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The Ultimate Pro-Longevity & Anti-Aging Handbook

"Immediatly useful and highly practical tips to optimize your health and wellbeing by renown experts such as Dr. Andrew Hubbarman, Dr. David Sinclair, Dr. Andrew Gilles and many more."

1. Micronutrients For Health & Longevity (Dr Ronda Patrick)
2. The Hubberman Sleep Protocol (Dr Andrew Hubarman, Standford)
3. Complete Longevity Supplimentation Guide (Dr David Sinclair, Harvard)
4. Hormones: How They Work & What You Can Do

Micronutrients: Vitamin D, Omega-3's, Sulforaphane & More!

Credit: Dr Ronda Patrick & Dr Andrew Huberman

Dr. Rhonda Patrick (@foundmyfitness) has a Ph.D. in biomedical science and is an expert on nutritional health. She has dedicated her research career to finding proactive and preventive solutions to aging and longevity. Check out her podcast, Found My Fitness, and visit her website for tons of research articles and interviews.

The following information was taken from Dr Andrew Huberman's Episode 70 podcast.

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Andrew Huberman and Rhonda Patrick discuss the four major categories of micronutrients that regulate cellular and organ stress and antioxidants, inflammation, hormone regulation, immune system, and longevity. They review actionable protocols for obtaining key micronutrients from food and/or supplements as well as protocols for deliberate heat and cold exposure.

Host: Andrew Huberman (@hubermanlab)

Key Points

Intermittent challenges or stressors to your system are good – humans are evolved for challenges, but today's lifestyle has taken away most of the common struggles Novo Labs experienced before

Three key nutrients for the brain and body: (1) sulforaphane; (2) omega-3; (3) vitamin D

Food sources of sulforaphane: broccoli (barely cooked), broccoli sprouts, moringa powder
"I personally think [omega-3 fish oil] is one of the most powerful anti-inflammatory things, dietary lifestyle things we can get easily that is going to powerfully modulate the way you think, the way you feel, and the way you age." – Dr. Rhonda Patrick

Vitamin D is not just a vitamin! 70% of the US population is deficient – it's worth measuring & supplementing to optimal bone health, immunity, hormone conversion, and more.

There's a strong dose-dependent nature of sauna use: people who use sauna 4-7x/week have a lower risk (60% reduction) of dementia and Alzheimer's; people who use sauna 2-3x/week have a 20% reduction in risk.

Heat stress mimics moderate cardiovascular exercise effect – this could be a great onramp for people who are otherwise unable to exercise due to disability or whatever reason.

The cardiorespiratory system is improved in people who do both sauna and exercise compared to doing either alone.

Cold exposure increases nor-epinephrine and sustained clean dopamin release. This in turn can lead to sustained motivation, clarity and focus (unlike an adderall or cup of coffee).

Stress & memory: if you're too relaxed you won't remember things as well; at peak levels of stress, you remember things better until you reach too high a level of panic

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Hormesis: Our Bodies Want Some Stress

Intermittent challenges or stressors to your system are good – humans are evolved for challenges, but today's lifestyle has taken away most of the common struggles we experienced before (i.e., food, hunting, a distance of travel)

Hormesis: stressors activate pathways for maximum autophagy, adaptation, and hormone optimization.

Our bodies are supposed to be getting some stress to activate certain pathways that clear out bad things in the bodies.

Molecular hormetics are exogenous molecules that have side effects since they're foreign to the body.

Plant foods are full of molecular hormetics

There are plants that are toxic in small quantities, but you aren't going to get poisoned by eating broccoli with dinner

What Is Sulforaphane?

Sulforaphane is an anticarcinogenic isothiocyanate associated with cruciferous vegetables.

Sulforaphane is a chemical end-product of myrosinases and glucoraphanin.

Bacterial myrosinases found in the human gut convert unhydrolyzed glucoraphanin to sulforaphane.

There are two ways of hydrolyzing glucoraphanin: (1) chew cruciferous vegetable/sprout/seed, (2) microbiome

Clinical studies have linked the benefits of sulforaphane to a variety of chronic diseases such as autism, aflatoxin toxicity, cancer, air pollution toxicity, cardiovascular disease, diabetes – and much more.

Sources And Dosing Of Sulforaphane

There's no way to know whether you are a good converter of sulforaphane

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There's no way to test how much sulforaphane or glucoraphanin is in broccoli or broccoli sprouts.

Clinical studies point to 50-100 µmol sulforaphane per day.

Sources of sulforaphane: broccoli, broccoli sprouts, brussel sprouts, cauliflower>

Interestingly, broccoli rabe does not have a significant amount of glucoraphanin or sulforaphane.

All cruciferous vegetables are isothiocyanates but not all contain sulforaphane.

100g of broccoli would yield about 0.5mg -18mg of sulforaphane.

100g of broccoli sprouts would yield about 5-16mg sulforaphane.

Studies show about 60g of broccoli sprouts give you as much glucoraphanin as ¼ – ½ pound of broccoli.

You get the highest levels of glucoraphanin from broccoli seeds – but they don't taste very good so it's more palatable to eat the sprouts.

Gut microbiome variations in individuals lead to varying yield of sulforaphane per serving
Not all broccoli is treated equally from sourcing to the sale so some will have a higher yield of sulforaphane than others.

Cooking destroys myrosinase – if you are cooking broccoli or broccoli sprouts, you are solely counting on myrosinase in the gut.

If you need to cook broccoli, microwaving until it's just tender is the best method to reduce bioavailability loss.

Ground mustard & exogenous sources of myrosinase increase the bioavailability of sulforaphane in cooked broccoli.

Good sources of myrosinase: ground mustard, mustard seed, horseradish, wasabi.

Quality broccoli seed vendors: Johnny's Selected Seeds

Potential traumatic brain injury (TBI) help: glutathione increased in the brain after ingestion of sulforaphane

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Moringa: Alternative To Broccoli Sprouts

Moringa leaf powder is a great alternative to broccoli sprouts.

In many assays, the isothiocyanate is better than sulforaphane.

Moringa has not been as heavily researched in clinical research but has been used safely in areas of tropical climate.

Blood glucose control is the biggest medical indication for moringa powder.

Sources Of Omega-3 Fatty Acids

Wild game has a higher concentration of micronutrients (e.g., zinc) and omega-3 versus conventional.

Raw fish is higher in mercury than cooked fish – but fish eggs/caviar are a great source of omega-3.

Grass-fed, grass-finished meat is usually darker, stronger tasting, and less fatty than conventional.

Before 2017 factory farmers were feeding antibiotics to cows because it made them bigger and was actually inducing antibiotic resistance via the water supply.

In 2017 FDA shut down the use of antibiotics unless medically prescribed to curb the rise in antibiotic resistance.

Omega-3s are critical in diet: people with low omega-3 index have higher all cause mortality and lower lifespan.

People with low omega-3 index have been shown to have earlier all-cause mortality, decreased stroke incidence.

Plant-based version of omega-3 that's reasonable (but not as good): ALA and micro-algae.

High-quality fish oil supplements will be in triglyceride form with DHA or EPA – like these Therapeutic effects of EPA for cardiovascular disease are only in high doses – can get purified.

EPA Vascepa prescription if triglyceride levels qualify intervention (but must take with food)

Omega-3 dose: 4g EPA per day; 2g per day is a good threshold

Studies have shown people on sufficient EPA doses can get away with lower doses of SSRIs or avoid going on them completely.

"I personally think [omega-3 fish oil] is one of the most powerful anti-inflammatory things, dietary lifestyle things we can get easily that is going to powerfully modulate the way you think, the way you feel, and the way you age." – Dr. Rhonda Patrick

Measuring omega-3 index (not plasma measurement): measures omega-3in red blood cells – check out omega quant.

Complexity And Importance Of Vitamin D

Vitamin D is so much more than a vitamin.

Vitamin D gets converted into a steroid that regulates some of the human genome and plays an important role in activating the innate immune system.

Immune cells have vitamin D receptors.

70% of the US population has vitamin D insufficiency and 28% has deficiency.

Vitamin D supplementation can decrease respiratory tract infection.

The structure of vitamin D is more similar to that of cortisol and other hormones.

Standards of vitamin D dosage depend on the indication.

Part of the complexity with vitamin D is our standard doses are based on bone studies, not immunological data.

It takes time for vitamin D to be metabolized in the liver; in an acute situation it may be more important to supplement with 25-hydroxyvitamin D – the major circulating metabolite of vitamin D.

The problem is we don't have a gland that makes vitamin D – it's produced through the skin which is why we want sun exposure.

Even if you are taking vitamin D3, you want to get out in the sun
Be choosy with sunscreen! Sunscreen crosses the blood-brain barrier and some are downright dangerous – lean towards sunscreens with minerals.

Vitamin D supplementation has been shown to reduce epigenetic age, but studies have only been on small sample sizes.

It's worth your while to get a vitamin D level test and supplement accordingly.

Dose of vitamin D: around 1000 IUs per 5 nanogram increase needed for an adequate level

About 40% of the population doesn't get enough magnesium (or through dark leafy greens) – magnesium deficiency makes it difficult to make vitamin D hormone or ATP

There are several different versions of magnesium depending on what you're looking for – magnesium with malate is a good start.

Using Deliberate Health & Cold

Even 20 seconds of immersion in 49F water can lead to long-lasting increases in neuromodulators and neurochemicals.

Cold exposure (11 minutes per week, up to the neck) has been shown to increase brown fat which increases metabolism and the ability to feel comfortable in cold temperatures.

The more you expose yourself to cold, the more you can brown your fat and tolerate cold longer while improving metabolism regulation.

Beige fat is a more metabolically active version of white fat.

The endorphin system is activated when we experience short stress.

Dynorphin system: the struggle of heat exposure ultimately activates pathways that lead to an increase in the baseline level of mood and heightened level of happiness and improved mood

Regular use of sauna and other heat exposure can reduce mortality by cardiovascular events, stroke, and all-cause mortality

Defining sauna use: temperature between 80C-100C or 176F-212F (depending on how hot it feels to you), 5-20 minutes per session, 2-7 times per week

You will become better adapted and better at sweating excess heat with frequent exposure

Options if you don't have access to a sauna: try a hot water bath up to the neck – getting a similar temperature is key (176F-212F); wear a plastic suit (like fighters trying to drop weight)

Hormone effects of heat: decrease in cortisol output

Activation of heat shock proteins (HSP): heat changes the way in which proteins are configured at the molecular level – HSP makes sure cells of the brain and body don't misfold.

Heat for lifespan: heat upregulates pathways (FOXO3) related to DNA repair and clearing out of senescent cells.

Heat for metabolic enhancement: recipe seems to be 57 minutes per week (total, spread out across sessions) of heat exposure – cold exposure recipe is 11 minutes per spread out of the uncomfortable but safe cold.

Brain & mental health benefits of sauna: antidepressant effect as early as first session.

Getting depressed people to exercise is challenging – a sauna could be a good way to get the benefits of exercise without actually exercising.

Exercise Tip

Incorporate some high-intensity bursts each week – try a Tabata: 20 seconds hard (all out), 10 seconds off x 8 cycles (4-minute block).

The Huberman Sleep Protocol

Andrew Huberman (@hubermanlab) is a neuroscientist and tenured professor in the Department of Neurobiology at the Stanford University School of Medicine.

His massively popular podcast the Huberman Lab has been featured many times on Podcast Notes. Here we provide a simple one stop shop to his Sleep Cocktail and Routine for our readers.

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Remember The key to sleep and sleep supplements is to alleviate anxiety and relax overactive brain activity.

Huberman Sleep Cocktail

- Magnesium Threonate or Glycinate: 200-400mg 2-3 hours before sleep
- Threonate is the form of magnesium that crosses the blood-brain barrier and will assist with sleep instead of absorption by gut
- ~5% of people have stomach issues with this form of magnesium, so be careful on the first night
- Apigenin: 50mg
- From Chamomile
- Glycine: 2 gram
- GABA: 100 mg
- Theanine: 200-400mg (Nootropic but takes the edge off and balances caffeine intake)

Do NOT take Theanine if you have night terrors or sleep walk

Other Keys To Optimal Sleep:

No caffeine after 2pm

Sleep in a cold room, use a Chilipad if you have one

Dinner is heavier on carbs which release serotonin (salad/meat for lunch)

Don't use melatonin

Within 30 minutes of waking up, go outside and view sunlight for 2-10 minutes

As sun is setting, view the sun to send another signal to your brain that it's evening

Why Do We Get Sleepy?

The organic compound adenosine naturally builds up in your brain the longer you're awake regardless of whether it's day or night.

"How sleepy we get for a given amount of adenosine depends on where we are in the circadian cycle" – Andrew Huberman

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"The circadian cycle is just this very well-conserved temperature oscillation" – Andrew Huberman

Your core temperature will be at its lowest 2 hours before you wake up and gradually start to increase. Your temperature will peak around late afternoon and then gradually decrease towards the evening thus repeating the cycle.

The combination of a low core temperature in the circadian cycle coupled with high levels of adenosine leads to the feeling of sleepiness.

This is also why if you make yourself stay awake despite being sleepy, you will eventually feel alert again. It's because your core temperature is increasing again and the synchronization required to feel sleepy isn't occurring.

It's also why it's easier to fall asleep in a cool environment.

While we sleep our body goes through 90-minute cycles of different levels of brain activity.

You will feel more alert when waking up at the end of a cycle rather than sleeping an extra hour and waking up in the middle of a cycle.

Sleep & Health

"People who are strictly nocturnal do far worse on immune function, metabolic function, etc. than people who are diurnal" – Andrew Huberman

The circadian cycle is useful not just for sleep, but also for cell regulation

"It's clear that having these very regular oscillations every 24 hours is essential to everything from metabolism to reproduction" – Andrew Huberman

"The entirety of the picture of sleep is similar to nutrition in that there are so many variables involved and it's so person specific" – Lex Fridman

Just like the nutritional needs of an athlete is different, the sleep needs of a high-performer will also be different.

If you sleep a respectable amount but still feel fatigued throughout the day it does NOT mean you need more sleep; it means you're excessively stressing your body by other means.

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Using Visual System For Optimization Of Sleep

Light viewing behavior has a strong impact on alertness and capacity to fall asleep and stay asleep.

We have to tell the body what time of day it is by viewing light with the eyes.

We can adjust our circadian clock through light – if we flood it with light, we are altering our natural rhythm.

- ☐ Tip 1: within 30 minutes of waking up, go outside and view sunlight for 2-10 minutes – triggers healthy cortisol release to promote wakefulness; starts timer for melatonin

Shift cortisol pulse earlier in the day has been shown to ameliorate depression

Most powerful stimuli for biology and central circadian clock: (1) light; (2) exercise; (3) feeding; (4) social cues – interact with people early in the day

If you live in areas with heavy cloud coverage, turn on as many overhead lights as you can in the morning

As you approach evening, avoid bright light of any color and dim the lights
Bright light exposure between 11pm-4am has been shown to cause serious disruption in the dopamine system – even in subsequent days

- ☐ Tip 2: get first bright light exposure 14-16 hours prior to when you want to sleep

As sun is setting, view the sun to send another signal to your brain that it's evening

Temperature minimum: point at which body temperature is lowest during sleep – about 2 hours before natural wake up time

You can use temperature minimum to help with jet lag or travel plans by setting an alarm to wake up at that hour in the location you are traveling and view bright light

Caffeine

It's best to allow natural signals to wake up the body by delaying caffeine intake 90 minutes after rising

How does caffeine work to wake us up: caffeine is a psychoactive stimulant that increases dopamine and blocks adenosine (which makes us sleepier)

Caffeine crash: when coming down from caffeine, you lose the effects of caffeine, and the level of adenosine you suppressed comes rushing in

The dose and timing of coffee is what makes it helpful or harmful

The half-life of coffee is 5-6 hours depending on liver enzyme

Even if you don't feel the effects of late caffeine intake on sleep, cycles will likely be disrupted – particularly deep sleep

You might fall asleep and stay asleep well, but increase caffeine intake the next day because you don't feel rested

Suggestion for last caffeine intake: 8-10 hours from the time you would like to sleep

Melatonin In Naturally Occurring Form Versus Supplement

Melatonin starts to rise in as dusk approaches, peaking around the time of sleep itself

Melatonin tells the body when it's day and night and can help with the timing of sleep but not induce sleep

Analogy: melatonin is like a race director who calls all racers to the line but doesn't participate in the race itself.

Darkness triggers the release of melatonin: (1) try dimming lights in the house in the evening; (2) avoid blue light.

Melatonin is not particularly helpful as a sleep aid – a recent meta-analysis showed melatonin only increased sleep by about 4 minutes and sleep efficiency by about 2%.

Potential positive effects of melatonin for some people: may drop core body temperature, potential antioxidant effects, older adults who have a lower reduction of natural melatonin release, may reduce anxiety – or – placebo!
Problems with melatonin dosing: the amount of melatonin in supplements is orders of magnitude greater than amounts of melatonin naturally released in the system.

There is evidence that melatonin suppress puberty and should be used with caution as a sleep supplement

NMN, NAD+ & Other Powerful Anti-Aging & Prolongevity Supplements

Recommended and personally used by Dr. David Sinclair
Author Credit: Novo Labs
https://novoslabs.com/best-anti-aging-supplements-that-harvard-scientist-david-sinclair-takes/

David Sinclair is a professor at Harvard University who has been studying aging for the better part of his academic career.

Dr. David Sinclair's main research interest is the epigenetics of aging, with a focus on epigenetic reprogramming of aging (e.g. reversing aging via Yamanaka factors), NAD+ metabolism and sirtuins, and NAD+ precursors like NR and NMN.

You may have come across his published, New York Times best-selling book on aging, "Lifespan: Why We Age – And Why We Don't Have To", going deeper into those subjects (you can find our favorite longevity books here).

1. Nicotinamide mononucleotide (NMN), 1g per day, in the morning

NMN has been shown to slow down many aspects of aging in animal studies (R,R,R,R).

NMN is a precursor to NAD+, an important metabolic molecule that many proteins need to properly carry out their function, like protecting and repairing our DNA and epigenome.

1000 mg is a high dose of NMN. 250 to 500 mg is also sufficient to benefit from NMN's health and longevity promoting effects. In fact, studies done in humans with NMN use 250 mg per day (R,R).

It's interesting to know that David Sinclair takes NMN and not NR (another much touted "longevity" supplement). Despite all the hype on the internet, NR does not extend lifespan (R). Professor Sinclair considers NMN to be superior to NR.

Learn more about the differences between NMN and NR here.

2. Resveratrol, 1g per day, in the morning

Novo Labs view: We are lukewarm about resveratrol. We believe pterostilbene is better.

Resveratrol is a stilbenoid found in the skin of grapes in low amounts. Studies have shown that resveratrol can reduce the risk of heart disease, cancer and neurodegeneration.

David Sinclair believes that resveratrol works synergistically with NMN. Resveratrol is needed to activate the sirtuin genes (which protect our DNA and epigenome), while NMN is needed to fuel the sirtuins.

However, resveratrol is difficult to be absorbed by the gut, and the little resveratrol that ends up in the body is broken down very quickly.

Therefore, pterostilbene is a better alternative. Pterostilbene is a molecule that looks very similar to resveratrol, but it is absorbed considerably better and is far more stable in the human body.

Various studies show that pterostilbene works better than resveratrol regarding anticancer, antidiabetic and cardioprotective effects (R,R,R).

3. Metformin (prescription drug): 800 mg, in the evening

Novo view: We are cautiously optimistic about metformin, keeping in mind some caveats.

Metformin has shown to extend lifespan in various organisms, including mammals (R,R).

In humans, we see that diabetics taking metformin actually live longer than healthy non-diabetics who obviously don't take metformin (R). This was not the case for diabetics on other anti-diabetic drugs.

Taking metformin can, however, have side effects. In the short-term, metformin can cause diarrhea and gastrointestinal discomfort, which often subsides after a few weeks. In the long-term, metformin can reduce the uptake of vitamin B12.

Metformin probably works as a hormetic substance, meaning that it causes a little bit of damage to our cells so that our cells are put in a repair and protect modus. Metformin inhibits mitochondrial function, so the mitochondria will repair and protect themselves better.

Therefore, given exercise also "damages" the mitochondria somewhat (so that afterwards they will repair themselves, which is one of the health benefits of exercise) he does not combine

metformin with exercise given that could put too much stress on the mitochondria. That is why Prof Sinclair does not take metformin on the days he exercises.

Also, recent studies suggest that perhaps very old people should not take metformin, given metformin causes too much stress on already very old and very stressed mitochondria (R).

We wrote an article about natural alternatives for metformin here.

Furthermore, David Sinclair takes metformin in the evening, before going to bed. He says this because during the night, the body is already in a fasting state and metformin could further advance this state.

However, Novo Labs would recommend taking metformin always before the largest meal (ideally 20 minutes before mealtime). This way, metformin can make the body more insulin sensitive when it matters the most: during and in the hours after a meal, when mitochondria have to process the sugars and fats from the meal. This is also how metformin is ideally prescribed according to medical guidelines.

Furthermore, during the night, you are already in a fasting (insulin sensitive) state. It could be better to get the body more into an insulin sensitive state during the day too, especially when processing carbohydrates and fats after a meal.

David Sinclair takes 800 mg of metformin only once per day.

Novo Labs would prefer loNovo Labsr doses spread over the day, like 500 mg twice daily, before lunch (500 mg) and before dinner (500 mg) – not in the morning because this is when the body is already most insulin sensitive anyhow.

4. Vitamin D3

Our view: Novo Labs are positive about this vitamin.

Vitamin D can extend lifespan, at least in simple organisms (R). Vitamin D can reduce the risk of various aging-related diseases. Vitamin D deficiency in humans has been associated with an increased risk of heart disease, type 2 diabetes, autoimmune diseases and Alzheimer's disease.

Vitamin D activates many genes that confer important health benefits (R).

The dose of vitamin D that most governments advise is too low (e.g. 400 to 800 IU per day). Most vitamin D experts advise to take at least 2000 IU per day, and get your vitamin D levels checked at least every year.

Vitamin D is one of our supplements everyone should take for optimal health.

5. Vitamin K2

Our view: Novo Labs like vitamin K (a lot).

Vitamin K is important not just for bone health, but also vascular and mitochondrial health. Vitamin K also improves skin appearance.

If you take vitamin D, you ideally also combine it with vitamin K2 (MK-7 is the best form): the two vitamins work synergistically.

However, taking only a few vitamins, like vitamin K and vitamin D, is not going to cut it: most people are deficient in many other vitamins, minerals and micronutrients, even when they eat healthy.

Learn more about the vitamins, minerals and other nutrients everyone should take here.

6. Statin (prescription drug) – taken since his early 20s due to family history of cardiovascular disease

Lab Me Note: We do not condon the use of statins unless absolutely necessary. It is not a true “longevity supplement”, it is a powerful prescription medicine that has a lot of negative side effects that are significant in nature.

Statins could lower the risk of heart disease. But there is a lot of discussion about how significant the effect of a statin is on reducing the cardiovascular risk.

Some scientists claim you should take statins if you have an increased risk of getting a heart attack (known as “primary prevention”), while others claim that you should only take statins when you’ve already had a heart attack (as “secondary prevention”).

Other studies suggest that for many people, statins don’t work very well for primary prevention.

This will likely depend on your personal genetic make-up; Novo Labs see that some people react much better to statins while others derive no effect (R).

Also, not all statins are the same. Some statins seem to be able to extend lifespan in mice (like simvastatin) while other statins do not have this effect. Also, statins can have side effects, like muscle aches or neuropathy (nerve pain), and some statins more than others.

After all, statins inhibit the production of cholesterol, a molecule that is an important component of our cell membranes, especially of neurons and muscle cells.

7. Low-dose aspirin – 83 mg per day

Our view: Neutral, but also a bit disappointed.

A low dose aspirin could reduce inflammation, reduce the risk of heart attacks, and perhaps the risk of cancer.

However, a recent large study that involved almost 20,000 participants and that lasted 4.7 years showed that a low dose of aspirin did not reduce cardiovascular disease and did not improve survival (R).

In fact, it even showed that it could actually increase cancer risk somewhat (R), despite many other studies showing that aspirin could have health and longevity benefits.

Further studies have to be conducted to sort this out.

8. Alpha lipoic acid (ALA)
Our view: This antioxidant very likely does not extend lifespan in humans. In fact, it may actually even shorten lifespan.

Note: According to earlier sources, Dr. Sinclair mentioned taking alpha-lipoic acid. However, in recent interviews (done in 2022) David Sinclair didn't specifically mention taking this supplement.

Alpha lipoic acid (ALA) is a strong antioxidant. There has been a bit of a hype around ALA, especially combined with acetyl-L-carnitine (ALCAR), to slow down aging.

However, there are various studies showing that ALA does not extend lifespan or slow down aging (R).

However, alpha lipoic acid is a strong antioxidant, and scientists have learned that antioxidants could actually accelerate aging (as Novo Labs explain here).

So we should not be surprised to see that in studies in which aging mice receive alpha lipoic acid their lifespans are actually shortened (R,R).

This why alpha lipoic acid is one of the anti-aging supplements you should not take.

In short, Novo Labs would be careful with taking supraphysiological doses (much greater than you'd ever find in a healthy diet) of antioxidants.

9. Coenzyme Q10 (coQ10)

Our view: This antioxidant probably cannot extend lifespan in humans. It could possibly even shorten lifespan.

Note: According to earlier sources, Dr. Sinclair mentioned taking coenzyme Q10. However, in recent interviews (done in 2022) David Sinclair didn't specifically mention taking this supplement.

Coenzyme Q10 is an antioxidant that improves mitochondrial functioning. There is insufficient scientific evidence (at least in well-conducted studies with the right disease model mice) that coenzyme Q10 can extend lifespan.

Various studies show that coenzyme Q10 does not extend lifespan (R,R,R,R). Some studies show that coenzyme Q10 can actually shorten lifespan (R).

Also, coenzyme Q10 is an antioxidant. In recent years, scientists have learned that antioxidants can actually accelerate aging (for reasons described here). We would be cautious about taking strong antioxidants like coenzyme Q10 to extend lifespan.

That is also why Novo Labs added coenzyme Q10 to the list of anti-aging supplements one should not take for longevity.

10. Spermidine, 1-2 mg per day, in the morning

Our view: Novo Labs think spermidine is an interesting molecule for longevity.

Spermidine is a molecule first found in sperm, hence its name. As a supplement, spermidine is extracted from wheat-germ. It can also be found in foods like cheese, soy, legumes, and mushrooms.

Spermidine can impact important aging-mechanisms, such as autophagy.

Studies have shown that spermidine can improve various biomarkers of health and longevity (R), and that spermidine can extend lifespan in different organisms, including mice (R).

11. Quercetin and fisetin, 500 mg each, once per day, in the morning

Our view: Novo Labs like fisetin more than quercetin. Novo Labs would also reduce the dose.

Quercetin and fisetin are very similar molecules. They are often called “senolytics”, in the sense they are assumed they can clear away senescent cells.

Senescent cells are cells that accumulate during aging and secrete substances which damage normal healthy cells (learn more here).

However, Novo Labs believe the main reason why molecules like fisetin can extend lifespan is because of other effects than being a “senolytic”, such as by reducing inflammation.

For this reason, Novo Labs prefers that fisetin is taken in lower doses (100 mg per day) and in a continuous way, instead of in higher doses (e.g. 1000 mg or more) once every month in order to “clear” senescent cells.

Novo Labs prefer fisetin more than quercetin. One reason is that there are more and better studies done with fisetin showing longevity effects, such as studies in mice demonstrating that fisetin extends lifespan (R).

BONUS TIPS FROM DR SINCLAIR TO LIVE LONGER!

Of course, Dr. David Sinclair does not only rely on supplements to live longer and healthier.

He knows very well that nutrition, exercise, proper sleep and stress reduction are also very important methods to extend lifespan. How does he go about this?

1. Nutrition

David Sinclair often eats only 2 meals per day instead of 3 meals.

He drinks lots of green tea and very little alcohol.

He eats little (red) meat, and consumes lots of vegetables.

Professor Sinclair is a proponent of regular fasting.

Novo Labs wrote more about Sinclair's longevity regimen here.

You can read more about the best longevity diet (and download the poster!) here.

2. Exercise

Regarding exercise, David Sinclair runs once or twice a week, both in a low intensity and high-intensity way. He also does weight lifting once or twice a week.

3. Health tracking

Professor Sinclair uses a continuous glucose monitor (CGM) to track how the foods he eats increase his blood sugar levels.

Examples of continuous glucose monitors are Azumio which uses AI to make better health recommendation (https://www.azumio.com/).

He also does regular blood tests to track his health. Lab Me wrote about the best blood tests for longevity here.

The most comprehensive, affordable and accurate at-home health testing company today is www.labme.ai

CONCLUSION

Novo Labs think that the list of supplements that David Sinclair is not bad, but can be further improved.

In this regard, Novo Labs make the distinction between longevity supplements and health supplements.

Longevity supplements, like NMN, micro-dosed lithium or calcium alpha-ketoglutarate, could actually slow down aging.

Health supplements enable our body to work properly: deficiencies of them could accelerate aging.

Find here a list of the best longevity supplements, and find here an overview of health supplements that everyone should take. (https://novoslabs.com/product/novos-core/).

Checklist Of The Most Powerful Anti Aging Supplements AvailableTody:

- [ ] Fisetin
- [ ] Magnesium
- [ ] Glycine
- [ ] Glucosamine Sulfate
- [ ] Pterostilbene
- [ ] Spermidine
- [ ] Hyaluronic Acid
- [ ] Rhodiola Rosea
- [ ] L-Theanine
- [ ] Micro-dosed Lithium
- [ ] Vitamin C
- [ ] Calcium Alpha-Ketoglutarate
- [ ] Ginger
- [ ] Malate
- [ ] NMN
- [ ] Quercitin

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Timeline You Can Expect When Starting These Compounds

2 Weeks: More energy, clearer thinking, improved sleep and often improved cognition
6 Weeks: Skin improvement is noticeable
3 Months: Furthered improvements in skin texture and look, improved metabolism
1 Year: Increased general well-being, slowered pace of aging
5 Years: Exponential improving of health & slowing aging leading to increased youthfulness.

Hormones: How They Work & What You Can Do

Author Credit: Dr. Kyle Gillett & Dr. Andrew Huberman
Listen to it here.

Introduction

Dr. Kyle Gillett, MD, (@kylegillettmd) is a dual board-certified physician in family medicine and obesity medicine and an expert in optimizing hormone levels to improve overall health and well-being in both men and women. He is a firm believer in practicing medicine and focusing on prevention by approaching the body, mind, and soul.

Andrew Huberman and Kyle Gillett break down how to improve and optimize hormones levels for better health in both men and women.

Host: Andrew Huberman (@hubermanlab)

Key Takeaways

- Six pillars of hormone health: (1) diet (specifically caloric restriction); (2) exercise (specifically resistance training); (3) stress & stress optimization; (4) sleep optimization;

(5) sunlight; (6) spirit – dial in the body, mind, and soul connection

- Think of yourself as a Venn diagram: you have a body, mind, and soul – you can't completely be well if you're missing the health of one area

- Tip to get your doctor to order more bloodwork than the basic panel: tell your doctor your (fill in the blank) – energy, sleep, endurance, etc. – is not as good as it used to be

- High alcohol intake and smoking marijuana will ultimately decrease testosterone

- Caffeine has a negligible effect on hormones

- Vegans: you are possibly at risk of not getting enough of certain types of fats and nutrients to maintain a proper ratio of testosterone to estrogen – supplement with algae or other healthy fats
- To naturally increase growth hormone output: don't eat within 2 hours of sleep, get good deep sleep, resistance exercise early in the day, manage stress

- A word of caution about peptides: work with a skilled physician or healthcare practitioner! There are so many bad quality peptides with detrimental side effects

How To Approach Hormone Health

"Doing a little amount of lifestyle interventions over a long period of time is going to be far more helpful or efficacious than doing a lot than doing nothing, then doing a lot, then doing nothing." – Dr. Kyle Gillett

Six pillars of hormone health: (1) diet (specifically caloric restriction); (2) exercise (specifically resistance training); (3) stress & stress optimization; (4) sleep optimization; (5) sunlight; (6) spirit – dial in the body, mind, and soul connection

Diet should be an individualized approach – your goals and genetics should dictate your diet, not fads or what others are doing

Ideally, get bloodwork every 3-6 months for preventive purposes – even better if you can get one while fasting and one while not fasting

"The more you're doing zone 2 cardio, the slightly less important your caloric restriction is." – Dr. Kyle Gillett

Men, how to know whether you should use caloric restriction: if you're obese or have metabolic syndrome, the caloric restriction will increase testosterone in men

"There's nothing special about intermittent fasting or caloric restriction or exercise when it pertains to body weight in general. When you lose weight about 33% of that is lean body mass and about 10% of fat cells are lean body mass." – Dr. Kyle Gillett

The reason for exercise, caloric restriction, and intermittent fasting in general: it's how you increase healthspan, not necessarily change the weight on the scale

Intermittent fasting & effects on hormones: more significant spike in growth hormone and IGF-1 levels which will help in older age groups than younger – the longer you fast, the bigger the spike

Major functions of IGF-1 and IGF-2: growth hormone acts on the liver to produce IGF-1 which is the active form of growth hormone with a much longer duration of action

Potential underlying hormonal causes of poor sleep: (1) growth hormone deficiency (very rare); (2) vasomotor symptoms of menopause or andropause (very common); (3) being on testosterone replacement therapy (TRT) increases the risk of sleep apnea

Testosterone In Women

For health optimization: it's just as important to know testosterone levels as it is to know estrogen and progesterone levels

For pathology prevention (e.g., breast cancer): it's more important to know estrogen and progesterone

Women think they have very low testosterone levels because tests generally look at free testosterone which is the smallest proportion of testosterone in the body

If you look at the total amount of DHEA (weak androgen) and testosterone in a woman, it's more than estradiol but it's in different measurements

Testosterone in pre-menopausal women comes from theca cells in ovaries

Women with endometriosis are candidates for tongkat ali

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Testosterone In Men

“Testosterone is not going to cause prostate cancer, however, normal aging causes prostate cancer and testosterone will grow your prostate cancer.” – Dr. Kyle Gillett

The question is really, do you want to take something that will definitely grow prostate cancer once you have it?

Men, be sure to check prostate-specific antigen (PSA) levels – also be aware, overweight and obese men have higher rates of prostate cancer

Tips to maintain prostate health: prostate is right by the colon so make sure you have regular bowel movements, be aware of any genetic predisposition to an enlarged prostate, there’s an interesting correlation between having female offspring and prostate cancer, check estrogen levels (there’s a link to high estrogen and prostate cancer), make sure CRP levels are low

TRT’s goal is steady-state with minimal peaks and troughs

General TRT doses: 100-120mg/week divided over 2-3x per week – but there is a law of diminishing returns here, TRT has its trade-offs so you have to find the right level for you
Very few people need aromatase inhibitors – there are a lot of ways to control estrogen through lifestyle or other interventions without the potency of aromatase inhibitors

Non-traditional supplements which increase testosterone: creatine, tongkat ali, stinging nettles, boron, turkesterone, fadogia acrastis

Tongkat ali (from Indonesia) regimen: 11 months on, 1 month off because it does affect aromatase and is an estrogen receptor modifier

Fadogia acrastis (shrub from Nigeria): can increase testosterone by stimulating luteinizing hormone release and receptor sensitivity – but there’s not a lot of evidence supporting long term use

Tongkat Ali & Fadogia Protocol

Tongkat ali + fadogia acrastis regimen: cycle 3 weeks on, 1 week off
Boron dosage: 3-6mg 1-2x per day

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Dihydrotestosterone

Dihydrotestosterone (DHT): an androgenic hormone on the X chromosome (so its from the mother)

DHT is responsible for male pattern baldness so you can look to the males on your mother's side – the better your androgen receptor works, the more likely you are to experience male pattern baldness

Role of DHT:

In central nervous system: activates androgen receptor gene and helps make effort feel good and motivating

In the cardiovascular system: androgen receptors are present in heart tissue

Impact of diet on DHT: a diet high in bioavailable plant polyphenols (such as curcuminoids, turmeric, black pepper) inhibits an enzyme that converts testosterone to DHT – but don't worry, effects are nearly always reversible

Creatine can increase the conversion of testosterone to DHT

If you're worried about hair loss, creatine can potentially add fuel to the fire – but if the follicle is still there the hair will come back after a few months

Diving Deeper Into Hair Loss

There are two types of hair loss: (1) male pattern baldness/androgenetic alopecia; (2) other types of alopecia

For androgenetic alopecia: you want something to decrease the activity of androgen receptors – most promising treatment is **dutasteride mesotherapy** (localized injections in vulnerable areas) Women can get male pattern baldness

Polycystic Ovarian Syndrome (PCOS)

"This is one of those diseases that is underdiagnosed. Its prevalence is much higher than we think." – Dr. Kyle Gillett

Most women don't know they have PCOS until they have infertility or subfertility

PCOS is usually diagnosed in the 30s

Symptoms of PCOS: androgen excess (symptom would be excessive hair growth, deepening of the voice, etc.), insulin resistance, oligomenorrhea (more than 35 days between periods or less than 9 per year), infertility

If living with PCOS: be vigilant about addressing insulin resistance and insulin sensitivity (talk to a doctor about inositol variation, metformin)

Female Contraception & Effects On Hormone Output

Perceptual effects of oral contraception: some studies have shown that there's a shift in how men and women perceive attractiveness in each other among women who take oral contraceptive

Almost all contraceptives have a synthetic estrogen and progesterone

Ethanol estradiol (common synthetic estrogen): 100x more potent than endogenous estradiol in the liver so binds to estrogen receptor in the liver and increases sex hormone-binding globulin which decreases free-testosterone and DHT

Oral contraceptive blunts increase testosterone that occurs before ovulation and usually come with an increase in libido

Effects of contraception on fertility: if contraception is taken 6-12 months, fertility is likely equitable as baseline; beyond 12 months it's still unlikely to have a long term effect on fertility unless you are experiencing side effects of the contraception such as insulin resistance

Social Interactions & Relational Effects On Hormones

Feelings about a new partner or love interest are largely regulated by the dopamine system
There's a lot of pheromonal and hormonal crosstalk that happens in relationships between men and women

Prolactin & estrogen are close cousins: prolactin inhibits the release of testosterone from the pituitary glands

Prolactin helps with nesting and breastfeeding

Building in “prolactin adjustments” can be helpful for your relationship: take some time away from each other so it’s exciting when you see each other – prolactin and dopamine are inversely related

Plan ahead to have good times if you know you are going to enter a tough period or crisis in your relationship

In long-distance relationships: the dopamine remains high until you are together for a longer period of time and the hormones adjust

Read more from Lab Me on the effects of time/distance on hormones in relationships.

Pelvic Floor

If you don’t know where the pelvic floor is – think of your body as a box: your abs are the front of the box, your back is the back of the box, your diaphragm is the top of the box, your pelvic floor is the bottom and serves as your port to the outside world

Prostate, bladder & urinary health: phosphodiesterase and tadalafil (low dose is not arousing) can help will flow regularity and decrease nighttime urination trips

A daily low dose of tadalafil is becoming a more common regimen for men’s health

Other Notable Hormones

HCG is (1) a hormone produced during pregnancy; (2) fertility treatment; (3) can help maintain testicular function while on testosterone

HCG: when a woman is pregnant her HCG levels double every 48 hours, preventing hypothyroidism in pregnancy

L carnitine can support fertility and can increase the density of androgen receptors – and can be supplemented or found in food but isn’t very bioavailable; you can find injectable L carnitine – try 500mg-1g per day

Effects Of Marijuana And Alcohol On Testosterone

Cannabinoids will not reduce testosterone by themselves
Smoked marijuana promotes significant reductive activity in aromatase (which converts testosterone to estrogen)

Note, high-fat diets also promote aromatase activity

Pot smokers have a higher rate of development of gynecomastia (male development of breasts) High alcohol intake will decrease testosterone (as will any gabba agonist, which you want to be cautious to not take gabba daily)

Interestingly, the American Heart Association recommends females consume 0-1 servings of alcohol per day and men consume 1-2 servings of alcohol per day

Alcohol recommendation: it's better to have 2 drinks of alcohol 1-2 days per week than drink every day

Lab Me note: This is slightly misleading information. Dr. Ben Horne of Standford university and advisor to Lab Me had this to say:

Dr. Horne follows by saying,

"So far our work has just been presented in abstract format at the American College of Cardiology conference. We are working on the full manuscript now that will need peer review. Our study essentially showed that people taking statin medications had as much prevention of major adverse cardiovascular events whether or not they consumed alcohol, so those who did drink and took statins did not receive any additional benefit from alcohol.

People not taking statins did have a protective benefit from alcohol consumption, though, in our observational study.

This suggests to us that at least people who don't already drink alcohol can receive that same health benefit by taking a statin, which medications do have strong evidence of benefit from randomized trials (and low safety risk). So non-drinking patients do not need to worry about whether they should start consuming alcohol if they take their statin."

If you currently do not drink alcohol, there is no need to start drinking (or even reduce your alcohol consumption since you have none). However, if you are concerned about heart health and want to improve it there are a number of things that you can do. The best advice is to talk with your doctor to discuss how you can lower your risk with lifestyle changes and with medications that are proven to improve health without being reliant on alcohol.

Read more about alcohol and the heart here.

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Additional Lifestyle Factors That Can Affect Hormones

An ice bath will help overheated testes
“Temperature is the enemy of testes. They like to be 5-10 degrees cooler than the rest of the body.” – Dr. Kyle Gillett

Avoid saunas if you are experiencing infertility or have a low sperm count – but the real enemy is warm water (i.e., warm bath, jacuzzi) which raises the temperature of the testes faster than a sauna

Ice bath increases the activity of beta-adrenergic receptors

Peptides & Prescription Drugs

Most hormones we make have been synthesized and are available by prescription from a physician

Caution: anytime you inject something, you will shut down your own production of that hormone

BPC157 Peptide

Peptides: short sequences of amino acids that resemble hormones enough, they mimic the effect of hormones in the body – some peptides change gene expression and set pathways for continued production of the hormone of interest

Peptides increase healing rates, weight loss, recovery, etc., and are used by actors, athletes, etc

Therapeutic peptides are prescribed by physicians

Body protective compound (BPC-157): identical to the protein found in the stomach used to treat disorders in intestine

BPC-157 is tolerated for short periods of time and the most prescribed peptide

Benefits of BP-157: the healing of many different types of tissue from tendon, muscle, and the nervous system, increases blood flow back to injured sites, protects organs, prevents stomach ulcers and heals skin burns

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Bonus Information: How To Definatively Increase Your Motivation & Drive

Author Credit: Dr Andrew Huberman
Listen To Complete Episode Here.

Introduction

Dr. Andrew Huberman, Ph.D. is a Professor of Neurobiology and Ophthalmology at Stanford University School of Medicine. His lab focuses on neural regeneration, neuroplasticity, and brain states such as stress, focus, fear, and optimal performance.

In this episode of Huberman Lab, Dr. Huberman breaks down the science of motivation and drive. He explains dopamine and other chemicals involved in the pursuit of goals, pleasure, and reward as they relate to addiction, how to leverage behaviors for benefit, and how to maintain motivation over the long term.

Key Takeaways

Dopamine is involved in wanting – not having – the excitement or anticipation about something increases dopamine firing 30-40x

Dopamine motivates you to take action toward the thing you want

Novelty is the number one trigger of dopamine release

A subtle feature about the dopamine system: for every bit of dopamine that's released, there's a crash associated when prolactin is released

Prolactin is behind the feeling of "what's next" or letdown after a big goal

Dopamine make us focus on things outside of us that we have to chase; serotonin makes us content with the here and now

To maintain high levels of motivation, try intermittent reward: celebrate successes every other time, every tenth time, etc. to blunt dopamine response, prevent a crash, and keep you on the path to bigger goals

Host: Andrew Huberman (@hubermanlab)

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Background On Motivation

Motivation and the chemistry of motivation are fundamental to our life

Without motivation, we wouldn't move

Motivation is about balancing pleasure and pain

There is a relationship between dopamine released in the brain and the desire to exert effort

Dopamine is responsible for our sense of motivation and movement

Dopamine is a double-edged sword: responsible for motivation and pleasure but underlies addiction

Dopamine

Novelty is the number one trigger of dopamine release

Dopamine is the substrate from which adrenaline is made (or epinephrine in the brain) which allows us to take an action

Mesolimbic pathway AKA reward pathway: ventral tegmental area (VTA) + nucleus accumbens
The prefrontal cortex controls how much and when dopamine is released

Dopamine neuron fire at a low rate until you start thinking about or craving something – could be as simple as food, coffee – or more complex

If you get excited or anticipate something, the rate of dopamine firing increases 30-40x and pushes you to action

Examples of activities and associated dopamine increases: sex doubles dopamine levels; nicotine increases dopamine 150%, cocaine and amphetamine increase dopamine approximately 1000%, video games can release dopamine somewhere between nicotine and cocaine

Just thinking about the activity – sex, food, drug, etc. – can sometimes release as much dopamine as the actual act of whatever you're craving

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Pleasure-Pain Balance & Addiction

When you anticipate something, a little dopamine is released – when you participate in that thing, a little more dopamine is released

When you repeatedly engage in craved behavior, there is a shift away from dopamine and into pain

A subtle feature of the dopamine system: for every bit of dopamine that's released, there's a mirror image downward deflection of pleasure (pain)

Part of the experience is to want more of that thing you crave

The more you participate in craving, dopamine reduces and pain increases – this leads to addiction

15-20% of people have a genetic bias toward addiction

Dopamine isn't as much about pleasure as it is the desire and pursuit to reduce the amount of pain

"Much of pursuit of pleasure is simply to reduce the pain craving. Part of the enjoyment is craving and wanting more of that thing." – Dr. Andrew Huberman

Dopamine Versus "Here And Now" Molecules

Body and brain can direct our attention to inside or outside of us

Dopamine biases us toward thinking about things we don't have; serotonin, cannabinoids, and other "here and now" molecules make us content in the present

Dopamine make us focus on things outside of us that we have to chase; serotonin makes us think about the here and now

Serotonin is the molecule of bliss and contentment for what you already have

Shift from dopamine system to 'here and now' molecule release

Dopamine makes people rabidly in pursuit of things; things that hit the serotonin system (e.g., marijuana) tend to make people content

Dopamine can cause high achievers to become manipulative and unpleasant:

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"Dopamine doesn't care how you reach your goals, it only cares that you reach your goals." – Dr. Andrew Huberman

Procrastination And Motivation

There isn't a single source of procrastination

Two types of procrastinators: (1) people who enjoy the stress of impending deadline – tapping into epinephrine system – which activates action in the body; (2) people who are simply not releasing enough dopamine

To break procrastination type 1 – induce epinephrine release: super oxygenation breathing, caffeine, consume L-tyrosine (via red meat or supplement),

To break procrastination type 2 – induce dopamine release: mucuna pruriens, anti-depressant

"You can become a person where is enough is never enough – the only thing dopamine wants is the release of more dopamine." – Dr. Andrew Huberman

Try to attach dopamine with the pursuit instead of the end-goal

Dopamine Crash

After dopamine release, prolactin releases

So much dopamine is released in pursuit of a goal, to finish a race, before a big meeting, etc. that it can be hard to manage the crash that comes after – that crash sensation is prolactin

Prolactin is behind things like post-partum depression, letdown or low after goal, "what next" feeling

The dopamine-prolactin system first evolved for reproduction: after orgasm, prolactin is released and creates the lethargy, stillness period

Vitamin B6 and zinc are potent prolactin inhibitors

There are subjective effects of dopamine: the longer you can extend arc of positive experience, the more you will offset pain

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Reward-Prediction Error

Possibility is deeply woven into the dopamine system

In the neurological system, the surprise, novelty, motivation, and reward release dopamine
Reward-prediction error = actual amount of dopamine released in response to something – the amount expected

If you tell a child they “might” have ice cream later, you’re effectively telling the dopamine they will have ice cream – if it doesn’t happen, there’s a big dopamine crash

Attention Deficit Disorder (ADD) & Attention Deficit Hyperactivity Disorder (ADHD) In Kids

The drugs given to treat ADD and ADHD in kids (like Adderall) have amphetamine-like properties

In kids, these drugs activate forebrain circuitry and reduce impulsivity

Impulsivity at age 10 is predictive of overeating disorders later in life

The goal of ADD/ADHD drugs: suppress the release of dopamine to better control the schedule of dopamine release

Dopamine Schedule

You can control dopamine schedules to optimize motivation and pleasure

There is some subjectivity in dopamine release

Viewing bright light in the middle of the night blunts dopamine and suppresses activation of the reward system

Separate pleasure from motivation: dopamine is about the motivation of pleasure, not the ability to experience pleasure

Over the counter phenylethylamine (PEA) releases dopamine and serotonin at low levels: heightened sense of mental acuity, athletic performance, improved mood and attention

Caffeine can increase dopamine release in the brain by about 30% and have a protective effect

To Maintain Pursuit Of Goals

To ensure you will remain on the path and exceed previous performance: occasionally remove reward subjectivity

As you move toward goal, blunt reward response for intermediate goals

Celebrate some wins but not all wins – intermittently reduce the impact of reward

Not celebrating keeps the dopamine system in check and avoids the big crash, and keeps you on the path of higher goals

Intermittent reinforcement schedule: reward yourself every other time, every tenth time, etc

Blood Tests You Can Do To Measure Longevity

Despite their limitations, blood tests can still be interesting

Blood tests can still be interesting to find out other problems than vitamin or mineral deficiencies, such as metabolic issues. Interesting metabolic blood test biomarkers to measure are total cholesterol, LDL, HDL (and their ratios), fasting triglycerides, fasting insulin, fasting glucose and HbA1c.

However, keep in mind that many people (up to 70 percent) who end up in the hospital with a heart attack have normal cholesterol, LDL or HDL levels, indicating that many other things (which are not measured in a standard blood panel) contribute to heart disease risk, such as low-grade inflammation (e.g. high levels of TNF-alpha, IL-6, IL-1, etc), the size of the cholesterol particles, the amount of glycation, the health of the endothelial cells that line the blood vessel walls, and so on.

So what are some of the most interesting and practically helpful blood tests you can do?

1. Fasting insulin

A measure of insulin resistance. This is an interesting blood biomarker. The lower the fasting insulin levels, the better.

Increased insulin resistance plays a role in many aging-related diseases, such as cardiovascular disease, Alzheimer's disease, and type 2 diabetes.

Increased insulin resistance accelerates aging.

“Fasting” means at least a 9 to 12 hour fast before the blood is drawn in the morning – so no breakfast or other food before the blood draw.

2. Fasting glucose

Higher than normal fasting glucose levels could be a sign of an unhealthy metabolism, or even worse: pre-diabetes or diabetes.

https://www.labme.ai/products/crucial-health-check/

3. HOMA-IR (Homeostatic Model Assessment of Insulin Resistance)

Ideally, this value is also calculated. It’s a more accurate measure of insulin resistance and glucose metabolism, taking into account fasting insulin levels and fasting glucose levels.

4. HDL cholesterol, LDL cholesterol and total cholesterol ratios

These are biomarkers to assess cardiovascular risk.

However, people can have normal HDL, LDL or cholesterol levels, but still have an increased risk of heart disease.

Therefore, ideally, also the diameter of cholesterol particles is measured (smaller cholesterol particles are more dangerous given they can get into the blood vessel walls more easily), and how much cholesterol particles are oxidized and glycated (the more oxidized and glycated the cholesterol particles are, the more dangerous), but these tests are not readily available.

Low-grade smoldering inflammation can also increase the risk of heart disease. Therefore, us-CRP, a measure of inflammation, would also need to be measured (see further below).

Keep in mind that when the good cholesterol (HDL) rises, your total cholesterol also rises, so don’t panic if your total cholesterol is too high: look at the ratio of total cholesterol versus HDL cholesterol: the lower, the better.

Lab Me’s flagship tests (crucial, baseline and executive) not only measure these (and many

others) but also calculates the ratio's described above. The executive test automatically calculates your risk of heart attack in the next 5 years using the Renyolds Risk Equation.

https://www.labme.ai/products/baseline-health-check/
https://www.labme.ai/products/executive-health-check/

5. HbA1c

A measure for glycation. The more glycation, the faster the body ages and the higher the risk of aging-related diseases.

https://www.labme.ai/products/executive-health-check/

6. Fasting triglycerides

To assess cardiovascular risk. Triglycerides are fats circulating in your blood. Some cardiologists believe that fasting triglycerides are a bigger risk factor for heart disease than increased cholesterol levels.

https://www.labme.ai/products/crucial-health-check/

7. Vitamin B12

Is often measured in the blood. However, often vitamin B12 levels can be normal while one still can be deficient. It's better to measure the vitamin B12 metabolite methylmalonic acid in the urine to get a view of vitamin B12 status.

Despite this, people can have normal methylmalonic acid levels, but still be deficient.

Also, vitamin B12 levels can be "normal" but one can still be deficient in many other B vitamins, like vitamin B1, vitamin B2, vitamin B5, folic acid, vitamin B6 and so on.

8. Thyroid-stimulating hormone (TSH)

This biomarker is used to detect thyroid abnormalities, including the most common manifestation, hypothyroidism (a slow thyroid gland).

Most labs use a cutoff value of 4 mU/L (above 4 mU/L is indicative of hypothyroidism). With that said, many endocrinologists believe that TSH levels should be at least below 2.5 mU/L.

However, still be skeptical: TSH can often be normal in people, but they can still be iodine deficient (as happens a lot in people who consume a Western diet). It's better to do an iodine challenge test and collect the amount of iodine in the urine during 24 hours, but most MDs have no experience with this test.

https://www.labme.ai/products/thyroid-stimulating/ (TSH Only)
https://www.labme.ai/products/crucial-at-home-thyroid-test/ (TSH, T3, T4, TPOab)

9. Homocysteine

Deficiencies in vitamin B12 and other B vitamins can lead to increased homocysteine, which leads to insufficient methylation in the body, which can be negative for health and increase risk of heart attacks and stroke, among other diseases.

10. High sensitivity or ultra-sensitive C reactive protein (hs-CRP)

A measure of inflammation. Low-grade inflammation accelerates aging and increases the risk of aging-related diseases.

https://www.labme.ai/products/executive-at-home-thyroid-test/

11. The levels of tumor markers like prostate-specific antigen (PSA), CEA, CA13, CA125

These can vary a lot among people. However, keeping track of whether they increase or not (instead of focusing on just a one-time measurement/baseline level) could be more interesting to see if there is a tumor growing. This can be especially useful for PSA in males, given prostate cancer is very prevalent. In the future, more advanced methods will be developed to diagnose cancer much earlier via a simple blood test.

https://www.labme.ai/products/male-executive-wellness/ (contains PSA along with hs-CRP, A1C, and lipid profiles)

12. Cortisol

Cortisol levels are often measured in the blood. However, it's better to measure cortisol levels in the urine, collected over a period of 24 hour, to have a better idea of the total daily cortisol production.

https://www.labme.ai/products/cortisol-test/

13. Magnesium and other mineral and vitamin levels

The levels of these minerals are often measured in the blood. However, these are often inaccurate measurements. People can have normal magnesium levels (and other normal levels of vitamins and minerals) and can still be deficient in these substances. The best way/test to see if you are deficient in specific vitamins and minerals is by taking them in appropriate dosages for at least 90 days and seeing if you notice an improvement.

14. Iron levels

Iron deficiency can be measured in multiple ways, like looking at iron levels, proteins involved in iron metabolism and transport (transferrin, ferritin), and the size and amount of red blood cells, as defined by for example MCV (mean corpuscular volume), RDW (red cell distribution width), or HCT (hematocrit – the amount of red blood cells).

Too much iron can lead to an increase in senesence cells (zombie cells) that lead to the aging process including cancer.

https://www.labme.ai/products/overload-health-test/ (Ferritin, hsCRP, Cortisol, hbA1c, Glucose)
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However, it is possible to have "normal" iron biomarkers, but to still be iron deficient.

Also, when the size and amount of red blood cells decreases (they need iron to be produced), the iron deficiency is often already (very) severe and long-standing.

Be skeptical of blood test values

The cut-off values that labs use are not the ideal cut-offs values: they are often based on population averages.

In other words, if many people are deficient in a specific biomarker, often such levels will be considered as “normal”.

Additionally, the cut-off values are often based on disease outcomes: if they are below or above a specific cut-off value, you can become (very) ill.

But these cut-offs are often not based on optimal values for a long, healthy life. Learn more here about optimal levels and doses of the most important health supplements here.

We believe that there are other, innovative tests to holistically assess your overall aging process and health, like the Lab Me Advanced Neurotransmitter Test and The Sleep Scanner Test.

Important Note: Lab Me at-home testing is only available in the USA and is not affiliated with an of the authors quoted here.

Sources & Additional Learning

Vitamin D and the omega-3 fatty acids control serotonin synthesis and action, part 2: relevance for ADHD, bipolar disorder, schizophrenia, and impulsive behavior (The FASEB Journal)
Role of phosphatidylcholine-DHA in preventing APOE4-associated Alzheimer’s disease (The FASEB Journal)
Skin exposure to UVB light induces a skin-brain-gonad axis and sexual behavior (Cell Reports)
Human physiological responses to immersion into water of different temperatures (European Journal of Applied Physiology)
Sauna use as a lifestyle practice to extend healthspan (Experimental Gerontology)
“Has Harvard’s David Sinclair Found the Fountain of Youth?” (Boston Magazine)
Anti-Aging Approaches (Harvard Magazine)
Why This Harvard Researcher Thinks We “Don’t Have To” Age (InStyle)
David Sinclair’s Harvard Medical School laboratory
The most comprehensive and affordable at-home blood tests avaliable today.