Aging: It’s Not Just for the Old

The Nature of Aging

Probably no other area in alternative health is more subject to over-promising and under-delivering than anti-aging medicine, especially with the Baby Boomer generation now solidly into retirement age. We’re talking about every “magic bullet” under the sun, from face rejuvenation creams to human growth hormone supplements.
Ah, if only it were that simple! But aging is not the result of any single factor, but is the cumulative result of a number of factors, including:

- Cell senescence (or the aging of cells)
- Diminished telomerase activity (telomerase is an enzyme involved in DNA replication)
- Protein degradation
- Advanced glycation end-products (AGEs)
- Excess sugar in the blood
- Progressive systemic inflammation
- Dehydration
- Accumulated toxic build-up in organ tissue
- Reduced circulation
- Reduced cellular energy production and impeded energy flows in the body
- Changes in hormone levels and hormone balance
- Excessive body weight
- And, of course, body wear and tear

The above list is hardly complete. We could also add stress, the accumulation of free radicals in the body, and the results of cumulative poor nutrition, for example. The key here is not to identify every single factor (an impossible task), but to understand that if you want to slow the aging process, you have to look at more than a “magic bullet” approach involving one or two supplements. The only way to maximize health and life span is to use a whole-body, systemic approach. In other words, you need to do everything all at once. The good news is that there are definite steps that you can implement to help retard the aging process and keep you more youthful, more energized, and healthier for longer than you ever thought possible — or at least dramatically improve your odds of doing so.

Before we address these factors of aging and present a program for slowing down and even reversing some of them, we need to separate the factors into three categories in order to decipher clues as to how to handle them. The three primary categories that affect how we age are:

1. The things that we do to ourselves, which are easily correctable (relatively speaking).
2. The micro-level factors programmed into our cells, which until a few years ago seemed impossible to change.
3. The macro-level factors programmed into our bodies as we age—primarily hormonal changes—many of which can be modified.

**The Purpose of Aging and Death**

Although it may not seem so from an egocentric point of view, aging and death are good things for the species. The concept is simple—adaptation and evolution. In order to ensure the survival of the species, nature selects those traits most useful for survival in a particular environment and passes them on to the next generation. The species evolves over time so that it becomes more and more capable of surviving in its environment. But why do “we” have to die after passing on our genetic information? From a genetic point of view, if the older generation did not die off, it wouldn’t allow the species to
advance because the older generations would continue to procreate and advance the “older” gene pool generation after generation. It’s only by eliminating the older gene pool that the species evolves.

In order to accomplish its purpose, nature has programmed our bodies with certain time bombs. For example, at the micro level, our cells can replicate only so many times before the cells become non-functional and die off. And at the macro level, genes program certain changes into our bodies so that once our “biological” usefulness has been fulfilled, aging is accelerated. Menopause is a prime example.

The benefits of this process of the old dying off and being replaced by the new is not just reserved for the next generation. Although it may not seem so, it does indeed provide immediate benefits for us too. We can see it at work in our bones, for example. Our bones grow and renew as older bone dies off and is replaced by new, less fragile bone. If all we had was our original bones, we wouldn’t be able to repair broken bones.

You may have seen the movie based on this premise called *Death Becomes Her* in which characters played by Goldie Hawn and Meryl Streep become immortal. They cannot die, and the cells in their bodies cannot die, but without daily death and replacement at the cellular level, there is no mechanism for repairing damage. By the end of the film, although they are both alive, their bodies have suffered ghoulish but comic damage.

This whole mechanism of death and replacement works. If it weren’t such a personal issue when we ourselves die, we’d all be pleased with the process. It’s also worth noting that the only “immortal” cells in our bodies are aberrant cancer cells.

**Tampering with Nature?**

A number of people have suggested that trying to change this process is contrary to the laws of nature and shouldn’t be attempted.
I don’t agree, and I would like to submit to you an opposing “genetic” point of view. If the purpose of the whole process is to advance the species, then with humans we have a new element added to the equation, because we rely on our brains, on our intelligence, for our advantage in the world. Other species advance primarily by improving their gene pool as it relates to physical adaptation, but humans advance not just according to physical traits but also according to what they know and how they think. Knowledge and experience are becoming far more important for the survival of mankind than for any other species. Books and computers can capture the knowledge of individuals, but not their experience. And the longer we can hold onto that experience, the greater our species’ chances of survival.

I believe that nature supports this premise. As our knowledge grows, we are now learning that we can indeed manipulate and alter some of the limiting factors that nature built into the “early prototypes” of our bodies. In a sense, at the point knowledge has become fundamental to our survival, nature is allowing us to view and alter some of these previously hidden secrets.

Another point to consider is that some scientists believe that we are not actually “living longer,” but that we are merely living closer to our built-in limit of around 150. If so, then all we are really doing is helping people live the length of life their bodies were designed to live, which would make the “tampering with nature” question moot. In either case, let’s discuss some of those things we’ve learned.

The Things We Do to Ourselves

The damage we do to ourselves is the easiest to correct. In fact, 90% of what’s discussed at the Baseline of Health Foundation addresses this issue, which means that most of what you may already be doing to optimize health is exactly what you need to do to prolong life. Just to reiterate, here is a quick summary of some of the key points.

Compromised immune system

One of the major causes of death in the elderly is the collapse of the immune system as we age. This makes us susceptible to everything from pneumonia to cancer. For example, seniors don’t die from the flu when they get it; they die from the pneumonia their flu progresses into because their immune systems are too weak to stop it. Some of this is inevitable, of course, but it is amazing how much of it can be prevented, and even reversed, by following the principles of the Baseline of Health Program.

- Boosting your immune system.
- Destroying pathogen invaders.
- The Baseline of Health Program and all of the things that impact your immune system.
Inflammation

Chronic inflammation is a major aging factor and a primary contributor to premature death. It is implicated in everything from lung problems to chronic heart disease, and even cancer. There are a number of things we can do that help reduce inflammation systemically far better and more safely than taking an aspirin every day. Probably the two most important are regular the regular use of systemic proteolytic enzymes and bringing the ratio of Omega-6 to Omega-3 fatty acids closer to the 1:1 ratio where it needs to be.

Toxins

Every day, we are exposed to over 100,000 “new” chemicals that have been released into the environment over the last century. Many of them are chemical estrogens, potent in amounts as small as a billionth of a gram. Cleansing those toxins out of our bodies with colon, liver, heavy metal, blood, and kidney detoxification is essential for maximizing your health and increasing your life span. In addition, modern industry has released untold tons of free heavy metals, including mercury, cadmium, lead, and aluminum, into the environment—all of which is eventually making its way into our bodies. They are inescapable no matter where you live…or how cleanly you try and live.¹

Circulation and energy flows

Proper circulation in the broad sense (blood, lymph, and energy) is essential for maximized life span. For example, if there is any restriction of blood circulation (caused by anything from narrowing of the arteries to tension in the surrounding muscle tissue) several problems arise. Sufficient oxygen can no longer reach key areas of the body. Sufficient nutrients can no longer reach every cell in the body, thus starving them, weakening them, and making them vulnerable to rapid aging and mutation. And the waste material produced by the cells can no longer be efficiently removed. The buildup of toxic waste in the cells eventually leads to cell mutation and death.

Your lymph is your body's sewer system, removing dead cells, waste, toxic matter, heavy metals, bacteria, etc. from body tissue. Unfortunately, the lymph system has no pump of its own. If for any reason your lymph is stagnant—such as lack of exercise—you end up poisoning yourself. This accelerates the aging process and the onset of age-related diseases such as cancer.

Fundamentally, our bodies are pure energy systems. As you look more and more closely at the subatomic structure of all matter, the physical world begins to disappear. All that's left is a series of force fields and probabilities that create the illusion of matter as we know it. Certainly, we have to deal with this illusion (the physical world) as we experience it, but we also have to deal with the consequences of the world of energy that remains unseen—but is nevertheless the reality behind all physical matter. The bottom line is that a major factor in the aging process is when these energies in our body become unbalanced or diminished in any way. A number of non-Western forms of medicine such as Traditional Chinese Medicine and Indian Ayurvedic medicine directly address this energy aspect of health.

Free radicals

Free radicals play a major role in the aging process as well as in the onset of cancer, heart disease, stroke, arthritis, possibly allergies, and a host of other ailments. The link between free radicals and the “aging diseases” is one of the most important scientific discoveries of the last century. The use of a full-spectrum antioxidant supplement, particularly one that contains resveratrol, at a maintenance level may provide the ultimate defense against the premature aging effects of free radicals. At therapeutic
levels, antioxidants can play a significant role in reversing many of the effects of aging and disease. In the world of anti-aging, antioxidants are the “celebrities” of the moment, with a new one blazing across the media every few months. It’s hard to have missed the stories about noni, mangosteen, goji, acai, pomegranate, and resveratrol over the last few years. Incidentally, the issue of antioxidants is more complex than the simple comparison of ORAC numbers promoted by many alternative health companies.

- ORAC nonsense
- Antioxidants, Part 1
- Antioxidants, Part 2

Exercise...but not too much

No one likes to hear this, but it's true. If you don't move, you die. Exercise fundamentally changes every system and function in your body. And the older you get, the more important it is… and the more pronounced the benefits are. As reported in the *Journal of the American Medical Association*, two 45-minute weight (strength) training sessions a week can improve bone density, muscle mass, strength, balance, and physical activity in older women (ages 50-70). After one year of strength training, women emerged physiologically younger by 15-20 years than when they began. Other studies have demonstrated the same results for men who weight train. The bottom line is that people in their 70s and 80s can experience strength gains of as much as 180% in a matter of just a few weeks.

Understand, exercise includes weight bearing exercise, aerobic/interval training, and the almost universally forgotten stretching exercise. You need to do it all. The operative words when it comes to exercise are balance and common sense. If you overdo it, the benefits start to reverse, and you're looking at long term disability from ligament and cartilage damage. Over-exercise is counterproductive and eventually breaks the body. Moderate exercise, as we’ve already mentioned, can double the strength of a person in their nineties in just a few weeks.
Diet and Nutrition

This is a big topic -- bigger than we can cover in this report. If you haven't already done so, you can download your free copy of Lessons from the Miracle Doctors at www.jonbarron.org/detox/book-free-lessons-miracle-doctors and read Chapters 6 and 7 (or Chapters 7-12 if you own the hardcover expanded version). The key thought to remember is that you can't build the same life expectancy into your body with pepperoni pizza, beer, and Ding Dongs that you can with healthy living food.

What you think

What you think absolutely matters -- not just mentally, but physically. Stress and depression are major aging factors.

Smoking

Smoking not only shortens your life, it makes you look older in the process. This is not just an issue of vanity—your skin is a functioning organ, like your heart, and serves as a window to your overall health. This is easily seen in heavy smokers. The dried up, heavily wrinkled, gray skin seen on the outside of the body is highly reflective of the damage that has been done out of sight in the lungs and cardiovascular system. If your skin doesn’t have a rosy, youthful glow, then you might want to start making changes in your lifestyle according to the Baseline of Health Program.

Calories and Sugar

Of all of the things one can do to increase longevity, only one has been proven to actually extend life across the board: caloric restriction (CR). Caloric restriction is the only means of retarding aging that is both well-researched and proven. (Note: CR is not the same as dieting or starvation. It entails the reduction of caloric intake while maintaining the optimal intake of essential nutrients, especially vitamins and minerals.)

What effects does CR have on the body that help extend life? It appears that its effects are threefold:

1. It lowers body temperature
2. It raises DHEA levels
3. It reduces plasma insulin levels.

Interestingly enough, lowering plasma insulin levels also tends to lower body temperature and increase DHEA levels, indicating that insulin may be a prime factor in the aging process. And in fact, this was supported by studies that showed that the glucoregulatory agent, metformin, might be just as effective as CR in reversing aging and rejuvenating the elderly.4

Does that mean we should all start taking metformin? Not necessarily. First, although, as far as drugs go, metformin is relatively benign, it is not totally without side effects. It occasionally causes death from lactic acidosis, for example, which is not insignificant for those who die from it. But more importantly, it is quite likely that some minor changes in lifestyle and the use of natural supplements can offer the same benefits with no negative side effects and at less cost.

- Cut way back on your intake of high glycemic foods. (This is the positive side of the low carb craze.)
- Use a formula based on natural glucoregulatory herbs with your meals. These include herbs such as: nopal cactus, Konjac mannan, Gymnema sylvestre, high galactomannan fenugreek
extract, banaba leaf extract (corosolic acid), bitter melon extract (Momordica charantia, blueberry leaf extract, and cinnamon extract (Cinnulin PF). The use of these herbal extracts will significantly reduce the amount of simple carbs your body absorbs and minimize the insulin response from those that get through. In essence, this formula will mimic the effect of metformin, without the side effects.

- Go on a regular fasting program. Start with just one day a week on fresh juice and a super food formula that contains ingredients such as chlorella, spirulina, presprouted barley, and a full complement of naturally occurring antioxidants. Then, supplement that with one three-day fast a month, and a one-week juice fast twice a year. Short-term fasting produces many of the benefits of long-term caloric restriction, and it’s a lot easier to do. In addition, going without food, forces your body to “eat up” older cells whose functioning has been compromised to survive. This effectively makes room for newer more vibrant cells.

One final note: it’s never too late to start. Studies have shown that CR is just as effective in extending life span late in life as it is early in life. In fact, many of the major benefits can be received in as little as four weeks on the program.

**Micro-level factors: cellular aging**

Unlike the things we do to ourselves that accelerate aging and which are easily correctable (relatively speaking), the micro-level factors that promote aging are programmed into our very cells. Until a few years ago, these factors seemed impossible to influence, but this is changing. Of all of the things that make us “old,” two things stand out because, until now, they have been so untouchable—the Hayflick Limit and the glycation of proteins.

**The Hayflick Limit**

The Hayflick Limit is named after the person who discovered it almost 40 years ago. A quick description is that all cells have only a limited capacity to continue to divide through the course of our lives. Those numbers are different for each type of cell in our body, and by early adulthood, half of those divisions have been used up. By mid-life, maybe only 20-40% of those divisions are left. At that point, old age starts taking over – then death. This limited capacity of a cell to perpetuate itself is called the Hayflick Limit. **In effect, the Hayflick Limit determines life span at the cellular level.** With each division, a cell becomes less likely to divide again, until finally it stops dividing altogether and becomes what we call senescent. Cell senescence is the final step before cell death. Senescent cells are still alive and metabolically active, but they’re no longer capable of dividing. More importantly, though, senescent cells exhibit all of the characteristics that so bother us about old age, such as the difference
between the supple skin of a child and the wrinkled skin of the elderly.

As cells approach the Hayflick Limit, they divide less frequently and become aberrant. They take on wildly irregular forms. They no longer line up in parallel arrays; they assume a granular appearance, and deviate from their normal size and shape. This distorted appearance, called the senescent phenotype, is accompanied by a state of declining functionality that, UNTIL RECENTLY, was thought to be irreversible.

Protein glycation

Glycation is the uncontrolled reaction of sugars with proteins. It's kind of like what happens to sugars when you heat them and they caramelize. Or to put it another way, glycation is what happens when excess sugars caramelize the proteins in your body. It's a major factor in the aging process – and it's particularly devastating to diabetics. Your body is mostly made up of proteins. In fact, proteins are the substances most responsible for the daily functioning of your body. That's why anything that causes protein deterioration has such a dramatic impact on the body's function and appearance. Thanks largely to the destructive effect of sugar and aldehydes, the proteins in our bodies tend to undergo destructive changes as we age. This destruction is a prime factor, not only in the aging process itself, but also, as with cell senescence, in the familiar signs of aging such as wrinkling skin, cataracts, and the destruction of our nervous system – particularly our brains. Fortunately, there is a way to ameliorate these forms of protein degradation.

Supplements to reverse cellular aging

As it turns out, not only can we reverse the aging process at the cellular level now, and actually do it quite simply and quickly, but we can also reverse aging at the system level and the organ level as well – after all, systems and organs, are merely the sum of their individual cells. And for that matter, we can reverse aging in terms of how we look and feel, and by that I mean our skin and hair and energy levels. This also affects our life span as well. There are a number of nutraceuticals that can play a role, but three stand out: L-carnosine, dimethylaminoethanol (DMAE), and acetyl-L-carnitine. Based on everything we know, supplementing with a combination of these nutrients is one of the most effective and safest steps we can take to help turn back the clock at the cellular level.

L-Carnosine

L-Carnosine is a naturally occurring combination of two amino acids--alanine and histidine--that was discovered in Russia in the early 1900s. Because much of the research was done in Russia, it was largely unavailable in the United States until just a few years ago. Now, though, there have been a number of studies and experiments in other parts of the world verifying everything done in Russia, and more. Most notably, there were a series of astonishing experiments done in Australia that proved that carnosine rejuvenates cells as they approach senescence. Cells cultured with carnosine lived longer and retained their youthful appearance and growth patterns.5

It was discovered that carnosine can actually reverse the signs of aging in senescent cells. When the scientists transferred senescent cells to a culture medium containing carnosine, those cells exhibited a rejuvenated appearance and often an enhanced capacity to divide. When they transferred the cells back to a medium lacking carnosine, the signs of senescence quickly reappeared. In other words, the carnosine medium restored the juvenile cell phenotype within days, whereas the standard culture medium brought back the senescent cell phenotype. In addition, the carnosine medium increased cell life span, even for old cells. When the researchers took old cells that had already gone through 55 divisions and transferred them to the carnosine medium, they survived up to 70 divisions, compared to
only 57–61 divisions for the cells that were not transferred. This represents an increase in the number of cell divisions for each cell of almost 25 percent. But in terms of cell life, the increase was an astounding 300 percent. The cells transferred to the carnosine medium attained a life span of 413 days, compared to just 126–139 days for the control cells.\textsuperscript{6, 7}

What does carnosine mean for actual life expectancy? A more recent Russian study on mice has shown that those given carnosine are twice as likely to reach their maximum life span as untreated mice. The carnosine also significantly reduced the outward “signs of old age” and made the mice look younger: Forty four percent of the carnosine-treated mice had young, glossy coats in old age as opposed to only 5 percent in the untreated mice. Another important difference between the treated and the untreated mice was in their behavior: only 9 percent of the untreated mice behaved youthfully in old age versus 58 percent of the carnosine-treated mice.\textsuperscript{8, 9}

Carnosine has the remarkable ability to throttle down bodily processes that are in a state of excess and to ramp up those that are under-expressed. For example, carnosine thins the blood of people whose blood tends to clot too much and increases the clotting tendency in those with a low clotting index.\textsuperscript{10} Another example is that carnosine suppresses excess immune responses in those who have “hyper” immune systems, whereas it stimulates the immune response in those with weakened immune systems, such as the aged.\textsuperscript{11} And carnosine even seems to have the ability to normalize brain wave functions.\textsuperscript{12}

As mentioned earlier, protein glycation is one of the primary factors that accelerate cellular aging. But carnosine protects cellular proteins from damage in at least two ways. First, it bonds with the carbonyl (or aldehyde) groups that, if left alone attack and bind with proteins.\textsuperscript{13, 14, 15} Second, it works as an antioxidant to prevent the formation of oxidized sugars, also called advanced glycosylation end-products (AGEs).\textsuperscript{16, 17} The less AGEs in your body, the younger you are. Both of these processes have important implications for anti-aging therapy.

And then there’s Alzheimer’s disease, one of the primary threats associated with aging. Here too, carnosine can be helpful as it has been proven to reduce, or completely prevent, cell damage caused by beta amyloid, one of the prime protein risk factors for Alzheimer’s disease. The presence of beta amyloid leads to damage of the nerves and arteries of the brain. Carnosine blocks and inactivates beta amyloid, in effect, protecting neural tissues against dementia.\textsuperscript{18} The key is that carnosine not only prevents damaging cross-links from forming in proteins, it eliminates cross-links that have previously formed, thus restoring normal membrane function in cells.\textsuperscript{19} This is true not only in the brain, but in all the organs of the body.

**Supplementing with L-carnosine**

Carnosine levels in our body directly correlate with both the length and quality of our lives. And since carnosine levels decline with age, supplementation with L-carnosine represents one of the most powerful things you can do to hold back the ravages of old age. While it is true that many people who supplement with carnosine are going to notice everything from younger looking skin to more energy, the bottom line is that you really shouldn't look for short term benefits from carnosine supplementation. If any short-term benefits are noticed, you should consider them an added bonus. The reason you want to supplement with carnosine is for the long term. You supplement with carnosine to protect against the ravages of aging, not the cosmetic changes associated with it.

Some experts recommend using only 50-100 mg of carnosine a day. Others say that if you don't take 1,000-1,500 mg a day, it won't work because your body metabolizes the first 500 mg or so. The key here is that all of these experts are ignoring the simple fact: different people need different amounts.

- The older you get, the more you need.
- If you eat a mostly vegetarian diet, you need more.
• If you're diabetic, or just have trouble with blood sugar, you need more.

Most people will do best on 500-750 mg a day. However, if you're young and healthy and include meat in your diet, then 250 mg a day makes sense. As you get older, and if you're starting to show signs of aging or glycation (such as cataracts or aging skin), then you'd want to think of increasing the dosage up to 1,000 mg - 1,500 mg a day.

In studies, carnosine has been proven safe in amounts as high as 7,000, 8,000, or even 10,000 mg a day, although a small number of people have noticed some minor muscle twitching at doses as small as 1,000 mg. The bottom line is: use what you need, and you won't have any problems – only benefits.

Once you actually understand what carnosine does – once you understand the role it plays in preventing and potentially reversing all of the signs of old age in the body (and we're talking about everything from wrinkled skin to cataracts to Alzheimer's) and even possibly extending life itself – then you're left with the unmistakable conclusion that supplementing with carnosine may represent one of the single best things you can do to help "turn back your biological clock."

**Lipofuscin**

Lipofuscin deposits as seen in heart muscle

There is, however, one “gap” in carnosine’s usefulness—lipofuscin. Lipofuscin is a pigment commonly found in aging brains and in other tissues such as the skin. By itself, it is not dangerous but merely a byproduct of harmful reactions such as free-radical damage and protein/aldehyde damage that have already taken place. In the case of aldehydes, for example, when you supplement with carnosine, it quickly binds with the aldehydes, preventing them from damaging the proteins. The byproduct of this reaction is lipofuscin. So once again you have inactive lipofuscin compounds, but this time as the result of preventing protein damage. In a sense, with carnosine you trade protein damage for lipofuscin. This, however, can lead to another problem. If enough lipofuscin accumulates over time (a process accelerated when you supplement with carnosine), it can interfere with proper
cellular and organ functions. It’s important, therefore, to continually remove the lipofuscin so it doesn’t build up, and that’s were DMAE comes in.

**Dimethylaminoethanol (DMAE)**

DMAE is the perfect companion to carnosine in an anti-aging formulation because it reinforces carnosine’s anti-aging properties and provides a series of complementary benefits of its own, particularly in the brain. DMAE is a naturally occurring nutrient—with oily fish such as wild salmon and sardines among its primary sources—that enhances acetylcholine synthesis. Adequate levels of acetylcholine are important for proper memory function. Normally found in small amounts in our brains, DMAE has been shown to remarkably enhance brain function when used as a supplement.

Many people may have heard of the anti-aging results that Romanian scientist Ana Aslan achieved using something called GH3 (procaine). In truth, the results were probably somewhat less than first reported by Aslan—a victim of “magic bullet” overpromising-- but notable nonetheless. The important point, though, is that GH3 breaks down in the body to form DMAE and para-aminobenzoic acid (PABA). In other words, DMAE is a key active component in Ana Aslan’s anti-aging formula.

One of DMAE’s prime actions is that it flushes accumulated lipofuscin from your body—from the neurons in your brain, from your skin, and from all other organs—preventing excessive build-up. It also complements carnosine in that DMAE has been shown to inhibit and reverse the cross-linking of proteins and extend life span. In a French double-blind study, individuals who were given 1,200 mg per day of DMAE for five days showed significant improvements in alertness and neuromotor control, with decreased anxiety. Studies have also shown that DMAE can help improve memory, concentration, and the ability to focus.

Clinical studies of DMAE have used up to 1,600 mg per day with no reports of significant side effects. In some cases, people may experience slight headaches, muscle tension, or insomnia if they take too much too quickly. These effects are easily eliminated if intake is reduced and then gradually increased. Although there is no direct connection, many manufacturers recommend that women who are pregnant, breastfeeding, anyone who suffers from convulsions, epilepsy, or seizure disorders, and people with manic depressive illness should avoid using DMAE. This is probably more of a legal caution than a medical one. Surprisingly (or maybe not so surprisingly if you think about it), for a substance found readily in nature, it is heavily regulated in some countries, such as Canada, where a prescription is required.

**Acetyl-L-Carnitine**

Like DMAE, L-carnitine is a perfect complement to L-carnosine. Although your body can synthesize L-carnitine in the liver, it depends on outside sources (meat being a primary one) to fulfill its requirements. This can present a problem for vegetarians since L-carnitine performs several key functions in the human body. For one, it can improve the functioning of the immune system by enhancing the ability of macrophages to function as phagocytes. And it can improve the functioning of muscle tissue and has been shown to increase running speed when given prior to exercise. It also plays a major role in cellular energy production by shuttling fatty acids from the main cell body into the mitochondria (the cell’s energy factories) so that the fats can be oxidized for energy. Without carnitine, fatty acids cannot easily enter the mitochondria.

And then there’s acetyl-L-carnitine (ALC) -- a specialized form of L-carnitine that is often deficient, even in meat eaters. It performs virtually all of the same functions as L-carnitine, only better. In terms of cellular energy production, in addition to shuttling fatty acids into cell mitochondria (the energy factories that power every cell in your body), ALC provides acetyl groups from which acetyl-
coenzyme A (a key metabolic intermediate) can be regenerated. This is important because acetyl-coenzyme A facilitates the transport of metabolic energy and boosts mitochondrial activity, thereby increasing cellular energy levels. Also, the addition of the acetyl group makes ALC water soluble, which enables it to diffuse across the inner wall of the mitochondria and to cross all cell membranes more easily. In particular, ALC readily crosses the blood-brain barrier, where it provides a number of specialized neurological functions. Studies have shown that acetyl-L-carnitine can inhibit the deterioration in mental function associated with Alzheimer’s disease and slow its progression. Part of this is a result of its ability to shield neurons from the toxicity of beta amyloid protein. As a result, ALC improves alertness in Alzheimer’s patients. Combined with L-carnitine, it makes a powerful one-two punch in combating the progression of Alzheimer’s.

Through its action on dopamine (a chemical messenger used between nerve cells) and dopamine receptors, ALC seems to play a major role in preventing and/or minimizing the symptoms of Parkinson’s disease. ALC retards the decline in the number of dopamine receptors that occurs as part of the normal aging process and (more rapidly) with the onset of Parkinson’s disease. In fact, many researchers believe that Parkinson’s may be caused by a deficiency of dopamine. ALC also inhibits tremors and may even play a role in helping with MS by inhibiting (and possibly reversing) the degeneration of myelin sheaths.

Overall, ALC helps slow down the aging process of the brain by:

- Facilitating both the release and synthesis of acetylcholine.
- Retarding the inevitable decline in glucocorticoid receptors that occurs with aging.
- Slowing the age-related deterioration of the hippocampus.
- Retarding the inevitable decline in nerve growth factor receptors that occurs as we age.
- Stimulating and maintaining the growth of new neurons within the brain and helps to prevent the death of existing neurons.
- Protecting the NMDA (N-methyl-D-aspartic acid) receptors in the brain from age-related decline. NMDA receptors play a critical role in “synaptic plasticity,” a key cellular mechanism involved in the brain’s learning and memory functions.
- Inhibiting the excessive release of adrenaline and the depletion of luteinizing hormone–releasing hormone and testosterone that occurs in response to stress.
- Enhancing the function of cytochrome oxidase, an essential enzyme of the electron transport system. This is important because reduced cytochrome oxidase activity is characteristic of neurodegeneration.

The mind-boosting effect of acetyl-L-carnitine is often noticed within a few hours, even within an hour, of supplementing. Most people report feeling mentally sharper, having more focus, and being more alert. And ACL, like DMAE, helps flush lipofuscin from the body, especially from the brain.

**CoQ10 – Ubiquinol**

When talking about anti-aging at the cellular level, there’s one other supplement that needs to be discussed – Coenzyme Q10. Often abbreviated as CoQ10, it is essential for life. It catalyzes the formation and utilization of energy in every human cell. Unfortunately, levels tend to drop significantly as we age. Research has shown that deficiency of CoQ10 is the major cause of cardiomyopathy, and congestive heart failure and these diseases can often be cured by CoQ10 supplementation. In addition, new research has found that CoQ10 may play a strong anticancer role. And finally, studies have shown that, like L-carnosine, CoQ10 can slow down cell senescence.
Note: coenzyme Q10 exists in two forms: ubiquinol and ubiquinone. You definitely want to supplement with the ubiquinol since it is utilized by the body far more effectively—up to 8-times more effectively—than ubiquinone.  

Aging at the macro level: optimizing hormones

The final step in a natural anti-aging regimen is to address the hormonal changes programmed into our bodies, changes that affect aging at a macro level. Hormones are your body's chemical messenger system, telling your body what to do and when. Adrenaline, for example, is produced in the adrenal glands, but serves to tell the heart to speed up and the blood vessels to narrow in times of stress. In regard to aging, hormones tell your body how to age, and changes in any hormone can affect aging. For instance, once we reach our thirties, available testosterone levels for both men and women tend to begin diminishing with age. This affects everything from our outlook on life to our ability to increase muscle mass. Another decreasing hormone is growth hormone, which affects everything from muscle/fat ratios to the graying of hair. Then again, balancing dropping melatonin levels associated with aging will improve the quality of our sleep and strengthen our immune system. Lastly, balancing estrogen and progesterone levels is vital.

Testosterone

A growing body of evidence suggests that testosterone levels drop as much as 40 percent in men between their early forties and early seventies. And for 10 to 15 percent of all men, those levels will dip below normal even as early as their thirties if they have to deal with stress, depression, personal life changes, or medications. This causes a decrease not only in sexual desire and performance, but also in the competitive drive to succeed and accomplish something meaningful in life. In women, excessive estrogen in the body causes a reduction in testosterone levels, which leads to a similar decline in sexual desire and performance and a similar reduction in “life drive.” Both men and women need and produce testosterone in their bodies, although in differing amounts. Testosterone (in both men and women) is responsible for:

- Pumping up energy levels
- Firing the need to succeed.
- Bonding us with our mates
- Fueling our sexual desires and elevating our levels of sexual satisfaction.
- Growing hair on our heads, while at the same time keeping us from going bald
- Building muscle and burning off fat
- Facilitating better blood circulation

Interestingly enough, a 1986 clinical study documented that it's not actual testosterone production that decreases as we age but the amount of free circulating (bioavailable) testosterone that decreases, as more of it gets bound to both albumin and a natural substance called SHBG (sex-hormone-binding globulin). SHBG plays the biggest role in testosterone binding when testosterone levels are low, while albumin plays the dominant role at higher levels. The important point is that when “bound” (particularly to SHBG), testosterone becomes unavailable for use by the body. This means that although total testosterone levels may remain essentially unchanged as you age, only a small fraction of that total is actually “available” to enter a cell and activate its receptor. And considering that as we
The amount of SHBG steadily increases, it’s easy to see that the level of bioavailable testosterone will only continue to decrease over time.

Most women in modern society have, at some point in their lives, taken birth control pills. But one study showed that contraceptive use was associated with elevated SHBG levels and reduced bioavailable testosterone, even after discontinuing use. In fact, women that were taking contraceptives at the time of the study had SHBG levels four times higher than those seen in women with no contraceptive exposure. Women who had stopped taking them for six months were still two times higher in SBHG than the women who hadn’t taken the Pill. Earlier research had shown increases in SHBG levels with oral contraceptive use to be associated with a concomitant 40–60 percent decrease in free testosterone levels. Keep in mind that lowered levels of free testosterone are believed to play a major role in women’s sexual problems and could place women at risk for decreased sexual desire, decreased arousal, decreased lubrication, and increased sexual pain.

The good news is that bound testosterone can easily be freed, with a little help. The use of herbs such as saw palmetto, wild oats and nettles, and puncture weed can reverse the binding process -- thereby increasing free testosterone levels an astounding 105 percent on average. And the benefits for both men and women are enormous.

**Saw palmetto**

It’s normal for men to have a lot of testosterone and for women to have some. In both men and women, testosterone is converted into a more potent, potentially harmful form called DHT (dihydrotestosterone). DHT is the hormone that stimulates hirsutism, the loss of hair on the head where you want it and hair growth where you don’t (including the back and ears for men and the face and legs for women). If you can reduce DHT, you reduce hirsutism, getting rid of hair from the less desirable places and potentially restoring it on top of your head.

Saw palmetto (Serenoa repens), a member of the palm family, appears to reduce DHT in three different ways:

1. Inhibits DHT production.
2. Inhibits the binding of DHT to its cell receptors.
3. Promotes the breakdown of DHT.

In fact, it appears that one of the primary mechanisms through which saw palmetto works in the body is that it inhibits 5-alpha-reductase, the enzyme that converts testosterone into DHT. Supplementation with extracts of the saw palmetto fruit lowers DHT, thereby reducing hirsutism and increasing available testosterone.

**Nettles and wild oats**

Extracts of wild oats (Avena sativa) and nettles (Urtica dioica) can safely help increase testosterone levels in the body. German researchers have identified a biochemical found in nettle root, known as (+/-)-3,4-divanillylterahydrofuran, that has a high binding affinity to SHBG, actually describing the affinity as “remarkable.” These researchers also suggested that the beneficial effects of plant lignans (such as found in flaxseed oil) on hormone-dependent cancers may be linked to their binding affinity to SHBG. The most potent known lignans in this respect are constituents of nettle root. In addition to SHBG binding, at least six constituents of nettle root inhibit aromatase, reducing conversion of androgens to estrogens and thus increasing available testosterone.
There are no formal studies testing the effect of wild oats on humans, but there are significant amounts of anecdotal clinical observations, particularly with younger men who had low testosterone levels for their age. Supplementation with Avena sativa results in dramatically increased testosterone levels. The key to the effectiveness of wild oat supplements lies in the quality of the extract, because active avenacosides provide the potency. If you’re going to use a supplement that contains wild oats, make sure it comes from a reputable supplier.

**Puncture Weed**

Puncture weed (Tribulus terrestris), also known as yellow vine and goat head, is a flowering plant found in Europe, Africa, southeast Asia, and Australia. It doesn’t just free up testosterone, it also boosts production of testosterone in the body. Tribulus enhances testosterone levels by increasing levels of luteinizing hormone (LH), which is responsible for “telling” your body to produce testosterone.

**The Benefits of Testosterone Balancing**

Surprisingly, women are far more vulnerable to testosterone level changes than men. The reason is that they have so much less to work with (and even less if on “the Pill”). So, when even a small amount of their available testosterone gets bound to SHBG, the results include a loss of energy and motivation, less interest in their significant other and loss of libido, decrease in muscle and significant increase in body fat (a prime reason women start to gain weight in their forties), hirsutism, and a significant increase in the risk of breast cancer since bound SHBG is no longer available to lock up excessive estrogens. Regular use of a women’s testosterone-balancing formula can help to significantly reverse and/or prevent all of these conditions.

It should be noted that SHBG binds not only to testosterone, but to all of the sex hormones including estradiol (an “active” form of estrogen). Normally, this binding serves as a storage system for excess hormones, but in men there is a problem: SHBG also has an affinity for prostate tissue. In effect, because of its affinity for both, SHBG can bind estrogen to cell membranes in the prostate, which causes an increase in prostate-specific antigen (PSA) secretion, a prime factor in prostate problems, including cancer. The wild oats and nettles found in most men’s testosterone-balancing formulas work together to reverse this binding process, thereby reducing the likelihood of prostate problems. Saw palmetto also has been proven to inhibit the 5-alpha-reductase enzyme, which causes testosterone to be converted into DHT, again stimulating the growth of prostate tissue. Regular use of formulas that contain saw palmetto, wild oats, and nettles can help reduce enlargement of the prostate, tone the bladder (improve urinary flow and relieve strain), decrease urinary frequency (especially during the night), and reduce inflammation of the bladder and prostate.

The ingredients found in testosterone-balancing formulas work naturally in both men and women to enhance sexual desire, sensation, and performance. The effect on human sexual appetite can be powerful. Both men and women can feel a boost in sexual desire, sometimes after only a few hours (more often, though, in about 7–10 days). And both men and women can experience an increase in frequency of orgasms when taking quality extracts of wild oats and nettles.

**Adrenaline**

Although not directly related, adrenal exhaustion (low adrenaline levels) and low testosterone levels share some key similarities. For most people, their impact is felt starting around the same time in life—in their thirties—and many of their symptoms are similar, including exhaustion, reduced sexual vitality, and loss of zest for life. Adrenaline is produced in the adrenal glands and is probably best
known as the body’s “fight or flight” hormone—the hormone that stimulates your body’s response to stress (tells the heart to speed up and the blood vessels to narrow). Unfortunately, the body was simply not designed to deal with “fight or flight” on the 24/7 basis of modern urban life. By definition, “fight or flight” refers to exceptional circumstances such as the sudden appearance of a Bengal tiger. Eventually, under constant stress, the adrenal glands run down and can no longer produce sufficient adrenaline. In response, we tend to use stimulants such as coffee or “energy drinks” to force the adrenal glands to pump even when exhausted. But there’s only so far you can push the adrenals, and eventually they reach a state of total exhaustion in which they can no longer produce sufficient adrenaline no matter how many stimulants you use.

Fortunately, there is a class of herbs known as adaptogens that work well with the testosterone-balancing herbs so that it’s possible to supplement with formulas that do double duty. By definition, an adaptogen is an herb that helps the body adapt to stress. As such, adaptogens naturally help to rebuild adrenal gland function and restore hormonal balance. Foremost among the adaptogens is ginseng. There are three main types of ginseng that you’ll find in formulas: American, Asian, and Siberian. American and Panax (Asian) ginseng are used primarily for their ability to energize the body and improve sexual function. Siberian ginseng, also known as Eleutherococcus, is not really a true ginseng but more of a distant relative. Nevertheless, it has the most powerful adaptogenic qualities—helping the body adapt to stressful conditions, improving athletic performance, and reinforcing the immune system. In the end, though, the type of ginseng used is probably less important than the quality. High-quality, wild-crafted, or organic ginseng costs $400–$600 per pound, depending on the season. Low-grade ginseng costs as little as $5 a pound. Obviously, there’s a difference in efficacy, yet both grades are designated “ginseng” on the label. And which grade do you think most companies use, especially considering that you have no way of knowing. Make sure you trust the company you buy your ginseng from. Regular use of a high-quality ginseng has been shown to increase stamina, revitalize the body, counteract chronic fatigue, improve resistance to stress, and enhance immune function. For these reasons, ginseng is useful for combating adrenal exhaustion and is a powerful weapon in the anti-aging arsenal.

**Human growth hormone**

The rejuvenating powers of growth hormone (GH) are no secret to the wealthy: for the last half century, GH has been available from doctors, required two injections a day, and cost up to $1,800 a month. Over the last few years, however, several alternatives for the rest of us have become available. And while I could never recommend the injections (for a variety of reasons), I can endorse the alternatives.

Many fantastic claims are made for the effects of growth hormone, even claims of “almost” eternal youth. Would that it were so! Although the effects are more subtle for most people, they are nevertheless wide ranging and significant, even if overstated:

- Fat loss
- Elimination of cellulite
- Higher energy levels and enhanced sexual performance
- Regrowth of heart, liver, spleen, kidneys, and other organs that shrink with age
- Greater heart output and lowered blood pressure
- Improved cholesterol profile, with higher HDL (“good”) cholesterol and lower LDL (“bad”) cholesterol
- Superior immune function
- Increased exercise performance
- Better kidney function
- Stronger bones
- Faster wound healing
- Younger, tighter skin
- Hair regrowth

How exactly does GH produce these results? First of all, as we mentioned earlier, it is important to understand that hormones are the body’s chemical messenger system—they tell the body what to do and when. Growth hormone is produced in the pituitary gland and released in a series of microscopic “pulses” throughout the day (mostly in the evening). It signals a number of body functions relative to aging and the production of other hormones, such as DHEA and melatonin, and various parts of the endocrine system, including the hypothalamus (considered to be the “master gland”). Interestingly enough, the release of GH at pulse levels stimulates the pituitary to produce even more GH.

However, it’s most important function is telling the liver to produce insulin-like growth factor 1 (IGF-1), the main key to anti-aging. Specifically, the benefits of GH can be measured in terms of how much it increases the body’s production of IGF-1 (above a 20 percent increase starts to be significant in terms of effectiveness).

There is some concern that, because it increases IGF-1 levels in the body, GH may increase the risk of prostate cancer. This is based on a couple of in vitro studies that showed IGF-1 may stimulate tumor cell growth, a study out of the Harvard School of Public Health that equated high levels of IGF-1 with an increased risk of prostate cancer, and the fact that human “giants” (who are, in fact, large because of abnormally high GH levels) have a higher risk of cancer. A simple reality check, however, calls these observations into question. First, both GH and IGF-1 levels decline as we age, yet the incidence of prostate cancer increases as these levels decline—the exact opposite of the expressed concern. More significantly, in numerous studies involving thousands of patients receiving growth hormone over many years, there were no observed increases in prostate cancer. In fact, based on real-life observation, there is evidence that growth hormone supplementation may reduce the risk of prostate cancer.

Supplementing with Growth Hormone

Most supplement formulas will increase IGF-1 levels by a minimum of 20 percent, with some even approaching 100 percent. Keep in mind, however, that one 30-minute aerobic session can easily increase IGF-1 levels by 100 percent, and a solid session of weight training can increase levels by an incredible 400–800 percent. Injections, on the other hand, which work directly on the liver (almost like a massive “pulse”), can increase IGF-1 production by only 20–40 percent. A downside to injections, in addition to cost, is that they can give too much GH to the body, shock the body, and can stop the pituitary from producing its own GH. This may explain why injectable GH produces more immediate results, yet ultimately plateaus in terms of effectiveness.
Incidentally, you can no longer actually buy true HGH or human growth hormone. Technically, only growth hormone actually taken from human beings can be called “human” growth hormone. Thirty years ago, the sole source of growth hormone was human cadavers, but that was abandoned when it turned out that growth hormone taken from people had a major downside (in addition to cost)—it occasionally caused the human equivalent of mad cow disease.

Fortunately, at around the same time, recombinant DNA technology came into its own and scientists learned how to alter the DNA of a single-cell yeast plant so that it would produce large amounts of growth hormone (molecularly identical to real HGH), safely and inexpensively. Because this growth hormone is identical to HGH, people often use the terms growth hormone and human growth hormone interchangeably, but it should be referred to as a “plant-based growth hormone.”

Given this good, inexpensive source of growth hormone, another problem remained: the growth hormone molecule is so large (containing 191 amino acids) that it cannot be absorbed when taken orally. That meant it could only be administered by injection, which required a doctor and, as already pointed out, is very expensive. Because of the cost, growth hormone injections became known as the secret youth formula of movie stars and the very rich.

For several years, the only alternatives to this have been the amino acid–based precursor formulas (also called GH secretagogues). Typically, such formulas contain ingredients such as glutamine, tyrosine, GABA, arginine, and lysine. Although not as powerful as growth hormone injections, these formulas can be quite effective, provided your pituitary is functioning well, and carry none of the downside of injections. Within the last few years, two alternatives have appeared that use real (plant-based) growth hormone. One is homeopathic GH, which makes use of real GH diluted down to homeopathic levels. Surprisingly, it appears to work, possibly about as well as the GH secretagogues. In the late 1990s, a new form of GH that could be sprayed into the mouth and absorbed orally was introduced. Again, this works about as well as a GH secretagogue for most people. Its advantage is that it will work for people whose pituitaries are dead and no longer capable of producing HGH. However, it can be expensive and there is a wide variation in the quality of HGH sprays – not to mention the fact that the companies that sell it seem to come and go faster than New England weather.

**DHEA (Dehydroepiandrosterone)**

In animal studies, DHEA supplementation bordered on the miraculous. It seemed to extend life by 50 percent; protect against heart disease, cancer, autoimmune diseases, obesity, and diabetes; boost the immune system; and reverse the effects of stress. The reality for human beings turned out to be somewhat less.

I am a qualified fan of DHEA supplementation (at least without a blood workup) for several reasons. First of all, oral DHEA is composed of particles that are too big to be directly used by the body, so it has to be sent to the liver to be broken down. Unfortunately, since the liver is unaccustomed to receiving DHEA in this form, it ends up converting most of it into androgens (sex hormones). It is these androgens that can cause the growth of facial hair in women and may contribute to prostate disorders in men. The second problem with standard oral DHEA supplementation is that there is
strong evidence that it reduces the body’s own production of DHEA. Also, DHEA supplementation (usually in doses greater than 10 mg a day) is often accompanied by side effects that include acne and excessive skin oiliness, growth of facial and body hair in women, irritability or mood changes, and overstimulation and insomnia.

That said, there has been a lot of debate as to whether DHEA contributes to prostate problems or not. As with growth hormone, once you step back, you see that most of the debate makes no sense. The argument is that since DHEA can be converted into testosterone and dihydrotestosterone (hormones believed to stimulate prostate tissue), it is counterproductive in those who have prostate gland enlargement or prostate tumors. But actual experience does not support that conclusion. The only case I know of that showed a definite link was one in which the patient was receiving DHEA doses of 700 mg a day—much higher than the usual dose of 2–50 mg a day. At low dosage levels, DHEA may actually work to block androgen receptor sites in the body—making them unavailable to the more potent androgens—thus serving to protect the prostate.

**Supplementing with DHEA and/or 7-Keto**

As just mentioned, the oral DHEA commonly available is composed of particles that are too big to be directly used and are therefore sent to the liver, which ends up converting most of it into androgens. What’s left is converted into 7-Keto DHEA, the useful portion. So, what if you could simply avoid the conversion process? As it turns out, supplemental 7-Keto DHEA is now available and seems to provide most of the benefits of regular DHEA, but since it isn’t converted into active androgens (testosterone and estrogen), it is much safer and has minimal side effects. If you’re looking to supplement with DHEA, 7-Keto probably makes the most sense.

Many people use supplements containing Mexican wild yam (Discorea villosa) in place of a DHEA supplement. The theory is that wild yam contains diosgenin, a DHEA precursor that your body uses to produce its own DHEA. Unfortunately, there is no evidence that your body converts any wild yam into DHEA. All benefits related to wild yam appear to be from its phytoestrogen effect. In other words, wild yam is fine for what it is, but it’s probably not very useful as a DHEA surrogate.

**Pregnenolone**

Pregnenolone is the ultimate hormone precursor. Virtually every hormone in the body can be produced by your body, as needed, from pregnenolone. Again, as with all of the other hormones that we’ve talked about, pregnenolone levels decline precipitously as you get older.

The prime benefit of pregnenolone is that it helps balance out your other hormone levels as required. In addition, it does provide specific benefits in its own right, such as:

- Extremely powerful memory enhancement and improved cognitive performance
- Supports the adrenal glands
- A strong anti-fatigue agent
- Significant benefit in rheumatologic and connective tissue disorders (rheumatism, osteoarthritis, scleroderma, psoriasis, lupus, and spondylitis)
- Repair of the myelin sheath structure protecting the nerves as well as the stimulation of the growth of new nerve tissue
- Improved immune function
- Reduced PMS and menopausal symptoms
- And it just makes you “feel” really good
Melatonin

Melatonin is a natural hormone made during sleep in the pineal gland, a pea sized gland located in the brain. The trigger for production of melatonin is total darkness—any light in the room will inhibit your body’s production. Today, however, living in a world with nightlights in the bedroom or streetlights sneaking through the window, we actually have an epidemic of people with insufficient melatonin production, even at a very young age. The problem doesn’t just come from light falling on our eyes while we sleep, but from light falling on any part of the body. Even if you wear an eye-mask, if light is falling on your arms or chest or feet, that’s enough to slow melatonin production. Without artificial light, we would normally be in total darkness 8–12 hours a night, producing melatonin during all of those hours. Living in a city or suburban area may cut the hours of total darkness to six or less, and in many cases, zero. And nowadays, we have an addition problem. Staring at TVs or computer or video game screens before bed will inhibit production. And if all else fails, melatonin levels also decline significantly as we age.

Since its discovery in 1958, melatonin has been studied extensively and shown to be widely beneficial to the body. The benefits of supplementation include:

- **Better Sleep**—Lowered levels of nighttime melatonin reduce the quality of sleep, resulting in the need for more sleep. If your pineal gland does not produce adequate melatonin early enough in the evening, both the quality and quantity of your sleep may suffer. Lack of melatonin may make it difficult for you to fall asleep or may cause you to wake up too soon. Too much melatonin and you will feel exhausted or “drugged” throughout the day. By taking melatonin instead of other sleep aids, rapid eye movement (REM) sleep (dreaming) is not suppressed nor does it induce “hangover” effects when used as directed.

- **Enhanced Immune Function**—Many people report that supplementation with melatonin has significantly reduced their incidence of colds and infections. The exact way in which melatonin affects the immune system is not known. However, since much of the activity of the
immune system takes place at night, some researchers have proposed that melatonin interacts with the immune system during sleep, helping to buffer the adverse effects of stress. It has been proposed by some that the increased incidence of cancer we see today is partially due to the extended time we are exposed to artificial lighting. This is reflected in the fact that melatonin levels in breast cancer and prostate cancer patients are half of normal.48

- **Powerful Antioxidant Capabilities**—Melatonin is one of the most powerful antioxidants produced in the body. In addition, since it is both water and fat-soluble, melatonin can reach almost every cell in the body. However, since it cannot be stored in the body, it must be replenished daily.

- **Mood Elevator**—Nighttime melatonin levels are low in people with major depressive and panic disorders. Individuals with mood swings or who are melancholic also have lower melatonin levels. Both seasonal affective disorder (SAD) and cyclic depressions are related to the peaks and valleys of melatonin levels.

- **Cancer Fighter**49
- **Helps the Heart**50
- **Alzheimer’s**51
- **Cataracts**52
- Etc.

### Estrogen and Progesterone

Both men and women need to keep their levels of estrogen and progesterone balanced for their particular sex as they age. Yes, men need to be concerned about estrogen and progesterone too. However, the problem is the opposite of what might be expected. As women age, their levels of the two hormones decrease, leading to many of the problems women associate with aging such as: weight gain, bone thinning, hair thinning, and menopausal symptoms in general. With men on the other hand, the problem is that estrogen levels actually climb to unacceptable levels. It is no accident that as many men age, they develop breasts. In fact, the average man over 65 has more free estrogen in his body than the average woman of the same age. Amusing, yes? Actually, not so much. In addition to causing men to grow breasts (**gynecomastia**), the extra estrogen can bind to prostate tissue – doing the same thing in the prostate that it does in women’s breasts – promoting the overgrowth of prostate tissue and the development of prostate cancer.

The problem for both men and women, to a large degree, is exposure to petroleum based xenoestrogens in our food supply and drinking water. These can be potent in amounts as small as a billionth of a gram and can overwhelm the body’s ability to handle it. It is no accident that the average age for puberty in young girls has plummeted from an average age 16 or 17 to an average of 12.4 – and now even pushing seven or eight, and in some cases, as early as age three. It’s also not a coincidence that there has been a huge increase in the number of male children born without fully descended testicles in the United States.53

In addition to trying to avoid foods such as meat and dairy that contain added hormones and removing hormones present in your drinking water at the tap with either a filtration system, a water distiller, or a reverse osmosis unit, you might want to consider using an all natural progesterone crème. Progesterone
is the natural balancer to excess estrogen. Note: there are progesterone crèmes specifically designed for men. For more information on estrogen and progesterone, check out:

- Special Report on Progesterone Crème
- For Every Man Over 30

And you might want to lose some weight. Obesity is associated with abnormally high estrogen levels.

**Recommendations**

**Lifestyle changes**

- Clean up your act. Run yourself through the entire Baseline of Health Program. That means do at least one round of full body detoxes – and preferably three to four complete cycles.
- Optimize your immune system to better clean up invaders and debris
  - Immune support formula.
  - Pathogen formula
  - The Baseline of Health Program and all of the things that impact your immune system
  - And be sure to modulate a hyperactive immune system that can cause inflammation. Effective immunomodulators include L-carnosine, Cetyl myristoleate (CMO), and the Transfer Factor found in bovine colostrum.
- Start exercising to move lymph and energy through your body.
- Clean up your diet, either eliminating or cutting way back on high glycemic foods such as most grains and sugars.
- Improve the ratio of omega-6 to omega-3 fatty acids in your diet to bring it closer to 1:1 to 2:1 max that it should be.
- Take a daily high end full spectrum antioxidant.
  - Full spectrum antioxidant formula
- Use a good proteolytic enzyme formula to reduce systemic inflammation.

**Cellular formula**

Based on everything we know, supplementing with a combination of L-carnosine, DMAE, and Acetyl-L-carnitine is one of the simplest, most effective, and safest steps we can take to help turn back the clock and optimize our health.

Look for a formula that allows you the flexibility of moving between doses of L-carnosine that range from 250 mg a day to 1,500 mg a day as needed. (As a side note: Dr. Oz has recently begun promoting L-carnosine as the “newest” miracle anti aging supplement. Unfortunately, he’s about 15 years late to the game, but even worse is promoting it as a silver bullet ingredient, which bypasses all the advantages of an integrated formula.)

Aging dramatically reduces the amount of CoQ10 in your cells – particularly in your heart muscles. It’s recommended to supplement with 100 mg of ubiquinol a day.

- Cellular aging formula
- CoQ10
Testosterone

Extracts of saw palmetto, wild oats, nettles, and tribulus can safely help increase testosterone levels in the body by releasing the bound testosterone already there and helping to prevent conversion of testosterone to dihydrotestosterone in men. Look for a formula that combines all those elements plus adrenal support. For men, zinc supplementation of approximately 50 mg a day is also advisable to help prevent production of dihydrotestosterone.

- Men’s testosterone balancing formula
- Women’s testosterone balancing formula

Growth Hormone

Supplementation with a growth hormone boosting formula makes sense for anyone over 35. And all the boosters can be used on a daily basis as they do not suppress the body’s own production of GH. Most of the formulas on the market will increase IGF-1 levels by a minimum of 20%—some even approaching 100%. Feed back on the homeopathic versions, although positive, is sketchy. As for the oral sprays, unfortunately companies that provide this source keep coming and going so it’s impossible to make any recommendations in that regard. Thus, for most people, a good secretagogue is probably the best way to go. Keep in mind, however, that one 30 minute aerobic session can easily increase IGF-1 levels by a good 100%, and a solid session of weight training can increase levels by an incredible 400-800% -- and at no cost.

- Secretagogue

DHEA

I do not recommend supplementation with DHEA without constantly monitoring DHEA levels in the blood. Supplementation with 7-Keto DHEA at 25–50 mg a day (up to 200 mg can actually be used to promote weight loss) bypasses virtually all potential problems with DHEA. Also, supplementation with pregnenolone and/or growth hormone will help raise DHEA levels in the body. If you choose to supplement with regular DHEA, 5–25 mg makes sense (up to 50 mg if blood levels are monitored), but do not use it daily, as supplementation may suppress your body’s own production of DHEA. Instead, I recommend using 7-Keto, which avoids many of the problems associated with DHEA supplementation.

- 7-Keto

Pregnenolone

Start with 10 mg a day of pregnenolone and increase by 10 mg every couple of days (to a maximum of 50 mg) until you feel really good. Then, try backing it down to the lowest level that still produces that same feeling. Finally, start backing off on the days that you use it until you are using it only 2–3 times a week (so as not to suppress your body’s own production). As you age, you can increase the days and dosage. The final recommended dosage is age dependent: if you’re younger than 50, consider dosages in the range of 10–20 mg two to three times a week; if you’re over 50, the dose should typically be 30–50 mg daily.

Use of pregnenolone has shown no serious side effects even at very high doses of up to 700 mg. However, at the high dosage level, there has been some occurrence of minor side effects, including over stimulation and insomnia, irritability, anger or anxiety, acne, and headaches.
• **Pregnenolone**

**Melatonin**

Melatonin in small doses several times a week (so as not to suppress your body’s own production) makes sense as a supplementation program. Dosage varies according to what your body needs, ranging from 0.3 mg to 20 mg a day. The correct dosage is the one that helps you sleep but let’s you wake up without feeling “drugged.” Start with 0.5 mg and increase by 0.5 mg a night until you find what works for you. Another alternative, actually preferred, is to use a 3 mg timed release capsule and increase the number of capsules as required. Note that the effects of supplementation often carry over several nights, so you may need to supplement only every other night or every third night. As you get older, you can increase the amount and frequency of supplementation as needed. Also, consider using black-out curtains in the bedroom and turn off any nightlights in order to get the bedroom as close to total darkness as possible. This will help increase your body’s own melatonin production. And when you wake up in the morning, expose yourself to sunlight immediately to cut melatonin production and wake yourself up.

• **Timed release melatonin**

**Estrogen and Progesterone**

Women who are still going through their menstrual cycles or are premenopausal, menopausal, or postmenopausal should seriously consider supplementation with an all-natural progesterone cream. Make sure you and your doctor avoid all synthetic forms of progesterone. The benefits can be profound, and the risks of not supplementing potentially include an increased risk of breast cancer, endometrial cancer, and osteoporosis. For men, since they are not immune to the effects of xenoestrogens, low levels of natural progesterone supplementation can help with depression, relieve prostate problems, and prevent prostate cancer.

Women looking to begin a regimen of natural progesterone supplementation should look for a premium quality balancing crème that contains a minimum of 500 milligrams per ounce (the amount recommended by Dr. Lee) of 100% pure, USP grade progesterone, naturally derived from soybeans. Look for a natural vegetarian formula that uses no artificial or synthetically derived fragrances, parabens or preservatives. And look for a formula that uses all natural oils and an enhanced liposome delivery system to help move the progesterone through the skin.

Men should look for similar qualities in a progesterone formula, but with less progesterone. Men should look for a crème that provides approximately 8-12 mg of progesterone a day.

In most cases, estrogen supplementation is not called for. The problem is usually related to a lack of progesterone, not estrogen. But in those cases where it is required, make sure your doctor uses either all-natural triple estrogen in the normal body ratio (approximately 90 percent estriol, 7 percent estradiol, and 3 percent estrone) or a pure estriol crème. As we discussed earlier, this is the exception, not the rule, and most doctors are unaware of the difference.

• **Women’s progesterone crème**
• **Men’s progesterone crème**
• **Estriol crème**

**Precautions**

There are several precautions that should be observed when supplementing with hormones.
• Pregnant or nursing mothers should not supplement without guidance from their doctors. Likewise, women trying to conceive would be advised to check with their doctor first.
• Anyone being treated for a pre-existing condition should check with their doctor. This would include conditions such as autoimmune diseases, cancer, and mental illness or depression.
• Anyone on prescription steroids should check with their doctor first.
• Athletes should, of course, be careful as most hormone supplements are considered “performance enhancers.”

In fact, it makes sense to check with an anti-aging specialist before starting a program of hormone supplementation. Yes, there are now anti-aging specialists! That means you need to keep in mind that these specialists are still medical doctors and may therefore be prone to the same paradigm blindness that afflicts many doctors.

Conclusion

The bottom line is that naturally slowing down the aging process is a far, far better alternative than trying to pharmaceutically hide it.


6 Ibid


11 Ibid.


