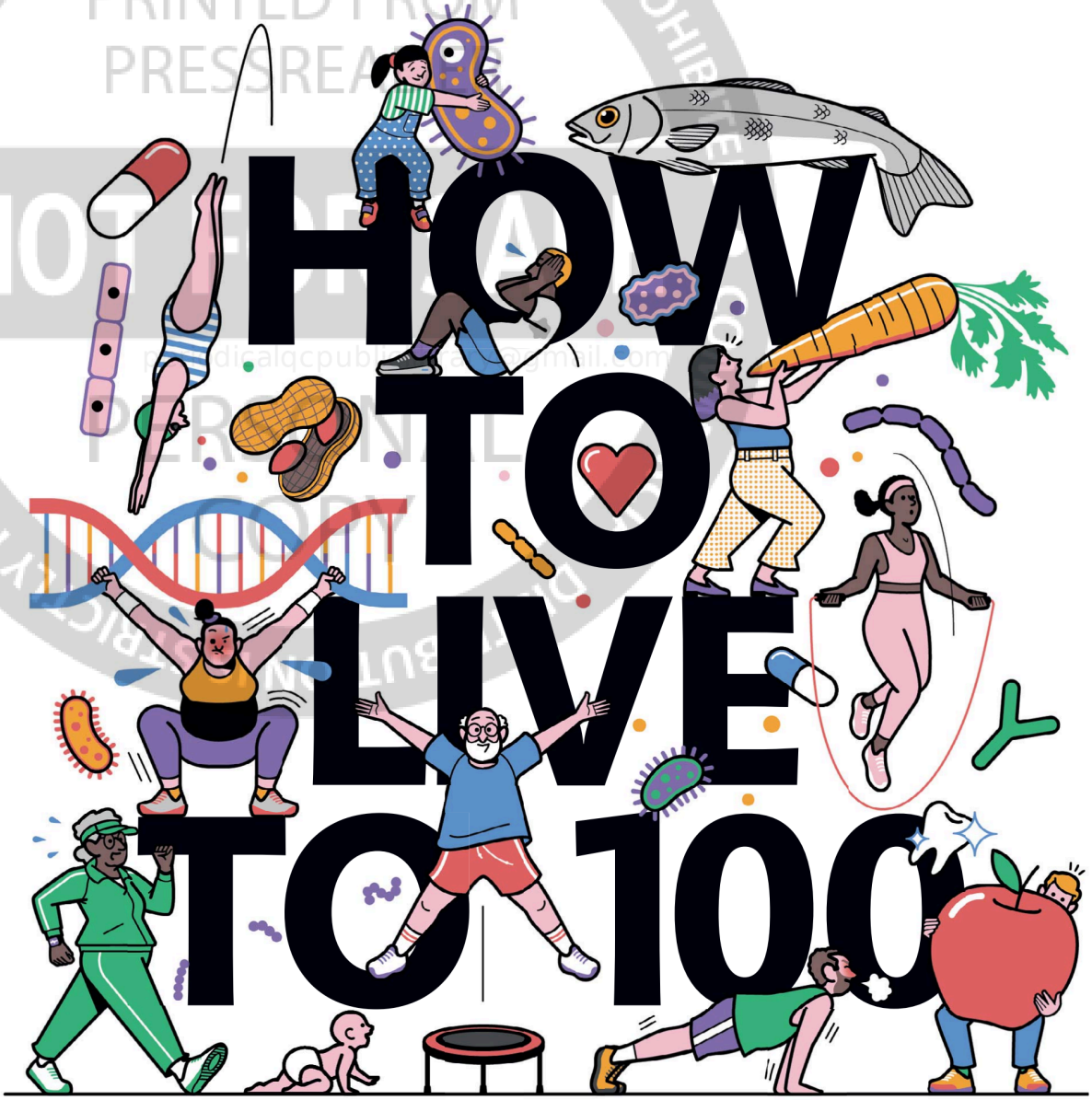
- Longevity



WE LIVE in an exceptional time in human history, with more people than ever now reaching the age of 100. What's more, the science of longevity is revealing the secrets of how to make the extra years as healthy and happy as possible. Of course, some factors – like genes – are out of our control, but habits and lifestyles can extend our lives by decades. Over the next 10 pages, discover how to vitalise and maximise your latter years – and get the inside story on how you can harness your diet, exercise, mindset and more to reach the centenarian club in style.

COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED • PRINTED FROM PRESSREADER

THE EXERCISES THAT WILL HELP YOU LIVE LONGER

"MY SECRET is that I never get off the sofa," said no centenarian, ever. But it is worth noting that the world's oldest people rarely mention punishing fitness regimes, either. Instead, centenarians tend to report a lifetime of regular, moderate exercise, such as walking, farming and gardening.

This exact prescription doesn't fit well into many modern lifestyles, but that hasn't stopped scientists from trying to identify the optimal dose and type of exercise for a long, healthy life.

What is clear is that doing nothing isn't an option. Lack of physical activity has been linked to at least 3.9 million premature deaths globally per year, and it significantly increases the risk of chronic illnesses, including heart disease, stroke and some cancers. On the flip side, getting enough exercise can add up to seven years to your life, while also extending the time you spend in good health.

A rough guide to how much is enough can be found in our evolutionary history. Modern hunter-gatherers, the closest we can get to how our ancestors lived, take around 11,000 to 20,000 steps per day, and get their resistance training from hunting, climbing, digging for tubers and carrying the resources they collect home.

They have lower rates of chronic diseases seen in Western nations, and the reason seems to lie in the body's response to all this work, which results in a surge in internal maintenance and repair. Harvard University evolutionary anthropologist Daniel Lieberman speculates that the reason exercise and physiological upkeep are linked is that evolution tied the two together, so that the genes involved in body repair and maintenance are activated only when we move. If we don't, the body saves energy by letting these functions slide.

Because of the "use it or lose it" aspect of this, a growing number of researchers see exercise not as an "anti-ageing" strategy, but as a way to reverse the life-shortening and illness-inducing effects of a chronic lack of movement, potentially adding healthy years to our lives. "Exercise is one of those strategies that we can adopt in order to optimise the rate at which we decline," says Norman Lazarus, emeritus professor of exercise physiology at King's College London.

So how much will do the trick? Lazarus says that the World Health Organization's (WHO) guidelines are a good place to start. Based on large epidemiological studies, these state that adults should do at least 150 to 300 minutes per week of moderate-intensity physical activity (exercise that leaves you able to talk, but not sing, such as brisk walking), or 75 to 150 minutes at vigorous intensity (running, or cycling in hilly terrain, which leaves you breathing hard and fast), plus strength training done at least two days per week. People aged 65 or over should do an extra strength session and add balance and mobility exercises.

Importantly, none of this has to be in the form of structured exercise. Anything that uses physical strength or raises the heart rate will do the job. And it doesn't all have to come in one session – there is some evidence that multiple workouts are just as effective as longer, more structured ones.

Mikel Izquierdo at the Public University of Navarra in Spain and lead author on a "global consensus" on exercise recommendations for healthy longevity, which was published in January, agrees that the WHO guidelines are a good guide to lowering disease risk and extending lifespan. But, he adds, they may not be enough to guarantee a sprightly old age. "The majority of studies supporting the WHO recommendations focus on reducing disease risk and mortality, rather than functional independence," he says. "The reality is that meeting the basic guidelines doesn't automatically translate into preserved autonomy, especially in populations over 65."

From middle age onwards, says Izquierdo, everyone should get serious about working on their muscle strength. From our 30s on, muscle mass starts to decline, with fast-twitch muscle fibres, those needed to stand up from a chair, for example, taking the biggest hit. If left ›

SAM PEET

"Getting enough exercise can add up to seven years to your life, while also extending the time you spend in good health"

https://www.pressreader.com/uk/new-scientist/20250920/page/38 2/11

unchecked, this loss of strength and endurance can lead to problems with walking, standing and an increased risk of falls and dying of any cause for older people.

Multiple studies, for instance, have shown a link between weaker hand grip strength and a shorter lifespan. However, this doesn't mean you necessarily need to beef up your hands. Grip strength is a proxy for overall muscle strength because it is easy to measure and has been shown to correlate with strength in the major muscle groups, particularly the legs.

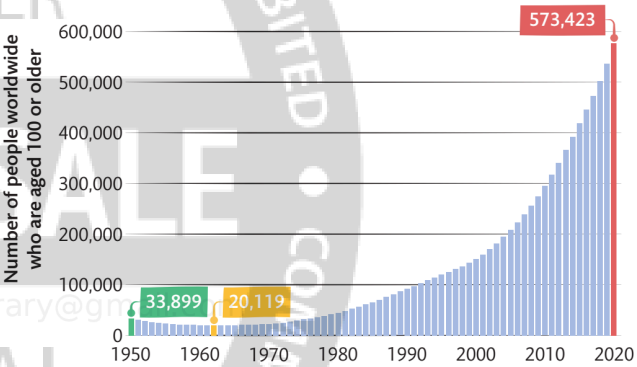
It is also a good idea to work on balance from middle age onwards. According to a 2022 study, people aged 51 to 75 who couldn't balance on one leg for 10 seconds were twice as likely to die within the following 10 years.

Bodyweight exercises such as squats and planks are a good place to start, says Izquierdo, but as muscle loss accelerates, the only way to stay one step ahead of this decline is to gradually increase the load by adding weights or using resistance bands.

Maria Fiatarone Singh, a geriatrician at the University of Sydney, also advises power training: jumping up stairs for those who are more agile, or doing fast leg presses in the gym at 80 per cent of the maximum weight a person can lift. This is because more explosive strength training builds up fast-twitch "type II" muscle fibres, which are the first to be lost during ageing.

Centenarian boom

More people than ever before are living to 100 and beyond.



SOURCE: WEFORUM

"From middle age onwards, everyone should get serious about working on their muscle strength"

It is never too late to start. Power and strength training have helped even frail people in their 90s build muscle, which in turn improved their ability to stand and walk independently. Intriguingly, even the intention to get stronger has some benefit, says Fiatarone Singh. Even if the weight doesn't move much at first, "it is the 'intent' to move fast which sends the message from the brain to the type II fibres to contract which optimally recruits them", she says.

So, all in all, there are many ways that we can fight against the physical decline of ageing. But we should also be realistic, says Lazarus, a keen cyclist who is approaching his 90th birthday.

There is only so much that exercise – or any other intervention – can do. "There are things happening to us over which we've got no control," says Lazarus. Maximal heart rate, for example – an estimate of the fastest rate that should be possible during exercise – is 220 minus age. "The formula doesn't say 220 minus age plus exercise, it says 220 minus time passing," says Lazarus. "You can exercise until the cows come home, you're not going to change that." Even elite athletes lose muscle mass, strength and cardiovascular efficiency with age, no matter how much they train.

"We are all going to die," says Lazarus. "You want to keep functioning as long as possible and die in a year. Not slowly over 40 or 50 years."

Or, as Izquierdo puts it, we should aim to "die young, as late as possible".

Caroline Williams



https://www.pressreader.com/uk/new-scientist/20250920/page/38 3/11

WHAT TO EAT TO ADD A DECADE TO YOUR LIFESPAN

ONE OF the standard questions put to centenarians is: "How do you do it?" The answers often revolve around food. For Maria Branyas Morera, who was the world's oldest person when she died last year aged 117, it was eating three yogurts a day. Jeanne Calment, officially the oldest person to have ever lived (though that has been disputed), put her amazing staying power down to olive oil, chocolate and the occasional glass of port.

Of course, what you eat matters. Diet has a huge influence on your health, and staying healthy is a prerequisite for a long life. But a better question might be: "What didn't you eat?"

For instance, Lars Fadnes at the University of Bergen in Norway and his colleagues have recently devised a longevity-enhancing diet, based on their analysis of a huge dataset called the Global Burden of Disease Study. This revealed, to no great surprise, that typical Western diets – high in refined grains, added sugars, red and processed meats and dairy products, and low in wholegrains, fresh fruit and vegetables, nuts and fish – aren't optimal for longevity. In fact, they are deadly, responsible for 11 million premature deaths a year.

The researchers modelled what would happen if people eating this diet switched permanently to a healthier one, and found a major impact on life expectancy. For example, a 20-year-old woman in the US today can expect to live to 80 on a typical diet eaten there. But if she drastically cut down on meat, sugar, dairy and refined grains and switched permanently to a diet of mostly wholegrains, fruit, vegetables, nuts, legumes and fish, her life expectancy would increase to 89 – a gain of nearly a decade. A 20-year-old US man making the same switch would similarly increase his life expectancy, albeit from a lower starting point, from 76 to 86.

"We gain a lot from increasing whole grains, nuts and legumes, and also reducing sugary foods and meats – processed and red meats in particular," says Fadnes.

And even if your 20th birthday is a long time ago, there are good reasons to still make the change. A 60-year-old US woman making the switch would gain more than seven extra years, increasing her life expectancy from 81.6 to 89. Even an 80-year-old gains a few extra years.

Fadnes also modelled what would happen if people switched to a diet halfway between a Western-style one and the optimal one. They still saw gains in life expectancy, albeit lesser ones.

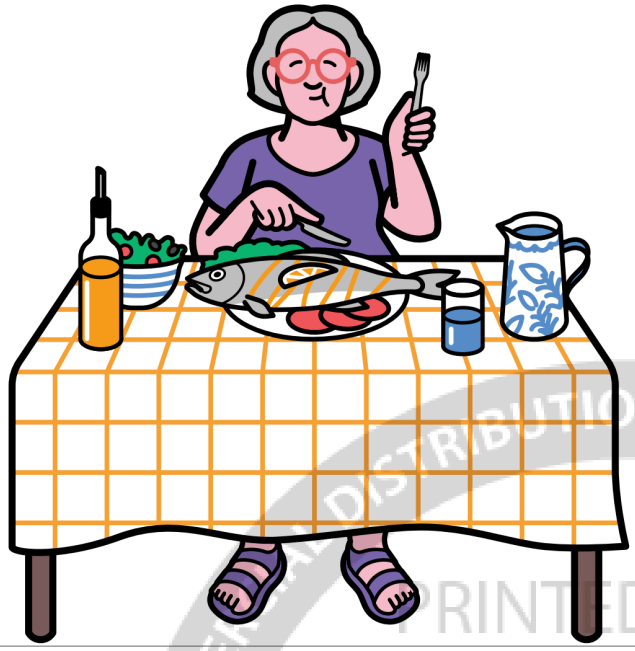
These are theoretical models – a clinical trial of a longevity-promoting diet would take decades to deliver results. But there is real-world data to back the headline conclusion that diet has a big impact on health in later life.

Last year, Zhaoli Dai-Keller at the University of New South Wales in Sydney, Australia, and her colleagues took a deep dive into the dietary habits of thousands of people aged 95 and over who still lived in community settings across east Asia, Australia and western Europe. By definition, these people had aged successfully, and the researchers found that they had earned it.

They were, on the whole, paragons of dietary virtue. Only a quarter drank alcohol, and they mostly ate a balanced and diverse diet rich in fruit, vegetables, white meat, fish and legumes. Something else also stood out, says Dai-Keller. "Salt intake tends to be lower in the centenarians," she says. High salt consumption is a causal factor in cardiovascular disease, the world's biggest killer.

In a similar study, Anne-Julie Tessier and Marta Guasch-Ferré at Harvard T.H. Chan School of Public Health in ›

"We gain a lot from increasing whole grains, nuts and legumes, and also reducing sugary foods and meats – processed and red meats in particular"



COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED
PRINTED FROM PRESSREADER
NOT FOR PERSONAL COPY
PRINTED FROM PRESSREADER

Boston, Massachusetts, and their colleagues reanalysed data from two research projects that followed more than 105,000 people over three decades starting in 1986, as they progressed from middle age into early old age. They were looking for evidence of healthy ageing, which they defined as reaching 70 free from major chronic diseases, as well as being physically fit and mentally sharp.

Only around 10 per cent of the participants achieved that, and when the researchers analysed what they had in common, they found that diet was key. The majority had stuck to healthy Mediterranean-style fare throughout middle age. Those who binged on fatty, salty and meaty foods, on the other hand, rarely aged healthily.

Reaching 70 in good health is no guarantee of getting to 100, of course, but it helps.

However, longevity isn't just about what you eat, but how much. According to the 2024 study led by Dai-Keller, one of the defining features of people aged 95 and over is that they are slim. Around half were a normal weight, and a third were underweight.

Obesity isn't a prescription for making it to 100, it seems. However, when the researchers looked at the ability of their participants to carry out basic daily living activities, they found that being overweight, but not obese, was significantly helpful for day-to-day functioning compared with being a normal weight. Being underweight increased the risk of impairment by around 25 per cent.

Which brings us neatly to one of the methods sometimes advocated for longevity: calorie restriction. One of the most reliable ways to extend the lifespans of laboratory animals is to restrict their preferred calorie intake by 25 per cent or more. However, it is hard for people to do this, and calorie restriction has yet to be proven to work in humans – and even if it does extend life, it might impair the ability to carry out day-to-day tasks.

All in all, though, if you want to give yourself the best chance of living to 100 in the best condition possible, a large slice of the secret is on your plate.

Graham Lawton

'I'm like an Olympian, but for longevity'

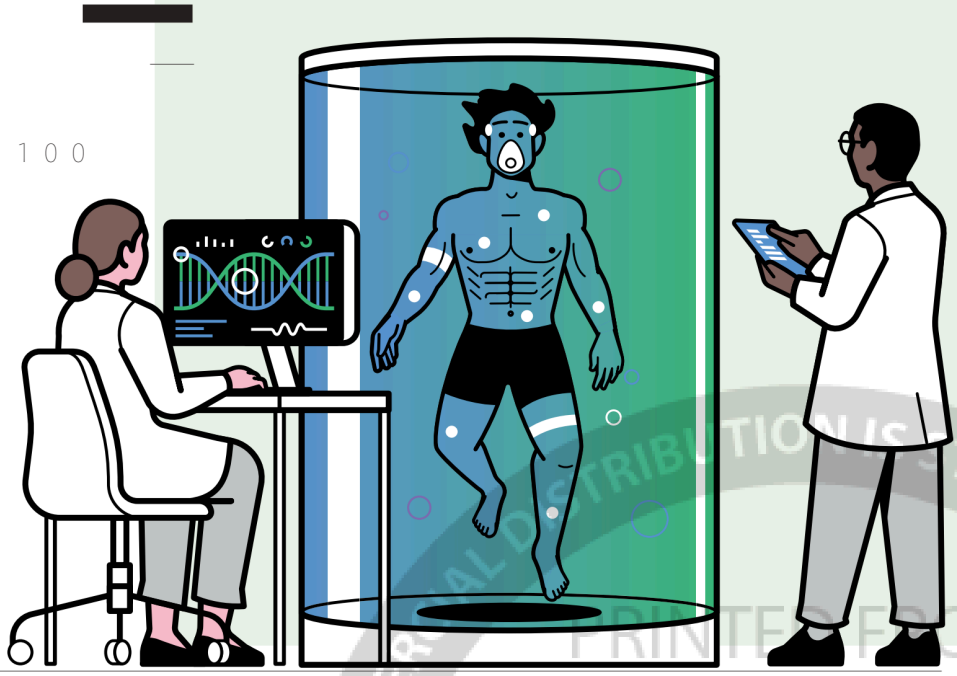
Tech millionaire turned longevity pioneer **Bryan Johnson** is going to extremes to reverse the age of his body. What can the rest of us learn from his radical approach?

BRYAN JOHNSON is finishing his 6.5-hour morning routine when I sign on to Zoom for my allotted 15-minute call (a constraint of what a member of his team describes as his "crazy" schedule).

The tech millionaire is standing in front of a cement wall in his California home, the coldness of which is relieved by green bursts of tropical houseplants. Wearing a helmet-like headset, wires trailing out and down past the screen, together with a black T-shirt bearing the words "Don't Die", the effect is somewhere between a luxury Balinese villa and a VR store designed by Apple.

Immortality has been a human preoccupation for millennia, but it is hard to imagine anyone going to greater lengths to reach for it than Johnson. Take his headset. That's an experiment to improve cognitive function by stimulating certain brain regions with infrared light. He has been using it for 10 minutes a day for the past two weeks "to see if the treatments have measurable effects on my cognition", he says.

The other 6 hours and 20 minutes that Johnson devotes daily to longevity work are spent, variously, measuring his waking body temperature, using serums for hair growth, working out for an hour – cardio, strength, balance – taking a 20-minute sauna, using red light therapy and hypoxia therapy (the latter is a new addition, involving breathing in varying concentrations of oxygen) before eating breakfast. This is a mix of ground nuts, seeds and blueberries, extra virgin olive oil,



https://www.pressreader.com/uk/new-scientist/20250920/page/38 5/11

pomegranate juice extract, cocoa, collagen protein, pea and hemp protein, cinnamon powder, Omega-3, Omega-6, grapeseed extract and macadamia nut milk, among other ingredients. All this is to "follow the data and the science" to turn back the clock.

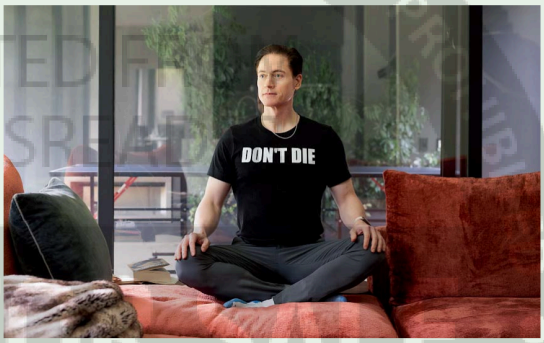
"A lot of people hear this and they think, 'That's crazy'," he says. "The way they can think about it is I'm a professional rejuvenation athlete. I'm like an Olympian, but for longevity."

Johnson, now 48, began his longevity quest after a series of midlife endings: leaving the Mormon church he was raised in; ending his marriage; and selling his mobile payment company. That sale is how he made the millions that fund his endeavours.

In 2021, he announced the start of Project Blueprint, a mission to measure his organs and try to "maximally" reverse the biological age of each. (He also runs a start-up named Blueprint, selling supplements, blood tests and other products, which is the subject of multiple controversies.) Johnson claims that his bone mineral density is in the top 0.2 per cent of all people, his cardiovascular fitness is better than 85 per cent of 20-year-olds and he has the fertility health of a 20-year-old, too.

Going to extreme, and often unevidenced, lengths in the pursuit of a longer life isn't atypical for his tech millionaire cohort. But with a strict routine that entails having his last meal at 11am, Johnson is surely the most extreme player in the longevity game, and he has amassed a team of 30 specialists to assist with the quest. "We try to find people in every domain of expertise... the brain, the heart, protein patterns," he says. "This project really speaks to them because we're very playful, we're very experimental."

"Very experimental" is a fair assessment. Johnson's protocols sometimes involve taking drugs based on limited trials in humans, like rapamycin, originally formulated to act as an immunosuppressant for people after an organ transplant, and which is being investigated for possible anti-ageing effects. Promising results have been seen in mouse studies, but Johnson stopped taking the drug last year after experiencing side effects. His team then also found a study



Bryan Johnson devotes more than 6 hours a day to preventing ageing

indicating that rapamycin may accelerate ageing in humans.

So, is he ever fearful of experimenting with interventions that aren't backed up by solid science? "I would flip that. A lot of people would look at this experiment and say, 'Bryan, but wait, you are at so much risk!' and I say, 'Friend, you are at greater risk than I am because you are experimenting with fast food and staying up late and drinking alcohol and eating toxins'," says Johnson. "Their lives are higher-risk than mine. I am taking fewer risks overall because I eat well, I sleep well and I exercise all the time. I look at them and say, 'Why are you running the experiment to see what happens to you when you eat junk food?'"

If some scientists enjoy Johnson's experiment, others question the semantics used. Richard Siow, director of ageing research at King's College London, notes that certain biomarkers associated with ageing are reversible. Things like indicators of inflammation found in blood, lung capacity, lipid levels, cholesterol and epigenetics are all modifiable, he says. But that doesn't mean that attributing "ages" to them – for example, that someone has the metabolism of a 25-year-old at 40 – is possible. This is because we don't have population-wide datasets drilling into the average biomarkers of people at specific ages. Longevity clinics offering such tests are likely to be basing these on limited datasets, says Siow. "The numbers are good for marketing, but clinically less meaningful."

Unsurprisingly, Johnson's research team disagrees. "Bryan Johnson knows the biological age of his organs through extensive, scientific testing and monitoring... using a variety of methods including MRI scans, ultrasounds, blood work, genetic screening (such as epigenetic clocks), and other clinical tests," wrote one of them in an email. These metrics are shared via X, though they have yet to be analysed in peer-reviewed studies.

Still, Siow is glad that Johnson is willing to self-experiment in a way that couldn't happen in a clinical trial, due to ethical issues, even though it isn't possible to extrapolate from one person to the wider population, he says.

But for all his high-tech experimentation, Johnson's top recommendation for everyone aiming to live to 100 is pretty straightforward: "Lower your resting heart rate before bed," he says. "[This] determines how well you're going to sleep. And how well you sleep determines if you will exercise, and if you exercise, that determines if you will eat well. So [it starts] a positive cascade."

To lower your resting heart rate, he recommends stopping eating 4 hours before bed; taking an hour to wind down before sleep by reading, having a walk or meditating, and avoiding screens; and being mindful of heart rate-raising stimulants like caffeine. "And the biggest one is rumination. Rumination can increase heart rate between five and 25 beats per minute [by thinking about] things you're mad about, worried about, obsessed about."

Johnson takes his own advice to the nth degree. Surprisingly, though, the number of years he has left on the clock is less of a preoccupation than his efforts suggest.

"Johnson's top tip for everyone aiming to live to 100 is pretty straightforward: lower your resting heart rate before bed"

When I ask him how long he expects to live, based on his current biomarkers, he is solemn. "I don't think my life expectancy matters," he says, due to advances in artificial intelligence. Part of his "Don't Die" endeavour is to upload his thoughts to an AI model, meaning that he can exist in some form for an unquantifiable amount of time. "Right now is the first time we are seeing actual immortality being born, where you can in fact train a model on a human... The changes we're going to see with AI will be so dramatic and will happen much faster than my expected 40-to-50-year time span that I have left, that it's really not a relevant question."

Claudia Canavan

PERSONAL DISTRIBUTION IS STRICTLY PROHIBITED. PRINTED FROM PRESSREADER. FOR SALE. COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED.

HOW TO NURTURE THE RIGHT MINDSET FOR LIVING TO 100

H O W

T O

L I V E

T O

1 0 0

"I'M 87. I DON'T FEEL 87, I don't think like I'm 87," declared Elaine Neuwirth on TikTok. "The most important thing is to get involved... interact with other people... have a purpose. Get up and move... Be part of the world."

Her words, now viewed by 3.6 million people and counting, capture the growing scientific consensus that it isn't enough to just eat well and exercise regularly: to live a long life, you must nurture your psychological well-being, too. And while you can't outrun a lifetime of poor dietary choices and a sedentary lifestyle, there is evidence to suggest it is never too late to reap the benefits of making some psychological tweaks.

Let's start with your relationships. To understand their importance, turn to the longest in-depth study of human life ever performed, the Harvard Study of Adult Development. Since 1938, it has followed 724 boys and young men, and more than 1300 of their descendants, to identify what makes people flourish, both physically and mentally.

Mark Schultz, associate director of the study, says one thing stands out: high-quality relationships. It turns out that social ties are powerful predictors of late-life health and well-being. For instance, one analysis of data from the study showed that men who have more positive social relationships and are more involved with their community during midlife have a lower risk of depression and better cognition in late life.

"People we're close to help us figure out solutions to problems; they help us regulate difficult emotions," says Schultz. "Just being near people calms the body in important ways." This is because close relationships positively affect our hormones, our immune systems and even how our genes are expressed.

When people are in good relationships, their wounds literally heal quicker. Several studies published over the past year hint at why. They show, for instance, that having more close friends is associated with a stronger immune system in general and a greater proportion of cells that delay immune ageing – suggesting that sociability can help make the immune system more potent and youthful.

Having close friendships also appears to alter the activity of genes responsible for cellular ageing and several of the systems that help our bodies cope with stress. And since chronic stress is a known driver of heart disease, Alzheimer's and many other conditions, these effects can be significant over the long run. For instance, one analysis of 148 different studies of links between social connectivity and longevity found a 50 per cent increased likelihood of survival for participants with stronger social relationships.

But how many relationships are enough? "If you have no one who's got your back, then going from zero to one will obviously bring huge gains," says Schultz, "but the literature is pretty consistent that larger networks are associated with better health."

A useful test, he says, is to ask yourself who you would call if you woke up sick or scared at night. If no one comes to mind, you may be at risk of loneliness, a driver for depression, heart disease and cognitive decline. Loneliness is so bad for our health that its influence on early death is greater than that of obesity.

"The emotional pain resulting from loneliness can produce the same stress response as a chronic medical condition and thus lead to chronic inflammation and reduced immunity," says Ashwini Nadkarni at Harvard Medical School. "This is why enhancing a sense of community can be so important while ageing."

The good news is that tackling loneliness doesn't require professional help. Clinical psychologist Katherine Schafer at Vanderbilt University Medical Center in Tennessee recommends two steps: find a way to contribute to someone else's life and let others contribute to yours. "Start super small. Did you see a new parent drop a toddler's shoe? Grab the shoe and hand it to the parent. You have positively impacted someone," she says. "Letting people do the same for you, and considering the way they cared, can have a great impact and lead to connections – the antidote to loneliness."

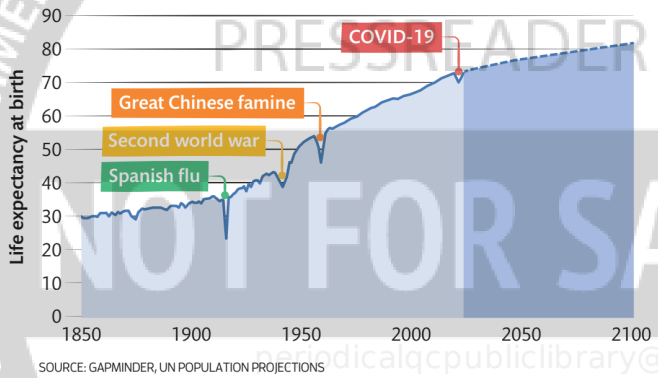
Alongside tending to your social connections, you might also want to consider your sense of purpose. Yes, it may whiff of unscientific woo, but there's growing consensus that purpose – something that gives



https://www.pressreader.com/uk/new-scientist/20250920/page/38 7/11

Global longevity leap

Average life expectancy is now 42 years longer than it was in 1850, and is still rising. This means the number of centenarians is rising, too.



SOURCE: GAPMINDER, UN POPULATION PROJECTIONS

your life direction or makes it feel meaningful – can keep you alive for longer.

Having purpose is associated with a reduced risk of chronic disease and overall mortality. The mechanisms haven't been elucidated just yet, but having purpose is thought to lower stress levels and motivate people to exhibit healthier behaviours. If it doesn't come naturally, though, can finding purpose later in life make a difference?

In 2022, Eric Kim at the University of British Columbia in Canada and his colleagues set out to answer that by analysing data from nearly 13,000 US adults over 50. Participants had their sense of purpose and health measured across eight years. Those who found more purpose in life over that time had higher physical activity, fewer sleep problems and reduced risk of stroke and overall mortality.

It can also help to try to fight back against any negative attitudes you have about ageing itself. A 2022 study of almost 14,000 US adults over the age of 50 found that those who felt most positive about ageing had a 43 per cent lower risk of dying of any cause over four years compared with those who felt the least positive.

Other studies have shown the influence of mindset on health: shifting away from negative thoughts can reduce chronic stress, while becoming optimistic can decrease your risk of heart disease.

Stacking the odds in favour of a long and healthy life was always going to require effort. So, alongside diet and exercise, remember to nurture your psychological well-being. Call a friend, embrace ageing and reflect on what is truly valuable. As Neuwirth says, get up and be part of the world. It might just help you stay in it for longer.

Helen Thomson



WHY TAKING CARE OF YOUR MICROBIOME IS KEY TO A HEALTHY OLD AGE

IF YOU WANT to live to a grand old age, it might help to think of yourself not as a human, but rather a holobiont – a collective of human cells plus the trillions of microbes that live in and on you.

Because it isn't just our own cells that change with age; our microbiome transforms too. And, increasingly, researchers are showing that our friendly – and not so friendly – bacteria and other residents lie at the core of healthy ageing. Nurturing them may be a smart way to live healthier and longer.

More than a century ago, zoologist Élie Metchnikoff speculated that senility was caused by "putrefactive bacterial autotoxins" and recommended fermented milk and a simple lifestyle as a remedy. Today, that early theory has blossomed. We now know that our microbiome is so deeply embedded in our physiology that it influences everything from digestion to metabolism and even brain function.

Yet untangling its impact has been challenging. "The complexity of the microbiome is akin to the complexity of the human brain," says microbiologist Filipe Cabreiro at Imperial College London.

No two people's microbiomes are the same, and even within an individual, it can shift from day to day. But we are gaining some vital clues. We are getting a much better idea, for instance, about which gut residents are beneficial and which are pathogenic. One thing has become clear: diversity is key. The greater the variety of gut microbes, the healthier you tend to be.

Unfortunately, as we age, our microbiome changes, tending to show a decreased abundance of healthy bacteria in later life. Older adults tend to eat less diverse diets, take more medication and have fewer social interactions – all of which have knock-on effects on the types of microbes living in the gut. But even animals raised in identical conditions throughout life show age-related changes in their microbiome, suggesting an intrinsic shift with age.

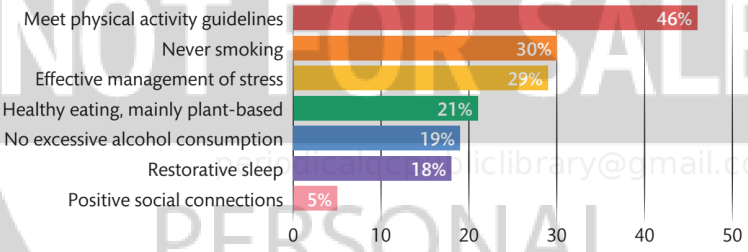
To understand the impact of this decline, many researchers have focused on microbes that produce short-chain fatty acids (SCFA) through the fermentation of dietary fibres. SCFAs are involved in many beneficial processes, such as maintaining the cells in our gut lining, suppressing ›

COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED • PRINTED FROM PRESSREADER • NOT FOR SALE • periodicalqcpubliclibrary@gmail.com • PERSONAL COPY

COMMERCIAL DISTRIBUTION IS STRICTLY PROHIBITED
PRINTED FROM PRESSREADER
NOT FOR SALE
PERSONAL COPY

Lifestyle habits to boost longevity

Adopting certain healthy habits can extend your life by decades, according to a large US study. A 40-year-old who adheres to these habits can expect to live more than 20 years longer than a person who adheres to none of them



SOURCE: AMERICAN JOURNAL OF CLINICAL NUTRITION

inflammation, regulating our immune system's response to pathogens and controlling blood sugar levels.

As we age, the number of microbes making SCFAs reduces while the pro-inflammatory ones increase. "This imbalance is thought to contribute to chronic, low-grade inflammation, a state known as inflammaging, which is associated with higher risk of conditions such as cardiovascular disease, dementia and stroke," says Jessica Schneider, chief scientific officer at Corundum Systems Biology, a company in Tokyo, Japan, that invests in research.

However, the gut microbiomes of people who reach extreme old age seem to be better able to resist this decline. Key evidence of this comes from a 2023 study of 1575 people aged between 20 and 117 by Shifu Pang and Xiaodong Chen of Guangxi Medical University in Nanning, China, and their colleagues. The study found that, compared with adults aged 66 to 85, the gut microbial signature of those aged 100 to 117 was more similar to that of young people, with higher diversity and greater abundance of beneficial bacteria from the Bacteroides phylum. "Our results strongly suggest that the gut microbiota signatures of centenarians show similarity to those of young people, the researchers concluded, and speculate that this factor contributes to longevity.

> "The gut microbiota signatures of centenarians show similarity to those of young people"

This raises the question of whether we can nurture our microbiome to age better.

Changing your gut microbes isn't easy. "You're trying to introduce a complex community into another complex community that tends to be strong," says Cabreiro. Nevertheless, while prebiotics, supplements which provide food for helpful gut microbes, and probiotics, gut-friendly microbes that you can take as a supplement, may not fundamentally reshape the microbiome, they might give it a nudge in the right direction, at least temporarily.

For instance, last year, nutrition company Zoe showed in a randomised trial that its prebiotic, with 30 plant-based nutrients, increased beneficial bacteria, with some improvements in health measures such as inflammatory compounds in blood.

Another study, of 50 adults living in nursing homes, showed that taking a daily prebiotic containing the plant-



PRINTED FROM PRESSREADER

derived compounds fructooligosaccharides and inulin over 13 weeks improved measures of frailty compared with a placebo.

Dietary changes may be just as effective. When older adults across several countries adopted a Mediterranean diet for one year, those who adhered most closely retained more microbial diversity and boosted gut microbes linked with healthy ageing. This correlated with many improvements to their health, says Schneider, such as better walking speed, strength and memory.

More radical treatments are also being explored. Faecal microbiota transplants have already been approved for *Clostridium difficile* infections, and promising data shows they could also treat other conditions, but whether such approaches can extend lifespan remains an open question. In animals, swapping out an old microbiome for a younger, healthier one has striking results – older killifish live 37 per cent longer if they have eaten the faeces from younger fish, for instance. Mouse experiments show similar gains.

But the field is still in its infancy, says Cabreiro. We have much to learn. Microbial activity affects many biological pathways associated with ageing, including those in mitochondria, metabolism and the immune system, and we are only just beginning to explore how we might manipulate our microbes, through diet, drugs or even CRISPR gene-editing technologies.

"It's early days, we haven't figured it all out properly," says Cabreiro, "But there's excitement about how this can all benefit our health and longevity – and rightly so."

HT

H O W T O L I V E T O 1 0 0

THE SECRET SAUCE TO GETTING TO 100

MY PARENTS are both in their 80s and are fit and well for people of their age. I would like them to be around for many years longer. But how do you get from your 80s to 100 and beyond?

Good fortune plays a big part: avoiding fatal accidents or deadly infectious diseases and living in a peaceful country with clean water and a good healthcare system. It also helps if you win the genetic lottery. Women are much more likely than men to notch up a century: more than three-quarters of centenarians are female, and the list of the oldest-ever humans is utterly dominated by women.

Longevity also runs in families, and geneticists have identified hundreds of gene variants associated with living to a ripe old age. Research on twins and family trees suggests that the biological traits associated with extreme longevity are about 30 per cent heritable. Most of these genes appear to confer unusual levels of protection against the diseases of old age, such as cardiovascular disease, according to Nir Barzilai, who studies "superagers" at the Albert Einstein College of Medicine in New York City.

The best way to tell if you have got a longevity-promoting genome is to look at your parents, if this is possible. There isn't a whole lot you can do about your DNA, but the good news is that there is still plenty of scope to actively intervene. That might suggest a life of virtuous restraint – good diet, lots of exercise and sobriety. Surprisingly, however, these don't appear to make much difference, at least in people who have already attained exceptional longevity.

A 2011 study dug into the lifestyles of 477 Ashkenazi Jews who had made it to 95 and were still living independently. Three-quarters of them were women; the oldest was 109. The researchers collected data on their diet, physical activity, smoking, alcohol consumption and body mass index, and compared this to a representative sample of the general population born at the same time, most of whom had already died. There were no significant differences. The survivors were just as likely as their deceased peers to have drunk alcohol regularly, had similar BMIs and done similar amounts of exercise.

But don't read too much into that, warns Barzilai. Among these very old people will be a disproportionately large number of the lucky few who inherited a great set of longevity genes and can withstand all sorts of insults that would do the rest of us in.

For mere mortals, a healthy lifestyle is absolutely crucial to keeping going after 80. "There are four things," says Barzilai. "Optimise your exercise, your sleep, your diet and your social connectivity." Strength and flexibility exercises become increasingly important in older age, and 8 hours sleep is a good target. Eating a Mediterranean-style diet plus ›



"Women are much more likely than men to notch up a century: more than three-quarters of centenarians are female, and the list of the oldest-ever humans is utterly dominated by women"

New Scientist Live

Can we eat our way to happiness?
Hear Emily Prpa reveal more about the gut-brain connection on 18 October **newscientist.com/nslmag**

Longevity hacks

Here are five simple but lesser-known things you can do now for a healthier older age.

Sit on the floor

Sitting on the ground isn't just for children. Getting up and down from the floor strengthens leg and core muscles and keeps joints flexible. What's more, the ability to do this as an adult is linked to a significantly longer life. If possible, try getting up without using your hands for an extra challenge.

Floss your teeth

Let your oral hygiene slip, and harmful microbes from your mouth can travel all over the body, triggering problems – from cardiovascular disease and cancer to Alzheimer's disease and arthritis. Keeping your oral microbiome in balance, however, staves off decline.

Train your nose

A declining ability to detect aromas is linked to conditions such as Parkinson's and Alzheimer's. Restoring this neglected sense might not only reduce cognitive decline, but studies also show it could reverse it – and the ability to smell is something that can be trained.

Have sex

"A fulfilling sex life is an essential part of subjective well-being" was the conclusion of one review of research into the link between the sex lives of people aged 40 to 90-plus and how positively they felt about themselves.

Mix with younger people

Aside from any psychological benefits, your microbiome will get a boost from mixing with younger people. Our gut microbiomes are shaped by those of the people around us, and a shift to a more youthful profile is linked to better health.

intermittent fasting, such as the 16:8 diet, is also very effective, he says.

How we look after our cognition also matters. This is the finding of a 2024 study of the life-course pathways that lead to exceptional longevity, which followed 547 people from the Lothian Birth Cohort study for 24 years after they reached the age of 79. The research revealed that cognitive ability in later life was an important predictor of survival in the oldest participants, having more impact on longevity than their physical functioning.

This highlights the importance of making our brain "fitter" throughout our lives by building new brain connections or "cognitive reserve". However, the Lothian study found that three early life factors – childhood social class, IQ at age 11 and length of time spent in education – were key contributors to higher cognitive function aged 79.

Social connectivity is perhaps the surprise ingredient. A few years ago, Boo Johansson and Valgeir Thorvaldsson at the University of Gothenburg in Sweden dug into data collected on 699 octogenarian, nonagenarian and centenarian Swedes who had subsequently died to see what distinguished those who made it only to their early 80s from those who kept going through into their late 80s and beyond. Predictably, they found that a healthy lifestyle increases the likelihood of living longer. But social factors also scored very highly. "Perhaps the most striking finding, at least for the general public, was the relative importance of what might be called 'softer' factors," says Thorvaldsson. "Higher life satisfaction and stronger social connections."

People over 80 who had people to talk to and felt part of a friendship group survived longer than those who lacked company or felt abandoned. The closer and more emotionally rewarding those connections, the better.

Life satisfaction also had a major impact. This was measured by the responses to 13 statements such as "As I grow older, things seem better than I thought they would be" and "When I think back over my life, I didn't get most of the important things I wanted."

Other researchers have also found that low life satisfaction is a major risk factor for earlier death among men in their 80s. "We were not surprised to find an association between life satisfaction and mortality, but we were quite surprised by the magnitude of the effect," says lead researcher Phil St John at the University of Manitoba in Winnipeg, Canada.

Good social connectedness and life satisfaction aren't always easy to engineer, but there is another route to healthier ageing, says Barzilai. "There are four drugs that can be repurposed to treat ageing," he says. These are the diabetes drugs metformin and the SGLT2 inhibitors, GLP-1 agonists like the weight-loss or diabetes drugs Ozempic and Wegovy, and the osteoporosis drug zoledronic acid.

These medicines were developed for specific conditions, but they also happen to target the biology of ageing in general. "All the evidence is that you take them at an old age and prevent a variety of diseases and also overall mortality," says Barzilai – though whether your doctor will prescribe them to "treat" ageing is a different matter. ▮

GL

