

HANOVER WELLNESS EDUCATION NEWS

January 2008

<http://www.hanoverschools.org>

Sarcopenia

Sarcopenia (Sar-co-PEE-nee-ah) is the age-related loss of muscle mass, strength and function.

Sarcopenia generally begins around age 45, when muscle mass begins to decline at a rate of about 1% a year. As muscle mass decreases, so does muscle strength. As strength declines, so does physical functioning—the ability to climb stairs, do chores, dance, take walks, enjoy a day of physical activity, go shopping and so forth.

As your lean muscle begins to erode, your body begins to weaken... as your body begins to weaken you lose your ability to exercise... as you fail to exercise, your lean muscle through a lack of use, further erodes and your body becomes even weaker.

If left unchecked, this ongoing depletion of your lean muscle, strength and ability to exercise leads to a dramatic decrease in your body's metabolism (Stryer, 1997; Bogardus, 1990). Over time as the energy you consume becomes greater than the energy you require, your body begins to store the surplus, as excess body fat (Hill, 1987).

The muscle loss occurs in people of all fitness levels, even master athletes. But those who have less muscle to begin with pay a higher price. Women in particular face risks from lost muscle mass. After adolescence, “women have about one third less muscle mass than men,” says Miriam Nelson, PhD, director of the Center for Physical Activity and Nutrition at Tufts University. “So their muscle loss has an impact sooner. More women end up in nursing homes. Also, women live longer—so they’re older but much weaker,” she explains.

What causes sarcopenia? Some believe it’s caused by a gradual loss of certain nerve cells that link the brain to the muscles; in turn, loss of chemical connections between the two causes a loss of muscle cells themselves. Other age-related declines may play into it as well. For instance, the immune system gradually weakens, and that, some researchers suggest, may increase levels of substances that break down muscle. In addition, levels of hormones that stimulate muscle growth—estrogen, testosterone, and growth hormone—fall with age.

Sedentary behavior is also a contributor to sarcopenia. The loss of strength from sarcopenia can create a vicious cycle. When it takes a great deal of physical effort to perform daily tasks, people naturally shy away from doing them to avoid discomfort. But since activity, no matter how limited, helps to maintain muscle mass, abandoning one’s efforts only serves to speed up muscle loss—creating more weakness still.

Stay Strong

It has been well known that strength training increases muscle mass and strength in young adults, many thought whatever muscle loss occurred in older people was inevitable. Part of the problem was

the belief that for older people to lift weights was strange, if not harmful. Researchers have found that people in their 90s can build muscle and strength.

Strength training

More people take part in aerobic activity for exercise rather than strength training. Incorporating a walk into the day doesn't take much planning, and other aerobic activities like cycling, jogging, or swimming are things you already know how to do and already enjoy. For less than an hour and a half of strength training a week—about 40 minutes a session—you can receive great benefits.

Aerobic exercise, while it strengthens the heart and lungs, isn't sufficient by itself to hold back sarcopenia. A study from Denmark illustrates the point - Men in their late 60s who'd lifted weights regularly for years had muscle mass similar to that of non-athletes in their 20s. But older runners and swimmers didn't, even though they'd trained for years, too. Running and swimming did not prevent sarcopenia.

Strength training has many benefits, providing not just muscle but also the vigor that goes with being stronger. It's not surprising when you consider that it can maintain or improve an older person's ability to perform so many activities important to daily life, such as climbing stairs, walking faster, or maintaining balance when on slippery footing. These things are essential for someone who wants to continue living independently.

Building muscle creates a positive cycle in people of any age. The better and stronger you feel, the more likely you are to stay active and do things you enjoy—gardening, playing tennis, and the like. The more active you are, in turn, the more you'll keep weakness at bay.

Preserving muscle mass can also impact your ability to withstand disease. When you're sick, the body burns protein faster than usual, pulling protein components from the muscles and delivering them to the immune system, liver, and other organs for use in healing wounds and building the antibodies and white blood cells needed to fight illness. If the muscle protein "reservoir" has already been depleted by sarcopenia, there's that much less ammunition available.

Research is beginning to show that along with strength training, particular nutrients may play a role in slowing the advance of sarcopenia. One of them is protein. The body has to make up everyday protein losses from skin, nails, hair, sweat, and body fluids. If your daily protein intake isn't enough, the body uses muscle as a resource for amino acids—the building blocks of protein. Poor protein intake doesn't just contribute to muscle loss from within. It also won't allow for proper muscle maintenance—there's not enough building material there to work with.

The idea that a chronic lack of protein could be drawing down muscle reservoirs in older people makes sense, especially when you consider that many are eating less protein than they should be. An estimated one in three people over 60 eats less than the current recommendation of 0.36 grams of protein per pound of body weight, or 54 grams a day for a 150-pound person. Some research even suggests that older people need more. Experts are still debating what the "right" protein number for older adults should be. Make sure you're getting at least the current recommended amount.

Testing for sarcopenia requires methods that are performed in the research laboratory, not the doctor's office. But if you want a reasonable indication, says Ronenn Roubenoff, MD, associate professor of medicine and nutrition at Tufts University, visit a registered dietitian. She or he can measure skinfold thickness and arm and leg circumference to determine a person's approximate

muscle mass and compare it to national standards. Falling below the 50th percentile for age is a good indication that a person has sarcopenia.

The content of this newsletter is NOT meant to provide anyone with personal medical advice which you should obtain from your health care provider.

References

National Institutes of Health (1985). National Institutes of Health Consensus Development Panel on the Health Implications of Obesity: National Institutes of Health consensus development conference statement. *Ann Intern Med*:103: 1073-1077.

Bortz, W. M. (1982). "Disuse and Aging", *JAMA*.:248: 1203-1208

Blair, S. N., Kohl. H. W., Paffenbarger, R.S., Clark, D.G., Cooper, K.H. and Gibbons, L.W. (1989) "Physical Fitness and All-Cause Mortality: A Prospective Study of healthy men and women." *JAMA*. 262: 2395-2401.

Stryer L. *Biochemistry*: Freeman. 1997. 445-467.

Bogardus C. Lillioja S. Ravussin E. The pathogenesis of obesity in man: Results of studies on Pima Indians. *Int J Obesity*. 1990: 14(Suppl. 1):5-15.

Hill JO. Sparling PB. Shields TW. Heller PA. (1987). Effects of exercise and food restriction on body composition and metabolic rate in obese women. *Am J Clin Nutr*. 46:622-630.

Van Itallie TB. Abraham S. (1985). Some Hazards of Obesity and its Treatment. In: Hirsch J. Van Itallie TB. eds. *Recent Advances in Obesity Research IV*. London: Libbey : 1-19.

Vandervoort, A.A. & T.B. Symons. 2001. "Functional and Metabolic Consequences of Sarcopenia." *Canadian Journal of Applied Physiology* 26(1):90-101.

Waters, D.L., R.N. Baumgartner & P.J. Garry. 2000. "Sarcopenia: Current Perspectives." *The Journal of Nutrition, Health & Aging* 4(3):133-139.

Dudley, A. (2007). Sarcopenia. Retrieved November 10 from <http://www.sarcopenia.com/fatloss.php>
<http://healthletter.tufts.edu/issues/2003-03/sarcopenia.html>

Tufts University. (2003) Are You Doing All You Can To Fight Sarcopenia? *Health and Nutrition Newsletter*. March