



Reversing Aging Through Exercise

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Authors' Note: This is the second of several articles based on exercise science to assist Auxiliarists in developing their own fitness programs.

Is there really such a thing as reversing one's age?

The search for eternal youth has been an ongoing quest for thousands of years. While there might not be a Fountain of Youth that Juan Ponce de Leon famously searched for or a medical procedure as depicted in the Twilight Zone's episode "Trade-Ins" where old people are transplanted in young bodies, there is scientific evidence that **exercise can reverse the aging process** in muscle cells as well as improve overall health.



Did you know that the average American adult experiences approximately a 5 to 10-pound loss of muscle mass and a 3 to 6-percent decrease in resting metabolism and an increase of body fat every decade. Why is this important and is this inevitable with aging?

As our bodies age we see changes in what is called the

Five Domains of Fitness:*

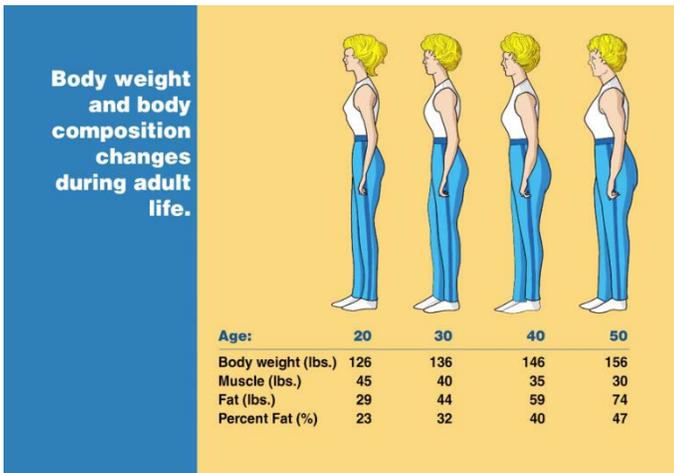
- Posture
- Strength
- Balance
- Flexibility
- Endurance.*

Muscle, including skeletal muscle, is the crucial element of our bodies and a measure of our physical fitness. Without adequate exercise, muscle fibers begin to bind together and blood flow and nerves become restricted weakening the body. This accelerates, as we get older and we see the Five Domains of Fitness begin to deteriorate over time. Without adequate muscle mass, posture begins to weaken; overall strength decreases; balance is harder to maintain and endurance lessens. With less muscle mass, the body's resting metabolic rate (RMR) decreases which then leads to weight gain furthering the deterioration of overall fitness.

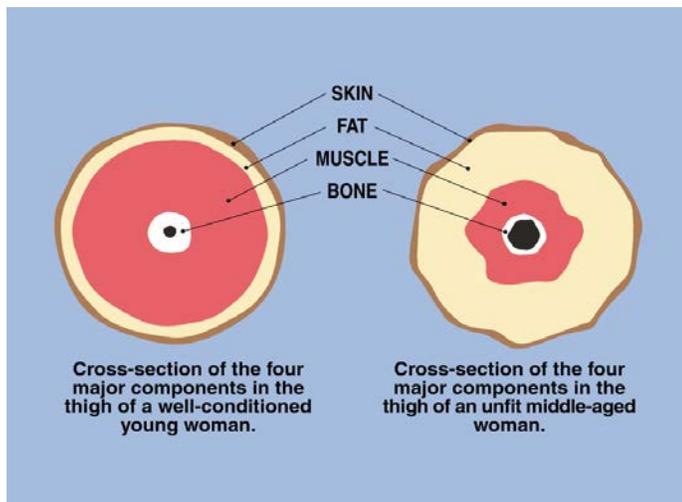
Scientific studies have found that strength resistance training (exercises that put stress on your muscles) can actually *reverse the aging* of muscle tissue. Adults averaging 68 years old who engaged in regular strength training have showed improvement to their muscle fiber matching those of 24 year olds, essentially reversing the age of their muscles' DNA structure. Studies have shown that through a program of strength training the average adult can add 3 pounds of muscle and a 7 percent increase in their resting metabolic rate as well as lose 4 to 8 pounds of fat in 12 weeks. Strength training can also

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make your skin and your face look younger and it will more importantly make your body feel and actually be physiologically younger and healthier than if you did not



exercise.



Resistance strength training combined with cardio exercise and stretching can reverse the aging effect on the **Five Domains of Fitness** in the following ways:

Posture

Poor posture can result from hours of sitting at a desk and without proper exercise and conditioning can worsen over time. Posture will improve with strength training as the musculoskeletal system supporting the spine and neck become stronger. Strength training has also shown to improve neck and back pain, which can affect posture. Studies have shown a lessening of arthritis as well as significant increases in femoral neck bone mineral density.

Strength

It is somewhat obvious that strength training, as the name implies, improves overall strength. Why is strength so important? Weakened muscles result in fragility and a loss of bone density posing serious health issues for older adults, especially women. Resistance training not only maintains but can also increase muscle strength at any age, including those in their nineties. Six months of standard strength training in older adults have shown to reverse the genetic fingerprint for mitochondrial function to levels seen in younger adults. These cells are the powerhouse of our bodies giving us the energy and strength to function properly. Research has shown that the DNA structure of these cells can return to the same composition as a twenty-year old with strength training exercise. Who wouldn't want that?

Balance

With the loss of muscle not only comes a loss of strength but also a loss of supporting blood flow and nerves. This affects the ability to maintain balance as reaction time, flexibility and strength are reduced. This can have devastating effects the older one gets as losing balance can result in falls with broken bones and other injuries some which can be life threatening. Increased muscle helps improve critical blood flow and creates new nerve endings supplying the muscles. With stronger muscles and improved reaction time one can maintain balance and resist falling. If one does lose balance, having stronger bones and protecting muscles can reduce the impact of the fall.

Flexibility

Muscles that are not regularly exercised eventually become stiff and rigid resulting in less and less flexibility. The loss of flexibility reduces the ability to carry out everyday tasks such as simple things as bending over to tie ones shoes or getting out of a chair. Strength training combined with stretching exercises will improve flexibility. Studies have found that strength exercise enhances joint function and eases the pain of osteoarthritis and rheumatoid arthritis. Resistance training also has shown a reduction of inflammatory markers in elderly women. Yoga and stretching are excellent programs to follow for achieving flexibility but one still needs to add resistance training to keep muscles from losing mass over time.

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Endurance

You need to have a certain level of endurance just to enjoy everyday life and especially if you wish to keep doing some of the activities you have enjoyed throughout your life. Strength training and cardiovascular exercise are both necessary for improved endurance. You don't have to be a long distance runner to enjoy the benefits of improved endurance. A simple program of walking can greatly improve endurance and is often used as a foundational building block to begin an exercise program or recover from an injury. You also don't have to be a body builder to enjoy the benefits of strength training. A moderate 40 minute program of combined strength training and cardio exercise can greatly increase overall strength and endurance (see the AUXFIT article in last month's NorEaster for an example of such a program).

Whatever your age it is not too late to begin a strength-training program. You will not only feel younger your body will actually become younger. Remember before you begin any exercise program, especially if you are over 50 years old, check with your primary care physician and start your program with moderation.



Yes, there is a Fountain of Youth and it's inside you; nature gave it to you and you just have to go and use it.

Special Note for Weight Watchers: Studies have shown that dieting alone has a negative result on fitness as it actually reduces muscle mass resulting in a reduction of RMR (Resting Metabolic Rate). Ninety five percent of those who dieted regain their weight after ending their diet as their bodies metabolism was less than what it was when they started. While endurance exercise has important cardiovascular benefits, it does not increase muscle mass or improve RMR. Ending endurance training also can result in weight gain, as there was no improvement in the resting metabolic rate. Resistance strength training on the other hand does increase resting metabolic rate as an increase in muscle mass directly increases RMR. The more muscle mass you have the higher your RMR and the easier it is to keep off weight. For more information, see last month's AUXFIT article in the NorEaster.

*The Five Domains of Fitness from *Age Defying Fitness* by Marilyn Moffat.

Special Acknowledgement: Many thanks to AUXFIT advisor Dr. Wayne Westcott, for use of his research materials and use of graphics.

For more information on how exercise can reverse aging and improve your health as well as ideas of various types of exercise programs that might best suit your personal interests I recommend the following books:

Aging Backwards, Miranda Esmonde-White, updated 2018, Harper Wave

Age Defying Fitness, Marilyn Moffat and Carole B, Lewis, 2006, Peachtree Publishers

The Exercise Cure, Jordan Metzl, MD. 2013, Rodale Books

Strength Training Past 50, Wayne Westcott. PhD, Third edition 2015, Human Kinetics, Inc.

For more information on Dr. Wayne Westcott's research visit: <https://quincycollege.edu/program/exercise-sciencepersonal-training>

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