

RESETTING YOUR BIOLOGICAL CLOCK: HOW TO SLOW THE AGING PROCESS

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“Youth has no age”-----Pablo Picasso (1881-1973)

We all desire to live long and healthy lives. None of us want to deal with the declining health or chronic diseases that are commonly associated with aging. If 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 “The Square Life Curve” as opposed to the “Declining Graph.”

With this article, I'm promoting the concept that we *can* age successfully. I'm introducing the idea that there are ways to control the diseases that cause declining health as we age. We can't *stop* aging, but with lifestyle changes that are mentioned below, we can certainly experience a more successful aging process. To age successfully, you must have a healthy mind, body and spirit! Interested? Keep reading.

First let me provide a basic understanding of what happens when we age.

WHAT IS AGING

Aging is when the body shifts from a constructive (anabolism) to a destructive (catabolism) 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 functions peak in the twenties, plateau in the thirties and then begins a sharp descent in the forties. *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: a) the brain shrinks and there is loss of cognitive function, focus and memory; b) vision worsens with cataracts and loss of visual acuity, darkness and color perception; c) hearing is impaired especially for higher tones; d) the skin loses elasticity and collagen, begins to wrinkle, thin, and it heals slower and bruises easier; e) smell and taste decrease, hair thins and fat increases as lean muscle mass and bone mass decrease resulting in decrease strength, osteoporosis and fatigue; f) the kidneys decrease in size and function and the bladder loses its elasticity and capacity resulting in incontinence; g) the heart has contracted about 2 billion times by the age of 50 and the incidence of heart attack and heart failure increase; h) the lungs lose elasticity and breathing capacity is reduced by over 20 percent; and i) 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 40's and 50's.

Reading this might dishearten even the most optimistic individual, but there are many ways to slow the aging process enough so that we can still have many years of living a vital, active, and rewarding life. Remember, we're working toward living a life that resembles the “Square Life Curve” as opposed to the “Sliding Graph.”

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 biological rate of aging. For a quick, simple glimpse into your chronological age, use the scoring system that I have developed that is posted on the REZOOM web site. As you can see, various physiological factors determine your biological age. A four year difference is significant between your biological and chronological age. Obviously, one would prefer to have their biological age younger than their chronological age.

Taking my test is a first step, but I also recommend that you go to a physician who will give you a thorough intensive examination. When there, review with the physician your complete medical history, then get a physical exam and a series of functional and anatomic diagnostic tests. You need to find out all the biomarkers of aging which include circulating levels of vitamins, minerals and antioxidants, anti-oxidant defense, blood 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.

What you do not want to hear when you visit your physician is "You have the body of someone twice your age!"

Remember that information is power. The sooner that you find out your current condition, then the sooner that you can start initiating the needed changes to help slow down your aging process. Now you are ready to begin an individual treatment plan.

TIPS TO SLOW AGING

The suggestions that I have listed below are based on excellent science and appear to be very safe in preventing disease and possibly slowing aging in humans. They are worthy of our consideration. I should point out however, that although there are many clinical research studies that have evaluated specific treatments to slow aging in animals, there are a limited number of proven recommended treatments in humans that will prolong life. Testing humans has proven to be difficult due to a human's life span.

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 such as cold water fish and nuts and omega 9 fatty acids like olive products, olive oil and nuts. Use more high quality vegetable protein and high quality animal protein such as cold water fish, wild game and grass or range feed meat. Avoid caffeine and all sodas, diet or otherwise. Eat less refined, processed and fast foods. Avoid high fructose corn syrup.

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

WATER

Consume at least one hundred 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 products...active or passive

EXERCISE

Exercise for at least one hour per day that includes a combination of aerobics, resistance training, flexibility and agility exercises. The aerobic exercises should achieve about 70 percent of the estimated maximum heart rate for the patient's age and can be a variety of mixed exercises individualized for the patients needs. Resistance training 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 level 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 weight and body mass index. The percent body fat in men should be less than 18 percent and in women less than 22 percent with increases in percent lean muscle mass to 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, heart rate and improve immune function 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 friendships, 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 life span and reduce the incidence of cardiovascular disease. Although any alcohol may be effective, red wine, especially those with high resveratrol content such as Pinot Noir, Cabernet, Merlot, Zinfandel, and Shiraz may be the most effective. About 20 grams per week is optimal, which is equivalent to about a six 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 is data in animal models that specific supplements are effective in extending life span. Coenzyme Q-10, R-Lipoic acid, acetyl-L carnitine, phosphatidyl serine, glycerophosphocholine, N-acetyl cysteine, EGCG, resveratrol, grape seed extract, polyphenols, vitamin C, B vitamins, selenium, zinc, lycopene, garlic, ginkgo, a good multivitamin, Gamma/Delta tocopherol and tocotrienols (forms of Vitamin E), royal jelly, omega 3 fatty acids (fish oil) increase life span and cognitive function in rats. Other supplements are being evaluated as well.

The combination of VasculoSirt, EFA Sirt Supreme and ResveraSirt comprise most of the basic nutritional supplements to slow vascular aging and aging in general.

Do not take a multivitamin with preformed Vitamin A or one with Beta Carotene or 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. Women need 1500 mg calcium with other bone minerals. Use ginger, turmeric, curcumin and other natural anti-inflammatories.

Recent studies have shown that increasing blood levels of the powerful intracellular anti-oxidant glutathione and maintaining enzymes that produce glutathione or reduce its destruction will reduce 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-acetyl cysteine, selenium, whey protein, broccoli, vitamin C and E, as well as a few others.

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.

Resveratrol shows the most promise as an anti-aging nutrient. Resveratrol is a polyphenol found in red wine, the skin of young unripe red grapes, grape seeds and purple grape juice. It's found in smaller amounts in peanuts and in the roots of a 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 SIR I and SIR 2 genes in human cells. Activation of SIRT I will extend life span and can be particularly effective in conjunction with caloric restriction. SIRT I blocks the activity of tumor growth, cell death and protects human cells from gamma radiation. SIR 2 increases DNA stability, speeds cellular repair and increases total life span.

The power of resveratrol in various studies is impressive. In yeast, resveratrol extends life by 80 percent. In mice, rats and primates, resveratrol demonstrates anti-aging and athletic endurance activities, promotes weight loss and simulates the anti-aging effects of caloric restriction without actually restricting calories. Resveratrol has also demonstrated anti-oxidant, anti-inflammatory anti-cancer, anti-platelet, and cholesterol lowering activities. Resveratrol increases insulin sensitivity, reduces insulin like growth factor I (IGF -I), activates the PPAR gamma system, increases mitochondrial number, increases energy expenditure and improves motor function.

Recent studies also suggest resveratrol reduces the risk of colorectal cancer and slows the progression of Alzheimer's disease, Supplements range from 1 to 100 mg per day. One liter (bottle) of red wine contains only about 1-2 mg of resveratrol (range of 0.2 to 5.8 mg per liter) The dose needed in humans to achieve an anti-aging effect are not known, but based on the doses that have been shown to be effective in animals, a human would need from 1500 to 28,000 mg per day of resveratrol. Most scientists recommend about 5 mg/kg per day, pending more studies. This would be about 150 mg per day for an average adult. No short or long-term adverse effects have been noted to date.

PHARMACOLOGIC AGENTS

1. ANGIOTENSION CONVERTING ENZYME INHIBITORS (ACEI'S) AND ANGIOTENSIVE CONVERTING ENZYME INHIBITORS(ARB'S).

These drugs are used to treat high blood pressure, 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 a hormone called angiotension II appear to be at play.

2. STATINS:

This class of drugs is used to treat high cholesterol and reduce heart disease and stroke. They also have pleiotrophic effects that are antioxidant, anti-inflammatory and anti-growth; they 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.

3. METFORMIN:

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

4. 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.

HORMONAL THERAPIES

Human growth hormone (HGH) has been used as an anti-aging treatment for a long time with some evidence of beneficial effects in elderly patients. HGH supplements may increase muscle mass, enhance the immune function, increase libido, and overall energy level. However, the long term effects may be more adverse because of increased osteoarthritis, higher glucose or diabetes mellitus, high blood pressure, weight gain and promotion of growth of pre-existing tumors and cancers such as prostate and colon.

Other hormonal therapies such as DHEA, melatonin and sex hormones show promise, but there are no good studies to date in humans to recommend them for long term use as an anti-aging program. Selected use of bio-identical sex hormones such as testosterone in men and estrogen and progesterone in women will improve quality of life, bone and lean muscle mass, reduce hormone-related symptoms and reduce fatigue.

One of the major difficulties in studying human aging is its duration. Therefore, animal models have been used to evaluate the biology of aging and study methods to alter its progression. The major model systems to study human aging are human cells, unicellular organisms such as yeast, the roundworm, the fruit fly, mice and rats and recently primates such as chimps. In this article I will discuss the biology of aging, theories of aging and methods to slow the aging process.

CONCLUSIONS

The potential life span 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 life span. 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. Now that you have the knowledge, information and capacity to slow the aging process in yourself, what are you waiting for?

To your life, good health and slower aging.

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