



SECRETS TO A LONG & HEALTHY LIFE

DAVID SCHUTZ

***FIT*after50**

A full-page photograph of an older couple walking barefoot on a wooden boardwalk by the ocean. The man, on the left, has grey hair and is wearing a dark blue jacket over a purple shirt and khaki pants. The woman, on the right, has short grey hair and is wearing a grey and white argyle sweater over a light blue shirt and dark pants. They are holding hands and looking at each other with smiles. The boardwalk has blue wooden railings. In the background, there is a sandy beach, the ocean with small waves, and a clear blue sky. The word "INTRODUCTION" is overlaid in white, bold, sans-serif capital letters in the lower-middle part of the image.

INTRODUCTION

What if I said you could add up to ten years to your life? And not 10 years of old age fraught with infirmity, where you're unable to do the things that bring you joy, but rather 10 years of fully functional life, where you can enjoy your kids and grand kids, gardening, traveling, or whatever it is that brings you joy. You see, a long healthy life is yours for the taking, if you're willing to understand what it takes, and potentially take the appropriate steps, and make some adjustments in your lifestyle. I say "potentially" because, who knows? You may be already doing these things.

The point is that at a very basic level, aging occurs at a cellular level because of an accumulation of damage. And you're probably aware of this. Ask yourself what lifestyle choices you're making that could be impacting how long you live, perhaps more than you realize? How much do you exercise? Do you smoke? Do you take recreational drugs? Do you drink alcohol more than you should? Do you eat junk food commonly, or are you overweight? Do you see your physician regularly? Do you sleep soundly? How's the stress in your life? How close are your relationships? Do you have a purpose in your life, or are you just coasting? These are all factors that influence longevity.

Of course, having good genes also affects your longevity, but it's mostly about good habits. Current estimates suggest that about 25 percent of the variation in human life span is determined by genetics, but which genes, and how they contribute to longevity, are not well understood. That means that if you adopt the right lifestyle, experts say you have a 75% chance you may live a decade or more longer.

So what's the formula for success?

People have been seeking the proverbial fountain of youth since time began. It's no wonder: most people have a fundamental fear of the unknown, and what happens when we die is a mystery. Research these days is taking different paths. Some endeavor to understand what lifestyle habits are common to the longest-lived people in the world, while others seeking to first understand the biological mechanisms of aging, and then identify interventions to counter those mechanisms. Finally, it's clear that are a few common psychological components that promote longevity. We'll take a look at all three factors.

Chapter 5 provides an overview of our current understanding of what causes aging. There are varying accounts as to the number of causes of aging - some emphasize 4, others 7, and here, I've identified 10. Note that these processes work together - aging is not one thing, but many.



1 LONGEVITY PROMOTING LIFESTYLE



In 2004, author and explorer Dan Buettner conducted a global study of communities with a high percentage of centenarians (people who live over 100 years). The study focused on five hot spots—called “Blue Zones” — a name from the blue circles drawn on a map — where there is a high rate of centenarians who enjoy a healthier lifestyle. These places were:

- Sardinia, Italy
- Okinawa, Japan
- Ikaria, Greece
- Loma Linda, CA, U.S.
- Nicoya, Costa Rica

The study found that seniors in these locations have in common a number of key habits or lifestyles, despite many differences in backgrounds and beliefs. These universal healthy habits have nine key things in common including a healthy diet, regular physical and mental exercise, focus on family and community, and a purpose. By these habits, a person’s life expectancy could increase by 10-12 year.

1. Move Naturally

Blue Zone residents are active in their everyday lives, whether they’re walking around town or gardening. Note that they don’t have formal exercise routines – they don’t go to the gym or run marathons, they simply perform low-intensity exercise as part of their regular lifestyles.

Movement is part of their daily life and rituals. They live in environments that nudge them into moving without thinking. For instance, they grow gardens and don’t have mechanical conveniences, but instead use their own labor to make things happen. They also commonly walk long distances each day. Moving comes naturally and is something they are doing constantly.

Whether you are gardening, walking, cooking, or doing other chores, natural movement helps improve your health.

2. Know Your Purpose

People in Blue Zones tend to have a strong sense of purpose. In Okinawa the word for life purpose is “ikigai,” while in Nicoya, the phrase is “plan de vida,” which loosely translates to “why I wake up in the morning.” And it’s not just in the Blue Zones. In a study conducted by University of Michigan School of Public Health that followed nearly 7,000 people over age 50 for more than a decade, researchers determined that people that have a strong sense of purpose live longer. Having a sense of purpose is worth up to seven years of extra life expectancy.

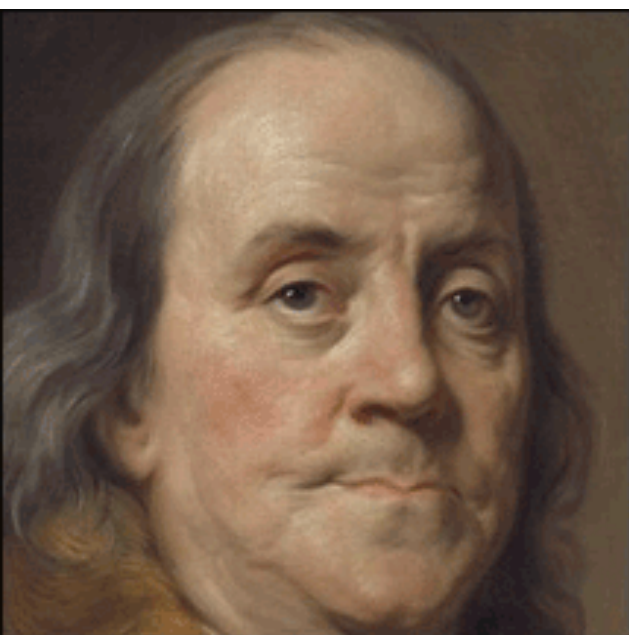
3. Reduce or Eliminate Stress

Stress is a major cause of disease and unhappiness in the world today. It leads to chronic inflammation, associated with every major age-related disease. Stress is a part of daily life and even people living in the Blue Zones experience stress, but it’s how they manage it that makes all the difference. The world’s longest-lived people have routines for shedding stress. Okinawans take a few moments each day to remember their ancestors, Adventists pray, Ikarians take a nap and Sardinians do happy hour.

Chronic stress is also a big contributor to aging, and the best way to fight it is with exercise. Mix it up with some HIIT, resistance training, aerobic exercise and mind/body practices to deal with whatever is causing the stress, for as long as it exists. When you take this multi-faceted approach, you can mediate the stress and have less cognitive decline as well.

4. Eat Not to Dullness

When Benjamin Franklin decided to purposefully cultivate his character, he identified 13 virtues he believed would help him become a better man. The first of these virtues was temperance, which he defined as “Eat not to dullness; drink not to elevation.” Restricting calorie intake and intermittent fasting are common practices in the Blue Zones. The



*Temperance
Eat not to dullness.
drink not to elevation*

Okinawan recite a 2,500-year old Confucian mantra, 'Hara hachi bu', before meals. This reminds them to stop eating when their stomachs are 80% full.

The 20% gap between not being hungry and feeling full could be the difference between losing weight and gaining it. People in the Blue Zones eat their smallest meal in the late afternoon or early evening and then they don't eat any more the rest of the day.

Icarians, typically Greek Orthodox Christians, practice fasting for religious holidays at different times throughout the year. Fasting has been shown to reduce your risk of chronic disease, including blood pressure and cholesterol.

The fact is that caloric restriction is one of the only proven methods of extending your life. Caloric restriction is a dietary regimen that involves reducing your calorie intake daily without incurring malnutrition or a reduction in essential nutrients. "Reduce" can be defined relative to the subject's previous intake before intentionally restricting calories, or relative to an average person of similar body type.

Caloric restriction is uncomfortable for most people, and so may not be practical, however adopting a habit of regular intermittent fasting is fairly easy, and produces similar benefits.

5. Eat Fresh Whole Foods, Mostly Plants

Shakespeare wrote "brevity is the soul of wit, " and author Michael Pollan demonstrates that with what may be the shortest, simplest and most sensible diet plan ever: "Eat food. Not too much. Mostly plants." This approach to diet is a clear theme across the Blue Zone communities, where they focus on fresh, organic food, with an emphasis on vegetables and fruits, and small amounts of red meat.



The majority of centenarians eat fruits and vegetables that are homegrown or locally grown organic products. Picking up food at local farmers' markets not only fosters a sense of community (another factor in longevity), but also allows you to eat seasonally, which means the fruits and vegetables will be more nutritionally dense. The same principles apply for growing your own food, which provides exercise and a sense of purpose, and the ability to control what goes into your food—and what does not.

According to their research, people in the Blue Zones consume meat uncommonly, typically about five times a month. When you eat is also important because it can help with digestion and ensure your body gets the energy it needs to perform. People in the Blue Zones tend to eat three meals a day and don't make a habit of snacking. Their smallest meal is usually dinner and then they don't eat anything after dinner.

6. Happy Hour

All of the Blue Zone people except the Adventists drink moderately, enjoying a glass of wine with food and friends daily. But the trick is the social connection and moderate drinking. That said, at least in the USA, alcohol consumption is on the rise—including increases in its abuse. If you drink, do so in moderation.

7. Embrace a Spiritual Belief System

Faith has an effect on our physical lives and longevity. In the Blue Zones areas people with exceptionally long lifespans share a common factor: trust in divine power. Ninety-eight percent of the centenarians interviewed in the Blue Zones study belonged to some type of faith-based community. In fact, the research shows that attending faith-based services each week has been shown to add 4 to 14 years of life expectancy.

Faith provides a sense of belonging and provides you with social support and can help to alleviate depression and loneliness. Denomination doesn't seem to matter.



8. Stay Close With Your Family

A common characteristic of the exceptionally long-lived is that they maintain close family relationships. It's not just in the Blue Zones: a study conducted at the University of Toronto's Dalla Lana School of Public Health found that older individuals who have more family in their network, as well as older people who were closer with their family, live longer. Other studies also show that having grandparents and parents nearby lowers the disease and mortality rates of children



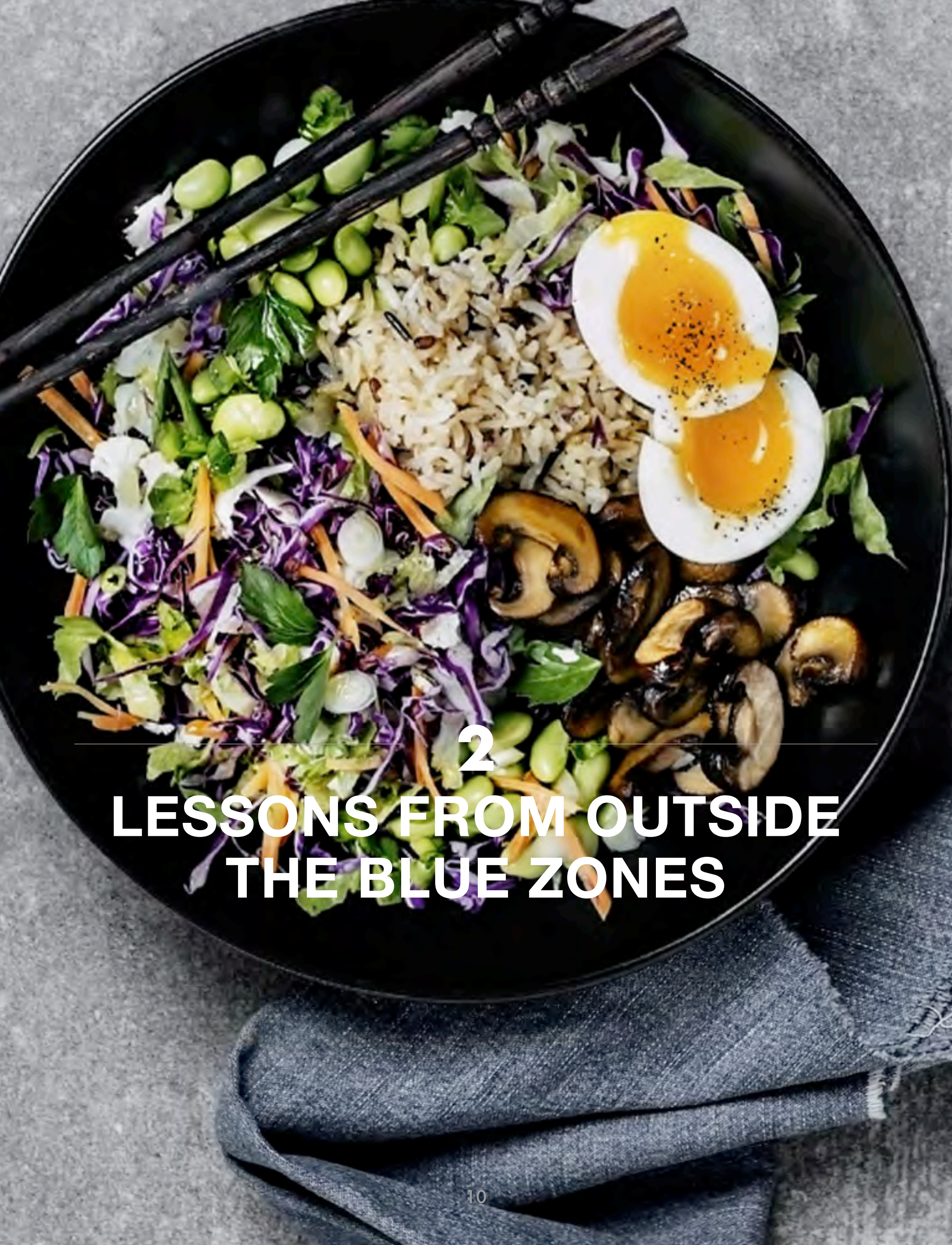
9. Build Close Relationships

The Blue Zone regions have this in common—they gather together. If you spend quality time with like-minded people in your community, you'll feel happier and have a sense of purpose.

Close relationships, in fact, seem to be a vital key to longevity. A 2010 meta-analysis study examining over 300,000 individuals concluded that social relationships can influence mortality as much as risk factors like smoking and drinking and actually have a greater impact than risk factors like physical inactivity and obesity.

We all know the benefits of finding your tribe. But even more so, being with a tribe that promotes life-affirming, healthful behaviors is even more vital.

The world's longest lived people chose—or were born into—social circles that supported healthy behaviors. Okinawans created 'moais'—groups of five friends that committed to each other for life. Research from the Framingham Studies shows that smoking, obesity, happiness, and even loneliness are contagious. So the social networks of long-lived people have favorably shaped their health behaviors. – Dan Buettner



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LESSONS FROM OUTSIDE
THE BLUE ZONES

1. More on Diet for Longevity

Dr. Valter Longo studied how to eat for longevity, and wrote a book on it I highly recommend called The Longevity Diet. Here's a brief summary:

Longevity Diet for Adults

1. Eat mostly vegan, plus a little fish, limiting meals with fish to a maximum of two or three per week. Choose fish, crustaceans, and mollusks with a high omega-3, omega-6, and vitamin B12 content (salmon, anchovies, sardines, cod, sea bream, trout, clams, and shrimp. Pay attention to the quality of the fish, choosing those with low levels of mercury.

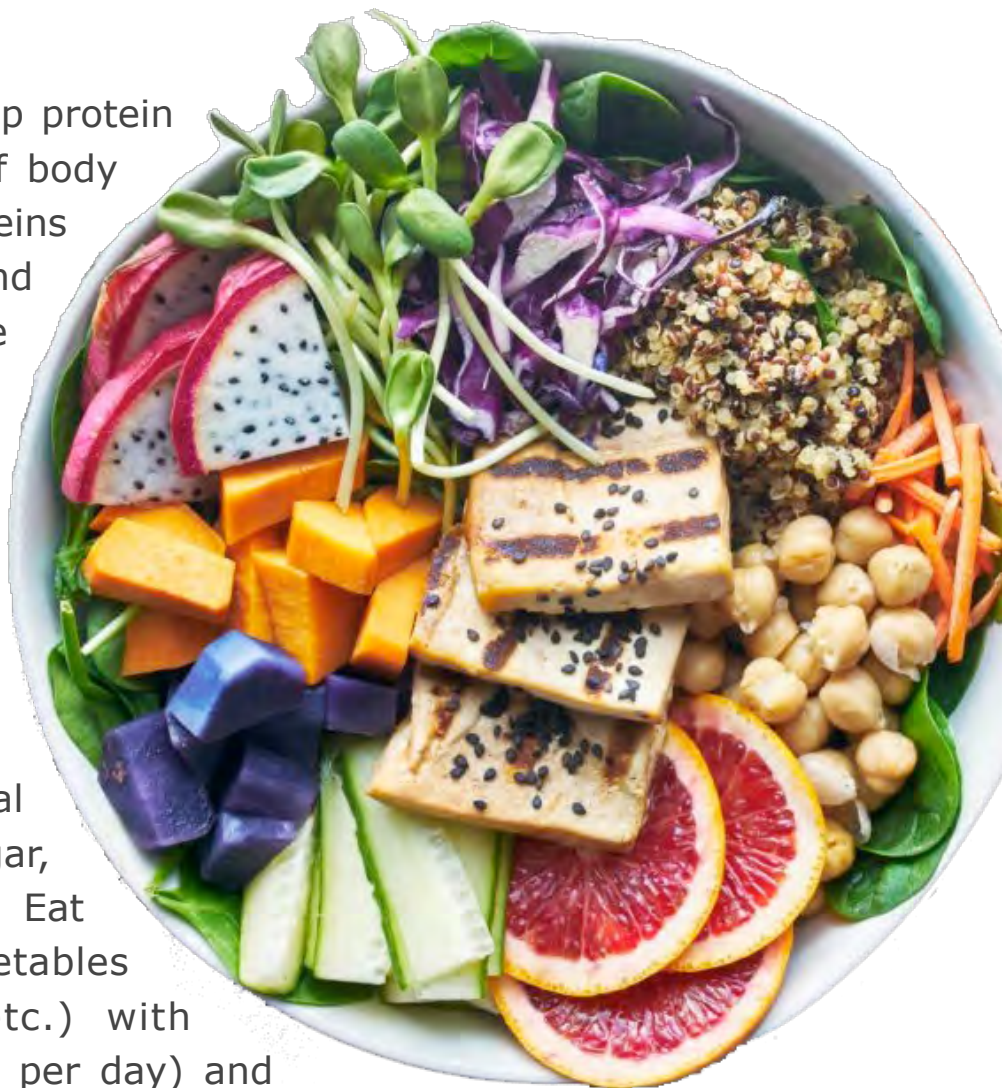
2. If you are below the age of 65, keep protein intake low (0.31 to 0.36 grams per pound of body weight). That comes to 40 to 47 grams of proteins per day for a person weighing 130 pounds, and 60 to 70 grams of protein per day for someone weighing 200 to 220 pounds. Over age 65, you should slightly increase protein intake but also increase consumption of fish, eggs, white meat, and products derived from goats and sheep to preserve muscle mass. Consume beans, chickpeas, green peas, and other legumes as your main source of protein.

3. Minimize saturated fats from animal and vegetable sources (meat, cheese) and sugar, and maximize good fats and complex carbs. Eat whole grains and high quantities of vegetables (tomatoes, broccoli, carrots, legumes, etc.) with generous amounts of olive oil (3 tablespoons per day) and nuts (1 ounce per day).

4. Follow a diet with high vitamin and mineral content, supplemented with a multivitamin buffer every three days.

5. Consume a variety of foods to take in all the required nutrients, but choose the ones that were common on the table of your parents, grandparents, and great-grandparents, so long as they are included in the Longevity Diet.

6. Based on your weight, age, and abdominal circumference, decide whether to have two or three meals per day. If you are overweight or tend to gain weight easily, consume two meals a day: breakfast and either lunch or dinner, plus two low-sugar (less than 5 grams) snacks with fewer than 100 calories each. If you are already at a normal



weight, or if you tend to lose weight easily or are over 65 and of normal weight, eat three meals a day and one low-sugar (less than 3 to 5 grams) snack with fewer than 100 calories.

7. Confine all eating to within a twelve-hour period; for example, start after 8 a.m. and end before 8 p.m. Don't eat anything within three to four hours of bedtime.

2. Exercise for Longevity

Dr. Valter Longo is one of the world's foremost experts on longevity. He is the director of the Longevity Institute at the University of Southern California in Los Angeles, and of the Program on Longevity and Cancer at IFOM (Molecular Oncology FIRC Institute) in Milan.

Dr. Longo has studied longevity for more than 30 years, and he has concluded how to exercise to increase healthy lifespan. In fact, his research shows that physical activity is the number 2 factor affecting lifespan, behind only diet.

Walk fast for an hour every day

This doesn't need to happen all at once. For example, if the train station is a 15-minute walk away from your house, and you do that each way, that's 30 minutes right there. Then you could pick a coffee shop that is a 15-minute walk away from your office, and make a daily visit. Those might not be your exact circumstances, but you get the idea — find places you can walk to and go there every day. On the weekend, walk everywhere, even faraway places — do your best to leave your car in the garage or driveway all weekend long.



Do cardiovascular exercise for 2.5–5 hours per week

Running, cycling, or swimming are all great options, but the type of exercise you choose isn't important. The key is working your body to the point of breathing rapidly and sweating. A simple way to hit this exercise threshold is to have a stationary bike and a road bike (go outside when the weather permits, otherwise ride indoors), and make a point of riding for 30–40 minutes every other day, and for 2 hours total on the weekend.



Resistance Training to Strengthen Your Body

Resistance training can include working out at the gym with weights or machines, or can be body weight training. Gymnasts have some of the most impressive physiques at the Olympics, and focus almost entirely on body weight exercises. This can be the classic gym routine, but your muscles also

become stronger when you take the stairs instead of the elevator (Longo advises to always take the stairs!), walk instead of driving, grow food in your garden instead of buying it, and do manual work around the house instead of hiring someone to do it. When you do engage in a hard weight-training session, consume at least 30 grams of protein in a single meal within 1–2 hours afterwards to maximize muscle growth.

How Much Exercise Should You Get?

In terms of how long you should exercise per week, research shows that most of the beneficial effects are caused by the first 2.5 hours. For example, a large Australian study of over 200,000 people aged 45–75 found that those who exercised (at moderate to vigorous levels) at least 2.5 hours per week had a 47% reduction in overall mortality. Going up to 5 hours per week led to a 54% reduction in mortality. Ensuring at least some of that activity was in the vigorous range dropped the risk of dying by another 9 percent.

Another very large study involving more than 650,000 people in the U.S. and Europe showed that mortality was reduced by 31% for people who exercised for at least 2.5 hours per week at moderate intensity (or for more than 75 minutes at vigorous intensity). Increasing the exercise totals to 5 hours at moderate intensity (or 2.5 hours at vigorous levels) lowered the risk of dying by 37%.

Examples of moderate exercise include fast walking or slow jogging (faster than 4 mph), cycling (10–12 mph), or gardening. Examples of vigorous exercise include climbing stairs or hiking, cycling (faster than 12 mph), playing soccer, or jogging (faster than 6 mph).

What Kinds of Exercise Should You Include?

In 2017 the Mayo Clinic conducted a study compared high-intensity interval training, resistance training and combined training. All training types improved lean body mass and insulin sensitivity, but only high-intensity and combined training improved aerobic capacity and mitochondrial function for skeletal muscle. As we've discussed earlier, decline in mitochondrial content and function are common in older adults.

One group did high-intensity interval training (HIIT) using stationary bikes, the second group did all strength training with weights and the third group did a combination of strength training and interval training. The study included a control group of people that didn't exercise. Not surprisingly, muscle mass increased in the strength training. But, they found the HIIT group reaped the biggest



benefits at a cellular level. The younger volunteers in the interval training group saw a 49% increase in mitochondrial capacity, and the older volunteers saw an even more dramatic 69% increase.

HIIT also improved muscle protein content resulting and significantly enhanced the cellular machinery responsible for making new proteins. That contributes to protein synthesis, thus reversing a major adverse effect of aging (see Section 1, number 6). Dr. Sreekumaran Nair, a professor of medicine and an endocrinologist at the Mayo Clinic and the study's lead author says it seems exercise, particularly if it was intense, "corrected" the decline in the cellular health of muscles that happens with aging.

Insulin sensitivity (the ability to regulate blood sugar), which reduces the risk of developing diabetes, was also improved with HIIT. However, it did not improve muscle strength as much as weight training only, and strength training is an important part of healthy aging, for many reasons including that muscle strength declines with age and muscle mass declines after age 30.

Since muscle mass protects against insulin resistance and prediabetes, no matter overall body size it's important to maintain muscle mass. A UCLA study showed that every 10% increase in the ratio of skeletal muscle mass to total body weight reduces the risk of insulin resistance by 11%, and results in a 12% drop in risk of transitional, prediabetes, or overt diabetes.

So any exercise program focused on anti-aging and longevity should include high-intensity interval training, ideally 3 non-consecutive days per week, regular resistance training, and regular low intensity cardio training, like walking. One of the doctors involved in the study said "it's the best method we know of for delaying the aging process, and there's no substitute for these exercise programs. These things we are seeing cannot be done by any medicine."

Another study conducted at Brigham Young University found adults with consistently high levels of physical activity have a 9-year aging advantage over those who are sedentary and a 7-year advantage over those who are only moderately active. To be highly active, women had to engage in 30 minutes of jogging (or any similarly demanding cardiovascular exercise) per day (40 minutes for men), five days a week.

The reason has to do with telomere length. Telomeres are the end caps of our chromosomes and are extremely correlated with age. Each time a cell replicates, we lose a tiny bit of the end caps. Therefore, the older we get, the shorter our telomeres. Think of them as a biological time clock.

People who maintain consistent high levels of physical activity have significantly longer telomeres than those whose activity levels range from sedentary to moderately active. So the casual gym goer isn't getting much by way of longevity compared to the couch potato. "If you want to see a real difference in slowing your biological aging, it

appears that a little exercise won't cut it," Tucker said. "You have to work out regularly at high levels."

Experts believe now understand that telomere length is linked to inflammation and oxidative stress. Exercise has been shown to reduce both over time.

Of course there's no guarantee that having longer telomeres will give you a longer, healthier life, but you will put the odds in your favor, Tucker says. "We all know people who seem younger than their actual age," and "we know exercise can help with that, and now we know that part of that may be because of its effect on our telomeres." High-intensity interval training (HIIT) not only slows, but actually reverses aging on a cellular level.



Recommended HIIT

While there are numerous approaches to HIIT, I recommend Sprint 8, which is clinically proven to increase telomere length in as little as 8 weeks – but it has to be a regular part of your exercise regimen to retain the effects.

In a recent study researchers at the University of Colorado concluded: "Our results indicate telomere length is preserved in healthy older adults who perform vigorous aerobic exercise and is positively related to maximal aerobic exercise capacity. This may represent a novel molecular mechanism underlying the "anti-aging" effects of maintaining high aerobic fitness.



The Sprint 8 protocol is simple, and involves intervals of high activity followed by active recovery. I'll describe it for walking/running, but you can adopt the protocol for swimming, bicycling, rowing, etc. To do Sprint 8, don't eat for at least an hour before you exercise, then gradually increase your heart rate by and warm up your body by walking briskly for at least 5 minutes. After you're warmed up, sprint for 30 seconds at an all-out intensity. If you can go longer than 30 seconds, you are not working hard enough. Keep in mind that, for some people, "all-out intensity" may be a fast walking pace. Following each sprint, walk at a reasonable pace for 90-seconds of active recovery. Repeat these intervals of sprint/walk a total of 8 times, then cool down by walking until your heart rate is back to normal, at least 2-3 minutes.

As you get good at Sprint 8, it's just 20 minutes: three minute warm-up + eight 2-minute intervals with the last one concluding with 2.5 minutes of cool down = 20 minutes.

Just 60 minutes of exercise per week for at least 8 weeks can produce a 67% increase in your telomere length. It's an astonishing tradeoff for such a significant gain in promoting longevity.

3. Water



Hydration is important at any age, but it is particularly key for older adults. Older individuals tend to retain less water than younger people, mostly due to decreased lean body mass, though also related to decreased fluid intakes or a decline in kidney function. This factor may increase your risk of chronic dehydration.

The average person requires roughly 1 milliliter of fluids for every calorie consumed. Therefore, if you consume an average of 1,800 calories daily, you require around 1,800 milliliters, or 60 ounces, of fluids.

Concerned about coffee? A study in the *Journal of Human Nutrition and Dietetics* has concluded that daily coffee intake, as part of a normal lifestyle is not associated with dehydration. Furthermore, current research suggests that regular coffee consumption may protect against cognitive impairment and decline later in life. This being said, it is good to keep in mind that water is the gold standard for hydration, and should make up a majority of fluid intake.

Aim to consume the majority of your daily fluids as pure water, though feel free to continue—or even consider taking up—your own daily coffee routine.

4. Stay Mentally Sharp



Exercising your mind may be just as important as exercising your body. Adding brain teasers and learning activities that support mental agility to your weekly routine not only boosts your memory, but can also protect against aging and certain types of dementia, and improve the quality of life in your mature years.

Staying mentally active throughout your life is essential to keeping your memory sharp and your brain in the best shape possible. There are many activities that can help keep your neurons firing, such as:

- Reading
- Crossword puzzles
- Memory or strategy games
- Brain teasers
- Crafting
- Puzzles

But, if you're looking for something to really make a big impact on your brain, make continued education a habit. Keep challenging your brain by engaging in activities and skills that are entirely new to you, to create brand-new neural pathways. In a word: Cross-train. Here are three ideas to get your brain moving.

Learn Something New

Research has shown that people who continually learn new things throughout life are less likely to develop Alzheimer's disease and dementia, so kick your mental fitness a step up and go outside your comfort zone.

If you can (literally) knit with your eyes closed, try something that requires an entirely different set of skills—like glassblowing, speaking Portuguese, or playing guitar. Remember: the greater the departure from your normal hobby or activity, the greater the benefit to your brain. If you love to read or have a passion for chess, by all means keep at it. But switching your reading habits from historical novels to essays is probably not going to move the needle much. However, speaking Mandarin instead of English—well, now you're onto something.



Challenge Yourself

Games and activities that involve multiple tasks or require interaction and organization appear to deliver the greatest protection against cognitive decline. Brainteasers and strategy games offer your brain a tough challenge and build your capacity to form and retain cognitive associations. Crossword puzzles and Sudoku also fill the bill. Board games and cards add a social component so you can connect with your loved ones while strengthening your mental muscles.

Variety Isn't Just Spice

Even mixing up your normal routine gets those neurons firing in entirely new ways. If you take a daily walk, mix it up. Go a different route. Go to a whole different neighborhood. Try a different trail. Take your dog to a different park, shop at a grocery store you're not familiar with, take a different route to work or school. Changing everyday habits on a regular basis creates new brain pathways and strengthens existing connections. It also keeps life fresh, ever interesting, and uniquely balanced.

In older adults, the kind of boost to mental acuity that comes with just short bursts of mental exercise is huge. It not only helps improve quality of life and problem-solving skills, it can significantly improve important everyday skills, like reaction times (think: driving), accuracy of reading signs and instructions (think: reading medicine bottles and recipe instructions), and memory (think: "Did I already take my pills?")

The best part is: Brain training is fun—so it's not only good for the brain, but also healthy for the heart and soul.

5. Importance of Sleep

Getting regular restful sleep is key to staying healthy and vital, yet it is so often neglected. A lack of restful sleep creates imbalances in the body, weakens our immune system, and speeds up the aging process.

One of the largest sleep studies involving more than one million participants over a six year period found that optimal sleep time for increased longevity is from six to seven hours for most people. Daniel Kripke, M.D. and his colleagues at the University of California San Diego have ample support for their study.



Thirty studies conducted later confirmed Dr. Kripke's findings.

Don't take seven hours as the magic number on its own – it's important to build awareness of how you feel when you wake up the next morning after 6, 7, 8, or 9 hours of sleep. Do you feel energized or you cannot function without that caffeine hit? Are you able to focus well? Be mindful of what how you feel the next day, and recognize that different factors including stress and how much exercise you get can change how much sleep you need on a daily basis.

Improve how soundly you sleep by following natural circadian rhythms. For most people that means going to bed around 10 p.m. and waking around 6 a.m.



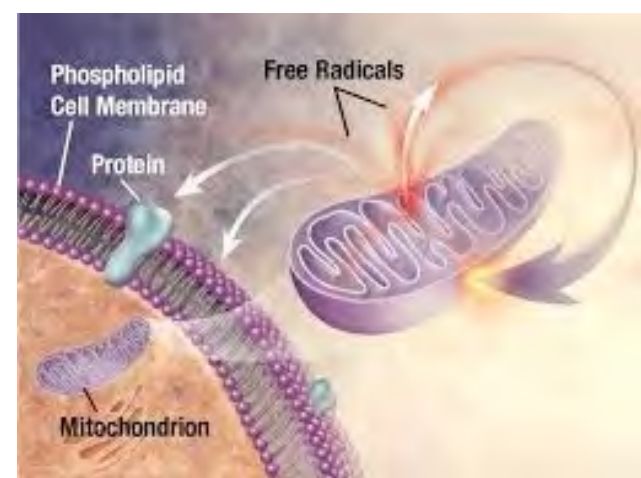
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LONGEVITY PROMOTING SUPPLEMENTS

Each of the following recommendations involves supplements. DO NOT take any supplements without checking in with your doctor.

1: Oxidation Control

Oxidative stress is an imbalance of free radicals and antioxidants in the body, which can lead to cell and tissue damage. Oxidative stress occurs naturally and plays a role in the aging process. Conquering oxidation requires having a well-functioning antioxidant system. Since glutathione, which is produced in our cells, is our natural, built in anti-oxidant system, it makes sense to do what's possible to make it work better, and there's solid evidence that N-Acetyl Cysteine, or NAC, a natural substance increases glutathione in our cells.



Since glutathione is broken down during digestion, none of it gets into your cells where it is needed. In contrast to this, NAC significantly upgrades our stores of glutathione, and is proven safe in thousands of clinical studies. Take NAC daily, in the morning and before bed.

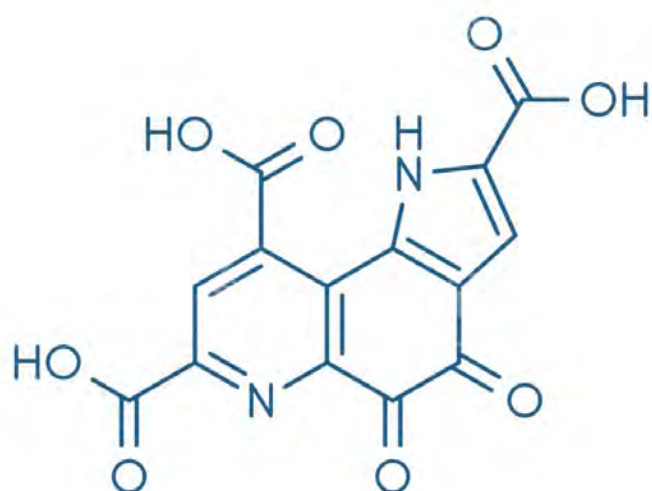
Recommended:

- Jarrow Slow Release NAC 600mg, 100 Tablets
- TwinLab NAC 600mg, 60 Capsules

If you take nitroglycerine in any way, check with your doctor prior to taking NAC.

2: Improve Cellular Energy

The key to upgrading cellular energy levels is to protect mitochondria, the “power plants” of our cells. A nutraceutical called PQQ is the most powerful enhancer of mitochondrial function yet discovered. It activates cell-signaling mechanisms that actually enable cells to create more mitochondria, and protects existing mitochondria from oxidative damage caused by free radicals.



pyrroloquinoline quinone

PQQ produces dramatic and measurable effects: in one study in persons between 40 and 70 years of age, memory function in the PQQ group doubled. Another study found PQQ is highly protective of heart function. And the good news is that PQQ is extremely affordable!

Take 10mg per day:

- Life Extension BioPQQ 10mg, 30 capsules

If your budget permits, take PQQ along with Ubiquinol, an enhanced form of CoQ10. Clinical studies prove that, taken together, these two supplements effectiveness dramatically increases.

- Swanson Ubiquinol 100mg, 60 gel caps

3: Activate Anti-Aging Genes

Resveratrol gives us the benefit of two powerful gene systems that promote sustained wellness and strong protection from heart disease, stroke and cancer. In addition to activating SIRT1 and FOXO, Resveratrol has proven to be highly effective against cancer. Resveratrol possesses the unique distinction of making normal cells hardier, while killing cancer cells.

Resveratrol exists in two forms, which represent molecular mirror images of each other: "CIS" and "TRANS." The TRANS is more biologically active, and thought to be responsible for most of the benefits.

Recommended:

- Doctor's Best Trans Resveratrol 200mg (60 vegicaps)
- Natures Plus Extended Release Resveratrol 125mg (60 or 120 tablets)



We know that Resveratrol is safe because it is found in substances like wine grapes and blueberries, with thousands of years of safe use and testing in mice in doses hundreds of times higher than those recommended here.

4. Pituitary Tune-up & Hormonal Regulation

Of all the anti-aging strategies discussed, none is more commonly known or controversial than Human Growth Hormone, or HGH. HGH is actually somatropin, a

hormone made up of 191 amino acids that signals to the body to synthesize proteins needed for life. It is vitally important long after our bodies stop growing.

The vast majority of studies show that, in optimum amounts, somatropin (HGH) exerts a broad range of beneficial effects in the body.

A natural method for supporting HGH production exists called Primary Locus Intervention, which elevates HGH by combining amino acids including arginine to stimulate HGH release from the pituitary.

Recommended:

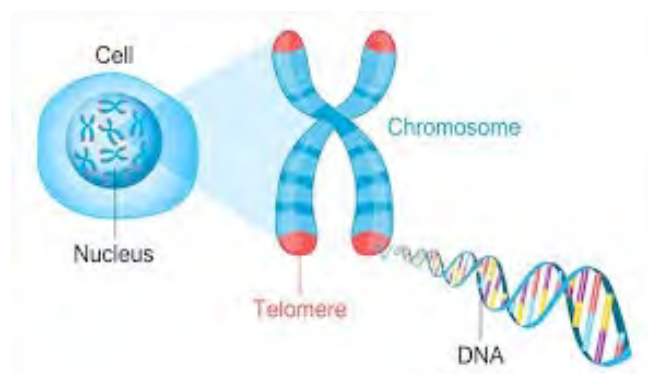
- Biocentrics Rejuvamax, Sugar Free HGH Booster, 350 Grams
- NutraBio Arginine Pyrroglutamate & Lysine, 500 grams

Biocentrics is best used first thing in the morning on an empty stomach, one hour before eating, while NutraBio is designed to take at bedtime on an empty stomach.

5: Telomere Support

The effect of telomere length on aging may be the hottest topic in anti-aging science. A 2010 study in Nature reported “unprecedented reversal of age-related decline in the central nervous system and other organs vital to adult mammalian health.” Aging wasn’t merely slowed down, it was reversed. Extends the ability of cells to replicate in a healthy fashion, prevents senescence of tissues, support the health and function of the heart, brain, skin and other vital organs, and prevents development of chronic disease.

Current studies show that it’s possible to slow the rate of telomere shortening, and even to lengthen telomeres, through supplementation with Omega 3, vitamin D, taking a good multi-vitamin daily, and getting regular exercise. I’ll touch on exercise in another section, but note that in one study, regular runners had telomeres 75% longer than people the same age that don’t exercise.



Recommended:

- TwinLab Daily One Caps Without Iron
- Pure Encapsulations Vitamin D3 Liquid 1000 IU Per Drop
- Carlson’s Labs Fish Oil 500ml

6: Taming Inflammation

Inflammation is such a complex phenomenon, affecting so many cell types, tissues and organ systems, that it’s remarkable that Curcumin, found in Turmeric, is effective so effective at controlling inflammation. Turmeric is a natural substance, with powerful and



wide-ranging anti-inflammatory effects, that is known through clinical studies to reduce the probability of cancer, relieve arthritis, and reduce inflammation, providing cellular anti-aging support that is systemic.

One scientific review paper calls it “an almost universal remedy.”

Curcumin also activates mTOR, a genetic switch that controls numerous cellular mechanisms

related to aging. By activating mTOR, Curcumin exerts powerful anti-cancer and anti-aging effects, which are unrelated to its anti-inflammatory effects. Curcumin also substantially increases HDL (good cholesterol).

My recommendation is to choose one of the new, enhanced-absorption formulations of Curcumin. If you choose a cheaper brand, as long as it is from a reputable company, such as Jarrow, Now or Pure Formulations, you will still be getting immense benefits. I recommend one capsule daily of:

- Life Extension Super Bio-Curcumin 400mg (60 vegicaps)

7: Clean Up Cellular Garbage

A powerful nutraceutical called Acetyl-L-Carnitine (ALCAR) improves brain and heart function by removing cellular debris, and also improves mitochondrial function, boosting energy to brain cells. ALCAR is inexpensive, free of side effects, has a long history of safe use, and has been proven extensively in human studies. In addition to the impressive effects on brain function, ALCAR relieves depression, improves sexual function, and has documented heart benefits.

ALCARs proven positive effects indicate that we are just beginning to understand the number of ways it slows the aging process.

ALCAR is recommended for those under 50 at 1000mg per day, while for those over 50, 2000mg per day is best; in either case, take half in the morning and half at night.

Recommended:

- NutraBulk Acetyl-L-carnitine 500mg (1000 capsules)
- Now Foods Acetyl-L-carnitine 500mg (200 capsules)

Combining ALCAR with PQQ produces dramatic improvements in mitochondrial function, but ALCAR works well with all the supplements suggested.

8: Reverse Advanced Glycation End Products or AGEs

Our bodies have a built-in for managing glycation and AGE formation. Carnosine is a natural, essential substance our cells make. Carnosine production declines with age, making us susceptible to glycation. The good news is that we can increase the amount of carnosine our cells make by taking the natural amino acid Beta Alanine, which is safe and inexpensive.

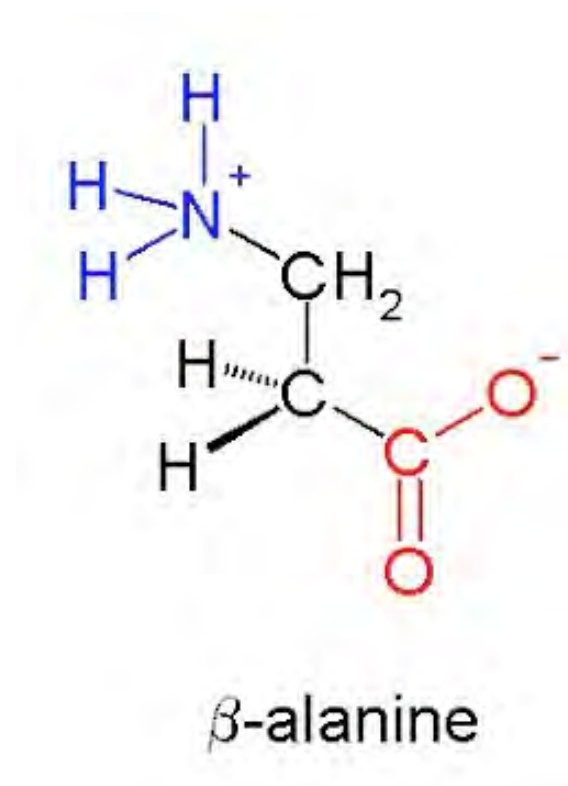
Like niacin, Beta Alanine can cause a tingling sensation, when you first start taking it, which is not harmful, and goes away after a while.

Beta Alanine powder is less expensive than capsules; add 1/2 teaspoon to a glass of water nightly.

Recommended:

- Now Foods Beta Alanine 750mg, 120 capsules
- Now Foods Beta Alanine Powder, 500g

There are no known drug interactions with beta alanine. As with all supplements, it is important to let your doctor know what you are taking.

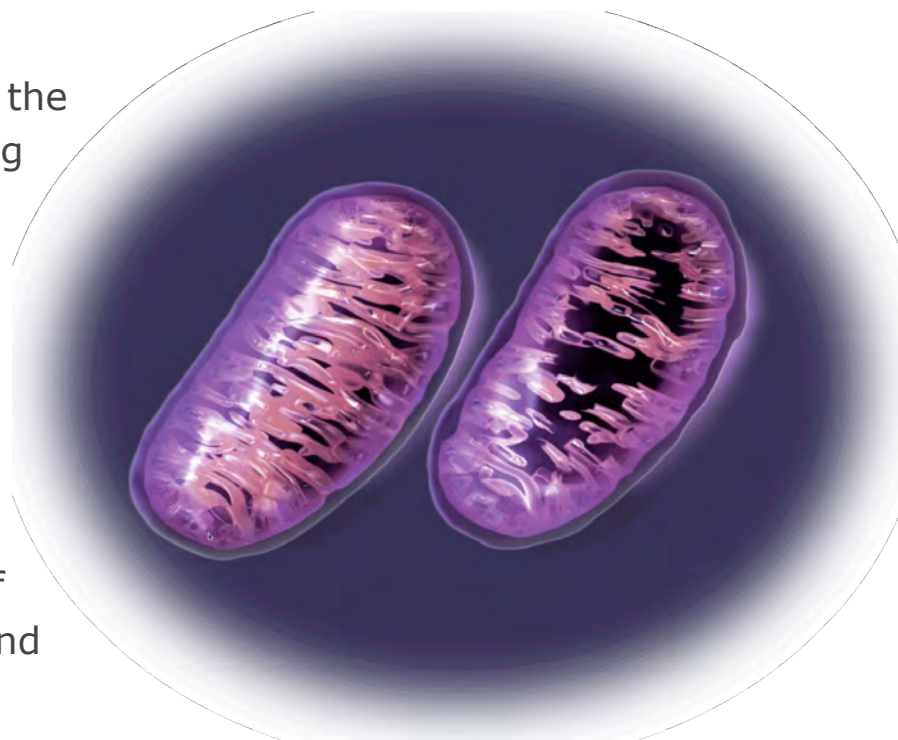




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10 CAUSES OF AGING

1. **Altered Intercellular Communication** - cells, like neurons in the brain, stop passing signals to each other effectively because they have begun to deteriorate. This hinders the body from functioning normally as these signals are necessary for proper cognitive and motor functions
2. **Stem Cell Exhaustion** - all adult bodies have stem cells; they are found mainly in the bone marrow and are used to make new blood cells as well as bones, cartilage, and connective tissues. They also allow the body to heal itself after injury, in addition to keeping blood oxygen levels stable. When these stem cells become exhausted, they stop making blood cells and new tissues to replace older or damaged tissues. This can be problematic as we age because bones and tissues also get older and need replacements. This can lead to anemia, osteoporosis, and intestinal malfunctions. Stem cells are not regenerated as easily as other cells are, and so rejuvenating stem cells are difficult but can reverse signs of aging at the cellular level.
3. **Cellular Sleep** - cellular senescence, or the state at which a cell is essentially asleep, contributes to aging. In this state, cells have stopped growing and dividing. This can be problematic, as cells die and are replaced often while we are young. As we age, cell turnover slows because of other cellular damage, such as mitochondrial dysfunction or genomic instability. In other words, the body doesn't want to make more cells that don't do their jobs. An accumulation of these senescent cells, however, may aggravate other damaged cells or lead to issues with immunity. So while cellular sleep starts out as a beneficial process, preventing damaged cells from propagating, it also speeds the aging process as cell regeneration ceases.
4. **Mitochondrial Dysfunction** - mitochondria are the organelles in every cell responsible for producing energy by burning carbohydrates, fatty acids and amino acids to create ATP, the cellular form of energy. As we age, the machinery used to make the energy stops working as effectively. A lack of energy can cause cells to die, as they can't perform their other functions without energy and can impact cellular signaling as outlined above. This leads to aging because the lack of energy decreases the lifespan of both the cells and their tissues.
5. **Deregulated Nutrient Sensing** - as the genetic issues of aging worsen, the body will try to take up fewer nutrients in an effort to repair itself. Studies have shown that dietary restriction can increase lifespan, and it seems the body tries to do this naturally. By not overloading already damaged cells and DNA with nutrients, the body can repair the damage that has been done. However, this only works



when nutrients are restricted for a short time; a lack of nutrients can be harmful, as the body can no longer tend to itself the way it did before it began to age.

6. **Decrease in Protein Genesis** - much of the physical signs of aging are based on the instability of proteins, as well as the cessation of making new proteins. Often, proteins need to be a very particular shape in order to work effectively. When they are made improperly as a result of aging, the body will immediately degrade them. For example, collagen, a protein that works to plump up the skin while we are young, is often made improperly as we age, or even not made at all. A lack of this essential protein is what causes us to look wrinkled or develop saggy skin.
7. **Changes to DNA** - as a result of cellular processes working less efficiently, our DNA responds by becoming less likely to work. The environment created by cellular issues like mitochondrial dysfunction and cellular sleep causes the DNA to turn itself off. If the DNA is off, it can no longer command that new cells be made or certain cellular functions be carried out. Changes to DNA that turn it off contribute to aging, as nothing new can be generated and the body is stuck with all of its deteriorating cells. However, scientists have indicated that changes to the DNA are reversible and that this may lead to an anti-aging treatment.
8. **DNA Damage** - as we age, our DNA may randomly degrade as a result of the loss of its protective factors, telomeres. Telomeres bind the ends of the DNA strands in order to keep them safe from mutation and degradation. As we age, the telomeres, instead of the DNA, are worn down, but make the DNA more susceptible to being worn down as well. As DNA is our genetic information, it decides our hair color, eye color, as well as operative functions like providing the information to replenish cellular machinery like mitochondria or stem cells in the body.



9. **Genomic Instability** - as DNA damage and changes accumulate, the DNA becomes less apt to fix itself. In our youth, issues with DNA are easily fixed, due to the lack of aging factors listed above. However, as damage builds up in the body over time, DNA becomes less apt to give instructions for making new cells or proteins, leading to further aging.

10. **Advanced Glycation End Products or AGEs** - are a diverse array of compounds produced in the body through a variety of chemical reactions. AGEs form through a process called glycation, which occurs inside our bodies when sugars combine with certain amino acids (the building blocks of proteins) or fats. We also consume AGEs, mostly from many cooked or processed foods, and absorb them from tobacco smoke. The body has ways to eliminate AGEs via enzymes and the kidneys, but those formed in the body are more likely to accumulate, which damages our cells by contributing to oxidative stress, chronic inflammation, and premature aging.

OK, so there's a summary of what we currently understand contributes to aging. Scientists and researchers are hard at work trying to figure out just what can be done to slow, stop, or reverse those processes. And we may not be far off from real breakthroughs, but there are steps that we can take now – some clinically proven, some are more speculative.

A person's hands are shown holding a glowing blue DNA double helix structure. The structure is surrounded by a cloud of golden particles, creating a sense of energy and science. The background is dark, making the glowing elements stand out.

5 FINAL THOUGHTS

A long, healthy life is about much more than good genes; it's highly dependent on building healthy habits. Habits—both good and bad—are integral to everyday life. Part of forming healthy habits is to become intentional with them until they become ingrained into your daily routine. It will take effort on your part, but if the payoff could be a more youthful, longer, healthier life, then it's worth it, right?

Don't let your age dictate your youthfulness. By forming healthy habits you can optimize your lifestyle—and may gain an extra decade of good life you'd otherwise miss. Use your lifestyle to create a younger version of yourself, and adopt the lifestyles that promote a healthy, connected, and purposeful life.