Essential Oils Treat Baldness and Acne

Essential oils treat baldness

A reader commented on my post on whether fungal infection causes male pattern baldness, and says that rosemary oil is making his hair grow back:

After reading some studies about rosemary essential oil being as effective as minoxidil for hair regrowth (and without the warnings about not letting my wife and kids touch it). I’ve been doing a self-experiment of applying a few drops of a homemade hair tonic consisting mainly of rosemary and lavender essential oils suspended in a carrier of sesame oil to my scalp and beard.

At the start of the experiment, in mid-Summer, the top of my head was a cue-ball with a few stray short hairs here and there. During the first week or so after I started, it was like an unnoticed whitish, salt-like crust came up off of the top of my scalp. Then, I noticed hair growth. At first, they were short, blonde baby hairs, but now I have extensive patches of brown hair on the top that need regular trimming.

My hair seems to be coming back in the reverse order that I originally “lost” it. It isn’t fully back yet though. But the progress has been surprising. I continue to use my normal shampoos and conditioners, or whatever partially-used mini bottles my wife asks me to help finish. Sometimes I wear hats, sometimes I don’t. Sometimes I brush it, sometimes I don’t.

I haven’t used any other hair growth products or treatments during this time and haven’t tried anything else for 5+ years. I had basically resigned myself to look like my father.
Now, what is the rosemary changing on the top of my head, I don’t know. But by using it, my hair looks healthier. Also, my beard looks fuller.

He cited a couple of studies. One: Rosemary oil vs minoxidil 2% for the treatment of androgenetic alopecia: a randomized comparative trial. Rosemary oil was as effective as minoxidil (Rogaine).

“... both groups experienced a significant increase in hair count at the 6-month endpoint compared with the baseline and 3-month endpoint. No significant difference was found between the study groups regarding hair count either at month 3 or month 6.”

Rosemary oil is anti-fungal. And, it turns out, a number of essential oils are also anti-fungal.

The essential oils obtained from five commercial samples of Sicilian aromatic plants, laurel, sage, oregano, rosemary and coriander were analyzed by GC/MS and assayed for their antibacterial, antifungal and antioxidant activities. Twenty-five different genera of bacteria and one fungal species were used in this study as test organisms. The oils showed a high degree of inhibition against all the microorganisms tested.

Clove and rosemary oils in combination have synergistic effects against fungi and bacteria.

Totally makes sense, since many phytochemicals made by plants are there to be used for chemical warfare against other plants and against animal predators. In this case, fungi predate on plants, so the plants need to have anti-fungal defenses.

I don’t know whether the other essential oils besides rosemary will treat baldness, but I bet they would. In any case, the fact that rosemary oil does treat it, and is anti-fungal, adds further evidence to the cause of male pattern baldness.

Essential oils and iron chelators treat acne

I mentioned this in my article on acne: The use of iron chelators in biocidal compositions. Through the magic of SciHub, I got my hands on the full paper. The authors show that iron chelators potentiate acne medications such as salicylate and benzoyl peroxide from 4 to 250-fold.

Could you add an iron chelator to an acne med on your own? Maybe. Green tea extract or IP6 seem likely candidates. Topically applied IP6 penetrates the skin.

Essential oils also treat acne. Tea tree oil was as effective as benzoyl peroxide.

A number of essential oils are effective in killing the bacteria that causes
acne, *Propionibacterium acnes*. The most effective were thyme, cinnamon, and rose oils.

The beauty of essential oils in this case are that their chemical nature makes them able to penetrate skin. However, I don’t know whether they might be irritating or toxic to skin.

**Rosacea, iron, and fungi**

Another skin condition is rosacea, characterized by red, inflamed skin on the face. It can range from mild to disfiguring. They still haven’t figured out the cause of it. The most effective treatment appears to be topical metronidazole.

Metronidazole is an interesting drug, the only one in current use that’s effective against both protozoan parasites (like *Giardia* or *Plasmodium*) and anaerobic bacteria. It’s been thought that this drug works against rosacea by killing *Demodex*, a skin mite. The problem is that it appears most people have *Demodex*; that doesn’t mean it’s not causative; most people seem to have *Malassezia* too, and that causes dandruff and maybe baldness.

However, rosacea patients have higher levels of ferritin in the skin of their lesions.

Serum peroxide levels were significantly higher and serum total antioxidative potential levels were significantly lower in patients with rosacea than in healthy control subjects (*P* < .05). Compared with control subjects, the number of ferritin-positive cells was significantly higher (*P* < .001) in skin samples from patients with rosacea, especially those with severe disease.

Ferritin is made in response to free iron, so this suggests that rosacea is associated with higher iron levels in the skin, causing oxidative stress and just maybe allowing for the growth of some microorganism, such as a fungus.

I was unable to find whether metronidazole successfully kills fungi; in any case, it isn’t used for that. But its structural resemblance to the anti-fungal drugs ketoconazole and fluconazole did not escape my attention. And ketoconazole chelates iron.

So it seems possible that metronidazole is either killing fungi in the skin and/or removing iron. (Either that or I’ve been looking at PubMed for too long and starting to see things.) A wastewater treatment for removing metronidazole uses iron particles, indicating iron chelation.

**Conclusion**

In summary, baldness, acne, and rosacea may have something in common: the presence of microorganisms. In turn, these microorganisms could get a perch on the skin by access to iron.
What we need is a study to see whether blood donors have fewer of these skin conditions. Rosacea typically starts after age 30, as does baldness, which could implicate iron. Obviously multiple factors, including genetic susceptibility, must be at work in all of these conditions.

PS: Check out my books, Dumping Iron, Muscle Up, and Stop the Clock.

PPS: You can support this site by purchasing through my Supplements Buying Guide for Men.

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Do Bacteria Cause Hypercoagulation and Aging?

I recently wrote about hypercoagulation, which is the phenomenon of increased activation of blood clotting and decreased activation of clot dissolution, and how it’s connected to aging. I showed how iron is involved in hypercoagulation. There’s likely another player in hypercoagulation, also connected to iron, and that’s bacteria. Do bacteria cause hypercoagulation and aging?

Consider that there’s lots of evidence both that healthy people have bacteria in sites normally considered sterile, such as the blood, and that numbers of bacteria are increased in unhealthy people, for instance those with cardiovascular disease. People with cardiovascular disease have as much as 40 to 70 times more bacteria in their blood than healthy people, and bacteria, fungi, and viruses have been found in the brains of Alzheimer’s patients.

How do bacteria fit in with hypercoagulation?

Gram negative bacteria, which are the most numerous and important gut bacteria, have an endotoxin, called lipopolysaccharide (LPS), very toxic stuff.
Tiny amounts of it set off a coagulation cascade.

So, we have the sequence:

Aging -> increased iron -> bacterial growth supported by iron -> shedding of LPS by bacteria -> hypercoagulation.

Increase in venous thromboembolism by age.

If hypercoagulation is characteristic of aging, and caused by bacteria, are bacteria the cause of aging?

We know that aging is also characterized by oxidative stress, inflammation, mitochondrial dysfunction, and decreased autophagy.

Bacterial and other infections produce oxidative stress and inflammation; protection of mitochondria can alleviate infectious processes; bacteria can subvert autophagy.

In theory, bacterial invasion could account for many of the manifestations of aging.

Bacteria require iron to grow and reproduce. Most of them produce molecules called siderophores that grab iron from their milieu and sequester it for use by the bacteria.

The bacterial genus Pseudomonas, an ubiquitous organism that causes infections, uses salicylate as a siderophore.

Salicylate is the metabolic end-product of aspirin and is responsible for its pain-killing anti-inflammatory action. It goes like this: aspirin ->
salicylate -> iron chelation. In Pseudomonas, the sequence goes like this: salicylate -> iron chelation -> use of iron for growth.

**Iron is the center of an evolutionary arms race**

Humans and other mammals use the protein called transferrin to transport iron within the body. (Ferritin is used for safe iron storage.)

Transferrin and the iron it transports are at the center of an evolutionary arms race between bacteria and humans.

**The frontline of host-pathogen coevolution**

Pathogens have to subvert a host’s innate defenses to avoid being killed. Barber and Elde now show that this principle extends to nutrient-transporting proteins, such as transferrin, which binds iron. Without iron, invading pathogens cannot replicate, but iron is sequestered in transferrin, which stops pathogens using it. So pathogens have evolved a succession of transporters that can hijack transferrin’s iron. Over time, the primate transferrin binding surface has coevolved to wrestle iron back from the grip of pathogens.

**Aspirin and heart disease**

Consider that aspirin prevents heart attacks and cancer. How does it do this?

By following the logic of everything I’ve written above, aspirin prevents blood clots which leads to less heart disease, and it prevents the growth of clot-causing, LPS-shedding bacteria by preventing them from getting iron.

As heart disease is mainly a disease of old people, once again we see how iron and bacteria promote aging.

**Summing up**

Scientists avidly search for the causes of aging.

They’re overlooking iron and the bacteria that it enables.

Most aging experts insist that aging has nothing to do with the passage of time.

Yet humans have a mechanism for acquiring iron, but no mechanism to get rid of it. Since evolution doesn’t care about what happens to us after reproduction, iron accumulates into older age.

Iron feeds bacterial growth, which leads to hypercoagulation, and perhaps many of the other manifestations of aging.
Iron alone also causes increased fibrin clots, and slower fibrin degradation. Iron and bacteria are a double whammy causing disease and aging.

PS: Read more in my book [Dumping Iron](#).

PPS: [You can support this site by purchasing through my Supplements Buying Guide for Men.](#) No extra cost to you.

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**Targeting Hypercoagulation for Anti-Aging**

Coagulation (clotting) of the blood is an important process that keeps us from bleeding by stopping blood flow in a timely fashion. It’s intricately regulated by dozens of proteins, with positive and negative feedback loops. Hypercoagulation refers to the abnormally high tendency of the blood to clot, and there’s a marked association of hypercoagulation and aging. Here we’ll discuss targeting hypercoagulation for anti-aging.

One of the most important of the proteins that promotes blood clotting is fibrinogen, and it markedly increases with age. Higher levels of fibrinogen are associated with [heart disease](#) and cancer.

Fibrinogen forms fibrin, which in turn forms a blood clot. Dissolution of fibrin is as important as its formation; clots that form too quickly or don’t dissolve soon enough can cause heart attacks, strokes, and deep vein
thrombosis.

Why do fibrinogen levels rise with age? It may be due to inflammation, since fibrinogen is an acute phase reactant.

Noteworthy also is that fibrinolysis, the process of breaking down a blood clot, decreases with age. “[T]he increasing hypercoagulability observed with aging may account for the higher incidence of thrombotic cardiovascular disorders in the elderly”.

So, we have increased fibrinogen, possibly due to greater inflammation in aging, and decreased fibrinolysis, both of which tend toward the formation of blood clots, which increase the risk of heart attacks, cancer, and stroke, and probably lots of other diseases.

**Why blood clots won’t break down**

In fibrinolysis, the breaking down of blood clots, enzymes designed for that purpose act on fibrin. If something alters the molecular structure of fibrin, clot-dissolving enzymes can’t function as well, or even at all.

What could alter the fibrin structure?

Iron, for one. **Iron enhances the generation of fibrin**, and makes it harder to break down.

Here, we show by means of electron microscopy that iron ions added to human blood dramatically enhances fibrin fibers formation with thrombin, and significantly delays fibrinolysis during spontaneous clotting of native blood. Iron ions caused the appearance dense matted fibrin deposits, similar, if not identical, to those observed in plasma of patients with stroke. **These results may explain a known relationship between thrombotic diseases and the increased body concentrations of free iron and/or hemoglobin derivatives.** We conclude that any action resulting in the inhibition of hemostatic abnormalities, as well as in the reduction of body free iron and scavenging of hydroxyl radicals (e.g., by polyphenols) can potentially prevent pathological reactions associated with consequences of stroke.

Iron, through its ability to generate hydroxyl radicals (OH⁻), changes the structure of fibrinogen, and the fibrin formed by it, and makes it difficult to break down.

The mechanism of this phenomenon is very likely based on hydroxyl radical-induced modification of fibrinogen tertiary structure with the formation of insoluble aggregates resistant to enzymatic and chemical degradations.
It’s even suggested that the presence of iron-induced fibrin clots may be the cause of the inflammation that raises fibrinogen, and could be very important for causing heart disease.

Accumulating evidence within the last two decades indicates the association between cardiovascular disease (CVD) and chronic inflammatory state. Under normal conditions fibrin clots are gradually degraded by the fibrinolytic enzyme system, so no permanent insoluble deposits remain in the circulation. However, fibrinolytic therapy in coronary and cerebral thrombosis is ineffective unless it is installed within 3-5 hours of the onset. We have shown that trivalent iron (FeIII) initiates a hydroxyl radical-catalyzed conversion of fibrinogen into a fibrin-like polymer (parafibrin) that is remarkably resistant to the proteolytic dissolution and thus promotes its intravascular deposition. Here we suggest that the persistent presence of proteolysis-resistant fibrin clots causes chronic inflammation. ...We argue that the culprit is an excessive accumulation of free iron in blood, known to be associated with CVD. The only way to prevent iron overload is by supplementation with iron chelating agents.

Iron appears to be the biggest culprit in the increased fibrinogen and decreased fibrinolysis seen in aging, and may therefore be largely responsible for increased rates of heart disease and cancer seen in older people.

Iron also increases with age, which gives us another piece of evidence in the chain: aging → more iron → greater tendency to clotting → heart disease, stroke, cancer.

Iron is well-known to be involved in Alzheimer’s disease, and the ability of iron to enhance clot formation may be one of the reasons.

Amyloid hypothesis of Alzheimer’s disease (AD) has recently been challenged by the increasing evidence for the role of vascular and hemostatic components that impair oxygen delivery to the brain. One such component is fibrin clots, which, when they become resistant to thrombolysis, can cause chronic inflammation. It is not known, however, why some cerebral thrombi are resistant to the fibrinolytic degradation, whereas fibrin clots formed at the site of vessel wall injuries are completely, although gradually, removed to ensure proper wound healing. This phenomenon can now be explained in terms of the iron-induced free radicals that generate fibrin-like polymers remarkably resistant to the proteolytic degradation... In addition, iron-induced fibrin fibers can irreversibly trap red blood cells (RBCs) and in this way obstruct oxygen delivery to the brain and induce chronic hypoxia that may contribute to AD.
How to avoid the hypercoagulation of aging

Avoiding the hypercoagulation of aging would be a potent strategy for fighting aging and remaining free of the diseases of aging. There are a few ways to do this.

1. Keep iron in the low normal range, via blood donation and/or iron chelators. Both can be useful, since blood donation targets total body iron, while iron chelators mop up any excess free iron.
2. Magnesium can help dissolve fibrin-red cell aggregates. It’s therefore no surprise that magnesium reduces death rates in heart attack patients, and deficiency is associated with stroke.
3. Polyphenols like EGCG (from green tea) and curcumin protect against hypercoagulation. No accident that they also chelate iron.
4. Aspirin enhances fibrinolysis. This may be one of its modes of action that protects against both heart attacks and cancer. Long-term aspirin use also results in lower levels of iron.

Conclusion

The hypercoagulation of aging represents an important target for any anti-aging and life-extension regimen. Even middle-aged men should pay attention to it, since they have a high rate of heart attacks – as well as high iron, which is why they have the high rate of heart attacks.

Unfortunately, no one is talking about this. While it’s well known that blood clots can precipitate heart attacks, the idea that hypercoagulation may be a (or the) root cause of heart disease is barely even considered. (Instead, we get all that cholesterol nonsense.)

Even less discussed is the role of iron, whether it’s increasing fibrinogen, decreasing fibrinolysis, causing infections, cancer, or any number of other things, including aging itself.

PS: Read my book Dumping Iron.
Higher Altitude Means Much Lower Death Rates

A new study from Austria reports “Lower mortality rates in those living at moderate altitude”. As we’ll see here, higher altitude means much lower death rates.

Here’s a graph showing death from colon cancer in men, and breast cancer in women, by altitude:
Death rates from both of these cancers were about half as high at an altitude of greater than 1000 meters (3300 feet). The study also found about a 30% reduction in deaths from coronary artery disease at >1000 meters.

This accords well with a number of other studies. For example, "Lower Mortality From Coronary Heart Disease and Stroke at Higher Altitudes in Switzerland". This study found 22% less heart disease death for every +1000 meters in altitude, and 12% less stroke death.

"Association Between Alzheimer Dementia Mortality Rate and Altitude in California Counties": This study found about half the death rate from Alzheimer’s at an altitude of 1600 meters vs that at sea level.

There’s less diabetes at high altitude.

Are there population differences, so that genes play a role? Not likely. The studies adjust for it, e.g. the first study confined results to towns of <20,000 population to control for migration from elsewhere; migrants overwhelmingly live in cities. Also, there’s increased death from COPD and respiratory infections at higher altitudes, so if there were some kind of general wealth or IQ effect, we wouldn’t see this.

What’s going on here?

In a word, hormesis, which is the biological response to low doses of toxins or stressors that results in making the organism healthier and stronger. It results in lower incidence of the diseases of aging, including heart disease, cancer, and diabetes. One of the main ways that hormesis works is through activation of the Nrf2 system, which increases cellular defenses.

Hormetic factors at play with higher altitude include
• hypoxia, or less oxygen
• background radiation — from being surrounded by massive rock formations
• solar radiation, including cosmic rays — from less atmosphere to block them
• exercise — walking around at high altitude (up and down) is more strenuous than at sea level
• iron: at higher altitudes, humans have higher hemoglobin, which requires iron, and thus ferritin levels are lower

Non-hormetic factors could be cleaner air and higher blood levels of vitamin D from all the sunshine.

Seems that someone really serious about an anti-aging program would do well to consider moving to the mountains. Lower obesity rates are also found in the mountains.

PS: For more on anti-aging, see my book, Stop the Clock.

PPS: Check out my Supplements Buying Guide for Men.
Nobel Prize in Medicine for Autophagy Research

In the news today it was announced that the Japanese scientist Yoshinori Ohsumi won the 2016 Nobel Prize in Physiology or Medicine for his work on the basis of autophagy.

Medicine Nobel for research on how cells ‘eat themselves’

Japanese biologist Yoshinori Ohsumi recognized for work on autophagy.

Molecular biologist Yoshinori Ohsumi has won the 2016 Nobel Prize in Physiology or Medicine for his work in the field of autophagy: the processes by which the cell digests and recycles its own components.

The 71-year-old Ohsumi, who is currently a professor at the Tokyo Institute of Technology in Yokohama, was recognized for his experiments in the 1990s, when he used baker’s yeast (Saccharomyces cerevisiae) to identify genes that control how cells destroy their own contents. The same kinds of mechanism operate in human cells — and are sometimes involved in genetic disease.

“You can answer the most basic and important questions about the nature of life through yeasts.”

“He’s a very humble yeast geneticist who basically transformed the field,” says Sharon Tooze, a cell biologist at the Francis Crick
Institute in London. “He was interested in this weird pathway that turns out to be a vitally important pathway in medicine.”

The word ‘autophagy’ — from the Greek for ‘self-eating’ — was coined in 1963 by the Belgian biochemist Christian de Duve, who saw how cells broke down their parts inside a waste-processing sac that he called a lysosome. Biologists now understand that this process is fundamentally important to living cells.

**Autophagy** is the regulated process in which cells break down their own constituents, such as proteins and organelles like mitochondria, into their more basic parts such as amino acids, and recycle them for later use, either burning them for fuel or using them to make new structures. The cell replaces the old parts that it’s destroyed and replaces them with brand new ones.

In this way, autophagy provides for renewal.

Autophagy is critically important in aging and disease. One of the most characteristic aspects of aging is a decline in the levels of autophagy. Since aging by definition is an increase in the susceptibility to disease, it can be seen how important autophagy is to all diseases.

Autophagy relates to virtually all chronic diseases in one way or another, and even some non-chronic diseases, like infection. It’s important in cancer, cardiovascular disease, and brain disorders such as Alzheimer’s and Parkinson’s.

Autophagy declines in aging. A salient characteristic of youthful organisms is a robust response to stimuli of autophagy, most notably the absence of food, or fasting.

When old, the level of autophagy is only 20% or less in some mammals than that seen in youthful members of the same species. Increasing it to youthful levels is perhaps the most important thing within our control to slow the aging process. (I wrote about this at length in my book, *Stop the Clock.*)

While fasting and calorie restriction are the best-known ways to increase autophagy, scientists are very interested in developing drugs that will do this as treatment for a number of diseases. This is a hot topic now, with many scientists researching this, and presumably drug companies as well.

To place this Nobel Prize in perspective, it should be noted that Dr. Ohsumi won it for elucidating the molecular mechanisms of autophagy, not for its health implications.

Also worthy of note is that he did his research using the yeast *Saccharomyces cerevisiae*, the same yeast used in wine, beer, and bread making. This is important because the same mechanisms have been found at work in mammalian cells, showing that the mechanisms have been conserved by evolution, i.e. as single-celled organisms evolved into multicellular organisms, they retained the molecular machinery of autophagy. (An important piece of research on iron and aging also used yeast.)
The Nobel Prize in Medicine went to a worthy recipient, whose research greatly furthered our understanding of the vitally important process of autophagy. Undoubtedly, important discoveries on how it affects health and disease are yet to come.

PS: Autophagy and how to increase it to youthful levels is central to my book, *Stop the Clock*.

PPS: Check out my Supplements Buying Guide for Men.

Subscribe and get my free book on fat loss

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**Cracking the Aging Code: The Science Book of the Year**

In his new book, *Cracking the Aging Code: The New Science of Growing Old and What It Means for Staying Young*, Josh Mitteldorf, who has studied aging for decades and writes about it at his website, explores the science of aging and sets forth his own theory as to why we, and virtually all organisms above the level of bacteria, age. (The book has a co-author, Dorion Sagan, but the theory is Mitteldorf’s, and in any case, perhaps because I’ve been an avid reader of his website, the author’s voice seems like Mitteldorf’s alone.)

This is the science book of the year, the best I’ve read in quite awhile.

Mitteldorf is an expert in evolutionary theory (he used to be an astrophysicist), and deftly and skillfully expounds and criticizes the
several current theories of aging. He then proposes his own radically different theory. And he’s very convincing. Whatever the fate of his theory, he brings enough evidence to bear both in its favor and against the other theories that, it seems to me, his theory must be reckoned with.

A thorn in the side of evolutionary theory

Aging has been a thorn in the side of evolutionary theory since the beginning. Even Darwin knew and understood this and could not see a way to incorporate aging into the theory of evolution.

Aging poses a conundrum for evolutionary theory because aging manifestly decreases biological fitness, causing lower reproduction and greater mortality. Why wouldn’t evolution have abolished it, or not allowed it to come into existence?

If an organism didn’t age, it would seem to have an advantage: it would never die of aging and it would continue to reproduce throughout its lifetime; hence the longer an organism lived, the more offspring it would leave, and the fitter in evolutionary terms it would be.

Indeed, we do see this in some organisms. Lobsters, for example, apparently do not age, but grow bigger and more fertile with the passage of time. (The record weight for a lobster was 44 lbs.) Mitteldorf describes some species of long-lived shellfish that are almost nothing but feeding and egg-laying machines, cranking out a million eggs daily.

But humans and most animals do age. Animals in the wild have a greater chance of death from predators and infections the older they are. Why hasn’t evolution put a stop to this?

One older idea, that of Peter Medawar, is that the force of natural selection declines with age. If an organism has aged and then dies, any genes that contributed to aging and death have already been passed to its offspring. The idea is that some genes that may cause aging are also necessary for growth and reproduction. Therefore natural selection is unable to eliminate the genes for aging.

Medawar’s idea led to the three main modern theories of aging.

Mutation Accumulation: Genetic mutations are always present in a population; in other contexts, this is known as genetic load. If a mutation is not severe enough to cause death, but causes only, say, a 1% decreased level of fitness, then these genes can stick around in a population for a long time. Essentially, natural selection has not had enough time to get rid of them. An example might be the ApoE4 gene, which raises the risk of dementia and heart disease.

But even a 1% difference in fitness is, as Mitteldorf says, “far from being invisible to natural selection”. Aging animals do not die of senescence usually, but they die at a much greater rate from disease and predators than younger animals. In some arctic species, 60% of deaths in the wild can be
attributed to aging. Natural selection should be capable of eliminating the genes that cause this huge death toll, and to be able to do it quickly.

**Antagonistic Pleiotropy**: Some, maybe most, genes have multiple functions, and this theory says that genes with important functions in youth cannot be weeded out when they cause aging. An example of this might be the hormone IGF-1, which is involved in both growth and aging. Mice without it die shortly after birth — but high levels in older people are associated with cancer and higher mortality.

Mitteldorf describes the work of Michael Rose, who bred fruit flies for longevity in order to see what would happen to fertility. In theory, if he selected long-lived flies and bred them for longevity, their fertility should decrease, given antagonistic pleiotropy. But that’s not what happened; their fertility went up. So there seems no reason that nature can’t separate the function of fertility from aging.

**Disposable Soma**: Resources, usually in the form of food energy, are always in short supply, so this theory says, so that organisms must allocate these resources to different needs. Damage repair at the cellular level is one of those needs and is an important component of aging, since if the body can repair all of its damage, aging will not occur. So if resources are lacking, the organism allocates them preferentially to growth and reproduction, and essentially allows itself to age.

The huge counter to this theory is calorie restriction, the most robust life-extending intervention in lab animals. When they are literally starving, animals can live 50% longer than normally fed animals. If resource scarcity were causing aging, we could expect to see the opposite. If you ate more, you would live longer; but such is manifestly not the case. Eat more, die younger — and this holds true for virtually every species of organism which has been put to the test.

Same is true for exercise: if damage and repair are crucial for aging, exercise would make you age faster. Exercise causes damage — yet it makes animals, including humans, live longer.

**Hormesis**

Both calorie restriction and exercise are examples of *hormesis*, in which the application of a stress or toxin causes better health and longer life. The organism doesn’t just repair the damage, but becomes stronger and healthier than before.

Hormesis is central to Mitteldorf’s theory of aging. As he says, it looks as if the organism already has potent anti-aging capabilities that, in normal, “easy” times, it does not use. The organism is fully able to slow aging, when the conditions are right.

Aging is not damage that the body can’t control or that natural selection can’t abolish. It isn’t due to lack of resources or pleitropic genes. No.
Aging is programmed.

Programmed Aging and Group Selection

The theory of programmed aging clashes directly with the neo-Darwinian theory of evolution, which is the theory that represents current thinking in biology.

Neo-Darwinian theory states that natural selection takes place at the level of the gene, and only benefits individuals carrying that gene.

Mitteldorf’s theory of programmed aging relies on group selection, a notion that most evolutionary scientists say cannot exist.

Hence my description of Mitteldorf’s theory as radical, since it takes on the entire neo-Darwinian synthesis, and the scientists that back it.

In this light, it’s of more than passing interest that Mitteldorf’s mentor has been another proponent of group selection, David Sloan Wilson, the author of the masterful book *Darwin’s Cathedral: Evolution, Religion, and the Nature of Society*.

The programmed theory of aging sees aging as a “suicide program”, one that is of no benefit to the individual but which is of great benefit to the group. The organism dials up genes that cause inflammation and other forms of damage, leading to aging and death. Aging is a deliberate effort on the part of the organism, not something it tries to avoid.

Why would organisms do this? The benefit to the group would have to be a very powerful one in order to override the harm to the individual. And indeed it is, according to Mitteldorf.

Organisms age in order to avoid extinction.

In any successful group of organisms, it seems easily possible for the group to overshoot its environment and to succumb to famine or other causes.

All animals are predators in some way or other, depending on other life forms for sustenance, and if the animals are too successful, they risk famine or epidemics and subsequent extinction of the entire group.

Aging is the organisms’ way of buffering the population. In good times, with plentiful food, organisms age and some of them die, thus keeping the group within its environmental limits and in tune with its ecology. The group thrives.

In bad times, with fewer available resources, aging slows. The species does not want every member to die at once, of famine or some other cause. It wants to avoid extinction, an event which means the demise of every gene carried by the species. When the crisis is over, aging resumes.
Criticism

Mitteldorf supplies abundant evidence for his theory, and it makes for fascinating reading. While reading it, I thought of a few objections, which wasn't easy, as the author is convincing. Note that I am not an evolutionary biologist.

Aging seems too messy a process to be a “suicide program”. If you think of all the ways that aging causes damage, illness, and death, how could multiple sources of these things arise? One gene that caused death would be a lot simpler, and the fact that aging apparently has multiple genetic roots makes one wonder how it could arise by natural selection.

Admittedly, this objection is probably more a matter of taste than of empirical backing.

Another objection is that the mere passage of time seems involved in some aspects of aging, for example, in the accumulation of iron or exposure to antigens.

Iron seems a good example of pleiotropic effects: it’s necessary for growth and reproduction, but causes aging. Furthermore, natural selection might be unable to eliminate its effects on aging. Women with higher iron are more fertile, which might swamp the effect of natural selection on iron causing aging after a person has already had children.

Antigen exposure comes from infectious agents, and is a primary cause of inflammation in aging. The longer we live, the more antigens we’re exposed to, and in fact those exposed to more diseases die younger, i.e. they age faster. But perhaps the organism can’t dial down inflammation, since we need it to fight off pathogens.

Conclusion

Cracking the Aging Code is the best book I’ve read this year, and should be required reading for anyone interested in aging or indeed evolution and biology. Mitteldorf skillfully wends his way through evolutionary theory, its history, and the biology of aging – he even knows his chops when it comes to field biology and ecology.

At the end of the book, he discusses the prospects for anti-aging research as well as what he believes are the best means of slowing aging that we have right now.

His ideas about slowing aging are, I’m happy to say, very much in tune with what I’ve expounded on this site: exercise, intermittent fasting, supplements like berberine and curcumin, aspirin, and more. (He should have mentioned iron.) On the horizon are technical developments like telomerase therapy, which hold great promise in getting to the root mechanisms of aging.

So go read this book.
Health Benefits of Blood Donation Are Immediate

High iron causes disease

Body iron stores are correlated with and likely causative of cancer, heart disease, infections, and lots of other bad things, all of which I discussed in my recent book, Dumping Iron. This is related to the health benefits of blood donation.

The surest, quickest, most effective means of lowering body iron is through blood donation.

Lowering iron, whether through blood donation or other means, benefits health mainly over the long run, since heart disease and cancer don’t develop overnight.

But it turns out that the health benefits of blood donation — or therapeutic phlebotomy — begin immediately after donation.

The instant benefits of blood donation

A group of medical scientists looked at 96 healthy blood donors and measured the levels of C-reactive protein, pentraxin-3, superoxide dismutase, and nitric oxide in their blood both before and after a voluntary blood donation.
Their paper: “One more health benefit of blood donation: reduces acute-phase reactants, oxidants and increases antioxidant capacity”.(1)

C-reactive protein (CRP) is an important marker of inflammation. High levels are associated with heart disease risk.

Pentraxin-3 is a marker of molecular oxidative damage.

Superoxide dismutase is an important detoxifying enzyme. Increasing it through genetic manipulation of lab animals increases their lifespan — that’s how important it is.(2)

Nitric oxide is an important signaling molecule that is vital for the dilation of arteries. It controls blood pressure and is responsible for many of the benefits of exercise.

The study was done in Turkey, where blood donor participation as a percent of the population is low; the researchers were interested in stressing the benefits of blood donation so as to increase donor participation rates.

Through nefarious means (SciHub), I got my hands on the full paper. Yes, I’m that interested in the health effects of blood donation.

Pentraxin-3, the marker of molecular damage, dropped by more than 60%.

Nitric oxide, the beneficial artery dilator, increased by 60%.

Superoxide dismutase, the detoxifying enzyme, increased about 33%.

CRP, the inflammation marker, dropped about 10%.

To emphasize, this all took place 24 hours after donation.

**Blood donation a form of hormesis**

The authors comment regarding the reduction in pentraxin-3 and CRP, “We think that these reductions arise from reduction of iron levels.” I agree.

As for the other results, the authors posit various mechanistic explanations, but in my opinion what may be going on here is hormesis. That is, a blood donation causes a stress response which activates stress defense mechanisms, resulting in better health. The body senses a loss of blood and prepares to defend itself.

The benefits of blood donation are not confined to the long-term lowering of iron stores, although that is probably the chief benefit.

Blood donation appears to result in immediate better health, as seen in several biomarkers.

**PS: For much more on this topic, get my book,** Dumping Iron: How
Do Microbes Cause Aging?

Microscopic organisms – bacteria, fungi, protozoa, and viruses – are extremely abundant on the planet; the estimated number of bacteria alone is ~5 x 10^30, and their total content of carbon, nitrogen, and phosphorus weighs more than all plants put together.(1)

Many of these organisms are capable of either living in or on humans, and some of them cause disease when they do so.

Humans and indeed all organisms possess more or less elaborate means of protecting themselves from microbial invaders. We normally think that certain sites of our bodies are meant to be off-limits to microbes, and other sites to be loaded with them. The human mouth, gut, and skin are loaded with microbes, but generally other body sites are supposed to be sterile – the blood, for instance.

But scientists have recently discovered that the blood of healthy people (blood donors) contains an abundance of bacteria and viruses.(2)

These microorganisms get into the blood presumably through breaches in the tight junctions in the gut, through the lungs, and the skin.

What they’re doing there is anyone’s guess just now. It was formerly thought that any bacteria in the bloodstream caused disease – sepsis – but apparently not.

The blood of patients with cardiovascular disease is higher in bacteria than
in healthy controls, from 40- to 70-fold higher, which suggests that there could be a link between these bacteria and heart disease.\(^3\) It’s already known that periodontal disease increases the risk of heart disease, apparently even when controlling for socioeconomic status.\(^4\) It could be that the pockets of oral infection shed bacteria into the bloodstream, leading to increased heart disease risk.

A new book by Michael Lustgarten, PhD, *Infectious Burden: The Cause of Aging and Age-Related Disease*, makes the case that these new discoveries show that microorganisms are intimately involved in aging and in fact may cause aging. (The book is free for the next several days.)

Lustgarten shows that microbes are involved in many diseases that increase with age, such as heart disease, cancer, and Alzheimer’s.

**Older people get many infections**

As people get older, their susceptibility to infections increases due to declining immune function.

So is the increased number of infections due to aging, or do the bacterial, viral, and fungal agents of infection cause aging?

Certainly, finding that bacterial numbers are greatly increased in heart disease, and that bacteria (Treponema) and fungi may be important to Alzheimer’s disease is important.

Do these increased numbers result from a lack of immunity?

In most infections, the agents causing the disease are pathogens, i.e. they are capable of causing disease when they invade a host. Think of *Salmonella*, for instance, which may be normal flora in some animals but causes serious illness in humans.

In other infections, the organisms are opportunistic, causing disease only in debilitated subjects (e.g. pneumocystis pneumonia in AIDS patients), or causing disease when they get somewhere they don’t belong (e.g. *E. coli* and urinary tract infections).

Therefore, it’s not a simple matter to say when an organism is causing a disease and when it just happens to be there. Everyone has bacteria on their skin, for instance, but few people have skin infections.

Likewise, if healthy people have bacteria in their bloodstream, but no apparent illness, what’s going on?

So, we already know that elderly people are subject to increased infections; we may yet confirm that microorganisms are causative in heart disease and Alzheimer’s. But are these microbes causing aging, or these diseases, or is a great part of their power that they hit aging and/or debilitated people?

Older people have increased amounts of iron in their bodies, and more of it
is unregulated, i.e. not bound to ferritin. And iron increases infections. Microorganisms require iron for growth, and usually have a hard time getting it; having a lot of it around is just giving pathogens what they need.

So if bacteria and fungi are in the brains of Alzheimer’s patients, what’s causing the Alzheimer’s, iron or pathogens?

Alzheimer’s has also been characterized as type 3 diabetes, and in diabetes, blood sugar levels are high, again providing pathogens with a required nutrient. Diabetics have up to a 10-fold increased incidence of urinary tract infections for that reason: glucose in the urine feeds bacteria. (4)

My judgment on whether microbes cause aging is that the case is very provocative but not proven.

**What to do about microbes and aging**

In his book, Dr. Lustgarten makes a number of suggestions as to what to do about microbes as they relate to aging. For example, he suggests using soaps that do not raise the pH of skin (most of them do), so as to maintain the skin barrier function. (He didn’t suggest going all the way and not using soap at all. That’s for us radicals.)

He also suggests ways to maintain the barrier function of the gut, which is indeed important, as well as ideas for promoting good oral health.

However, bacteria are everywhere, and while you can keep the numbers of those that get into the body way down, you can’t keep them out entirely.

Good oral hygiene has been shown to decrease the number of incidents of pneumonia in the elderly who live in nursing homes, but will it do the non-elderly and reasonably healthy any good?

It’s a good question. While infected gums are associated with heart disease, is this just an association? People with infected gums and missing teeth are very likely to neglect their health in other ways.

And if healthy people have bacteria in their blood but no heart disease or other illness, what does that mean? Will keeping bacteria out of your body help you at all?

We simply don’t have all the answers yet.

My take on prevention is that a sound and healthy immune system is the best defense. While you don’t want huge numbers of even allegedly non-pathogenic bacteria pouring into your bloodstream, it appears that it may be next to impossible to keep them all out.

A healthy immune system is the result of everything else that makes for good health: diet, exercise, sleep, supplements, etc.

Infectious Burden presents a provocative thesis, and we will undoubtedly learn much more about the role of microbes in aging in the years to come.
How I Plan to Reach 110 Years of Age

It’s strange. At 61 years old, according to statistics and common knowledge, I’m supposed to be getting to the point where age-related diseases start to get me. Aside from the usual, dreaded ones like cancer and heart disease, there’s also obesity, arthritis, and sarcopenia waiting for me. And I’m supposed to feel tired and out of it.

But I don’t feel old at all. While comparisons are difficult, when I was 18, I was out-of-shape and smoked cigarettes, and I certainly feel better now.

My hair is even getting darker. (I should write a separate post on that.)

So, far from feeling like I’m about to hit old age, I feel like there’s no reason I can’t get another 50 years out of my brain and body.

One often reads about centenarians and how they reached that age. The vast majority I would characterize as lucky: they have the right genes.

Most of them appear to have done little in the way of health interventions. The longest-lived person ever, Jeanne Calment, who died at the age of 122, smoked cigarettes most of her life. That’s not to say that some haven’t inadvertently done some good things for their health; for instance, when you read of someone who eats bacon and eggs every day but avoids donuts, or only eats one meal a day instead of eating around the clock.

Jack LaLanne, fitness buff extraordinaire, reached 96. His brother Norman, who apparently didn’t much take care of his health at all, made it to 97.
But did Jack LaLanne do everything right? While he certainly did many things right, he was fond of juicing, which adds a lot of sugar if it’s fruit juice, he took liver tablets, which are high in iron, and he ate a low-fat diet. Not criticizing him at all, but one must have proper knowledge, and he was mainly flying by the seat of his pants, or so it appears.

Hopefully we have a little better knowledge now. We also have to keep an open mind to new things, and to revise our beliefs if necessary. (Harder to do than it looks.)

So how do I plan to make it to 110? Here’s how.

**Weightlifting**

Muscle loss begins at age 30 (though barely perceptible then) and by the time someone is 80, they’ve typically lost half their muscle. Muscle loss leads to insulin resistance, obesity, and debility.

To live healthily to an old age, it’s essential to build and keep muscle, and to keep fat tissue off.

The average old person is, physically, a mess, with lost of muscle loss and plenty of fat tissue to replace it. Too much fat is detrimental to long life.

**Low-carbohydrate paleo diet and intermittent fasting**

High-carbohydrate diets speed aging through insulin and IGF-1 signaling. Low-carbohydrate diets, and intermittent fasting, slow aging. Fasting results in improved mitochondrial function and number, making it strongly anti-aging.

Paleo diets avoid destructive food elements even more so. Omega-6 fatty acids from vegetable oils, for instance, and sugar.

So I’m planning to maintain a low-carb paleo diet, with intermittent fasting days, the rest of my life.

**Polyphenols**

Polyphenols are plant-derived chemicals found abundantly in coffee, tea, chocolate, red wine, fruits (especially berries) and vegetables.

They are associated with markedly better health and lower death rates. They extend life in lab animals.

I’m covered. I have no intention of ever giving up coffee, tea, and red wine. Or chocolate. I also supplement with resveratrol, green tea extract, and curcumin, all of which are polyphenols.
Iron

Iron accelerates aging, leads to heart disease, cancer, Alzheimer’s, and infections, and lots of other nasty things. I’ve lowered my ferritin to, at last check, 77, and plan to go lower. Keeping iron low is the most underrated factor in health. Read my book, Dumping Iron, to find out the several ways you can keep iron in the low normal range.

Vitamin D, magnesium, fish oil, and zinc

Fortunately, vitamin D is now no longer as obscure as it was just a few years ago. It is a must for avoiding premature death.

Magnesium is the nutrient most people are most likely to be deficient in, and it’s required for good health. It prevents sudden cardiac death, raises T levels, and promotes mental health.

Fish oil, with its high content of omega-3 fatty acids, helps prevent heart disease and keeps your brain in working order.

Zinc is important for immune function, and can reverse thymus atrophy, an important cause of immune decline in older people.

Sense of purpose

Here’s where we come to a more nebulous input. Too many older people, but especially the men, appear to have little sense of purpose, and use their time watching television or with other aimless pursuits. Forget about retirement. Read good books, write, lift weights, start a business, go into politics – anything but the dreaded years of sitting on your backside and watching yourself head towards death.

PS: Check out my Supplements Buying Guide for Men
6 Ways to Eliminate Acne

Acne is a condition in which pores in the skin become clogged, leading to inflammation and infection. It’s a particularly embarrassing condition because the clogged pores are typically on the face, so the person with the condition displays it to everyone. In the light of evolutionary psychology, the display of an illness, especially an infection, makes the person with acne something of a pariah. But you can eliminate acne.

While acne is most often associated with teenagers, it often persists into adulthood. I have some experience with this, and had flare-ups all my adult life, into my fifties, until I figured out how to prevent and eliminate it.

Doctors get it wrong, as usual

As with so many other health problems, it’s my belief that doctors look at this problem wrongly. They see it as something that needs to be treated with drugs and other treatments, rather than as something that can be prevented or that is due to lifestyle factors.

In their overview of acne, the American Academy of Dermatology does not mention a single lifestyle factor as being involved in acne. To them, it just sort of appears, and then you need to see one of their members for expensive treatment.

In contrast, it’s easy to see that diet – and some other lifestyle factors – play a key role in acne.

Traditional cultures with zero acne

Consider that an examination of over 1300 people, including several hundred aged 15 to 25, failed to turn up a single case of acne: “Acne Vulgaris, A Disease of Western Civilization”.(1)

The subjects examined were Kitavans (in the South Pacific) and Aché (Paraguay). The authors believe that genetic factors are not paramount, since members of closely related groups develop acne when living in Westernized societies.

From the study, the authors make the case that hyperinsulinemia due to a Western diet causes acne:

> Although diet is infrequently considered as an etiologic agent in the development of acne, it represents a well-recognized factor in acute and chronic hyperinsulinemia. Recent evidence has demonstrated that the hormonal cascade triggered by diet-induced hyperinsulinemia elicits an endocrine response that simultaneously promotes unregulated tissue growth and enhanced androgen synthesis. Hence, hyperinsulinemic diets may represent a previously
unrecognized environmental factor in the development of acne via their influence on follicular epithelial growth and keratinization and on androgen-mediated sebum secretion.

Another study makes the same case for increased insulin secretion, and focuses on mTOR (or mTORC as they refer to it), the cellular growth machine.(2) (NB: I don’t agree with everything in this article.)

These new insights into Western diet-mediated mTORC1-hyperactivity provide a rational basis for dietary intervention in acne by attenuating mTORC1 signaling by reducing (1) total energy intake, (2) hyperglycemic carbohydrates, (3) insulinotropic dairy proteins and (4) leucine-rich meat and dairy proteins.

So, increased insulin looks like a prime candidate in the causation of acne. The Kitavans, with zero cases of acne, do indeed have much lower fasting insulin (and glucose) levels than age-matched Swedes.(3)

The Kitavans eat no processed foods in their version of a paleo diet; the staples are fish, coconut, and sweet potatoes. Of interest to note that it’s a high-carbohydrate diet, with up to 70% of calories from carbohydrates.(4) However, the diet has a low glycemic index; they eat no grains or flour. This fact lends some support to the idea that carbohydrates per se aren’t the problem in Western diets, but “dense, acellular carbohydrates”, which cause obesity and other health problems.(5)

(By the way, 80% of Kitavans smoke cigarettes, and they have no heart disease.)

With all of that as well as my personal experience in mind, here’s how to eliminate acne.

**How to eliminate acne**

1. **Sugar.** Sugar raises insulin levels, including in the skin. In addition, high blood sugar levels that come from ingesting sugar feed the bacteria, *Propionibacterium acnes*, that infects pores after they’ve been blocked. High amounts of sugar reliably cause acne. Sugar should be entirely eliminated. Consider cutting way back on refined carbohydrates too.

2. **Caffeine.** The caffeine in coffee and tea stimulates production of oil in the skin, leading to blocked pores and acne. Caffeine is probably not as strong a cause of acne as is sugar, but if someone ingests large amounts of it and has acne, cutting back is advised. Note that many people put milk and sugar in their coffee and tea also, which will exacerbate its acne-producing effect. Also note that chocolate has caffeine and other related stimulants like theobromine, and is usually loaded with sugar. Chocolate has long been fingered as a cause of acne, and stimulants and sugar may be why.
3. **Milk.** There’s something about milk that doesn’t seem to apply to other dairy products in the causation of acne. Milk can cause it whereas cheese, yogurt, butter, and so on do not, or at least don’t seem to. Eliminate milk. Note that many people start the day with a bowl of sweetened cereal doused in milk, a perfect recipe for a spike in blood glucose and insulin and an acne breakout.

4. **Soap.** The dermatologists recommend washing the face several times a day to eliminate oils and kill acne-causing bacteria. The problem is that bacteria don’t live in a vacuum, but coexist with other bacteria in ecological balance. By using soap, the balance is upset, which may aggravate acne. I quit using soap on my face years ago at the suggestion of the late Seth Roberts (who often wrote about his problems with acne). It worked very well for me. I don’t know what the effect might be on someone with extremely oily skin, however, but I think it’s worth a shot.

5. **Iron.** This is a bit speculative, but the bacteria that cause acne need iron to grow and reproduce, as do all bacteria. Iron chelators greatly (4- to >20-fold) potentiate the effectiveness of topical anti-acne drugs like benzoyl peroxide. Keeping iron out of the skin may decrease acne, and the way to do this is to keep overall iron levels naturally low. Alternatively, an iron chelator like IP6 or green tea extract could be added to benzoyl peroxide, a common OTC topical acne med. An emulsion of green tea extract also reduces sebum production in facial skin. Oral supplementation of green tea extract also reduces acne. Incidentally, the bacterium *P. acnes* has been found growing in arteries, and this is also likely related to excess iron. Interestingly, another commonly used topical acne medication is salicylate, usually put into medicated soaps. Salicylate is a strong iron chelator. It may be effective by depriving bacteria on the face of iron.

6. **Sunshine.** Getting out in the sun can clear acne, probably due to the bactericidal effect of solar radiation. As with sun exposure in general, 10 or 15 minutes exposure may be enough. Longer exposure risks burning, which should be avoided.

The dermatologists don’t recognize lifestyle factors as being important in acne, one reason being that it cuts into their very high income. And the most effective topical anti-acne treatment, benzoyl peroxide, is dirt cheap and over-the-counter. Accutane, a prescription anti-acne drug, has a raft of terrible side effects, including psychiatric effects – suicidal depression being one.

As we’ve seen, a number of lifestyle factors, including diet, soap, and sunshine are intimately involved in the genesis of acne. As in so many other diseases of Western civilization, looking to correct these factors may be a more effective, cheaper, and healthier alternative.

**PS:** [Check out my books.](#)

**PS:** [Check out our Supplements Buying Guide for Men.](#)
I get asked lots of questions in the comments section and elsewhere, and both questions and answers often go unnoticed by readers. So I’m going to boost them up here, as lots of them are interesting and probably reflect similar questions that many readers have. I’ll also include some interesting comments that aren’t necessarily questions

**Does casein interfere with autophagy?**

Q. One of the things that has recently been swirling in my head is the speed with which different proteins are absorbed by our digestive system. Let’s take Whey and Casein as an example – as far as I have read Whey is absorbed within 2 hours (1.5 hours is the usual time given by people) and Casein within up to 7. This to me seems quite important. If one fasts for 16 hours per day (last meal 8 pm / first meal noon next day), it seems to me, that eating dairy protein (usually 80% casein) is a bad idea for increasing autophagy as it seems to cut the time without protein and keep you in the fed state longer. Since I do like hard cheese and many other dairy products (they are a staple here), I have moved them mainly to my lunch/breakfast meal. Any thoughts on that?

A. I agree with you. Some studies have shown that taking casein at night before bed leads to greater muscle growth when training. The reason it does this is because casein stays in the system virtually throughout the night, preventing muscle protein breakdown. It will also prevent autophagy, so I won’t be doing that. As far as amounts and timing, that could make for different results; for instance, having a piece of cheese with or after dinner may not have much of an effect – or it might, I don’t think we know.
Methylene blue against Alzheimer’s – is its mechanism antifungal?

Q. It’s odd how you’re writing about fungus and I just read today about how people are using methylene-blue for life extension and to treat Alzheimers. Also helps mitochondrial dysfunction or so some say. And dirt cheap at the small rates it’s taken.

A. He may be on to something. References:

Methylene blue and Alzheimer’s disease

Antifungal action of methylene blue

Does fungal infection cause Alzheimer’s?

Arimidex

Q. I’ve read that you take Arimidex twice a week. Why don’t you take it daily? What’s possible downsides of taking it everyday? Thanks.

A. Possible downside is too low estradiol. Estradiol and other estrogens are important even in men, so you don’t want to drive them to zero. Aside from that, 0.5 mg anastrozole (Arimidex) two to three times a week is the normal dose to raise testosterone and lower estradiol.

Did blood donation make her skin healthier and more attractive?

Q. Attesting from the field, I’m a 56 yr old female that started menopause 3 years ago. Coincidentally began noticing huge increase in skin aging (wrinkles, elasticity, etc.) and big decrease in eyesight. I’m physically athletic, have excellent diet, regular CR, coffee & herbal tea drinker, aspirin user, consistent 115 lbs, occasional red meat eater, never need doctor for anything person. Had become obsessed with anti-aging research in last couple years after noticing this huge skin aging dilemma, yet out of reading 100s of articles never read anything about the detrimental effects of iron! That is until recently a girlfriend told me she had hemochromatosis (with prescribed weekly phlebotomy), and I found your incredible iron articles. {Thanks! – PDM}

I haven’t had my ferritin level checked yet, but it all seemed to make sense especially having lived in Florida for 15 yrs with lots of sun exposure. First thing I did was schedule a blood donation. Encountered first problem too in that I did not pass the hemoglobin test level of 12.5 at the donation site. Sorry I was only 12.1. Crap! So I immediately made another appt. two weeks later. The 2nd time donating the admission nurse told told me to slap my hands together and rub hard with my fingers pointing up in praying position right before the finger prick for the hemoglobin test. Sure enough, tested 13.1 this 2nd time so I could continue with the donation.

Now here’s the amazing part (maybe psychosomatic, I don’t care) a few days after donating I noticed huge improvement in my skin and my eyesight! Will definitely become regular donor in future for all the other major health
benefits as well.

Can’t thank you enough Mr. Mangan for all your research and well-written articles. Looking forward to buying the print version of Dumping Iron. This whole iron issue may finally become mainstream knowledge thanks in part to your efforts.

A. Thanks. I have hopes that iron will indeed become a mainstream issue with my book. As for skin health and appearance, I don’t doubt that blood donation, which lowers ferritin levels quite a bit – 30 to 50 points per donation – could result in an almost immediate improvement in the skin. This commenter is actually not the first person who’s told me this. Wrinkles are another matter; most of the science points to wrinkles being permanent, but that could be wrong. Blood donors anecdotally look much healthier than others, which may be due in part to effects on the skin.

Check out our Supplements Buying Guide for Men.

Catching Up with Rogue Health

Dumping Iron, the book

I've been busy working on my project, my forthcoming book, Dumping Iron: How You Can Ditch This Secret Killer and Reclaim Your Health, which I’m very excited about. Endorsements from top iron experts have rolled in (read at the link), and, to put it in a nutshell, they love it. I’m currently having the cover designed, and all should be ready soon.
Muscle Up in the gym

The photo above came from a reader who runs a gym. He contacted me for bulk copies of Muscle Up, which he wants to give to new members as a signing bonus. He told me that the book completely validates his way of training. Winning!

Michael Sebastian, who writes at his site Honor and Daring, recently wrote a nice review of Muscle Up. Michael liked it and started lifting (or restarted), and found that he got way better results in terms of body composition than he did with aerobic exercise.

Timo Fischer wrote a great review of Muscle Up a couple months back.

As usual, I’ve come across lots of interesting ideas and papers. I’ve been wanting to install a microblog on this site for the purpose of posting interesting papers that I find, but haven’t managed to get around to it. For now, below are a few interesting ideas that may be useful in improving health.

Aspirin prevents death from prostate cancer

Aspirin Found to Prevent Death from Prostate Cancer, but Not to Protect from Prostate Cancer.(1) Aspirin use, after diagnosis of prostate cancer, decreased death due to cancer by almost 40%. Astounding, if you ask me.

While the researchers found no protective benefit in the prevention of prostate cancer, others have, especially in the large study conducted by Dr. Peter Rothwell.(2)

The effect of aspirin in preventing prostate cancer death is likely due to its ability to prevent metastasis.(3)

Depending on one’s point of view, the comments from the lead researcher who found the effect of aspirin on prostate cancer death are either humorous or tragic:

> It is premature to recommend aspirin for prevention of lethal prostate cancer, but men with prostate cancer who may already benefit from aspirin’s cardiovascular effects could have one more reason to consider regular aspirin use.

> These studies are certainly thought-provoking, but are best followed by formal clinical trials where we compare use of aspirin to either no treatment or perhaps a placebo.

So instead of widely publicizing these astounding findings, they call for further study and say it’s “premature” to recommend a cheap, OTC, and relatively safe drug to prevent death from cancer. I know that if I had prostate cancer, I’d get on aspirin immediately, regardless of what these
worthies say.

So, this is how it works at the highest levels of science and medicine: doctors discover that a cheap OTC treatment dramatically reduces death rates, and they decide not to recommend it.

They’re going to sit on their knowledge rather than give it the widest possible publicity, because... well, because it needs further study. Because they’re too frightened to make a move. Because the head of some medical group might rebuke them... and on and on.

This episode shows why you need to know more than your doctor about your condition. One of a doctor’s main functions is as a gatekeeper, and you can’t do it yourself. But intelligent people can take over some of a doctor’s diagnostic capability. In fact, if you don’t, you’re leaving yourself at their mercy.

Suppose you got diagnosed with prostate cancer today. You’ve read this article, and you mention to your doctor that aspirin lowers death rates from that disease by 40%. And he says not to take it, it needs further study. What are you going to do?

Aspirin prevents death from Staph infection

Staph infections are a huge source of illness and death, especially if they get into the bloodstream — sepsis.

Aspirin users who had a bloodstream infection with *Staphylococcus aureus* had an approximately 40% reduced death rate, 12% of users died vs 27% of non-users.\(^4\)

Dialysis patients using aspirin had a 54% reduced rate of even getting a Staph (MRSA) infection, and a reduced risk of it spreading if they did become infected.\(^5\)

It could be that the aspirin users had lower iron levels, which are necessary for the growth and reproduction of this microbe. Or, alternatively, some other mechanism. Whatever the case, Staph doesn’t like aspirin users. Once again this cheap OTC drug is shown to have massive benefits. If you add the risk reduction from infections to that of cancer, aspirin’s risk/benefit ratio becomes even better.

Ketogenic diet as anti-aging diet

I’ve previously written that a low-carbohydrate diet is an anti-aging diet. A paper that was drawn to my attention shows that in children, an anti-epileptic ketogenic diet lowers IGF-1 and slows the rate of growth.\(^6\) As IGF-1 is implicated in aging, this provides further evidence that a low-carbohydrate diet slows aging.

This effect also illustrates the growth-longevity trade-off. Less growth = less aging.
So, does a ketogenic diet result in less muscle growth because of lower IGF-1? No, because muscle growth does not depend on systemic IGF-1.

**Curcumin as anti-fungal**

Curcumin as a promising antifungal of clinical interest.(7) Curcumin was more potent than a standard anti-fungal drug against several species of fungi.

Between its iron-chelating effect and its anti-fungal effect, curcumin might be of benefit in Alzheimer’s.

Check out our Supplements Buying Guide for Men.

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**How to stay healthy at the office**

Many of us work long hours in an office, and considering how different and distant this is from the ancestral environment to which we are adapted, this could have deleterious health consequences. So here are a couple ways to stay healthy at the office.

Probably the most important consequence of being in an office is that office workers normally sit at desks all day, and this is also the main cause of adverse health.

Sedentary behavior is associated with a large increase in mortality risk, the people in the highest quartile of sedentary time having a six-fold greater risk.

It’s important to note here that sitting or rest of any kind causes bad things to happen in a relatively short time. Even if you’re not generally sedentary, sitting all day in an office is not good. Prolonged bed rest is even worse, and causes a massive loss of muscle, one of the worst things for your health.

**Insulin resistance and lipase**

Lipoprotein lipase is an enzyme that’s responsible for triglyceride uptake and HDL synthesis, and prolonged sitting leads to suppression of its synthesis.(1)

More importantly, but related to lipase, is that insulin resistance increases with sitting. One day of sitting reduces the action of insulin by around 40% in healthy men and women.(2)

A surprisingly small amount of activity can counteract the increase in insulin sensitivity that sitting causes.
A study was done using overweight or obese adults to see what the effects were of breaking up prolonged sitting. This was a crossover trial, so all the participants completed each condition, which were as follows:

1. Uninterrupted sitting for 7.5 hours
2. Seated with 2-minute bouts of light walking every 20 minutes
3. Seated with 2-minute bouts of moderate walking every 20 minutes

After an initial 2-hour period of sitting, participants drank a standardized test drink containing 75 grams of glucose and 50 grams of fat, and their insulin and glucose levels were measured.

The results for glucose:

The results for insulin (not shown) were similar. Both light and moderate walking, for 2 minutes out of every 20, substantially improved insulin sensitivity over uninterrupted prolonged sitting.

The lesson here is clear: don’t sit all the time. Doing so could be hazardous to your health.

Noteworthy is that a surprisingly small amount of activity counteracted the effects of sitting. Light walking – light as judged by the participants – was nearly as effective as moderate walking.

So, sitting should be broken up by activity as much as possible. Even a walk down the hall and back (maybe to chat with the administrative assistant) can be beneficial.

The other option is a standing desk. If you can’t get one at work, you could use one at home.

Personally, I like to stand as much as possible, no matter what I’m doing. A standing cocktail hour is a great idea.

**Sunlight vs fluorescent lights**

Another hazard of office work is being indoors under artificial lighting all day. Fluorescent lighting is the worst in that regard, as its spectrum of light doesn’t match light from the sun. Circadian rhythms can be thrown out of whack.

One simple way to ensure that circadian rhythms are entrained properly even when working at the office is to get sunlight on the way to work, when driving for instance. According to Dr. Daniel Kripke, a psychiatrist who specializes in sleep and light, *just driving to work without sunglasses could be enough to offset being indoors all day.*

If you work late at the office or another place with fluorescent lighting, consider using **blue-blocking glasses**, as this will block blue wavelengths of light and promote better sleep.
Normal lab values are for fat, sick people

Lab tests men need but don’t get

When you visit the doctor, whether for a checkup or an illness, he or she will often order a number of lab tests. Panels are common tests that consist of bundles of separate tests, the complete blood count (CBC) and chemistry panels being the most familiar and commonly ordered. A urinalysis is also very common. Virtually everyone who has any sort of complaint that is not easily figured out will get all of these. However, there are other lab tests men need but don’t get, and these must be requested. Even more important, normal lab values are for fat, sick people.

The CBC can determine whether the patient has an infection, whether he’s anemic or has too many red blood cells – this happens and sometimes occurs with testosterone replacement therapy. It can tell whether the patient has leukemia, iron deficiency (but not iron overload), whether any bleeding might be due to low platelet count, and even if anemia is present, what might be causing it, for instance iron vs a B12 deficiency.

The chemistry panel provides information on electrolyte balance; for example, a patient with vomiting and diarrhea could have dangerous imbalances of sodium and potassium in the blood stream. It can tell whether the patient has liver problems, for instance cirrhosis or hepatitis or fatty liver. Muscle and bone disorders also often show up in a chemistry panel, as does protein malnutrition, infection, and many other things.

However, lots of other lab tests exist that can be important, yet the doctor won’t order them. The reason are at least two: most doctors are oriented
toward acute care medicine and won’t order tests that don’t seem to be essential to a diagnosis. Insurance companies are the same, and may not pay for tests outside a certain diagnoses. To use an extreme example, if you go to the doctor complaining about a fungus-infected toenail, he and the insurance company may be uninterested in your complete blood count.

The doctor also may not order certain tests because he either doesn’t know about them or doesn’t care. Back when I was seeking treatment for chronic fatigue, my doctor ordered a test for glutathione, the result of which proved to be a breakthrough. My bet is that most doctors have never heard of it, or if they have, it was in medical school and they’ve forgotten. Glutathione just doesn’t figure much into the clinical practice of medicine.

As for not caring, a ferritin (iron) level might be a good example. If you don’t have any signs or symptoms that might lead a doctor to suspect either iron deficiency anemia or hemochromatosis, he’s probably not going to care a whole lot about it. On this blog, however, we know better that ferritin can be critical for health, even when it’s within the so-called normal range. (By the way, the doctor of a friend of mine recently assured her that there was no health benefit to blood donation. That’s how they roll.)

So, let’s say you go to see your doctor, either for something minor or for a checkup, what other tests can be useful? Most doctors will probably at least order a test if requested, though even then they resent a patient who looks like he knows more than the doctor.

Laboratory normal ranges come from fat, unhealthy people

Many people have asked me about laboratory normal ranges, which are stated values that the lab has found are indicative of normal, good health. For example, a ferritin test may have a normal range of from 20 to 300 ng/ml for a man, 20 to 150 for a woman.

Each lab calculates normal ranges based on the population it serves and its particular test methodology and instrumentation. Different instruments and populations give somewhat different results; for instance, normal ranges for a hemoglobin level in Denver may be higher than for elsewhere, since Denver is at high altitude, and a higher hemoglobin level is an adaptation to altitude.

Normal ranges are calculated such that 95% of apparently healthy people have values that fall within the normal range.

The catch here is “healthy”. We all know how healthy most people are: they’re overweight, eat processed crap, and don’t exercise. If you want to be like them, then by all means let the normal lab values be your guide.

If you care about your health, you must take the normal ranges with a large grain of salt.

The normal range for a blood glucose level is from 70 to 99. But you’re not normal if your blood glucose is consistently at the higher end of that range; if it is, you might have metabolic problems that are a prelude to diabetes.
“Normal” glucose tolerance test values are associated with increased risk of heart disease.

An oral 2-hour blood glucose test determines the value of glucose 2 hours after drinking a glucose-loaded solution. Normal range is <140 mg/dl (7.8 mmol/L). Yet the Whitehall Study found that any glucose value above 83 (4.6 mmol) was associated with greater risk of coronary heart disease. Take a look at the chart below. The highest level had 10 times the risk (log hazard ratio >1) of the lowest values.(1)

If you had an oral glucose tolerance test like the above, your doctor very likely won’t care unless your result is very high. I can guarantee that most doctors have never heard of the Whitehall Study and know next to nothing about the relationship between “normal” glucose tolerance test values and risk of heart disease.

The normal range for GGT, a liver enzyme, is 8 to 65 U/L. Yet men with a GGT > 38 showed almost double the risk of heart failure.(2)

What’s even worse is that most doctors will not even take a second glance at a lab value that is within the normal range and not flagged by the lab as abnormal.

That means that if you’re not satisfied with the average health of the average person, you must take charge. Unless you know something about glucose, GGT, and other tests, and they fall within the normal range, your doctor will in most cases do absolutely nothing.

Ferritin levels are another example. If you’re a man and your ferritin level is 250, your doctor may not even glance at it, since it’s not flagged as abnormal, and he or she will do nothing. Yet a ferritin of 250 is far too high for optimal health.

Be aware of lab normal ranges (values).

Valuable lab tests that you can request

Here are some suggested lab tests that do not routinely get ordered but for various reasons might be worth your while to request.

Testosterone

This one is obvious. The doctor will only order this on his own if he thinks you have symptoms that can’t be explained any other way than low (or conceivably, high) testosterone.

But those of us who take care of our health and fitness want optimal levels of testosterone, not just something within the very wide normal range.

In my opinion, every man ought to have a handle on what his T level is, whether he has symptoms or not. That might necessitate having a testosterone
test every few years. To get one, you’ll probably have to ask for it.

**Estradiol**

Estradiol is the main and most potent estrogen in men. This test probably isn’t necessary if you are without symptoms of T deficiency, but if you do have symptoms, this is important. I have mine tested as part of my treatment with an aromatase inhibitor, and if you want or need a scrip for one, you’ll be getting this test.

**Ferritin**

We’ve discussed ferritin a lot around here lately. In my opinion, everyone should know what his ferritin level is. The laboratory normal range is from 20 to 300. A better suggested range for those interested in life extension might be 40 to 80. Within that range, one is unlikely to have problems from too little or too much iron.

**Vitamin D**

The only way to tell if you’re vitamin D levels are adequate is through a blood test. Fortunately, more doctors have become aware of vitamin D and are ordering this test more often.

**Glutathione**

This test won’t be necessary for routine use for people in decent health. But if you suffer from unexplained illness or fatigue that doesn’t show up on any other lab tests, this may be of value, and most doctors won’t order it. Most labs don’t perform it either, so you’ll need to go out of your way to get one. Abnormal values are indicative of oxidative stress.

**Conclusion**

Laboratory normal values are designed for fat, sick people, in short, the average person in this country. If you’re the kind of person who takes charge of his health and wants to live a long time, you must be aware of lab normal ranges; do not think that you are necessarily healthy just because the lab hasn’t flagged your result as abnormal.

Other tests can be valuable, tests that your doctor probably won’t order unless you ask.
Coffee Is Associated With Lower Death Rates

Coffee is associated with lower death rates

A new analysis of three different studies totaling almost 300,000 people looked at the association between coffee consumption and mortality.\(^1\) The researchers had data from 4,690,072 person-years, which can probably be characterized as “more than adequate”. The researchers found that coffee is associated with lower death rates.

Mortality rate by consumption for never-smokers was:

- 0.94 for \(\leq 1\) cup a day
- 0.92 for 1.1 to 3 cups a day
- 0.85 for 3.1 to 5 cups a day
- 0.88 for > 5 cups a day

Significant inverse associations were found between coffee drinking and

- cardiovascular disease
- neurological diseases
- suicide

This is not by any means the first study that has found such a relationship. For example, another one that looked at around 400,000 people found very similar hazard ratios and effect on diseases, but additionally reported effects on mortality due to respiratory diseases, infections, stroke, injuries and accidents, and diabetes; again, cancer deaths were not affected.\(^2\)

What’s the mechanism of coffee’s effect on death? There are likely to be
several.

**Coffee causes hormesis**

Coffee promotes autophagy. A higher level of autophagy, the cellular self-cleaning process that rids cells of junk proteins and structures, as well as infectious agents, is characteristic of youth and health. Therefore, coffee’s effects are similar in this regard to intermittent fasting or exercise.

Altogether, these results indicate that coffee triggers 2 phenomena that are also induced by nutrient depletion, namely a reduction of protein acetylation coupled to an increase in autophagy. We speculate that polyphenols contained in coffee promote health by stimulating autophagy.

Coffee promotes insulin sensitivity.\(^{(4)}\)

...caffeinated coffee was positively related to insulin sensitivity and decaffeinated coffee was favourably related to measures of beta cell function. These results provide pathophysiological insight as to how coffee could impact the risk of type 2 diabetes mellitus.

Coffee lowers inflammatory markers.\(^{(5)}\)

Coffee is an antidepressant.\(^{(6)}\) Hazard ratio for depression in those consuming 4 or more cups daily was 0.80 compared to those consuming

Coffee prevents dementia and Alzheimer’s.\(^{(7)}\) Drinking 3 to 5 cups a day was associated with a 65% decreased risk of dementia/Alzheimer’s in late life.

Lots of other studies could be cited, but you get the idea.

At least two possible components of coffee could explain these results: caffeine, and phytochemicals, the latter mainly polyphenols.

In many of these studies it was found that tea had little to no effect, and in my view caffeine may explain the difference. Coffee just has a lot more caffeine than tea, over twice as much typically, and many of these associations with coffee were seen at high doses.

As for the polyphenols, some of the associations were also seen with decaffeinated coffee. For instance, the study on coffee and autophagy found that decaffeinated coffee stimulated autophagy equally as well as caffeinated.

Coffee (and tea) polyphenols stimulate the Nrf2 transcription factor, which mobilizes the body’s antioxidant stress-defense mechanisms.\(^{(8)}\) As such, coffee is an agent of hormesis, the process through which low doses of a toxic chemical produce healthful effects, and the process which is
fundamental to health and long life.

Coffee and tea inhibit the absorption of iron.(9)

So drink up. There appears to be little downside to coffee drinking. It doesn’t even increase the risk of something you might expect it to, atrial fibrillation.(10)

PS: See my book Stop the Clock for more on how coffee, tea, and red wine promote longer life.

PS: Check out my Supplements Buying Guide for Men.

Finding the anti-aging sweet spot

Aging might be said, to paraphrase von Clausewitz, to be a mere continuation of growth by other means.

The growth-longevity trade-off

The process of aging still holds many mysteries, but we can say with some certainty that there is a trade-off between growth and longevity. The more growth that occurs, the faster and greater the aging. Within species, bigger animals age faster and die younger, and this holds true in humans. This is probably why men age faster and die younger than women: men are bigger, and as such have experienced more and faster growth. Shorter men live longer.

Professional (American) football players, who are known for their huge size,
die at the average age of 55. Or it might even be 51. (There’s lots of talk about head injuries, which football players undoubtedly suffer from, but the idea that that kills them in their 50s strikes me as implausible. Muhammad Ali is still alive, and I’d bet he’s taken a lot more and more powerful shots to the head than almost any football player. N=1 of course.)

The average age of death of a sumo wrestler is around 63, about 15 years younger than the average Japanese man.

Whatever the mechanism of action or even whatever the ultimate truth is about the relationship between growth and longevity, plenty of evidence for it exists.

**Growth hormone and aging**

It seems that one of the reasons for the relationship lies with the growth hormone IGF-1. This hormone causes increased growth, but at later ages, increases the rates of cancer. IGF-1 activates mTOR (Nature Cell Biology), which in turn is implicated in “cancer, atherosclerosis, hypertension, heart hypertrophy, osteoporosis, type II diabetes, obesity, Alzheimer’s and Parkinson’s diseases, age-related macular degeneration, osteoarthritis and other diseases.” (Cell Cycle.)

Higher levels of IGF-1 make for a robust human being, able to survive the threats of infectious disease and wounds. But most of us are no longer in an environment where these threats are paramount. Those football players would likely be able to survive a battle or a plague better than others, but the consequence is that they age faster. In fact, one of the reasons humans are living longer is probably because the threats of infection and wounds are low, and slow-growing people with less robust constitutions who may not have been able to survive those threats now live longer, and age slower. (Aging.) In essence, there are more slow-aging people around because we’ve reduced the threats of infections and wounds.

**Wasting away**

On the other hand, with age comes a lack of vigor, susceptibility to infection, atrophy of muscles, bones, and brain, all around general deterioration of the body and of quality of life. Much of this can be traced to an increasing inability to repair and regenerate tissues.

Sarcopenia, or muscle wasting, is a very common affliction in the old, and can be devastating. Osteoporosis, the wasting of bone, is another common affliction.

As it happens, IGF-1, the same growth hormone that appears to increase aging, may also treat the diseases of atrophy seen in old age. Circulating levels of IGF-1 directly regulate bone density (Journal of Clinical Investigation), and therefore higher levels of this hormone may help prevent osteoporosis. Sarcopenia may be ameliorated with higher levels of IGF-1. (Mechanisms of Ageing and Development.)

Levels of IGF-1 are inversely correlated with measures of cognitive decline;
the more IGF-1, the better the mental function in people aged 65 to 86. (*Neuropsychobiology.*)

So, I’d say we need balance. **Intermittent fasting** can lower levels of IGF-1, and hence slow the aging process and improve health biomarkers. But, if fasting isn’t done carefully, and followed by periods of adequate protein nutrition and exercise, preferably resistance training, it could potentially lead to muscle and bone loss and frailty.

Successful implementation of anti-aging must be carefully done. A useful analogy might be with exercise; too little leads to poor health, and too much — such as extensive distance running — can lead to damage.

The program I outlined in *my anti-aging book* seeks to balance the increase in autophagy brought on by fasting with a renewal of lean tissue through diet and exercise.

We want to slow or reverse the aging process so we can live longer lives in robust health, not so we can spend more years in a nursing home.

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Too clean for our own good?
The advent of the paleolithic diet makes one realize that there are many other ways that modern lifestyle differs from that of our long-ago ancestors besides food. They had no bright lights interfering with sleep, they probably ate at irregular times and fasting was likely a regular occurrence, they were more often exposed to cold, heat, and sun, they had primitive or no footwear, and so on. One other thing they didn’t have was a high standard of cleanliness. They had no soap, no antibiotics, and no concept of the germ theory of disease.

In our day, it’s been suspected that living in an ultra-clean environment with little exposure to bacteria and parasites may be the cause of some illnesses, especially allergic and autoimmune illnesses. The idea is that exposure of the immune system to microbial agents is necessary for the proper regulation of immunity. This is known as the hygiene hypothesis.

It seems that the hygiene hypothesis may be able to explain some other diseases of civilization, such as Alzheimer’s. Immune function is known to be involved in the pathogenesis of this disease, so it stands to reason that hygiene could be involved also. A recent epidemiological study, Hygiene and the world distribution of Alzheimer’s disease, found a strong positive correlation between level of hygiene in a country and its rate of Alzheimer’s. The researchers used a number of variables as proxies for level of hygiene, such as parasite prevalence, historical disease prevalence, and level of urbanization. Here’s one striking graph of parasite prevalence vs Alzheimer’s rates.

This is an association of course, cause and effect have not been proven.

This is but one example of how our modern way of life could be contributing to poor health. A recent paper by Gordon Gallup and co-authors, Evolutionary Medicine: The Impact of Evolutionary Theory on Research, Prevention, and Practice (PDF), discussed a number of ways that modern lifestyle could result in poorer health:
We review recent evidence for a growing number of discrepancies between our contemporary existence and evolutionary history which have the potential to impair and undermine features of human mental and physical health. Included in this review are health issues related to bottle feeding, caesarian section, infection, cleanliness, fever, exercise, diet, mate choice, contraception, semen sampling, and body odor suppression.

Note that infection and cleanliness are two of these “discrepancies between our contemporary existence and evolutionary history”. Regarding infection, they write:

The skin is an important line of defense against infection. The easiest entry sites for infection are at the superficial level; cuts, scrapes, and scratches, typical innocuous injuries which create a pathway for microbes to enter the body. It is not surprising therefore that one of the most vital components of the human immune system is embedded immediately beneath the skin. In the ancestral environment, humans were subjected to a wide variety of circumstances in which cuts and scrapes were common. It can be argued that exposure to viruses and various other microbes through these entry points tended to promote immune system function. Many of us are now removed from conditions where cuts and abrasions are a part of the norm, thus making ourselves more vulnerable to infections that may otherwise be tolerated. Furthermore, it is common practice to apply an antibiotic ointment immediately after such an injury, thus limiting exposure and perhaps doing ourselves a disservice, particularly during development.

So, we don’t cut or scrape ourselves much these days, and that could – and probably does – result in worse immune function.

What can we do about all this? I’m not sure – unless you want to deliberately inflict cuts and scrapes on yourself – not a recommended practice – or expose yourself deliberately to sick people. It would seem to follow that outdoor
activities involving exposure to dirty conditions, as well as the occasional cut or scrape, may be healthy for reasons not involving exercise.

Just FYI, there’s a probiotic called Prescript-Assist that contains 29 different strains of bacteria, most of which come from dirt. (I have no association with the product.)

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**Supplements Buying Guide for Men**

My supplements buying guide for men is based on my book, *Best Supplements for Men*. I either use all these products myself or vouch for their efficacy and safety. Please keep in mind that there’s a lot of overlap between the following categories. Click on link or on product photo to buy. **Note, if you use an ad blocker, this page works better if you turn it off temporarily.**

### Muscle Growth

**Whey protein and BCAAs:** Undenatured and cold-processed whey is best, since it contains bioactive peptides that have important health benefits, beside the superb amino acid profile that makes whey the best protein for anabolism and glutathione support. NutraBio Whey Concentrate (or Isolate, with a higher protein content) is the brand I recommend. Take 20 grams immediately before or after a workout. Can also substitute for a meal.

**Creatine:** Creatine helps build strength and increases muscle hypertrophy, and extends life in lab animals. Purity is important with creatine, since it’s taken in gram amounts. NutraBio is a highly pure product. Suggested dose: 2 grams daily, or 5 grams two to three times a week.

**MYO-X:** MYO-X contains follistatin, a myostatin inhibitor made from egg yolk. Myostatin is a negative regulator of muscle growth: less myostatin, more muscle. Not only that, but less myostatin leads to longer life. I haven’t tried this product myself, but studies using recreationally trained weightlifters show that it works to increase lean mass substantially.

### Testosterone/Potency Boosters

**Magnesium:**

- is required for over 300 enzymatic reactions, including in energy production
- relieves depression and fatigue
- prevent sudden cardiac death.

Gut absorption is important; magnesium oxide (common drugstore magnesium) has virtually zero absorption. **NOW Magnesium Citrate** is virtually 100% absorbed. Suggested dose: 200 to 400 mg (one to two tablets) daily.

**L. reuteri Probiotic:** In mice, the probiotic bacteria *Lactobacillus reuteri* raised testosterone levels dramatically, from 4 to 8 times higher, and yielded much more luxuriant and shiny fur. *L. reuteri* increases oxytocin and immunity, and promotes wound healing, mental health, metabolism, and muscle maintenance.

Nature’s Way *Lactobacillus reuteri probiotic.* Suggested dose: one capsule daily.

**L-citrulline:** I use Bulk Supplements L-citrulline. This amino acid improves erectile function nearly as much as more well-known drugs such as Viagra, and increases energy metabolism and time to fatigue in exercise. I take up to 1.5 grams (2 capsules) before my workouts and it extends my time to fatigue, and has given me greater vascularity. Suggested dose: 750 to 1500 mg daily, and/or before a workout.

**DIM.** Diindolylmethane is a natural aromatase inhibitor that
- blocks estrogen and boosts testosterone
- has anti-cancer activity.

Suggested dose: one capsule daily.

**Zinc:** **NOW Zinc Gluconate**
- boosts testosterone levels
- promotes immune function and decreases incidence of infection in the elderly
- antidepressant.
- restores the thymus gland in aging mice, and a shrinking thymus is a major cause of lowered immunity in older people, leading to recurrent, even life-threatening infections.

Suggested dose: 15 mg daily. Alternatively, 50 mg once or twice a week.

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**Ketones**

**MCT Oil.** Boosts ketones, curbs appetite, improves brain function. Increasing ketones in lab animals extends their lifespan.
Viva Naturals MCT Oil.

**Ketone Supplement**: Works like MCT oil, but this is the direct stuff, pure ketones.

**KetoCaNa Ketone Supplement**.

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**Omega-3, Vitamins D and K**

**Vitamin D**: Has many important health functions, including for athletes and for men’s sexual health. An oil-based form is best for absorption; some dry forms don’t raise serum vitamin D levels much or at all.

**NOW Vitamin D** is olive-oil-based – be sure you don’t buy a brand that uses soy or other garbage oils. Suggested dose for a 75 kg man: one 5,000 IU capsule daily, unless you get regular sun exposure. Less often for someone who weighs less.

**Vitamin K**: Vitamin K ensures that calcium goes to bone, not arteries, and is an absolute must for preventing coronary artery calcification. It prevents cancer and heart disease. Adequate amounts of vitamin K are difficult to get from dietary sources; the most abundant source is full-fat, pastured dairy, which most people don’t eat much of. The MK7 form of vitamin K2 is much better absorbed than MK4, so I recommend that form.

**Doctor’s Best Vitamin K2, MK7 form**. Suggested dose, one capsule several times a week, up to once daily.

**Omega-3 fatty acids**: Reduce inflammation and have many beneficial effects on the brain, including increases in cognition and elevated mood, and might even raise IQ. Capsules are more subject to oxidation during storage, so use a liquid form.

**Carlson Cod Liver Oil** is a premium brand. Store refrigerated. Suggested dose: one teaspoon, which supplies 1 gram omega-3, daily or every other day.

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**Probiotic**

**Prescript-Assist** is the best probiotic bar none, containing 29 different species of bacteria originally obtained from the soil. **Prescript-Assist** more closely matches intestinal flora than other probiotics that contain only a couple of different species. Prescript-Assist is a must if you need to take a
course of oral antibiotics, as it could save you from much intestinal distress, not to mention a *C. difficile* infection. Can also be useful in other cases of intestinal inflammation as well as chronic fatigue. Suggested dose: 1 to 3 capsules daily.

**Life Extension**

**IP6 (inositol hexaphosphate):** Also known as phytic acid or phytate, this cheap natural supplement *chelates iron, prevents cancer and neurodegenerative disease like Parkinson’s and Alzheimer’s.*

The gold standard is **IP6 Gold**, Dr. Shamsuddin’s formula. One reader used it to lower his ferritin from over 400 to around 100 in a year and a half. Suggested dose: 500 mg to 1 gram daily on an empty stomach. Does not interfere with fasting.

**Resveratrol:** **Promotes mitochondrial biogenesis and autophagy, extends lifespan in lab animals, and inhibits aromatase, raising testosterone levels in lab animals.** Bulk resveratrol is the least expensive.

**NutraBio trans-Resveratrol Powder.** This is a 100-gram supply, which if taken at 100 mg a day, ought to last about three years, so it’s worth the cost. Suggested dose: 100 mg daily.

**Curcumin:** **Hormetic supplement that activates antioxidant defenses and autophagy, chelates iron, decreases inflammation and cancer risk.** Don’t get ripped off by companies selling turmeric.

**Doctor’s Best Curcumin** is 95% curcuminoids and contains piperine for maximum bioavailability. Suggested dose: 600 mg, one to three times daily, with a meal.

**Theracurmin:** One of the drawbacks of curcumin is a low rate of absorption. **Theracurmin** was developed to overcome this limitation, and is absorbed 27 times better than curcumin.

**Lithium:** **Extends lifespan in lab animals; natural levels of lithium in drinking water are associated with longer life in humans too.**

**Nutrient Carriers Advance Research Lithium Orotate.** Suggested dose: one tablet two to three times a week.
Intermittent Fasting / Autophagy Booster

**Berberine**: Berberine is as effective as the renowned anti-aging drug metformin in producing a healthy metabolic state: lowering blood sugar, and activating AMPK and autophagy. Results in fat loss in the overweight and in diabetics. The nearest thing to an anti-aging pill that you can get over the counter.

Skin Care for Wrinkles, Acne, Baldness

**Niacinamide 5% Face Serum**: Skin care products are notorious for making claims that have no backing and don’t withstand scrutiny. This one is the real deal though: lotion that contains niacinamide (vitamin B3, also known as nicotinamide) has a significant effect on wrinkles and in lightening dark skin. InstaNatural Niacinamide 5% Face Serum.

**Tea tree oil** synergizes with benzoyl peroxide to produce the most potent anti-acne formula there is.

**Rosemary oil** treats baldness as effectively as minoxidil (Rogaine) – for real.

Olive Oil

You should never use vegetable (seed) oils, and olive oil is a healthy substitute. But you must be careful buying them, since up to 70% of olive oils sold in the U.S. have been adulterated with soybean oil, and Italian brands are particularly notorious for this. Buy the wrong olive oil and you’re just getting the same old crap vegetable oil.

California Olive Ranch Extra Virgin Olive Oil is guaranteed 100% olive oil.

Self-Defense

Obviously not supplements, but anyone interested in preserving his health should have them for protection against the most dangerous predators: other human beings.

**Pepper Spray**: OC Police Magnum Pepper Spray: good value with the 4-pack. Have one for bedside, desk, by the front door, and car. Stops criminals in their
tracks. Suggested dose: use until criminal stopped in his tracks.

**Tactical Flashlights:** The ProTac 1L is just over 3 inches long, weighs 0.13 lbs, and has high, low, and strobe variations for its light. It’s very bright at 180 lumens strength. As bright as a Mag Light, but weighs only a small fraction of it. Fits in your pocket, or keep it at your bedside.

The ProTac HL3 emits about 5 times the light power as the 1L, at 1100 lumens.

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