

Research and Practice

Sarcopenia: a frequent cause of disability in older adults

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Key Highlights:

- Sarcopenia is characterized by age-related loss of skeletal muscle mass and strength, leading to adverse health outcomes, physical disability, and mortality.
- It is estimated to affect 10%–16% of the older population worldwide.
- While a globally accepted definition is still lacking, the 2018 revised EWGSOP2 definition identifies low muscle strength as the primary hallmark of sarcopenia and the most reliable indicator of muscle function.
- Aging is the primary cause of sarcopenia, with secondary causes including inactivity, disease, inflammation, and malnutrition.
- The main non-pharmacological strategies for preventing and managing sarcopenia are exercise training and adequate nutrition, either alone or in combination.

INTRODUCTION

The word Sarcopenia is derived from the Greek „*Sarx*“ meaning flesh and „*-penia*“ meaning poverty. Sarcopenia refers to the age-related loss of skeletal muscle mass and strength (1), which is associated with increased risk of several adverse health outcomes in the older population, including cognitive impairment, fractures, physical disability and mortality (2, 3).

DEFINITION

Sarcopenia was first described by Rosenberg in 1989 as a clinical condition characterized by the loss of skeletal muscle mass in the context of aging (1). In 2010, the European Working Group on Sarcopenia in Older People (EWGSOP) introduced a widely adopted definition of sarcopenia, which expanded on earlier definitions by including muscle function alongside low muscle mass (3). In 2018, the updated EWGSOP2 definition incorporated advancements in understanding muscle function (3). The revised definition identifies low muscle strength as the primary hallmark of sarcopenia and the most reliable indicator of muscle function (3).

In the revised paper in 2019, the EWGSOP2 also presented an algorithm for sarcopenia case-finding, diagnosis and severity determination (3). See Figure 1.

Figure 1. Sarcopenia: EWGSOP2 algorithm for case-finding, making a diagnosis and quantifying severity in practice. The ...

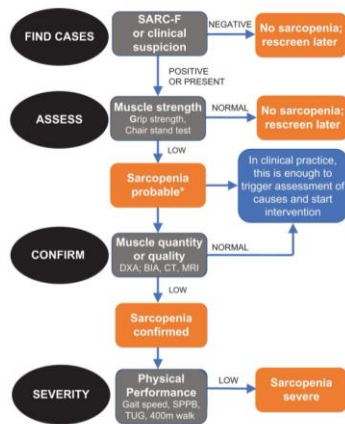


Figure 1. Sarcopenia: EWGSOP2 algorithm for case-finding, making a diagnosis and quantifying severity in practice. Age Ageing. 2018 Sep 24;48(1):16–31. doi: [10.1093/ageing/afy169](https://doi.org/10.1093/ageing/afy169)

Other definitions of sarcopenia were proposed by the Asian Working Group for Sarcopenia (AWGS), the Australian and New Zealand Society for Sarcopenia and Frailty Research (ANZSSFR), the Foundation for the National Institutes of Health (FNIH) Sarcopenia Project, the International Working Group on Sarcopenia (IWGS), and the Sarcopenia Definitions and Outcomes Consortium (SDOC) in 2020 (4). Moreover, between 2022 and 2023 the Global Leadership Initiative in Sarcopenia (GLIS) launched a two-phase International Delphi Study to establish a global conceptual definition of sarcopenia (4). Nevertheless a global and widely accepted definition of Sarcopenia remains lacking (2, 4).

EPIDEMIOLOGY

Sarcopenia is common among older adults but can also onset in mid-life (2,3). In the systematic review of Yuan, 2023, the prevalence of sarcopenia was largely variable depending on the definition and assessment method used (2). In this review the estimated global prevalence of Sarcopenia using all studies considered was between 10%–16 % of the older population in the world (2).

In addition to that, a higher prevalence of sarcopenia was reported in different subsets of specific disease-populations such as diabetics, patients with liver and renal failure, and cancers patients (2).

PATHOGENESIS

-**Ageing**: is the primary cause of decline in muscle mass, strength, and function (3). Other factors involved, related to aging, are also decreases in hormonal concentrations, including growth, sex, and thyroid hormones, and insulin-like growth factor (1).

Sarcopenia is associated also with different risk factors interacting with each other (1,3), which are mainly (3):

-**Inactivity**: the gradual decline in muscle fiber and strength related with aging can be aggravated by lack of exercise and sedentary lifestyles (1,3)

-**Disease**: disease-related inflammation can accelerate muscle loss (3)

-Malnutrition: inadequate protein intake and inability to synthesize protein (1) are other secondary factors associated with Sarcopenia including also under and over -nutrition, anorexia due to different diseases and malabsorption (1, 3)

TREATMENT

As there are no actual drugs approved for the treatment of Sarcopenia (1) the clinical management and prevention of sarcopenia includes non-pharmacological measures such as resistance exercise and adequate nutritional patterns (1, 5). Exercise interventions, especially those based on resistance training, may have a role in improving muscle mass and strength, and physical performance (1). Resistance exercise has been demonstrated as the main non-pharmacological sarcopenia management with significant positive evidence (1, 5). Regarding nutritional approaches, evidence-mainly observational, suggests benefits from adequate intake of protein, vitamin D, antioxidant nutrients, and long-chain polyunsaturated fatty acid (1, 5). Protein supplementation, particularly among older adults with low habitual protein intake, may be an effective strategy for preventing sarcopenia (5). This has led to discussions about whether protein requirements for older adults should be increased (5).

Notably, leucine and β -hydroxy- β -methylbutyrate (HMB) have been proposed as potentially beneficial for preserving muscle mass and strength (5). However, further research is needed to substantiate their effectiveness (5). A promising approach may be the combination of protein supplementation and exercise as a strategy to maintain muscle mass and strength in older adults, however further trial data are needed to develop precise recommendations (5).

CONCLUSION

Despite the lack of a widely accepted definitions, Sarcopenia is a relatively frequent condition in the aging population (2,3) imposing personal, social and economic burdens (1, 3). It can lead to declined quality of life, loss of independence and increased mortality (2, 3). Current evidence highlights the importance of early detection and emphasizes the role of an active lifestyle and high-quality nutrition, either alone or in combination, in the prevention and management of sarcopenia (5). However, further research is required to develop and implement targeted intervention strategies.

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