcopenia is related with a higher risk of polypharmacy and an increased number of medications.
Results: This meta-analysis and systematic review collected data from 29 studies. Sarcopenia was linked with a greater prevalence of polypharmacy (odds ratio [OR]: 1.65, 95% confidence interval [CI] [1.23, 2.20], I^2=84%, p<0.01) and a higher number of medications (mean difference [MD]: 1.39, 95%CI [0.59, 2.19], I^2=95%, p<0.01). Using meta-regression, a high variance was observed due to different populations (i.e. community-dwelling, nursing home residents, inpatients, outpatients) for both polypharmacy (r=0.338, SE=0.1669, 95%CI [-0.67, -0.01], z=-2.03, p=0.04) and number of medications (r=0.589, SE=0.2615, 95%CI [0.08, 1.10], z=2.25, p=0.02).
Conclusions: In this study, we found that people with sarcopenia have a significantly greater chance of polypharmacy and increased administration of number of medications than people without this condition. Future research should determine whether the specificity and number of medications play a direct role in accelerating the development of muscle wasting and dysfunction in older adults.

P26. THE EFFECTS OF DIETARY NITRATE SUPPLEMENTATION ON PHYSICAL PERFORMANCE IN OLDER PEOPLE – A SYSTEMATIC REVIEW

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Background: Dietary nitrate (inorganic nitrate) supplementation has been proposed as an intervention to improve muscle function via increased nitric oxide (NO) availability. Although some studies show benefit in younger adults, the effects in older people are unclear. This systematic review evaluated the effects of dietary nitrate supplementation on physical performance and muscle strength measures in older people.
Methods: The review was conducted according to a prespecified protocol by two reviewers. We included interventional studies using dietary nitrate supplementation, with a mean participant age of 60 and over, with or without sarcopenia or impaired physical performance. Outcomes of interest were physical performance and measures of muscle strength and mass. Risk of bias was assessed using a structured tool. Results were grouped by intervention and outcome measures and were described by narrative synthesis.
Results: Our search strategy found 1174 titles; 25 studies were included in the review. Study size ranged from 8 to 72 participants. Data on baseline functional status were not available, but 7 studies were in healthy older adults. The intervention duration ranged from a single dose to twelve weeks. Most studies had high or unclear risk of bias; three had low risk of bias. One hundred and nineteen outcomes were reported; 62 were physical performance measures and 57 were muscle strength measures. Twenty-nine outcomes showed significant improvement, two showed significant worsening and 88 showed no statistically significant difference. Results that showed significant improvement did not group together under any particular outcome populations, intervention duration and outcome measures.
Conclusion: Current evidence suggests that increasing intake of dietary nitrates may be beneficial for physical performance and muscle strength in older people, however data are limited. Future studies should be longer, larger and target older people with sarcopenia or impaired physical performance.

P27. NOVEL RECRUITMENT AND RETENTION STRATEGIES FOR SARCOPENIA TRIALS – LEARNING FROM THE MET-PREVENT RANDOMISED CONTROLLED TRIAL

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Background: Recruiting and retaining participants in sarcopenia trials is challenging due to barriers in diagnosis, case-finding, exclusion criteria, frailty and drop-out. We describe innovative processes used by the

MET-PREVENT randomised controlled trial to improve recruitment and retention.

Methods: MET-PREVENT was a two-centre, double-blinded, placebo-controlled trial examining the efficacy of metformin in patients with probable sarcopenia and pre-frailty or frailty. A telephone pre-screening step used the SARC-F to identify those at risk of sarcopenia. Exclusion criteria were minimised, and in-person or remote consent was permitted. All study assessments could be conducted in participants homes or at a clinical research facility according to participant preference. Outcome measures were chosen to be simple and quick to collect. Study research teams had significant experience of community practice and of research with older people.

Results: 268 people expressed interest in participation. 214 (80%) underwent telephone pre-screening and 112 (42%) progressed to face-to-face screening. 49 were ineligible due to ≥1 exclusion/ inclusion criteria, 33 declined but gave no reason why, 14 indicated that trial burden, ill health, age or frailty limited participation, 8 were unable to consent, 8 would not take metformin, 3 were busy, 3 cancelled due to Covid-19, 1 cited family concerns and 1 relocated. For 36 people no reason for non-participation was recorded. Of the 112 screened, 80 (71%) were eligible to participate and 72 (64%) were randomised. Of these 42 (58%) were frail (Fried score ≥3/5). The mean 4m walk speed was 0.59m/s (SD 0.22) and the mean SPPB was 5.8 (SD 2.7). 70/72 (97%) of participants underwent the final study visit; one participant withdrew due to adverse events and one participant died.

Conclusions: A package of innovations in participant identification, recruitment processes and flexible study visits enabled recruitment to target and very high retention rates in this sarcopenia trial.

P28. A FEASIBILITY RANDOMISED CONTROLLED TRIAL EVALUATING SARCOPENIA IN PATIENTS WITH INTERSTITIAL LUNG DISEASES (ILD) RECEIVING INSPIRATORY MUSCLE TRAINING AS PART OF A PULMONARY REHABILITATION PROGRAMME

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Background: Pulmonary rehabilitation programmes (PRP) are a multidisciplinary intervention that typically includes exercise training (endurance and strength) and respiratory muscle training in addition to education sessions. ILD are chronic progressive lung diseases of ageing. PRP is one of the few recommended treatments available to people with progressive ILD. The effect of PRP on sarcopenia in elderly patients with ILD is unknown.

Methods: This was a feasibility pilot randomised controlled trial evaluating the effect of inspiratory muscle training as part of an 8-week PRP on sarcopenia in patients with ILD. This research adopted the European Working Group on Sarcopenia in Older People's definition of sarcopenia. Sarcopenia outcomes were evaluated before and after PRP: muscle strength (handgrip strength measured by Jamar hydraulic hand dynamometer), muscle quantity (bioelectrical impedance analysis; Tanita MC780 body composition analyser), and physical performance (four-metre gait speed).

Results: A total of 14 participants with ILD were enrolled into this study, 64% male with mean (SD) age and weight of 68 (9.4) years and 79.1 (13.7) kg respectively. After PRP sarcopenia parameters of our cohort of patients with ILD showed a trend towards stabilisation/improvement. Pre and post median (interquartile range) were; right hand grip strength 31 kg (22.5-38.4) and 36 kg (26-42) respectively, left hand grip strength 35 kg (24-39) and 36 kg (26.7-36.0) respectively, Appendicular skeletal muscle mass (ASM/height^2) 7.3 kg/m^2 (6.6-8.9) and 8.2 kg/m^2 (7.3-8.9) respectively, and 4-metre gait speed 0.97 m/sec (0.89-1.00) and 0.99 m/sec (0.88-1.06) respectively. The prevalence of sarcopenia in patients with ILD was 3/14 (21.42%) before and 2/9 (22.22%) after the pulmonary rehabilitation programme.

Conclusions: Pulmonary rehabilitation programs for patients with ILD incorporating measurements of sarcopenia are possible and there is potential for improvement. This supports the value and importance of PRP for patients with ILD and the feasibility of performing larger studies evaluating sarcopenia.

P29. EFFICACY AND SAFETY OF METFORMIN AS A THERAPY FOR OLDER PEOPLE WITH SARCOPENIA AND FRAILTY – THE MET-PREVENT RANDOMISED CONTROLLED TRIAL

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Background: Metformin has pleiotropic biological effects which might improve muscle function in older people. The MET-PREVENT trial tested the efficacy and safety of metformin as a therapy for sarcopenia and frailty in older people.
Methods: Double blind, randomised, parallel-group, placebo-controlled trial. Participants aged ≥65 with walk speed <0.8 m/s and low muscle strength (handgrip <16 kg for women, <27 kg for men, or 5x sit to stand >15s) were recruited from primary care and hospital clinics. Participants were randomised 1:1 using a web-based interactive system to receive 4 months of 500 mg metformin or matching placebo 3x/day. The primary outcome, analysed by intention to treat, was the between-group difference in 4 m walk speed at 4 months, adjusted for baseline values. Secondary outcomes included grip strength, short physical performance battery, six-minute walk distance, muscle mass by bioimpedance, quality of life and activities of daily living. All adverse events were recorded.
Results: Seventy-two participants were randomised, mean age 80 (SD 6) years. 42 (58%) were women, 42 (58%) were frail (Fried score ≥3); mean baseline 4 m walk speed was 0.59 m/s (SD 0.22). 70 (97%) completed the trial (metformin 34/36, placebo 36/36). 14 (40%) discontinued metformin and 5 (14%) discontinued placebo. There was no difference in the primary outcome between the metformin (0.57 m/s [SD 0.19] m/s) and placebo group (0.58 m/s [SD 0.24]); adjusted treatment effect was 0.001 m/s (95%CI -0.06, 0.06); p=0.96. There was no significant effect on measures of muscle mass, physical performance, quality of life or activities of daily living. The metformin group had more adverse events (110 vs 77) and more hospital admissions (12 vs 3)
Conclusions: MET-PREVENT achieved successful recruitment with high retention rates, however metformin did not improve physical performance and was poorly tolerated with high rates of adverse events in older people with sarcopenia.

P30. VALIDATION OF REMOTELY MEASURED PHYSICAL PERFORMANCE MEASURES IN OLDER ADULTS

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Background: The Short Physical Performance Battery (SPPB) is a widely used tool to assess physical performance in older adults, particularly those with reduced mobility and this is normally performed in a clinical setting. However, remote data collection has potential benefits, including cost and time savings, and improved accessibility for individuals with mobility impairments, care commitments, or disabilities. The study aimed to compare remote physical measurements with in-person measurements, including height, weight, grip strength, gait speed, chair stand time (CST), balance and SPPB in a subset of adults from the PROMOTe trial.
Methods: Sixteen participants (8 twin pairs) were included in this retrospective observational study. Their mean age was 75 years (range 72-76), with 75% (12/16) females. Data collected remotely via videoconference were compared to in-person data, taken within 48 hours. Participants were posted a package with a dynamometer and a four-meter ribbon for remote grip strength and gait speed measurement. The same equipment was used during in-person assessments. CST was measured using participants' chairs remotely, and a standard-size chair was used in the department. Detailed instructions were given to the participants regarding the

proper execution of all the measurements. Bland-Altman plots with 95% limits of agreement (LOA) compared height, weight, grip strength, gait speed, and CST. Paired t-tests were used for the overall short physical performance battery (SPPB) score and total balance score.
Results: 32/32 (100%) of chair stand time, weight and gait-speed measurements and 30/32 (93.75%) of the height and grip strength measurements fell within LOA. There was no significant difference noted between in-person (mean 11.9375, SD 0.06259) and remote (mean 11.81, SD 0.1359) measures for overall SPPB score (p=0.16, effect Size=2.04). Balance score measurements were identical.
Conclusions: The study suggests that remote physical performance measurements are valid for healthy older people, supporting their use in future trials.

P31. PREVALENCE OF FRAILTY AND SARCOPENIA IN CRITICAL LIMB-THREATENING ISCHAEMIA: ASSOCIATIONS, CLINICAL OUTCOMES, AND MULTIMORBIDITY IN FraiLTI STUDY

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Background: Sarcopenia is negatively associated with survival in several diseases and refers to deterioration in skeletal muscle function. Vasculopathy is often associated with multimorbidity and long-term outcomes are poor. This study examined the prevalence of frailty and sarcopenia in those with critical limb-threatening ischaemia (CLTI).
Methods: FraiLTI (Frailty in chronic Limb Threatening Ischaemia) is a multi-centre, prospective, observational study in the UK investigating CLTI. FraiLTI was led by Newcastle University and supported by the Vascular and Endovascular Research (VERN) and funded by the National Institute for Health Research (NIHR). REDCap was used to collect patient data. All dedicated vascular centres were eligible to participate. The primary outcome was identification of prevalence rates of frailty, sarcopenia, polypharmacy and multimorbidity. Secondary analysis explored any associations between frailty and sarcopenia, with clinical outcomes, particularly amputation free survival (AFS).
Results: Using the clinical frailty scale 43 (51.8%) were frail and the Fried phenotype for frailty revealed 49 (62.0%) as frail. Grip strength (males <27 kg, females <16 kg) elicited 27 (32.5%) as sarcopenic. We found a significant association between sarcopenia and frailty (44.2% frail, 20.0% not frail) (p=0.0344). L3 skeletal muscle area (SMA) on computed tomography (males <114cm^2, females 89.8cm^2), showed 7 (17.1%) sarcopenic patients and 34 (82.9%) non-sarcopenic patients. Cox regression did not show a significant relationship between grip strength and AFS and L3 SMA and AFS. There was also no relationship between frailty scores and AFS.
Conclusions: In this multi-centre, prospective observational study we show that frailty and sarcopenia are highly prevalent in those with CLTI. Highlighting the fact, sarcopenia and frailty need to be treated in conjunction with each other in clinical practice in CLTI.

P32. FEASIBILITY OF SCREENING FOR FRAILTY, SARCOPENIA AND NUTRITIONAL STATUS IN OLDER ADULTS UNDERGOING ELECTIVE SURGERY FOR COLORECTAL CANCER

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Background: Pre-operative frailty is a key determinant of post-surgical outcomes and often co-exists with both sarcopenia and malnutrition. Older patients account for a significant proportion of patients undergoing surgery for colorectal cancer, and therefore are more likely to be affected by these pre-operative risk factors.
Methods: Patients aged 65 and over, undergoing surgery for colorectal cancer (with curative intent) were recruited from five NHS sites across the UK. All participants were screened preoperatively for frailty and nutritional status, using a combination of the clinical frail scale (CFS), Groningen Frailty Indicator (GFI), grip strength, gait speed and short form Mini Nutritional Assessment (MNA-SF). Participants collected spot urine samples for objective measurement of habitual dietary intake. These screening measures were repeated eight weeks post-operatively, with additional urine samples collected in the first week postoperatively and again at four weeks.
Results: 32 participants (mean age 74.5 years. 59 % male) have been included to date. Using the mini-nutritional assessment, 41% of participants were identified as being at risk of malnutrition and a further 13% identified as malnourished. 34% of participants were identified as frail based on a GFI score >4.0. The average length of stay in hospital following surgery was 6.7 days. 21% of participants were unable to complete the in-person post-operative follow up successfully. Ill health, exhaustion and poor appetite were the main reasons for participants being lost to follow up.

Conclusions: This on-going study has demonstrated the feasibility of incorporating frailty and nutritional assessment alongside routine clinical care, in older adults undergoing surgery for colorectal cancer. However, retaining participants into observational studies during postoperative periods of convalescence, or whilst undergoing adjuvant treatment, is challenging. This feasibility study has highlighted the potential of home urine sampling as a viable method of dietary assessment within community settings to aid malnutrition screening.

P33. SYSTEMIC CANCER TREATMENT IS ASSOCIATED WITH PROBABLE SARCOPENIA IN OLDER PATIENTS: CROSS-SECTIONAL ANALYSIS OF ROUTINELY COLLECTED CLINICAL DATA

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Background: Cancer cachexia is a well-recognised phenomenon. However, cancer treatment may lead to induction of senescence, which may in itself promote sarcopenia.

Methods: We performed secondary analysis on prospectively collected routine clinical data for older adults assessed within Geriatric Oncology Liaison Development (GOLD) clinics from 18/1/2023 to 9/6/2023. Handgrip strength and Timed Up and Go (TUG) were measured by clinicians. Probable sarcopenia was defined as <27 kg in males, or <16 kg in females.

Results: Data were available for 88 patients (mean age 77.3 [SD 8.2]; 63/88 [71.6%] male). Overall, 39/88 (44.3%) met criteria for probable sarcopenia. Prevalence of sarcopenia was higher amongst patients undergoing chemo/radio/immunotherapy compared to endocrine or no systemic treatment (53.3% vs 29.4%, p=0.033). Excluding those on endocrine therapy, TUG was longer in patients with ongoing treatment or post-treatment compared to pre-treatment (23.4sec vs 11.5sec, p=0.009), with no significant differences in handgrip strength (males 29.6 kg vs 30.4 kg, p=0.836; females 16.9 kg vs 16.3 kg, p=0.825). In linear regression, greater activity levels were predictive of lower TUG (β -0.59, p<0.001), but there was no association with protein intake.

Conclusions: Systemic cancer treatment may lead to accelerated declines in muscle strength and physical performance. Further research is needed to assess underlying biological pathways to enable targeted treatment whilst still maintaining efficacy of anti-cancer therapies. Exercise interventions should continuously be implemented to promote physical activity for patients whilst undergoing cancer treatment.

P35. LONGITUDINAL SARCOPENIA PREVALENCE IN PATIENTS UNDERGOING COMPLEX ENDOVASCULAR ABDOMINAL AORTIC ANEURYSM REPAIR

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Background: Peri-operative sarcopenia may lead to detrimental post-operative outcomes. Complex aortic aneurysms can be repaired by key-hole stent grafts and undergo rigorous longitudinal imaging follow-up. This study aimed to evaluate how peri-procedural sarcopenia interacts with complex aortic aneurysm repair outcomes.

Methods: A database of all complex aortic aneurysm repairs performed by key-hole fenestrated stent endografts (FEVARs) between 2007 and 2021 at Newcastle Hospitals was reviewed. Sarcopenia was evaluated by measuring skeletal muscle surface area at the third lumbar vertebral level on Computed Tomography (CT) images using appropriate cut-off values. Baseline and longitudinal clinical data were captured. The primary outcome was to evaluate the relationship between sarcopenia and survival.

Results: 136 patients (89% males, median age 74.5 years [IQR 69-79]) underwent FEVAR for infra-renal (53.7%), and juxta-renal and thoracoabdominal aneurysms (46.3%). The median hospital stay was 5 days (IQR 3-8), and median follow-up period was 2 years (IQR 1-3). 24% patients suffered post-operative complications, and the median survival was 4.14 years (IQR 2.5-5). 14.7% had pre-operative sarcopenia, which increased to 21.3% at 90 days after FEVAR (P=0.001). However, sarcopenia gradually recovered over a 3-year period (19.1% in the first year, 14.7% in the second year, and 10.3% in the third year). Male gender (p<0.0001) and pre-operative sarcopenia (p=0.001) were the only predictors for post-operative sarcopenia. However, peri-operative sarcopenia did not affect post-operative complications or 2-year survival. Cox regression survival analysis revealed that chronic kidney disease (HR 2.6, CI 1.28-5.32, p=0.008) and pre-intervention haemoglobin levels (HR 0.98, CI 0.97-1.1,

p=0.007) were significant predictors for 2-year survival.
Conclusions: Despite the minimally invasive nature of FEVAR, sarcopenia worsens post-operatively and takes two years to recover. Although there was no clear direct relationship between sarcopenia and clinical outcomes here, perhaps through further study improved post intervention rehabilitation will accelerate recovery for this prophylactic intervention.

P37. ATTITUDES AND BARRIERS TOWARDS RESISTANCE EXERCISE TRAINING IN OLDER ADULTS LIVING WITH FRAILTY, MULTIPLE LONG-TERM CONDITIONS, AND A RECENT DETERIORATION IN HEALTH

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Background: Older adults living with frailty and multiple long-term conditions (MLTC), particularly those with a recent deterioration in health, are at increased risk of sarcopenia. Resistance exercise (RE) training is currently the most effective treatment for sarcopenia. However, little is known about attitudes and barriers towards engaging in RE in this group of older people.
Methods: Fourteen participants living with frailty, complex MLTC, and a recent deterioration in their health aged 69-92 years (10 women) were recruited from an Older People's Medicine Day Unit in Newcastle. Semi-structured interviews were conducted in participants' own homes using open-ended questions focusing on attitudes and barriers towards RE. Data were analysed using thematic analysis.
Results: Physical and psychological barriers to engaging in RE were identified. The main physical barrier was a self-perceived lack of strength to perform RE. Psychological barriers included a fear of falling or injury during exercise. There was a general lack of awareness and understanding of RE, with most participants having never heard of the term and being unaware of potential benefits. When RE was described, several participants stated that they would be willing to try RE, but it was apparent that an individualised approach with tailored personal support would be required to support engagement.
Conclusions: A range of barriers and enabling factors to RE exist which should be incorporated into the design of future programmes. Further work is needed to inform older people living with frailty, MLTC and a recent deterioration in health about the potential benefits of RE.

P38. THE EFFECTS OF VITAMIN K2 ON RECOVERY FROM MUSCLE-DAMAGING RESISTANCE EXERCISE IN YOUNG AND OLDER ADULTS - THE TAKEOVER STUDY

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Background: Vitamin K2 supplementation has emerged as a potential nutritional strategy to enhance recovery and modulate post-exercise physiological processes. The aim was to determine the effects of vitamin K2 supplementation on the recovery from exercise-induced muscle damage (EIMD) in young and older adults.
Methods: Healthy young (n=38, aged 18-40 years) and older (n=40, aged 65+ years) males and females were randomised to 12 weeks of daily supplementary intake of either vitamin K2 (menaquinone 7, 240 µg/day, K2VITAL® 0.2% DELTA powder) or placebo (cellulose). At baseline and after 12 weeks, participants completed an EIMD protocol (5 sets of 15 repetitions of knee extensor and chest press exercises), with measures of muscle strength and activity, functional ability (chair rise time), and muscle soreness obtained pre-exercise and at 3h, 24h, 48h, and 72h post-exercise. Data was analysed using a two-way repeated measures ANOVA for the main effect of time and interaction with treatment via R statistics (significance accepted as $p<0.05$).
Results: Seventy-five participants completed the trial. The interim results (young cohort only, n=37) demonstrate that the resistance exercise protocol induced muscle damage, with knee extensor peak torque ($p<0.001$, $Eta^2=0.088$) and rate of torque development ($p=0.005$, $Eta^2=0.076$) reduced in the days following the exercise bout but returning to baseline at 72h. Vitamin K2 supplementation appeared to reduce the electromechanical delay at the start of the knee extensor contraction ($Eta^2=0.024$). Functional ability

was impaired following the exercise protocol ($p<0.001$, $Eta^2=0.037$), accompanied with thigh muscle soreness ($p<0.001$, $Eta^2=0.011$), however vitamin K2 did not attenuate these responses.

Conclusions: Intense resistance exercise induces muscle soreness and impairs muscle strength and activity in young adults. Twelve weeks supplementation with Vitamin K2 (MK-7) shows potential to reduce the lag time between the activation of the muscle and a measurable change in force, indicating potential to attenuate muscle damage.

P39. "IT MAKES YOU FEEL ALIVE AND YOUNGER... BUT IT'S STRESSFUL ...MY BACK AND LEGS ACHE": A FOCUS GROUP STUDY ENCOURAGING RESISTANCE TRAINING AROUND RETIREMENT

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Background: Muscle weakness is a key component of sarcopenia. Resistance training is highly effective at preventing and treating muscle weakness, however few adults meet recommended levels. Retirement may be a key transition point in the life-course to promote resistance training. Given the potentially enormous benefits of resistance training at this life-stage, we aimed to understand motivators and barriers to resistance training around the time of retirement in order to determine strategies and messages to increase its uptake.

Methods: We facilitated five virtual focus groups (n=30) exploring motivators and barriers to resistance training around the time of retirement. The focus groups were recorded, transcribed and thematically analysed. Patient and Public Involvement contributors reviewed a summary of our results, highlighted areas to focus on and suggested key implications.

Results: Seven themes relating to resistance training around retirement were identified: confusion around resistance training; feeling good; resistance training is too demanding; impact upon health; social dimensions of resistance training; the impact of retirement; and promoting resistance training. Resistance training was positively viewed when associated with immediate and long-term health and wellbeing benefits and had a social dimension. However, there was a lack of understanding as to what constitutes resistance training, the required intensity level for effects; the role of pain; and the consequences of muscle weakness.

Conclusions: At the point of retirement, even among those who are active, there is a lack of understanding of what resistance training includes and the negative consequences of muscle weakness. There is urgent need to increase awareness of resistance training, particularly with regard to the intensity needed and the range of exercise options available. Encouraging visibility of resistance training in public, on social/mass media and ensuring ways to train socially are available will help to communicate information and normalise resistance training around retirement.

P40. CHARACTERISING SEX DIFFERENCES IN SKELETAL MUSCLE EXCITABILITY OF YOUNG HEALTHY VOLUNTEERS

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Background: Limited research has explored the effects of sex on healthy and unhealthy skeletal muscle ion channel excitability. Therefore, the basis of sex differences in this context remains largely unknown. Electrodiagnostic tests are routinely carried out to help diagnose skeletal muscle ion channel disease. Muscle velocity recovery cycles (MVRCs) are a specialist method of electrodiagnostic testing which allow skeletal muscle excitability to be assessed *in vivo* and have demonstrated validity in research and clinically when assessing for a variety of diseases e.g., critical illness myopathy. MVRCs involve direct stimulation/recording of a muscle fibre bundle at varying interstimulus intervals providing measurements of muscle relative refractory period (MRRP), early- and late- supernormality (ESN; LSN). By improving understanding of healthy physiological processes at the ion channel level, pathophysiological processes can be better described, and diagnostic precision can be enhanced.

Methods: An observational study of two groups of young healthy volunteers was carried out over an 8-month period. MVRCs of the tibialis anterior muscle were obtained from 26 volunteers (8 males; 18 females).

Results: There were no significant differences in supernormality between the groups as conditioning stimuli were increased. However, the low sample size and discrepancy of number of males of females may have obscured potential sex differences.

Conclusions: The varying effects of physiological sex on skeletal muscle excitability may be demonstrated using MVRCs. Future studies should consider a larger sample size to better characterise underlying physiological effect of sex; these studies should also incorporate MVRCs across the life course to determine the effects of endogenous characteristics such as sex within the ageing population. This knowledge could shape clinical assessment and management of diseases associated with ageing such as sarcopenia.

P41. CAN EMG PARAMETERS HELP UNDERSTAND CHANGES IN MUSCLE PHYSIOLOGY AS DEPICTED IN MRI METRICS?

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Background: Sarcopenia affects the quality, strength, function, and structure of human muscles. Structural information including muscle volume related to muscle force and intramuscular fat related to muscle quality can be obtained from magnetic resonance imaging (MRI). Wearable sensors measuring surface electromyography (EMG) provides functional information about changes in muscle activity. Clinically, detecting metrics quantifying muscle structure in EMG signals would permit the application of wearable sensors to diagnose sarcopenia. This study aimed to evaluate whether changes in muscles reflected in EMG parameters are same in MRI metrics using Principal Component Analysis (PCA).
Methods: Data were collected from 6 healthy young adults (YA) (21–30 years, median 23) and 6 healthy older adults (OA) (60-75 years; median 66). Muscle activity while treadmill walking was recorded from 3 leg muscles (tibialis anterior [TA], medial gastrocnemius [MG]), soleus [SO]) using a wireless EMG system (PLUX S.A.,1000Hz). MRI data included 3-point Dixon for segmentation of muscle volumes (MV) obtained by manual segmentation in ITK-SNAP. EMG features like coactivity, repeatability of EMG, and power spectral density was estimated using a nonlinearly scaled wavelet transform (7-395Hz). MRI features such as muscle volume, intramuscular fat and thickness of adipose tissue were extracted. PCA using z-score was performed to evaluate contribution of these parameters towards the various components of PCA.
Results: Prominent contributions (28.16%) power spectral density in high wavelet frequency bands (271-395Hz) were found in TA and SO. Similarly, positive contribution of muscle volume of TA and SO were observed in 1st principal component.
Conclusion: The higher frequency contribution from EMG along with greater contribution of MV of the one-joint muscles TA and SO from MRI suggests there is a possibility to use wearable EMG sensors to identify changes in muscles. Further investigation is needed to determine if these changes are related to physical activity or solely to age differences.

P42. RISK ASSESSMENT FOR COLORECTAL SURGERY IN PATIENTS WITH CHRONIC LIVER DISEASE: A FEASIBILITY STUDY TO DETERMINE THE ROLE OF PORTAL HYPERTENSION AND OTHER FACTORS IN OUTCOMES FROM SURGERY

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Background: Chronic liver disease (CLD) is a condition where the liver becomes scarred and loses function. It is an important and often under-recognised condition, affecting 1% of patients who require colectomy. In patients who require colectomy, CLD is associated with increased rates of complication and death compared with patients who do not have CLD. The link between CLD and poor outcome is not well understood. This study sets out determine which patients with CLD are most at risk of complications and death after colectomy and to develop a better method of establishing their risk.
Methods: Patients with CLD under consideration for colorectal surgery for colorectal cancer undergo risk assessment. In addition to biochemical and clinical assessment, patients undergo transient elastography (TE), hepatic venous pressure gradient measurement (HVPG), MRI, sarcopenia and frailty assessments. Patients make a shared decision with their colorectal team regarding surgery based on the results of their risk assessment. The outcomes following surgery or non-operative management are then observed.
Results: 26 patients with CLD requiring resection have so far been referred for risk assessment. 18 patients have undergone surgery, 5 did not undergo surgery and 3 have a decision pending. 6 patients developed liver decompensation following surgery of whom 3 patients died. The rate of complications in patients undergoing surgery was 61%. Analysis of the impacts of TE, HVPG, MRI, sarcopenia assessment and frailty on outcome are ongoing.
Conclusions: Colorectal surgery in patients with CLD is associated with increased rates of morbidity and mortality. Once recruitment is complete the aim of this study is to determine the impact of portal hypertension and other factors in outcomes following colectomy.

APPENDIX

List of authors and abstract numbers.