**Sarcopenia**

Human muscle undergoes constant changes. After about age 50, muscle mass decreases at an annual rate of 1–2%. Muscle strength declines by 1.5% between ages 50 and 60 and by 3% thereafter. The reasons for these changes include denervation of motor units and a net conversion of fast type II muscle fibers into slow type I fibers with resulting loss in muscle power necessary for activities of daily living. In addition, lipids are deposited in the muscle, but these changes do not usually lead to a loss in body weight. Once muscle mass in elderly subjects falls below 2 standard deviations of the mean of a young control cohort and the gait speed falls below 0.8 m/s, a clinical diagnosis of sarcopenia can be reached. Assessment of muscle strength using tests such as the short physical performance battery test, the timed get-up-and-go test, or the stair climb power test may also be helpful in establishing the diagnosis. Sarcopenia is one of the four main reasons for loss of muscle mass. On average, it is estimated that 5–13% of elderly people aged 60–70 years are affected by sarcopenia. The numbers increase to 11–50% for those aged 80 or above. Sarcopenia may lead to frailty, but not all patients with sarcopenia are frail—sarcopenia is about twice as common as frailty. Several studies have shown that the risk of falls is significantly elevated in subjects with reduced muscle strength. Treatment of sarcopenia remains challenging, but promising results have been obtained using progressive resistance training, testosterone, estrogens, growth hormone, vitamin D, and angiotensin-converting enzyme inhibitors. Interesting nutritional interventions include high-caloric nutritional supplements and essential amino acids that support muscle fiber synthesis.

**A history of muscle loss**

Muscle is key to motion. As we age, significant changes in muscle mass and quality take place. After about age 50, muscle mass decreases at an annual rate of 1–2% [[1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR1), [2](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR2)]. The decline in muscle strength is even higher, amounting to 1.5% per year between ages 50 and 60 and 3% per year thereafter. These findings have only received systematic research over the last two or three decades during which interest in age-related changes in physiologic function increased. This fact appears indeed curious because Macdonald Critchley, then junior neurologist at King’s College Hospital in London, wrote already in 1931 that “the entire musculature tends with advancing age to undergo involutional changes, which are manifested as wasting” [[3](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR3)]. He went on saying that “probably the chief cause of this change is to be demonstrated in the general process of senile atrophy, which shows itself in the muscles and elsewhere.” Later on, in the 1970s, Nathan Shock published a series of articles on age-related physiologic functions using data from the first large-scale longitudinal study in this field [[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR4)]. Altogether, it evolved that no decline in structure and function is more dramatic than the decline in muscle mass that develops as we age. Irwin Rosenberg realized that if this phenomenon were to be taken seriously, a name was required, and at a meeting in Albuquerque, New Mexico, in 1988, he suggested to use the term sarcopenia [[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR5)]. Following the recommendation by Morley, the term took hold over these last 20 years [[6](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR6)].

**How to measure muscle mass and muscle strength?**

The name sarcopenia is derived from Greek *sarx* (flesh) and *penia* (loss), literally meaning poverty of flesh. Sarcopenia is one of the four main reasons for loss of muscle mass, the others being anorexia, dehydration, and cachexia [[7](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR7), [8](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR8)]. It is difficult to estimate the prevalence of sarcopenia (Table [1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/table/Tab1/)), mostly because of practical difficulties in assessing muscle mass. Many different methodologies have been used over the last 20 years, and new techniques are still being introduced. On average, it is estimated that 5–13% of elderly people aged 60–70 years are affected by sarcopenia, and the numbers increase to 11–50% for those aged 80 or above. Sarcopenia may lead to frailty, but not all patients with sarcopenia are frail. In essence, sarcopenia is about twice as common as frailty [[9](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/#CR9)].

SOURCE: National Institute of Health

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3060646/>