



Chapter 2: Resistance & Cardio Exercise

Author's Note

The information on this website, including all texts, graphics, images is provided to describe my pursuit of an expanded healthspan. My journey may not be appropriate for your individual circumstances. While I encourage all to have a strategy to expand their healthspan please develop your path in concert with your physician.

Resistance & Cardio Exercise

“I used to prioritize nutrition over everything else, but I now consider exercise to be the most potent longevity “drug” in our arsenal, in terms of lifespan and healthspan. The data are unambiguous: exercise not only delays actual death but also prevents both cognitive and physical decline, better than any other intervention.”



Peter Attia MD

Author of *Outlive*



The most ancient and potent “medicine” known to mankind that promotes healthspan is the engagement in organized, repeated and purposeful physical activities, or exercise training. The first documented exercise prescriptions by surgeons can be traced back to thousands of years ago in various ancient civilizations like the Ancient Greece and the Yellow River Civilization in China.

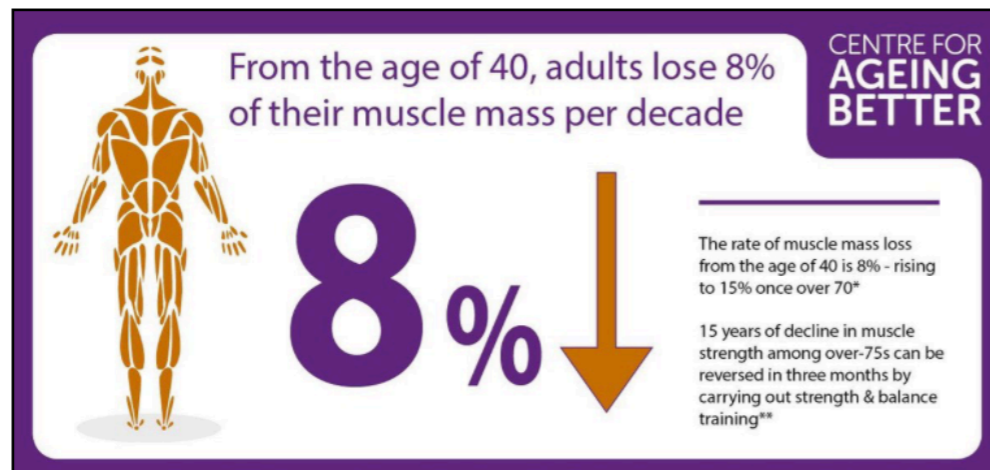


Over recent decades, public health studies have shown indisputable evidence that high physical fitness is the most crucial factor for delaying all-cause mortality and the onset of chronic diseases, especially cardiovascular diseases, metabolic disorders and cancer. Overall, exercise can be divided into two types: endurance and resistance exercise. Although the most direct executors of exercise are skeletal muscle and heart, regular exercise also leads to systemic changes in virtually all organ systems with superb, multifaceted benefits to health.

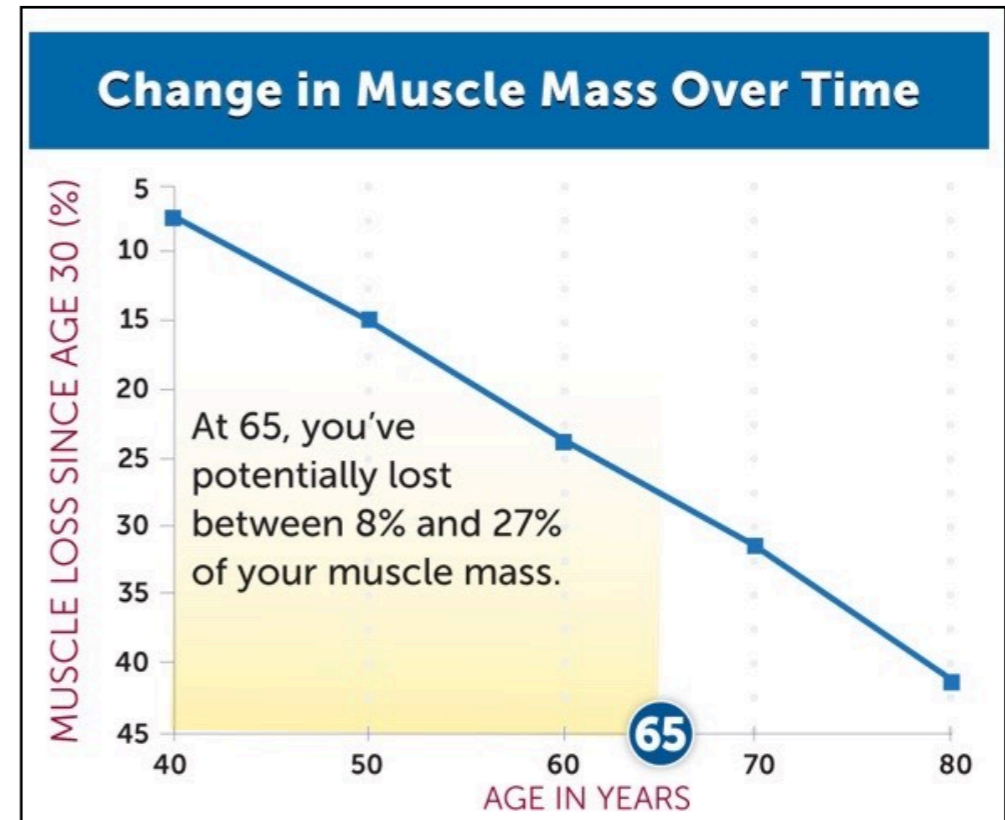
In summary, exercise training remains the most potent “medicine” that preserves quality of life and expands healthspan. The molecular understanding of exercise impacts in different organ systems reinstates that exercise is the most powerful lifestyle intervention against chronic diseases. While human lifespan seems to approach its limit, great potentials lie in promoting physical activities among any given communities to improve the healthspan and possibly lifespan as well.

Muscle Mass

It is frightening how much muscle mass we lose after 40. To further complicate this issue if we have low levels of protein this causes Sarcopenia which increases loss of muscle mass and physical function as we age. According to this statistic by 80 years of age we have lost 32% of our skeletal muscle.



Any loss of muscle mass is of real consequence because loss of muscle can mean loss of strength and mobility and independence. Sarcopenia generally accelerates around the age of 75 although it may happen in people aged from 65 to 80 and it leads to frailty and increases the likelihood of falls and fractures.



Many people are aware that with aging often comes loss of bone density or osteoporosis but it would appear that the same awareness of sarcopenia or age related muscle loss is not apparent. From the time you are born to around the time you turn 30, your muscles grow larger and stronger. But at some point in your 30s, you begin to lose muscle mass and function, a condition known as age-related sarcopenia. People who are physically inactive can lose as much as 3 to 5% of their muscle mass per decade after the age of 30.

Resistance Training

Tests show it's never too late to start a resistance training program. This chart was provided by the Institute for Aging Health



Resistance Training Improves Muscle Strength at Any Age

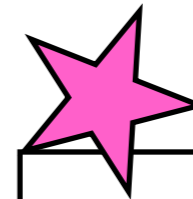
100 frail nursing home residents aged 72-98 years (mean 87) randomized to 10 weeks of progressive quadriceps resistance training or placebo.

RESULTS:

- 113% increase in muscle strength
- 12% increase in gait velocity
- 28% increase in stair climbing power
- 3% increase in thigh muscle area

Institute for Aging Research Harvard Medical School

The graphic features a dark blue background with yellow text. It includes two small photographs: one of an elderly man using a leg press machine and another of an elderly woman on a stationary bike. Logos for the Institute for Aging Research and Harvard Medical School are at the bottom.



For Ladies ONLY: Open this link to read a well written article about ladies strength! Strength training started surging in popularity among women, with many realizing that it's all about being fit and powerful rather than creating a bodybuilder look.



Check out this excellent article from Mayo Clinic which sets both strength and cardio exercise goals for us. Be sure to click on their strength training "how to" videos.

Hand Strength

This is a surprising fact but for clinical practice and geriatric health professionals, assessing adults' grip strength can be used as a signal to screen for physical and mental health. This is used in Moorings Park's Annual Wellness Evaluation.

A study published in the Journal of Geriatric Psychiatry and Neurology found that hand grip strength was a predictor of cognitive function in older adults. The study found that individuals with weaker hand grip strength were at a higher risk of cognitive decline compared to those with stronger hand grip strength.

Grip strength is something you can improve quickly. First, establish your baseline strength. You'll need a [grip strength dynamometer](#) (in most wellness centers), a device designed to measure the maximum isometric strength of the hand and forearm muscles, but once you test, build up your grip strength by exercising.



Cardio



Cardiovascular diseases are the leading cause of all mortalities around the world, with sedentary lifestyle being one of the biggest risk factors. The most direct clinical indicators of cardiorespiratory fitness are cardiac output and oxygen consumption, both are major parameters that decline with aging, potentially a determining factor for healthspan.

In a healthy individual, rigorous exercise may increase cardiac output by 4-fold. "VO₂max" is the maximal amount of oxygen that is utilized by the all the organ systems during exercise. Since the 1980s, it has been well categorized that "VO₂max" increases with endurance exercise training regardless of age, sex or exercise mode, and is a critical measurement of risk factors of aging-related diseases.



Dan Buettner, an expert in Blue Zones and *New York Times* bestselling author, explains that the best exercise to support longevity is none other than walking. Buettner reiterates that brisk walking can achieve 90% of the benefits of training for a marathon. This is a fraction of the impact of the physical activities related to exercise for a marathon and the effort required to complete the training!

Walking is excellent if we walk at a brisk pace to generate the BPM to exercise the heart. Walking is preferred by many females including my wife Patty who walks at nearly 4 mph for 3 miles four days per week. My preference is the elliptical machine which provides the opportunity to achieve Zones 2 & 3 without impact on hips, knees or ankles.

Using the Apple Watch

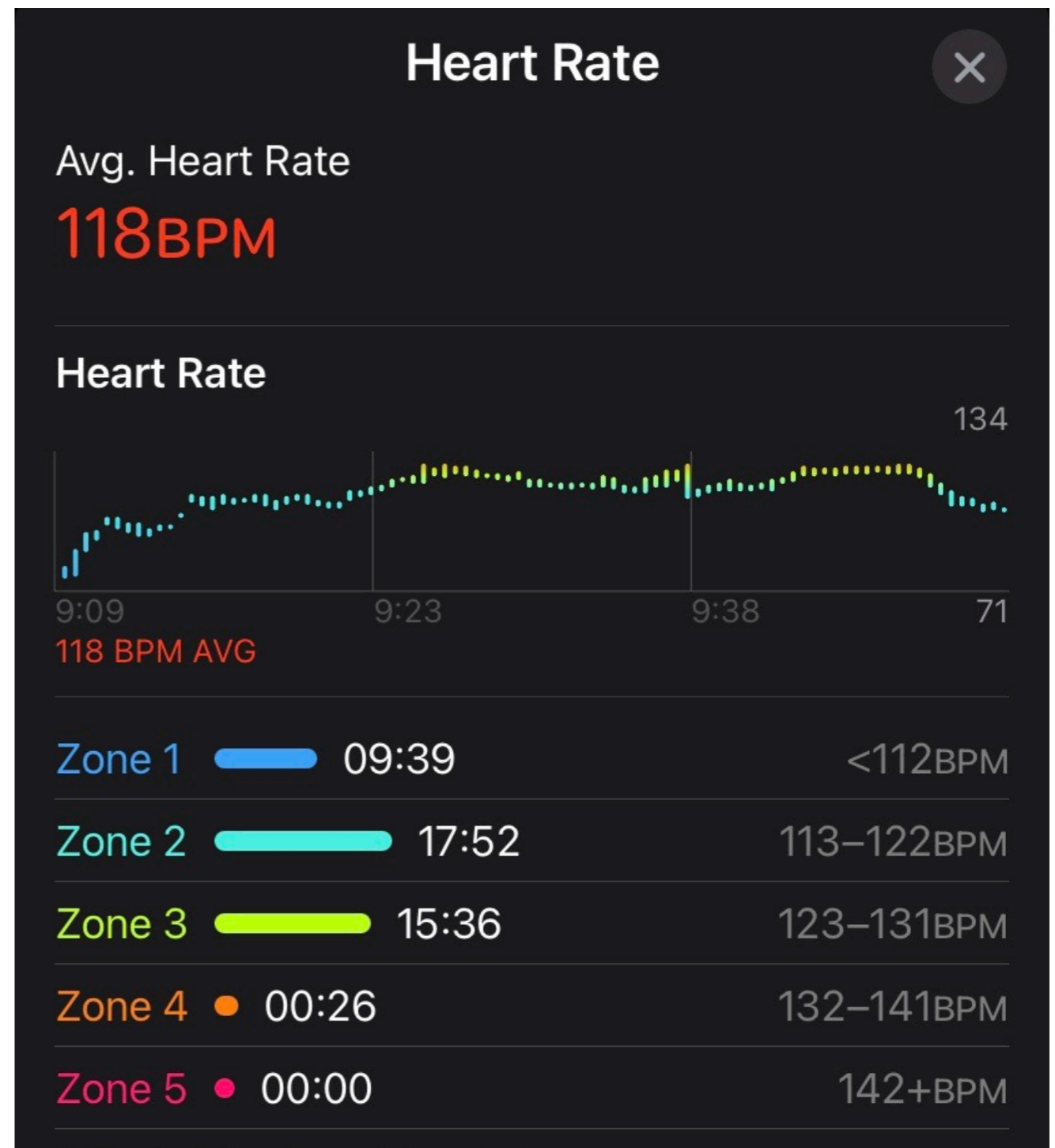
At right is a screen shot of my iPhone while using my Apple Watch to record a 40+ minute elliptical session. The Apple health applications provide excellent information to track your daily activity and progress.

My average of 118 BPM left me sweaty but pleased with a great cardio workout. Notice my minutes spread across Zones 1 - 4. I started our slow for 09:39 and then ramped it up to Zones 2 and 3. The lower right side of the screen shows my BPM range for each zone.

The maximum BPM rate for me is 140. (That's my age of 80 subtracted from 220) My 90% target is 126 and 80% is 112. I'm happy to spend an equal amount in Zones 2 and 3.

The suggested aerobic activity is at least 150 minutes per week. I do 120 minutes.

[To calculate your heart BPM zones click here.](#)



My Weekly Routine

Cardio and Strength for 2 hours on Tuesday, Thursday and Saturday. Skipping a day allows my body to recover.

- ◆ Elliptical for 40 minutes to raise my heart rate to Zone 2 (113 - 126)
- ◆ Upper body strength for 35 minutes
- ◆ Lower body strength for 35 minutes
- ◆ Chatting with friends for 10 minutes

My total investment is 6 hours per week to lengthen my healthspan.

Suggestions:

1. Put these sessions on your personal calendar and give it a top priority.
2. Hire a trainer for strength training at least one of your sessions. I do it for two sessions weekly. Performing these exercises with the proper technique and intensity is key. You have to exert yourself enough to “fray” your muscles to promote growth.

NOTE: In the 11 months from September, 2022 to July, 2023 I have gained 3.3 pounds of skeletal muscle mass using this strength program.

Also increased my total body water to the recommended 60%.

Weight dropped 10 - 12 pounds and lost 2 inches in waist size.

Bottomline: This works to improve your healthspan if you are dedicated.

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