Intermittent fasting: what is it, how does it work – and is it right for you?

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Until its recent emergence as a mainstream health craze, fasting was largely a religious ritual. But then longevity scientists discovered that regularly fasted bodies lived longer, with better metabolic and cardiovascular health. Granted, these bodies mostly belonged to mice, but now Rishi Sunak, Elon Musk and many others are trying intermittent fasting (IF), with influencers singing its praises and apps offering to track your fasts and pepper you with motivational messages.



The first version of IF to break through was the 5:2 diet, popularised by Michael Mosley in 2012, which involves slashing daily calories to 500 or 600 (depending on biological sex) on two non-consecutive days each week. Now, a less drastic regime is taking hold: time-restricted eating, whereby you simply prolong the overnight fast to at least 12 hours. This can mean anything from avoiding snacking after an early dinner to the 16:8 version – cramming all your eating into eight hours.

The logic goes that, back when we were hunter-gatherers and our bodily systems evolved to work in balance, the absence of supermarkets and industrially produced food meant that fasting sometimes happened naturally. The IF lifestyle, it is thought, could help us reset these systems, swerve disease and live longer.

But is it as simple as that? We asked a dietitian and two scientists working in the area.

Can intermittent fasting really be life-changing?

Valter Longo, a biologist at the University of Southern California, has been studying longevity and the effects of fasting on organisms from yeasts to humans for about 30 years. He has demonstrated that fasting can reverse diabetes and increase the effectiveness of cancer therapy (although more research is needed in this area). But what about the worried well, the middleaged seeking healthy old age? “It can make a big difference, but it depends how you do it,” he says.

Ioannis Nezis, a professor of cell biology at the University of Warwick, studies the cellular effects of fasting. He says the answer is a hard yes. “My research is focused on how fasting activates a mechanism called autophagy, which is responsible for the recycling of damaged proteins inside the cells,” he says. “This is beneficial because your cells are clean and function better.”

From a public health perspective, Aisling Pigott, a dietitian and spokesperson for the British Dietetic Association, is less sure. While the potential is exciting, she says, “it is just another idea or diet packaged up in a slightly different format. It is another method or tool for restricting calories, but it’s not going to be this magic answer.” Every day, she witnesses the unique and complex relationships that many people living with obesity, or who want to change their body shape or size, have with food and “that make fasting not the best solution”.

What does it do to your metabolism?

Fasting seems to boost the body's ability to digest and take nutrients from food, without spikes in blood sugar, blood fat, inflammation and insulin. "The metabolism changes because your body starts using the fat deposits that you have in order to produce energy," says Nezis. Meanwhile, when the gut isn't digesting food, the all-important microbiome gets a refresh, resulting in good bacteria flourishing, leading to associated improvements in digestion, immune function, mood, blood pressure and more.

Should everyone be doing it?

No. Fasting is not healthy for everyone – especially children and those who are pregnant or have an eating disorder. "You have to be an adult and it's important to ask your GP first," says Nezis. Many medical conditions could make fasting risky, he says, including low blood pressure, anaemia, being immunocompromised and having problems with your stomach, bowels or gall-bladder. When we eat, our gallbladder empties bile into the digestive tract; when we fast, it holds bile inside for long periods. "It can become concentrated and create 'gallbladder sludge' or gall-stones, which can block your bile duct and cause problems in the liver or the pancreas." If you have a family history of gallstones, you could be more susceptible.

Can it cause eating disorders?

"Hypervigilance towards weight, or very strict rules around foods, are not appropriate for people with a history of disordered eating," Pigott says. Also, using restrictive language in relation to food has been shown to be "related to risk of obesity".

More broadly, she says, the focus on the science behind fasting "moves us further away from people trusting their bodies. We still want somebody else to tell us the magic answer, getting in the way of the basic messages about nourishing and feeding and fuelling our bodies." She is also conscious of people trying restrictive eating in households with young children, particularly "what kind of message that will be sending to them, in a world where we've seen eating disorders explode over the last three to four years".

Nezis says there is certainly a risk of getting carried away: "Sometimes, people start with 16-hour fasts and then they say: 'OK, let's try 24 hours, then 48 …' They get obsessed. People should be careful."

Which choose? routine should you

There is no long-term data on IF, so a lot of it comes down to opinion and what works for each individual. But everyone agrees that closing your eating window a good few hours before bedtime will help you sleep soundly. That said, while an early dinner may work for many, Pigott says: "In some cultures, the family meal is at 10pm, so we have to fit with everybody's lifestyle."

Nezis believes a 16:8 fast, which generally means skipping breakfast, gives you all the benefits. He thinks you can safely fast for up to 20 hours, if it suits you, but Sunak's 36 hours every week is "quite a lot".

Longo, on the other hand, only recommends 12- or 13-hour daily fasts, because we don't have proof of longterm safety. "Skipping breakfast is associated with a shorter lifespan, more cardi-ovascular disease and lots of other problems," he says. "Just because you're doing time-restricted eating, it doesn't mean it's good for you." As for gallstones, he says, an epidemiological study in 1991 found that women who fasted more than 14 hours a day were twice as likely to need surgery related to them: "Some of the big hospitals even have prolonged fasting as a risk factor for gall-stones."

Nezis says that some of this risk is averted if you break your fast with a small meal. "A very big meal will push your gallbladder to function very hard – this is not good. When fasting, you need to

have a balance in everything you do."

What stages does a fasted body go through?

IF apps and gurus often list how many hours or days it takes for various benefits to kick in, such as autophagy and ketosis – whereby you convert fat into energy. But when you talk to the scientists studying this stuff, they are less easily drawn. "Most of the information we have about fasting and the activation of autophagy is based on animal models," says Nezis. Plus, we are all physiologically and behaviourally different. "We are different sizes; it depends on your age."

It is thought that autophagy doesn't fully kick in until around two or three days of fasting. Nezis doesn't dispute this. "However, 16:8 or 18:6 daily fasting for a prolonged period is believed to activate autophagy probably by a cumulative manner," he says. "Overall, more studies in humans are needed to have a clear picture."

Besides, he says, focusing on what is happening hour by hour is missing the point. "You can see the effects of IF on overall health after two or three months. If you do a blood test now and then another after three months of IF, all your blood parameters will be better – cholesterol, sugar, everything."

That said, after about 16 hours, Pigott says, "your body will be producing 'starvation ketones', so you will be starting to break down fat and muscle stores. But everybody's different." Medically speaking, starvation mode doesn't mean starving to death. However, she says, it can often "lead to a kind of fluid loss that can cause short-term weight loss. Like anything, if something is a short-term fix, as soon as you stop doing the fix, you will see a weight regain."

Like Nezis, Longo thinks getting hung up on precise timings and functions is pointless. "Autophagy is just one of those things that happens. It may happen in one cell, it may not happen. It is one of the many mechanisms of cellular repair." In any case, fasting isn't the only way to increase this natural process. Exercise can induce it, too.

How do you get started?

Gradually is best, says Longo. Don't be tempted to go all-in for a quick win. "We take two years to convert people into a healthy state," says Longo of his clinics. "They're diabetic and have cardiovascular disease and hypertension. Take your time, have some small metabolic benefits, insulin resistance will improve, and eventually the small benefits become big benefits. The important thing is that you stick with it."

Is it OK to consume your regular calories in your eating window?

There is no doubt that if you eat fewer calories as a by-product of IF, there can be benefits from that alone. Low-calorie diets extend lifespan and improve cardiovascular health, brain function, mental health and the immune system. "This is 100% verified in animal models and we can see it in several regions of the world where people take fewer calories and live more than 100 years," says Nezis.

According to Longo's studies, you will probably lose weight from fasting even if you have the same calorie intake overall. But he also says: "I don't think that people should count calories – it is pointless. I think people should ask: did I get the right nourishment?" Fasting should never be viewed as a way to enable bingeing on junk food the rest of the time. "That puts you in a potentially dangerous situation, particularly if you're skipping breakfast. Twenty years down the road, it could turn out to be a disaster."

Is it OK to exercise when you have been fasting?

Another woolly area. Pigott urges caution if you are extending an overnight fast towards lunchtime the next day: "You're really limiting the number of hours that you can give your body nour-

ishing foods. If you throw exercise into the mix, you're extending the period where you're not refuelling those muscles." Longo thinks a run is fine after about 13 hours of fasting, as long as you feel fine and have some protein straight after. "As long as you can sustain that run and you don't get hypoglycaemic, there is no reason why you can't do it. Just be careful and don't suddenly start running 10k if you've had no dinner."

As we age, we lose muscle mass, so more care needs to be taken as you get older. "It's important to have a source of protein in your diet in order to be able to maintain your muscles," says Nezis. But, as he points out, muscle wastage is also mitigated by exercise.

Any tips for coping with hunger pangs?

Nezis recommends adding some flavour to water – "lemon juice, or pieces of orange or cucumber, to make it tasty. Overall, drinking water will give you a sense of fullness."

What about mood swings?

"Try to do activities that make you feel good," says Nezis. "If you have mood swings because you want to have chocolate, then do something else that will give you pleasure, like watching a movie or listening to music."

Can fasting really boost your brain power?

As Nezis says, improved brain function generally comes with better systemic health: "When you have cells that have better metabolic rates and less damaged components, they work better, which is especially important for neurons." This is because we are born with most of our neurons and barely make any more once past childhood.

Longo, meanwhile, has mouse data that indicates improvements in learning and memory after fasting, so he says: "Probably yes, particularly if you now sleep better and if your metabolism is better. Keep in mind that diabetes nearly doubles your risk of Alzheimer's disease." He adds that – again in mice – fasting, or a fasting-mimicking diet, can also have an effect on neurodegenerative diseases.

Will all this make you younger?

Look at it like this, says Nezis: "When your overall health is better, you live longer, you live a better life and you feel younger."

You have to be an adult to fast – and it's important to ask your GP first

Ioannis Nezis