National Geographic, Life Span/Health Span. – Jan. 19, 2024
By Dina Fine Maron

It's not your life span you need to worry about. It's your health span.

Unlocking the secrets for living more years disease-free is increasingly the target for longevity researchers.

We're living much longer than our ancestors, but is that always a good thing?

With many people living well into our late 70s or beyond, more of us are also spending a greater portion of our lives—sometimes a decade or more—saddled with physical and mental health conditions that can make it challenging to accomplish the tasks of daily life.

Improving the quality of our twilight years is a growing area of inquiry among biologists and other longevity researchers who are working to boost the number of our disease-free years, a concept formally known as health span.

That term first showed up in medical journals more than 30 years ago, loosely defined as years free of disease, but the concept has become more mainstream among clinicians and patients alike, and its definition has broadened to focus more on the years without health conditions that would severely impede daily activities. Treated hypertension, for example, wouldn't significantly affect health span, unlike a stroke or dementia, says Harvard Medical School physician-scientist Sharon Inouye, who focuses on aging issues.

(*Can aging be cured? Scientists are giving it a try.*)

The targets of researchers like Inouye are numerous: understanding the underlying mechanisms for aging, working to identify health-promoting genes, and zeroing in on steps we can take in our daily lives to improve our health span.

GENETIC LESSONS FROM OUR 100-YEAR-OLD ELDERS

It's certainly possible to live healthier even as we live longer.

Nir Barzilai says we can learn as much from looking at the health and longevity of the centenarians he works with at Albert Einstein College of Medicine in the Bronx, New York. In academic parlance, his healthy study participants have what's called compression of morbidity—they're sick for a very small portion of their lives.

"They don't just live longer, they live much healthier—they got diseases 50 years after their friends and 30 years after their children's friends."

But how can the rest of us get there?

National Geographic, Life Span/Health Span. – Jan. 19, 2024
By Dina Fine Maron

Some of those centenarians' good luck comes from envy-worthy genetics. Studying their genetics is tantalizing, he says, since pinpointing which genes are linked to age-related disorders could lead to drugs that mimic their effects for those who weren't as lucky in the genetic lottery.

Barzilai's research has particularly focused on the genes that modulate our "good" cholesterol to help us stay healthier in a variety of ways. His centenarian study participants are much more likely to have a specific variant of the cholesterol-controlling CETP gene, and those patients tend to live longer with better brain function, he says.

Emulating that gene's effects is now a target of ongoing research. With such drugs in our arsenal in the future, Barzilai says, humans can and will improve their health span—particularly if they follow current recommendations for modifying diet, exercise, and social interactions.

LIFESTYLE TIPS TO LIVE HEATHIER, LONGER

Overall, the most cutting-edge developments when it comes to health span depend on your perspective, says Inouye, who also directs the aging brain center at Harvard-affiliated nonprofit Hebrew SeniorLife.

"If you talk with a longevity researcher, they will wax eloquent on the latest drugs being studied to enhance longevity—mostly in non-human models or animals at this stage," she says, adding, "to me, the most important work in health span focuses on the importance of prevention."

Eating a diet rich in fruits and vegetables and low in carbs is important, Inouye says, alongside keeping mentally active and socially engaged with activities like volunteering, regular aerobic and strength exercise, and avoiding tobacco and excess alcohol. Recent research in *JAMA Internal Medicine*, where Inouye serves as editor in chief, shows that diet, exercise, brain games, and other steps can significantly help preserve brain health.

Good sleep also remains essential, even if it's something you need to continually work on, adds geroscientist Matt Kaeberlein, formerly of the University of Washington and now CEO of the Seattle-based biotech Optispan. Poor sleep increases the risk of developing numerous disordersincluding type 2 diabetes, high blood pressure, heart disease, poor mental health, and even early death, according to the U.S. Centers for Disease Control and Prevention.

(*How scientists are unlocking the science of sleep*.)

The broad strokes of a healthy diet are well-documented, but different strategies may work better for certain individuals, Kaeberlein adds. Whether it's a Mediterranean diet, which is high in fruits, veggies, and whole grains, or approaches like intermittent fasting or a low-carb, high-fat ketogenic diet, Kaeberlein says, there should always be a focus on what feels right for you.

WHAT DO LONGEVITY RESEARCHERS DO FOR THEMSELVES?

Scientists steeped in the latest research on the biology of aging don't all adopt the same lifestyle choices themselves, and some even make personal choices that step outside the bounds of what the U.S. Food and Drug Administration has approved, which may come with some unknown risks.

National Geographic, Life Span/Health Span. – Jan. 19, 2024
By Dina Fine Maron

At age 68, Barzilai's health regime includes daily exercise, intermittent fasting, good sleep, maintaining social activities, and taking a widely prescribed diabetes drug called metformin that some aging researchers believe attenuates age-related diseases. In animals, the drug appears to work partly by improving the body's response to insulin with knock-on effects for cellular aging and combating cognitive decline. Barzilai says he takes the medication off-label since the FDA hasn't approved the drug to specifically treat aging.

(*Can fasting help you live longer? Here's what the science says.*)

Kaeberlein, who's in his 50s, has turned to a different off-label medication, an immunosuppressant called rapamycin that was originally approved by the FDA for organ transplant patients. When taken in low doses, Kaeberlein says it essentially tricks cells into turning down growth-promoting signals and turning up stress resistance, which then seems to halt or even reverse cognitive and functional declines in animals. His research as co-director of the long-term Dog Aging Project and other work in animals suggests that it shows promise: In mice, for example, the drug can expand life spans by as much as 60 percent.

But results in rodents often are not replicable in humans. Moreover, since these drugs aren't yet approved for age-extending use in humans, the data on potential long-term side effects in otherwise healthy people remains unknown.

People should weigh the risks and benefits of taking any medication and decide what makes sense for them in consultation with their doctors, Kaeberlein says.

GET TO KNOW YOURSELF BETTER

Beyond experimental drug approaches, Kaeberlein says a lot of progress in this space could simply come from better self-monitoring with more baseline health data about our own vitamin deficiencies, hormones, and blood sugar, among other factors.

Asking your doctors to measure those baseline indicators in your 30s or 40s could better inform what actions to take later in life and let you know if urgent interventions are needed, Kaeberlein says, though he notes that often such testing isn't covered by health insurance in the United States.

Simply popping a daily multivitamin to stave off or address unknown vitamin deficiencies is not a good idea, he cautions, since it doesn't allow people to know if they truly had deficiencies—and, if they do, multivitamins may not have the appropriate level of supplements to address an individual's specific need.

(*Not everyone should be taking a multivitamin.*)

MAKE FRIENDS AND CALM YOUR MIND

Another key pillar for expanding your health span is connectedness with one another and with yourself. Even if you routinely interact with at least one person that you live with, like a spouse, other social relationships and experiences remain important in our old age.

National Geographic, Life Span/Health Span. – Jan. 19, 2024
By Dina Fine Maron

"Right now, without taking any drugs, we can basically maximize our exercise, our nutrition, our sleep, and our social connectivity. Those are the four things that anybody who wants to can do," says Barzilai.

Activities like joining a walking group or joining a group focused on hobbies you already enjoy can make us healthier, according to the National Institute on Aging. Unsurprisingly, the benefits are myriad for mental and physical health, and may include lowering risk of dementia, heart disease, and stroke.

When we're out in the world, even if it's just walking our dogs (assuming we avoid falls), it also increases happiness and exercise. Volunteering, tutoring, or other meaningful activities that keep our brains active and involve social interactions as well can be personally fulfilling, and are linked to improved memory and reduced stress.

(Do pets really make people happier and healthier?)

"Even if you struggle with interpersonal relationships," Kaeberlein says, you can also focus on inner peace and wellness. Some people find meditation and mindfulness practices quite useful even if you don't have the interpersonal connection dialed in, he says.

People who have a great mindfulness regimen should still try to make friends, he says. "I'm trying to work at it, and I think it takes effort for some people who have neglected it in life," he says. "There's a lot to be gained from rebuilding those relationships."