

# PubMed Results : Sarcopenia ... the Missing Link

J Nutr Health Aging. 2000;4(3):140-2.

## **Sarcopenia: a major modifiable cause of frailty in the elderly.**

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Sarcopenia is the loss of muscle mass and strength that occurs with aging. It is a consequence of normal aging, and does not require a disease to occur, although muscle loss can be accelerated by chronic illness. Sarcopenia is a major cause of disability and frailty in the elderly. There are many candidate mechanisms leading to sarcopenia, including age-related declines in alpha-motor neurons, growth hormone production, sex steroid levels, and physical activity. In addition, fat gain, increased production of catabolic cytokines, and inadequate intake of dietary energy and protein are also potentially important causes of sarcopenia. The relative contribution of each of these factors is not yet clear. **Sarcopenia can be reversed with high-intensity progressive resistance exercise, which can probably also slow its development. A major challenge in preventing an epidemic of sarcopenia-induced frailty in the future is developing public health interventions that deliver an anabolic stimulus to the muscle of elderly adults on a mass scale.**

Can J Appl Physiol. 2001 Feb;26(1):123-41.

## **The effects of strength training (high intensity resistance training{HIRT}) on sarcopenia.**

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In the past decade strength training has been investigated extensively as a means of reversing the muscle mass loss that occurs with aging (sarcopenia). High intensity resistance training (HIRT) has led to increased protein synthesis, along with muscle hypertrophy measured at the whole body, whole muscle, and muscle fibre levels, in older adults. Typically, the strength increments associated with HIRT have been much larger than the hypertrophic response. However, most HIRT periods have been quite short. Less is known about the long-term hypertrophic response to HIRT in older adults. **In order to lessen the effects of sarcopenia, HIRT should continue over the long term in older adults, to improve functional performance and health.**

J Gerontol A Biol Sci Med Sci. 2003 Oct;58(10):M911-6.

## **Sarcopenia: causes, consequences, and preventions.**

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With the onset of advancing age, muscle tissue is gradually lost, resulting in diminished mass and strength, a condition referred to as sarcopenia. The sequela of sarcopenia often contributes to frailty, decreased independence, and subsequently increased health care costs. The following was adapted from an introduction to the conference "Sarcopenia, Age-Related Muscle Loss-Causes, Consequences, and Prevention," sponsored by the Kronos Longevity Research Institute in June 2002. This brief review will introduce potential mechanisms that may contribute to sarcopenia, although no one mechanism has yet, and may not completely, define this process. **The only agreed-upon intervention from these proceedings was regular physical exercise, stressing weight-training for elderly men and women. However, even those individuals who maintain their fitness through exercise do not appear to be immune to sarcopenia.**

Eur J Clin Nutr. 2000 Jun;54 Suppl 3:S40-7.

## **Sarcopenia and its implications for the elderly.**

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Sarcopenia is the loss of muscle mass and strength with age. Sarcopenia is a part of normal aging, and occurs even in master athletes, although it is clearly accelerated by physical inactivity. Sarcopenia contributes to disability, reduced ability to cope with the stress of a major illness, and to mortality in the elderly. The etiology of sarcopenia is unclear, but several important factors have been identified. These include loss of alpha motor neurons, decline in muscle cell contractility, and several potential humoral factors, such as androgen and estrogen withdrawal and increase in production of catabolic cytokines. **Treatment of sarcopenia with progressive resistance training is safe and effective, but dissemination of this technique to the general population has yet to occur. As the number of elderly persons increases exponentially in the new century, a public health approach to prevention and treatment of sarcopenia, based on increasing physical activity at all ages, will be crucial to avoiding an epidemic of disability in the future.**

J Nutr Health Aging. 2000;4(3):143-55.

## **Strength training for the prevention and treatment of sarcopenia.**

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There is a progressive loss of muscle strength, muscle mass and muscle quality with advanced age, which results in a condition known as sarcopenia. In this review, the authors outline the magnitude of these losses, their functional consequences, and the efficacy of strength training (ST) as an intervention strategy for delaying, preventing or reversing the effects of sarcopenia. The question of whether sex differences and genetics influence the effects of sarcopenia and responses to ST are also discussed. Although many potential mechanisms for sarcopenia exist, their specific contributions are still unknown. Nevertheless, proposed mechanisms of sarcopenia are outlined and, where information is available, we examine the effects of ST on these potential mechanisms, which include neurogenic factors, anabolic hormones, protein synthesis, gene expression, muscle morphology, and muscle regeneration. Finally, the potential impact of genetics in the muscle response to both sarcopenia and ST is discussed. **The evidence presented suggests that ST is an effective intervention for improving strength, muscle mass and muscle quality and delaying the onset of physical disability in the elderly. However, sex differences and genetic factors may play an important role in determining the muscular response to aging and ST.**

Geriatrics. 1996 May;51(5):46-7, 51-3; quiz 54.

## **Reversing sarcopenia: how weight training can build strength and vitality.**

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Sarcopenia, the loss of skeletal muscle mass with advancing age, results in lower basal metabolic rate, weakness, reduced activity levels, decreased bone density, and low calorie needs. The related increase in body fatness is linked to hypertension and abnormal glucose tolerance. **Many consequences of sarcopenia are preventable or even reversible. Progressive resistance exercises can produce substantial increases in strength and muscle size, even in the oldest old. For many older patients, exercise represents the safest, least expensive means to lose body fat, decrease blood pressure, improving glucose tolerance, and maintain long-term independence.**