

Wondering about your COVID-19 risk level and seeking precautionary steps?

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Your body is a complex machine, and there's little doubt that fueling it with junk and driving it nonstop will make it deteriorate faster. Conversely, if you take maintenance seriously — by eating nutritious meals, exercising regularly, and prioritizing sleep — you increase your chances of getting more mileage out of it. But is it enough? So-called biohackers would say no.

There's no universal definition of biohacking, but many fans use the term to describe a variety of habits and tools aimed at tapping into their biology so they can attempt to fine-tune it. Often — but not always — fringe scientific findings, high-tech gadgets, and self-experimentation play a role.

"To me, it's about using the best available evidence to optimize our biology," says [Chris D'Adamo, PhD](#), director of research and education at the [Center for Integrative Medicine](#) at the University of Maryland School of Medicine. "It's not just about not getting sick; it's about promoting optimal health and performance."

D'Adamo, a former personal trainer who dabbles in biohacking himself, says that before you can attempt to take your health to the next level, you first have to master the basics. "It's dangerous to think that any pill or treatment will take the place of good foundational habits" like eating well, exercising regularly, and getting enough sleep.

Got all that covered? Good. Here's what the science says about whether these popular biohacks really live up to the hype. Of course, it's a good idea to talk to your doctor whenever you tweak your diet, exercise routines, or try a new product or treatment — and that goes triple for biohacks.

Proven biohacks

Meditation — Perhaps the original biohack, studies have found that this ancient practice may help manage everything from anxiety and headaches to insomnia, asthma, and heart disease. What's more, [research suggests](#)

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that it actually curtails inflammation on a cellular level by changing the way certain genes are expressed.

If the idea of sitting still in silence or repeating a mantra makes your skin crawl, don't do it, says D'Adamo: Other types of breathing exercises, such as the 4, 7, 8 technique (breathe in for 4 seconds, hold for 7, and exhale for 8) may also be used to induce a relaxation response.

High intensity interval training (HIIT) — Any exercise you do is great, says D'Adamo. But **HIIT** — which entails alternating brief periods of fast, intense activity with longer, slower recovery periods — is one well-researched technique that promises to burn fat and build muscle with shorter workouts. HIIT tricks your metabolism into staying elevated well after you've finished your workout, which translates to burning mega calories without having to slave away all day at the gym.

According to [a 2016 study](#), people who participated in a super-short interval workout — three sets of a 20-second sprint on a stationary bike followed by two minutes of pedaling slowly — three times a week for 12 weeks saw improvements in their cardiometabolic health that were nearly identical to those reaped by members of another group who had done a 45-minute moderately paced bike ride during each workout session.

Other research suggests that HIIT might even slow the aging process by prompting your cells to make more proteins needed for mitochondria (which power your cells).

Might be right for some

Intermittent fasting — Some intermittent fasters eat only during an eight-hour window each day (the 16/8 method); others fast completely two days of the week (5:2 diet); and others eat at night (Warrior Diet). However you do it, intermittent fasting might sound wacky, but there's actually some evidence that it works — at least for some people.

In one trial that was published in [JAMA Internal Medicine](#), obese adults who were randomly assigned to try alternate-day fasting did in fact lose weight — but so did those who were instead assigned to simply cut back on calories.

We are all unique, and intermittent fasting might work well for some people and not others, says Robin Foroutan, MS, RDN, HHC, an integrative and functional nutritionist and spokesperson for the Academy of Nutrition and Dietetics. If you need to lose weight but struggle with approaches that require you to count calories or cut out specific foods, intermittent fasting might be worth a try — provided you don't have a history of eating disorders, or chronic conditions such as diabetes or heart disease. "I'm a fan of experimenting with different approaches to see how they affect you," says Foroutan.

Foroutan also notes that you don't necessarily have to do an extended fast to reap health benefits: **Research** suggests that not eating for just 12 hours — say, between 8 pm and 8 am — might be enough to give your metabolism a kick.

Keto — The ketogenic diet (aka keto) is a low-carb, high-fat eating plan that forces your body to burn fat instead of glucose for energy. According to one [meta-analysis](#), people who followed a keto diet lost more weight than those who followed a low-fat one.

If you opt to give keto a try, D'Adamo warns that it's not enough to cut

carbs and load up on fat. “I’d advocate for a trial of ‘clean keto,’ meaning it includes healthy foods like leafy greens,” he says.

A few important caveats: Strict keto is often a short-term solution, and readjusting to a more balanced diet afterward will be key to keeping those pounds off. Steer clear of keto if you have kidney or liver problems, and check with your doctor if you have any other chronic conditions.

Probably not worth it

Cryotherapy — Localized or whole-body cryotherapy (cryo or cold therapy) has potential, says D’Adamo: Exposure to super-cold temps may help speed muscle repair and recovery, though research has been mixed. (One [small study](#) found that cold might instead slow muscle growth.) It may also be beneficial for people with chronic pain conditions like rheumatoid arthritis.

That said, cryotherapy is expensive, and a DIY ice bath may also reduce muscle soreness after exercise. Cryotherapy may also be risky for anyone with high blood pressure, neuropathy, or other conditions, and you can get frostbite from it. Cryotherapy may be best left to elite athletes or those with a serious injury or pain under the care of a health professional.

Nootropics — So-called smart drugs like Adderall and Ritalin are definite no-nos for people who haven’t been prescribed them for a medical reason. Side effects like high blood pressure and addiction, among others. Piracetam, a synthetic compound that is available over the counter here but sold by prescription in other countries, is also best avoided by most people, because it has been tested only on those who already have cognitive problems, says D’Adamo.

If you’re intrigued by nootropic brain boosters, you might consider consulting an integrative nutritionist or other expert, says Foroutan. One that has been effective in [some research](#) (much of it industry sponsored) is L-theanine. When combined with caffeine (also considered a nootropic), it may have positive effects on alertness and cognition, including, in one small study, making multitasking easier. You’ll find both in green tea, says D’Adamo. But don’t bother with green tea if you’re sensitive to caffeine or if your doctor recommends avoiding it.

Steer clear

Young blood transfusion — Some biohackers are experimenting with young blood transfusion — as seen on the show *Silicon Valley* — which entails taking plasma from a young, healthy person and infusing it into the veins of an older person who’s hoping to live longer or stave off cognitive or physical decline. In case it wasn’t obvious, this is a very bad idea. Earlier this year, the [FDA issued a statement](#) saying that there is “no proven clinical benefit” to this procedure and that there are “risks associated with the use of any plasma product.”

“You’re opening the door to infusion reactions and diseases like hepatitis C and HIV,” says Reid Blackwelder, MD, past president of the American Academy of Family Physicians.

DNA editing — Some biohackers have been injecting themselves with gene-editing technology called CRISPR. Just don’t.

“CRISPR technology has the potential to correct genetic malfunctions and address clearly defined genetic illnesses,” but it’s not something the

average person should be messing around with, says Blackwelder. “I’m worried they’re going to create a mutation that’s bad.” Bottom line: Leave exploration in this area to the expert scientists.

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