

Sarcopaenia, nutrition and falls

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ICD 10 CM Code: M 62.84

Sarcopaenia:
a new diagnosis
ICD 10 CM: M 62.84

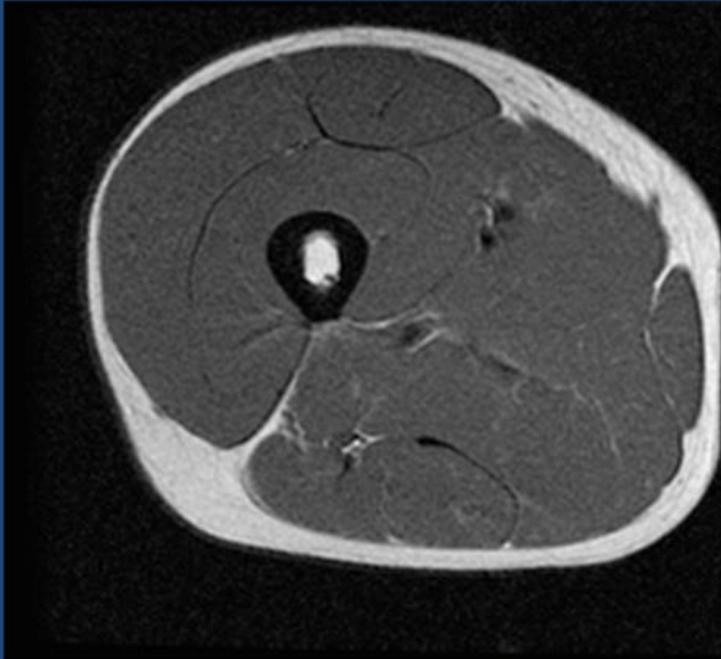


Age 25

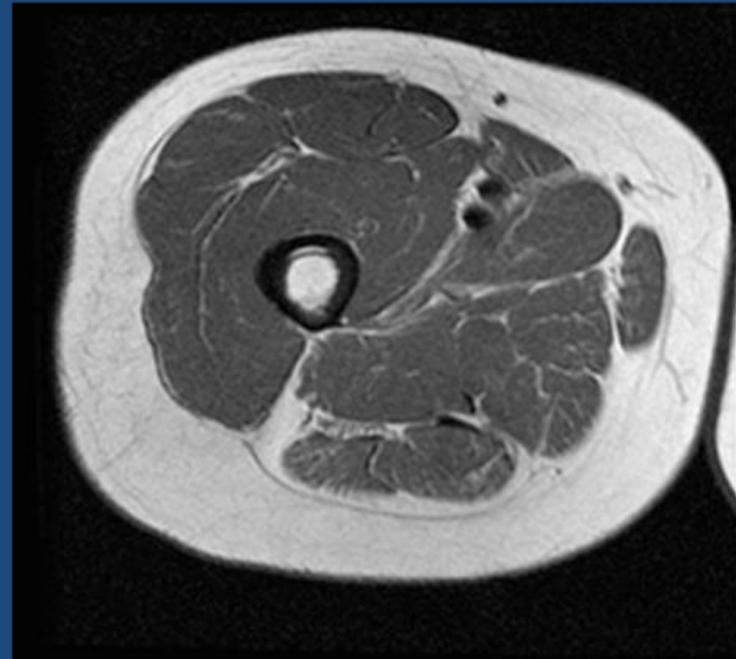


Age 63

Sarcopaenia in the thigh



Age 25



Age 63

Sarcopaenia

- Sarx = flesh
- Paenia = lack of
- Defined as:
 - an age associated combination of low muscle mass together with muscle weakness causing functional problems
 - A progressive and generalised loss of muscle mass and strength
- Make the diagnosis based on mix of muscle mass, muscle strength (hand grip strength) and gait speed

Sarcopaenia

- **Muscle mass** measured as appendicular lean body mass (ALM) which is non bone lean mass of the limbs, measured using DEXA
- **Muscle strength** is measured traditionally by hand grip strength, but chair rise or gait speed may be used
- **Functional limitations** may be on ADL assessment, gait speed, SPPB
- Some disagreement over definition and measurement of sarcopaenia

Definitions of sarcopaenia

Table 1 Comparison of sarcopenia definitions

Definition	Function	Muscle mass
SIG: cachexia-anorexia in chronic wasting disease [3]	Gait speed <0.8 m/s, OR other physical performance test	Low muscle mass (2SD)
EWGSOP [4]	Gait speed <0.8 m/s; grip strength 40 kg males, 30 kg females	Low muscle mass (not defined)
IWGS Sarcopenia Task Force [5]	Gait speed <1.0 m/s, grip strength	Low appendicular lean mass (<7.23 kg/m ² in men, 5.67 in women)
Sarcopenia with limited mobility (SCWD) [6]	6 min walk <400 m, OR gait speed <1.0 m/s	Low appendicular lean mass/height ²
Asian Working Group for Sarcopenia [7]	Gait speed <0.8 m/s; grip strength 26 kg males, 18 kg females	Low appendicular lean mass/height ²
Foundation for the National Institutes of Health [8]	Gait speed <0.8 m/s; grip strength 26 kg males, 16 kg females	Appendicular lean mass/BMI

EWGSOP European Working Group of Sarcopenia in Older Persons, *SCWD* Sarcopenia, Cachexia and Wasting Disorders, *IANA* International Association of Nutrition and Aging)

Sarcopaenia

- Difficulties with definition of sarcopaenia:
 - Similar approach to osteoporosis with use of a population based normal measurement
 - Differences in values depending on which instrument is used eg. BIA assesses more loss of muscle mass than DEXA
 - Differences in values depending on which population is used for comparison with age and ethnicity eg. Study of 654 late middle aged Dutch showed almost none were sarcopaenic using US normal values

Sarcopaenia

- We lose approximately 1% of muscle mass every year from age 30, more after age 75
- Lose gluteal muscle mass more than any other muscle groups in both men and women
- May be unrecognised because muscle is replaced by fat or connective tissue
- Loss of muscle with age is probably inevitable – even life long athletes have less muscle mass as they age
- Muscle mass is **not** the same as muscle strength, as quality of muscle is also important

Appearances can be deceptive



Sarcopaenic Obesity



Why is muscle important?

- It generates power and moves us
- But also:
 - It is a major source of protein and energy in times of stress and malnutrition
 - It regulates glucose levels - low muscle mass is associated with increased insulin resistance and Type 2 Diabetes
 - Low muscle mass also associated with increased drug toxicity, and reduced hormonal homeostasis

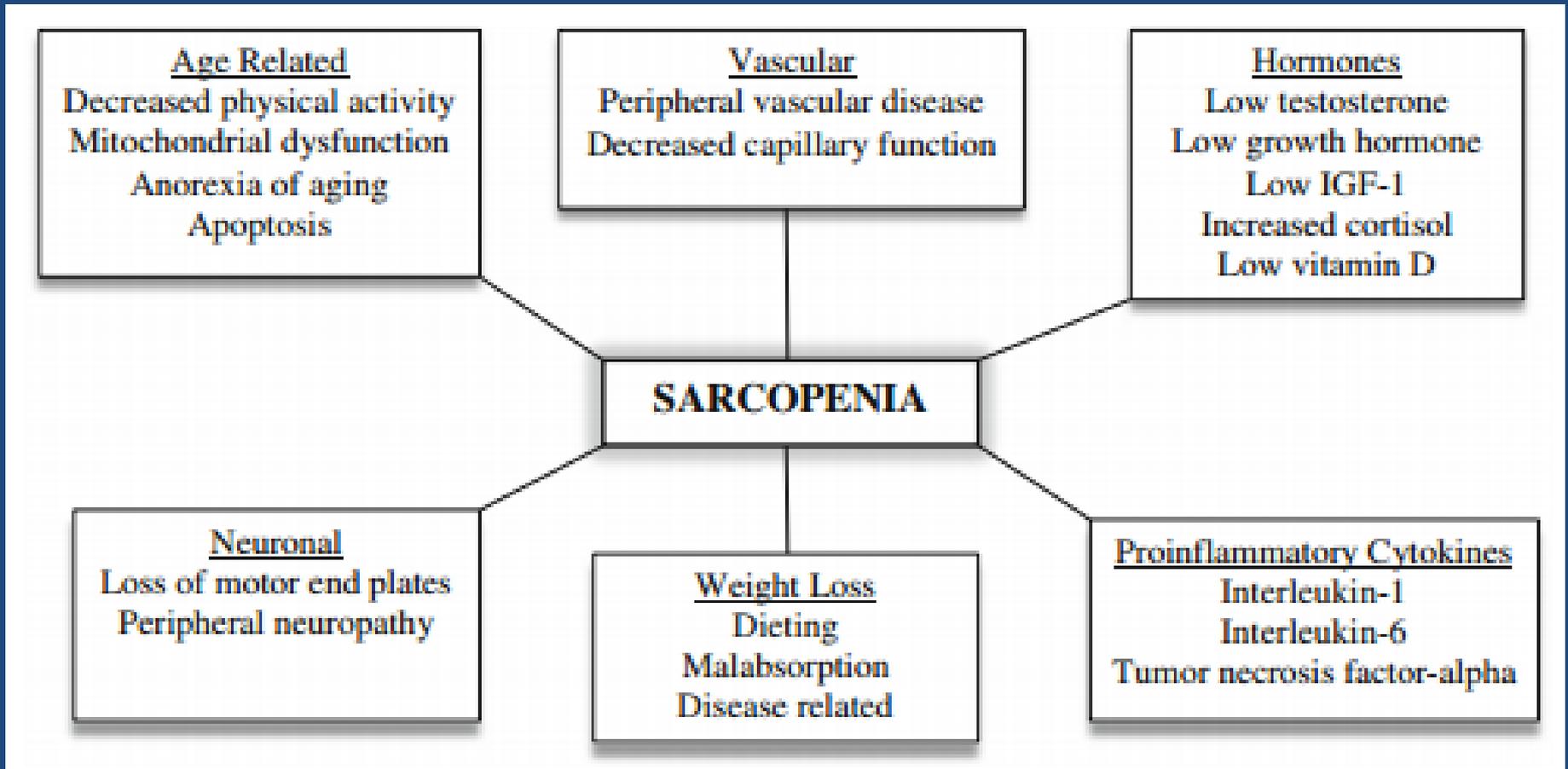
How common is sarcopaenia?

- Depends on which definition is used
- In CHAMP study of men > 70 years (FNIH def):
 - 14% had sarcopaenia using low ALM
 - 5% had sarcopaenia using low ALM and weakness
 - 4% had sarcopaenia using low ALM, weakness, and gait speed < 0.8m/sec
- In Western Europe using EWGSOP definition:
 - 11% using highest cut offs
 - 20% using lowest cut offs

Causes of sarcopaenia

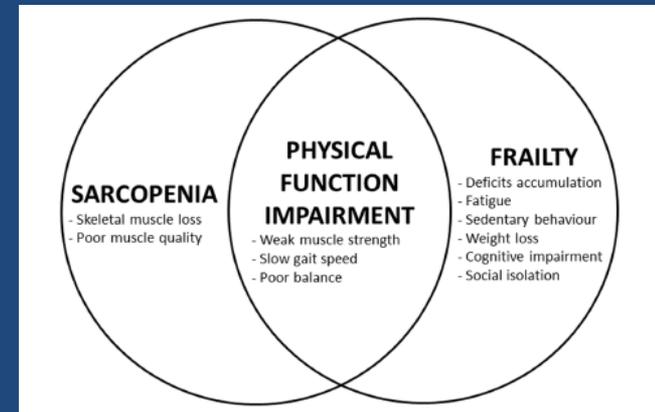
- Age
- Lack of exercise
- Pro-inflammatory factors – IL-6 which is produced in acute and chronic disease and in older age
- Decreased muscle satellite cell function
- Mitochondrial dysfunction due to oxidative damage → slower gait speed
- Smoking, medical comorbidities, Vit D deficiency, obesity

Causes of sarcopaenia



What are the consequences of sarcopaenia?

- Low muscle strength
 - Slow gait speed
 - Increased risk of falls
 - Decreased function in ADLs
- Increased chance of hospitalisation
- Increased chance of institutionalisation
- Poor post operative recovery
- Higher drug toxicity
- Development of frailty
- Increased risk of death

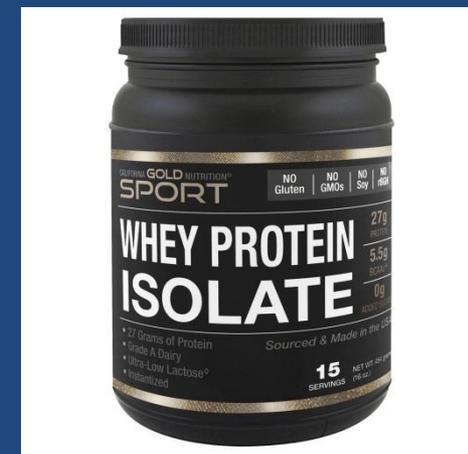


Sarcopaenia and falls

- Sarcopaenia as measured using EWGSOP definition in 260 older people 80+ over 2 years
 - 25% sarcopaenic
 - 27% with sarcopaenia fell
 - 10% without sarcopaenia fell
 - **3.2** times more likely to fall if sarcopaenic
- Sarcopaenia (EWGSOP) in 5800+ older people over 1 year (Study of Osteoporotic Fractures)
 - **2.4** times more likely to fall if sarcopaenic
- Loss of muscle mass and strength, and the associated loss of physical performance, increases the risk of falling

Sarcopaenia and bed rest

- Brief periods (from > 1 day) of disuse can accelerate sarcopaenia
- Older people on bed rest lose muscle mass at 2 to 3 times the rate of younger people
- Bed rest leads to insulin resistance, and resistance to anabolic protein metabolism, and subsequent muscle loss
- Resistance exercise and mobilisation can slow or halt these changes
- Supplementation with leucine enriched whey protein isolate for bedfast older people has shown reduction in muscle loss (20 gms TDS)



Assessing for sarcopaenia: SARC-F

TABLE. The Simple "SARC-F" Sarcopenia Questionnaire (0-10 points)³

Component	Question	Scoring
Strength	How much difficulty do you have in lifting and carrying 10 pounds?	None = 0 Some = 1 A lot or unable = 2
Assistance in walking	How much difficulty do you have walking across a room?	None = 0 Some = 1 A lot, use aids, or unable = 2
Rise from a chair	How much difficulty do you have transferring from a chair or bed?	None = 0 Some = 1 A lot or unable without help = 2
Climb stairs	How much difficulty do you have climbing a flight of 10 stairs?	None = 0 Some = 1 A lot or unable = 2
Falls	How many times have you fallen in the last year?	None = 0 1-3 falls = 1 4 or more falls = 2

SARC-F

- Validated in US populations: NHANES, Baltimore Longitudinal Study on Aging, African American Health study, and in Asia
- Correlates with handgrip strength, gait speed, SPPB
- “appropriate for detecting patients at risk of adverse outcomes including hospitalization and mortality...”



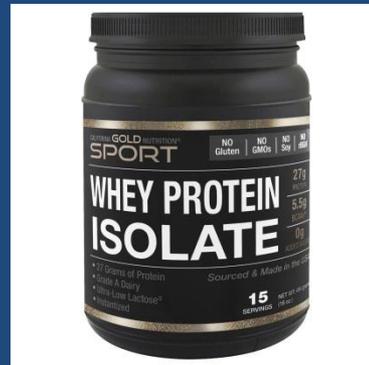
Treatment of sarcopaenia

- Progressive resistance training 3 sessions/week of main muscle groups
 - Reduces pro-inflammatory factors including CRP and IL-6 levels
 - Improves muscle satellite cell function
 - Improves blood flow to muscle
 - Decreases oxidative stress



Treatment of sarcopaenia

- Appropriate nutrition:
 - protein 1.5gm/kg/day in divided doses (whey protein enriched with leucine - WPI)
 - Omega 3 FAs 4gms/day



Treatment of sarcopaenia

- Medications
 - Vitamin D (to ensure Vit D replete)
 - Anabolic steroids (decadurabilon)
 - Hormones – oestrogen, tibolone
 - Myostatin inhibitors and other “peptides”
 - ACE inhibitors
 - Cytokine inhibitors



Management of falls in older people should include attention to nutrition

- If older people have sarcopaenia contributing to their falls risk, then exercise alone is not enough
- Older people need to have adequate protein in their diet (1.5gm/kg/day)
- Referral to dietitian is essential in some cases and important in most

 **April 2018**
APRIL FALLS MONTH
& **APRIL FALLS DAY**® - Wednesday 4th April

Nutrition and Hydration - Eating well to prevent falls



Exercising into older age: never too old



Are we and our patients all fated to develop muscle changes as we age?

- Yes and no
- We will all lose some muscle mass as we age even with regular exercise

BUT

- We can markedly ameliorate these changes with appropriate exercise and nutrition, and possibly medication (in the future)

Physical activity: Hippocrates

All parts of the body which have a function if used in moderation and exercised in labors in which each is accustomed, become thereby healthy, well developed and age more slowly; but if unused and left idle they become liable to disease, defective in growth and age quickly.

—Hippocrates, c. 450 B.C.

Sarcopaenia: Prof John Morley

- “It is time for physicians to screen for sarcopenia and provide treatment for it—at a minimum resistance exercise and protein, and vitamin D supplementation.”



Morley 2014

Thank you