

Resetting Your Biological Clock: How to Slow the Aging Process and Live Longer

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Youth has no age

Pablo Picasso (1881–1973)

We all desire to live long and healthy lives. None of us wants to deal with the declining health or chronic diseases commonly associated with aging. Given a choice, wouldn't we all like to live full, active, healthy lives and then, when the time comes, make the quick exit? I call this model of life the "Square Life Curve," as opposed to the "Declining Life Curve."

We can age successfully. There are ways to control the diseases that cause declining health as we age. We can't stop aging, but with myriad lifestyle changes, we can certainly experience a more successful aging process. To age successfully, you must have a healthy mind, body, and spirit.

What Is Aging?

Aging is when the body shifts from a constructive (anabolic) to a destructive (catabolic) state. Anabolism is the replenishing of the body's systems with new and stronger tissue, a rejuvenating or building mode. Catabolism is the breaking down of the body's physiological systems. Physiological function peaks in the 20s, plateaus in the 30s, and then begins a sharp descent in the 40s. In the US the "decade of vulnerability" occurs at the age of 40 to 50 years. During this time, the male ages 15.2 years and the female ages 18.6 years.

What Can You Expect to Happen As You Age

Individuals age at variable rates due to genetic and environmental factors such as nutrition, exercise, stress, smoking, and alcohol and various diseases such as obesity, high blood pressure, high cholesterol, and diabetes mellitus.

Regardless of the rate, however, these are the facts:

- The brain shrinks and there is loss of cognitive function, focus, and memory;
- vision worsens, with cataracts and loss of visual acuity, darkness adaptation, and color perception;
- hearing is impaired, especially for higher tones;
- the skin loses elasticity and collagen, begins to wrinkle and thin, heals slower, and bruises more easily;
- smell and taste decrease, hair thins, and fat increases as lean muscle mass and bone mass decrease, resulting in decreased strength, osteoporosis, and fatigue;
- the kidneys decrease in size and function and the bladder loses its elasticity and capacity, resulting in incontinence;
- the heart has contracted about 2 billion times by age 50, and the incidences of heart attack and heart failure increase;
- the lungs lose elasticity and breathing capacity is reduced by over 20%;
- the pancreas produces less insulin, and diabetes mellitus is more common. In addition, men lose testosterone starting at age 30 and women have reductions in progesterone and estrogen after menopause in their 40s and 50s.

How Old Are You, Really? Biological Versus Chronological Age

Before you can figure out how to slow down your own aging clock, you need to find out where it's currently set. You need to determine your *biological* age versus your *chronological* age. The chronological age is today's year minus your birth year. The biological age is every individual's unique physiological rate of aging. The most accurate means to determine your biological age is the Telomere Test offered by Spectracell Laboratories in Houston, Texas (800-227-5227 or www.spectracell.com). Telomeres on the end of our chromosomes will determine present biological age and also correlate with the rate of aging. There are many methods to slow telomere attrition rate that I will discuss in this article.

Taking the Telomere Test is a first step, along with a thorough intensive physical examination combined with a series of functional and anatomic diagnostic tests including all the biomarkers of aging such as: circulating levels of vitamins, minerals and antioxidants, antioxidant defense, hormone levels, cardiovascular status, vascular health, cardiovascular risk factors, pulmonary status, bone health, speed of nerve conduction, body composition, musculoskeletal health, sensory responses, balance, coordination, reaction time, neuropsychological status, and cognitive function. Please see the list of recommended tests for a complete evaluation.

Tips to Slow Aging

Nutrition

Eat an anti-inflammatory diet. One should consume 10 servings of relatively uncooked fresh fruits and vegetables per day (6 vegetables and 4 fruits of multiple colors, especially a variety of dark berries and grapes). Reduce the refined carbohydrates and foods that contain a high glycemic load or index, and increase complex carbohydrates and fiber. Reduce saturated fats, reduce inflammatory omega-6 fats, and eliminate trans fats; but increase omega-3 fatty acids, in foods such as cold-water fish and nuts, and omega-9 fatty acids, found in olive products and nuts. Use more high-quality protein such as that in cold-water fish, wild game, and grass- or range-fed meat. Avoid caffeine and all sodas, diet or otherwise. Eat less refined, processed, and fast food. Avoid high-fructose corn syrup.

Special consideration: Caloric restriction as been shown to increase the lifespan in primates and rodents by 40% or more. One would need to reduce total caloric intake by 30% to 40%. Caloric restriction with a diminished energy intake forces an optimization of the metabolism and may alter entire genetic programs. It reduces cellular damage and disrupts certain hormonal levels. Another practical method is to fast for 12 hours after 5 p.m. each day for 3 to 4 days per week, combined with increased energy expenditure via resistance and aerobic exercise 4 day per week. This achieves caloric restriction and increases growth hormone and male and female sex hormones, but reduces insulin and cortisol levels and may alter calorie-induced modification of aging genes.

Water

Consume at least 100 ounces of filtered or bottled water (from glass, not plastic) each day. Add some fresh lemon or lime to each glass.

Smoking

Avoid all tobacco use – active or passive.

Exercise

Exercise for at least one hour per day, at least 4 days per week, including a combination of aerobics, resistance training, and flexibility and agility exercises. The aerobic exercises should be interval training at near maximum heart rate for about 30 seconds, followed by 90 seconds at about 60% of maximum heart rate (220 – age). This is repeated for 20 minutes and adjusted as one achieves better cardiovascular conditioning. Resistance training is 40 minutes and should be rotated among different muscle groups. The hour per day does not have to be continuous, but can be divided into 15- or 30-minute segments to achieve the full hour. Remember also that any exercise that you do will help. Start slow, with fewer minutes and less-strenuous exercises, and increase the duration and intensity of exercise over the next several months. Exercise your mind as well with reading, crossword puzzles, math, memory tests, and other mental exercises.

Weight and Body Composition

Ideal body weight, waist circumference, waist/hip ratio, and body composition are important. The ideal body weight is based on body mass index. The percentage of body fat in men should be less than 18% and in women less than 22%. Increases in percent lean muscle mass will improve insulin sensitivity and other hormonal and physiological functions. The waist circumference should be less than 36 inches in men and less than 31 inches in women. The waist/hip ratio should be less than 1.0 in both genders.

Relaxation, Spirituality, and Religious Commitment

All of these modalities that reduce stress and provide inner peace will improve overall health and slow aging. Reductions in stress hormones such as cortisol and adrenalin levels help to reduce blood pressure and heart rate, and improve immune and brain function. Maintain an optimistic attitude and be a positive thinker. Be

adaptable and forgiving. Have a lot of love in your life and maintain social, family, and intellectual connections. Consider having a pet in the home. Practice safe and frequent sex with your mate.

Alcohol

Consumption of small amounts of alcohol per day may increase lifespan and reduce the incidence of cardiovascular disease. Although any alcohol may be effective, red wines, especially those with high resveratrol content such as Pinot Noir, Cabernet, and Merlot, may be the most effective. About 20 grams per week is optimal, equivalent to about a 6 ounce glass of red wine per day. More is not better and has detrimental health consequences.

Nutraceuticals, Vitamins, Antioxidants, and Minerals

Although there is no definitive proof in humans that specific nutraceuticals, vitamins, antioxidants, and minerals extend life expectancy, there are data in animal models showing that certain supplements are effective in extending lifespan. Coenzyme Q10, R-lipoic acid, acetyl-L-carnitine, phosphatidyl serine, glycerophosphocholine, N-acetylcysteine, EGCG (epigallocatechin gallate), trans-resveratrol, grape seed extract, polyphenols, vitamin C, vitamin D, B vitamins, selenium, zinc, lycopene, lutein, vitamin K2 MK-7, gamma- and delta-tocopherols and tocotrienols, and omega-3 fatty acids increase lifespan and cognitive function in rats. Other supplements are being evaluated as well. The best-quality sources for these nutrients are VasculoSirt, EFASirt Supreme, and Resveratrol HP from Biotics Research at 800-231-5777 or biotics@bioticsresearch.com.

Do not take a multivitamin with beta-carotene or only d- or dl-alpha-tocopherol (vitamin E). Males should avoid supplemental iron. Women and men need 2000 IU or more of vitamin D per day to achieve a blood level of vitamin D at 80 ng/ml. Women

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➤ need 1500 mg calcium with other bone minerals. Use ginger, turmeric, curcumin, and other natural anti-inflammatory agents.

Recent studies have shown that increasing blood levels of the powerful intracellular antioxidant glutathione and maintaining enzymes that produce it or reduce its destruction will decrease heart attack, stroke, high blood pressure, cardiovascular and vascular diseases, and cancer. Many foods and nutritional supplements will increase intracellular levels of glutathione, such as R-lipoic acid, N-acetylcysteine, selenium, vitamins C and E, whey protein, and broccoli.

According to Greek mythology, the hapless mortal Tithonus mistakenly asked the goddess Eos to confer eternal life rather than eternal youth. He thus found himself condemned to immortal decrepitude. A new report suggests that if Tithonus had cut a deal with Dionysus, the god of wine, he might have fared much better. This may be due to the resveratrol and other polyphenols in red wine

Resveratrol shows the most promise as an anti-aging nutrient. It is found in red wine, the skin of young unripe red grapes, grape seeds, and purple grape juice, and in smaller amounts in peanuts, the roots of the Chinese medicinal herb *Polygonum cuspidatum*, and a South American shrub – *Senna quinqueangulata* – that activates a group of genes called sirtuins (silent information regulator proteins), specifically SIRT1 and Sir2 genes in human cells. Activation of SIRT1 will extend lifespan and can be particularly effective in conjunction with caloric restriction. SIRT1 blocks tumor growth and cell death, and protects human cells from gamma radiation. Sir2 increases DNA stability, speeds cellular repair, and increases total lifespan.

The power of resveratrol in various studies is impressive. In yeast, resveratrol extends life by 80%. In mice, rats, fish, and other animal models, resveratrol demonstrates

anti-aging, promotes weight loss, and simulates the anti-aging effects of caloric restriction without actually restricting calories. Resveratrol has also demonstrated antioxidant, anti-inflammatory, anticancer, anti-platelet, and cholesterol-lowering activities. Resveratrol increases insulin sensitivity, reduces insulin-like growth factor 1 (IGF-1), activates the PPAR-gamma system, increases mitochondrial number and energy expenditure, and improves motor function.

Recent studies also suggest that resveratrol reduces the risk of colorectal cancer and slows the progression of Alzheimer's disease. One liter (bottle) of red wine contains only about 1 to 2 mg of resveratrol (range of 0.2 to 5.8 mg per liter) The dose needed in humans to achieve an anti-aging effect is not known, but based on the doses that have been shown to be effective in animals and other metabolic and lifespan considerations, a human would need about 250 mg per day of trans-resveratrol. No short- or long-term adverse effects have been noted to date.

Pharmacologic Agents

Angiotensin Converting Enzyme Inhibitors (ACEIs) and Angiotensin Converting Enzyme Inhibitors (ARBs). These drugs are used to treat high blood pressure and heart failure, reduce stroke and heart attack, improve kidney function and reduce urinary protein, improve vascular function, and reduce the incidence of diabetes mellitus. They also have potent antioxidant, anti-growth, anti-inflammatory, and other protective characteristics that increase life expectancy in rats and mice. The exact mechanisms are unclear, but increases in nitric oxide levels and inhibition of the toxic actions of angiotensin II appear to be at play.

Statins. These drugs are used to treat high cholesterol and reduce heart disease and stroke. They also have pleiotropic effects that are

antioxidant, anti-inflammatory, and anti-growth; increase endothelial progenitor cells (stem cells for vascular function); and induce expression of telomere repeat binding factor, which protects telomeres via a "capping" mechanism, reducing senescence. They improve telomere life and thus extend life expectancy in animal models.

Metformin. This drug is used to treat diabetes mellitus and insulin resistance. Its effects on improving glucose and AGE (advanced glycosylation end) products as well as many other biological effects may improve life expectancy in animals.

AGE Cross-Link Breakers. These drugs act by catalytically breaking AGE cross-links. Studies have shown improvement in blood pressure, pulse pressure, and arterial elasticity.

Conclusion

The potential lifespan of the human could be as high as 129 years! Achieving an optimal combination of both quantity and quality of life are important goals for future studies. Many animal studies have demonstrated a wide variety of modalities to increase lifespan. Although definitive studies in humans are lacking, it would seem prudent to consider many of the treatments that are safe as outlined in this article if you are seeking that youthful and healthy life. To age successfully, you must have a healthy mind, body, and spirit. And remember, it is never too late to start.

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