

Lean Muscle: The #1 Biomarker of Aging

Read this to understand why exercise is so important and so protective of our health

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Many people take their muscles for granted. What they might not know is that muscle mass (lean body mass) is the number one biomarker of the aging process. Loss of muscle mass, called *sarcopenia*, is a very common condition in the elderly, and is a significant factor for all populations in the progression of aging and the risk of chronic disease such as hypertension, heart disease, diabetes, and osteoporosis. A 1997 survey found that being overweight and physically inactive are among the five top causes of mortality and morbidity among American adults over the age of 65. Many people mistakenly believe that the 'aging process' is due to factors outside of their control causing the physical decline and illness. How often does an elderly or even a person in their late forties use the excuse of aging to explain a limitation? All the time in my experience. In reality, physical inactivity and poor nutrition are the chief causes of the aging process. They are problems that can be addressed, with the potential for reducing risk factors and reversing the process. This does not mean that we will not age, because aging is inevitable. How we age is not.

Muscles are highly energized tissues which do the work to create movement in the body whether it is the heartbeat, peristalsis, or running. The muscles that frame your bones, skeletal muscles, are composed of parallel, cylindrical muscle fibers, which run the length of the muscle. It is thought that the number of muscle fibers is fixed, but the thickness can vary. Increase muscle strength and mass comes about through an increase in thickness of the fibers.

It is said that at age 25 humans reach peak muscle mass. In the absence of exercise, over the next 25 years we lose 6.6 pounds of muscle mass every decade until age 50, whereupon we lose 1 lb muscle mass per year. *No decline in age is as dramatic or potentially more significant than the decline in lean body mass.* • (J. Nutr. 1997)

Muscle mass burns a lot of calories - 70 times more than fat tissue. This is significant because the loss of muscle mass means the loss of calorie-burning ability. If you have a wood-burning stove that is too small for the house, it will always be cold in the house. You can fill it up with wood, or even overfill it, but it won't do the job. You need a bigger stove. Your muscles are the stove and food is the fuel. Your metabolism depends on your lean muscles to burn fuel, create heat, and provide energy.

The scale may not even alert us to a muscle-loss problem, because while losing muscle mass we might be gaining fat mass that masks the loss. Muscle tissue is denser than fat tissue, making it heavier by volume than fat. Weight is not a good indicator of body composition because it does not differentiate between muscle pounds and fat pounds. Two people who have the same outline could vary in weight considerably. The one with more fat will weigh less than the one with more muscle. Many people get into a weight-training program and are startled to find they may have lost inches, but have gained weight. They are doing the right thing, but have to change their belief in the scale as an instrument for assessing progress.

A weight-loss diet that does not include resistance training will not be successful in losing fat and gaining muscle mass. If you are losing weight on a diet but not exercising, at least half of your weight loss is muscle mass. After the diet, since you have lost calorie-burning ability and lessened your ability to keep the weight off,



you gain weight again. This is the yo-yo of dieting.

The gradual weight gain that many experience over the years eventually affects more than the metabolism. At a certain point, the body starts packing fat into the abdominal area in the form of visceral fat, which contributes to insulin resistance and inflammation. The body starts storing fat in the liver and ultimately other organs such as the pancreas, causing problems with blood lipids, triglycerides, and pancreatic function. This is how not enough exercise can lead to diabetes, heart disease, obesity, and poor liver function.

Inactivity is a big risk factor for osteoporosis because it is the tension of muscles pulling on the bones that keeps them in a constant state of building and strengthening. Weight-bearing exercise keeps the muscles strong and tension on the bones so that healthy bones are maintained. People who exercise tend to have better balance, fewer falls in later years and fewer fractures. Hip fractures factor significantly in the loss of quality of life for many of the elderly in this country. *While thinning bones render the skeleton prone to fracture, it is the gradual erosion of lean muscle and ensuing frailty which lead to falls.* (www.sarcopenia.com)

The vital organs normally get their protein building blocks from dietary protein. Muscles are the backup reserves of proteins to be used in dire situations when dietary protein is not enough, such as extreme stress, starvation, and wasting disease. Studies have shown that sarcopenia is linked to poor stress adaptation, as the body does not have enough of the protein building blocks to keep up with the extra demand for cortisol, the main stress hormone. *Muscle is the major source of protein for functions such as antibody production, wound healing, and white blood cell production during illness. If the body's protein reserves are already depleted by sarcopenia, there is less to mobilize for illness.* • (JAMA 2001) Lack of muscle mass makes a person weak in many more ways than just physical strength.

Low or medium intensity aerobic exercise such as treadmill, elliptical trainers, stationary bikes, and walking does not prevent age-related loss of muscle mass nor does it build enough muscle mass to reverse excess body fat. Strength training (meaning resistance training such as medicine ball or kettle ball and body weight workouts and high intensity training) is the way to build muscle mass. It is never too late. Studies have shown that people in their 70s, 80s, and 90s can improve muscle function through strength training.

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