



The Positive Effects of Higher Intensity Exercise and Interval Training on Biological Aging
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Physiology of aging

As people age, lung capacity decreases and the heart beats slower and distributes less blood with each pump (reduced stroke volume). These age-related physiological changes result in **decreased maximal oxygen consumption**, which results in less oxygen reaching the muscles. Because oxygen is the life fuel for muscles, without it, muscles simply cannot work. The decrease in oxygen consumption is one of the main reasons that as people age, they slow down, grow weak and lose stamina. Without speed, strength and endurance, people struggle with the basic Activities of Daily Living (ADLs) that allow them to maintain health to both enjoy a better quality of life and to remain independent.

Oxygen consumption is directly related to aging.

Maximal oxygen consumption peaks at age 35 and begins to decrease between ages 50 and 60, with the greatest decrements occurring after 60. Although aging is inevitable, the rate at which a person ages can be slowed by increasing oxygen consumption over the lifespan.

Exercise increases the amount of oxygen consumed by muscles at work. The rise in oxygen demand forces the heart to work harder at pumping more oxygen-rich blood to muscles. The total increase in available oxygen benefits all other body systems. For example, when the face gets red during exercise it is because oxygen-rich blood is circulating at the skin's surface. This movement of oxygen-rich blood can help combat the effects of aging in the skin, such as loss of elasticity, wrinkles and lack of color.

Recent research shows that **regular aerobic exercise**, which dramatically increases oxygen consumption, **can decrease biological age by 10 years or more.**

Biological age (versus chronological age) is physiological age. **Biological age is the age that reflects a person's current physical and physiological state**, and it may not match chronological age. Biological age is the explanation for how some 80-year-olds can complete a marathon, while others that age have difficulty walking across a parking lot. Simply put, the marathon-completing 80-year-olds have the bodies of healthy, fit 40-year-olds.

Another example is someone like fitness celebrity Denise Austin, who, in her 50s looks 35-40 years old and undoubtedly demonstrates the health of a younger person. Factors that influence biological age include changes in the physical and physiological structure of the body, as well as changes in the

performance of motor skills and sensory awareness.

Motor skills and sensory awareness also reflect brain functioning. Research shows that **people who do high intensity aerobic exercise over the lifespan maintain brain functioning at a higher level** longer versus people who do not.

High intensity aerobic workouts maximize oxygen consumption and cell renewal

High intensity aerobic exercise increases maximal oxygen consumption and slows aging through intricate cellular mechanisms. **Regular aerobic exercise improves mitochondria function.** Mitochondria are the cellular structure responsible for energy production.

Consider mitochondria activity as turnover, which reflects health, action, regeneration and newness. Higher activity levels correspond with improved mitochondria function, which correlates to enhanced body functioning at the cellular level. **The harder a person exercises**, the greater the change in mitochondria, and **the greater the reduction in biological age** over the lifespan.

Recent research shows that high intensity exercise slows aging by increasing the total amount of oxygen that reaches all systems of the body. As a direct result, people who do regular high intensity exercise have a lower biological age than people of similar age that do not exercise.

Using interval training to maximize oxygen uptake

The most effective way to exercise at an intensity level high enough to significantly increase oxygen demands and ultimately slow aging is to interval train. Interval training is defined as short bursts of

“going all out,” followed by a brief, active recovery period. Interval training is in direct contrast to steady rate training, which is exercising at a constant heart rate. **Interval training requires individuals to exercise at a high intensity briefly to force the body to make adaptations that slow aging.**

30:30 interval training program

The 30:30 program on Octane Fitness elliptical cross trainers is a high intensity interval program characterized by 30 seconds of work followed by 30 seconds of active recovery. The key here is that the program motivates the user to exercise at a higher intensity than they would normally exercise at while coaching an active recovery interval between exertions. The 30:30 program **motivates users to increase their heart rate and their oxygen consumption which can lead to significant reductions in the effects of aging.**

Summary

Regular, high intensity aerobic exercise has been shown in university research studies to slow aging and reduce biological age by increasing maximal oxygen consumption and enhancing cellular regeneration. The 30:30 program on Octane ellipticals meets the necessary requirements to provide users with a means to work at high intensities, improve maximal oxygen consumption which in turn lead to improvements in biological age.

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For more information, contact Octane Fitness at www.octanefitness.com or 888-OCTANE-4.

About Amy Ashmore

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