A simple blood test could indicate how long you might live

Researchers are developing a simple blood test that could assess your health span and lifespan. Image credit: Santi Nuñez/Stocksy.

- **Intrinsic capacity is the sum of a person's mental and physical capacities, and is a measure of aging.**
- **Maintaining physical and mental function is a cornerstone of healthy aging.**
- **Formerly, assessing intrinsic capacity has been a costly and time-consuming process.**
- **Now, researchers have developed a method for assessing intrinsic capacity and age-related decline from a single drop of blood or saliva.**

- **They suggest that their test could be used to track aging and guide targeted interventions to maintain mental and physical function as people age.**

Intrinsic capacity (IC) is defined by the World Health Organization (WHO)Trusted Source as "all the physical and mental capacities that a person can draw on and includes their ability to walk, think, see, hear and remember."

A person's intrinsic capacity is influenced by a number of factors, including the presence of diseases, injuries and age-related changes.

Maintaining your intrinsic capacity is key to healthy aging. However, measuring intrinsic capacity has, until now, required sophisticated equipment and trained personnel.

A new study has found that measuring DNA methylationTrusted Source in blood samples to assess intrinsic capacity effectively predicts all-cause mortality.

The study, which is published in *Nature Aging*Trusted Source, suggests that the IC clock could be a useful tool for tracking aging and guiding targeted interventions to maintain function in older age.

Thomas M. Holland, MD, MS, a physician-scientist and assistant professor at the RUSH Institute for Healthy Aging, RUSH University, College of Health Sciences, who was not involved in this study, commented for *Medical News Today* that:

"A blood- or saliva-based test for intrinsic capacity, known as DNAm IC, is a very promising tool in aging science. […] This test uses DNA methylation patterns, chemical tags that regulate gene activity, to estimate your IC biologically, offering insights into how well your body is functioning compared to your chronological age."

"One of the most critical aspects is that this test can be done with a simple blood or saliva sample, making it accessible and noninvasive. It tells us not just how old you are, but how well you are aging, which is much more meaningful to help inform which interventions should be implemented, if any, to help prevent future health problems," Holland explained.

Elena Rolt, MSc, DipION, IFMCP, a Registered Nutritional Therapist and Functional Medicine Practitioner and cofounder of Health Miro, who was not involved in this research, also welcomed the findings.

“The DNA methylation-based intrinsic capacity (DNAm IC) test shows significant potential as a practical measure of biological aging,“ Rolt told *MNT*. “Unlike traditional epigenetic clock based tests, it also captures functional aging more directly.“

“As it reflects immune aging, physical capacity and lifestyle-related risk factors, this test may be particularly relevant for personalised aging interventions and preventive strategies,” she added.

“However,” Rolt cautioned, “its use should be complementary to other markers — e.g. PhenoAge, GrimAge, functional tests — and its utility in clinical practice will depend on further validation.”

Blood and saliva samples shed light on cellular aging

Using data from 1,014 people from the INSPIRE-T cohort, aged between 20 and 102 years, the researchers developed an IC score using five aspects of age-related decline:

1. cognition
2. locomotion
3. sensory (vision and hearing)
4. psychological
5. vitality.

From blood and saliva tests, the researchers collected data on DNA methylationTrusted Source — a process that activates or deactivates genes. DNA methylation changes over time because of developmental mutations and environmental factors, and abnormal methylation patternsTrusted Source have been linked to several diseases.

They used this, and the age-related decline data, to construct an epigeneticTrusted Source predictor of IC (an "IC clock," or DNAm IC), then evaluated associations between the IC clock and mortality.

The researchers found that DNAm IC was strongly associated with overall health. People with the highest DNAm IC had better lung function, faster walking speed, greater bone mineral density and were more likely to view themselves as healthy.

And people with a high DNAm IC lived, on average, 5.5 years longer than those with a low DNAm IC.

Holland told us this was a very significant finding: "Scientifically, this reflects strong associations between high IC and better immune function, lower chronic inflammation, and reduced risk for diseases like hypertension, heart failure, stroke, and other age-related conditions."

"Simply," he added, "if your body is functioning well internally you are more likely to live longer and stay healthier. This test doesn't just give a snapshot of your current state; it may also offer a glimpse into your future health."

Can you improve your intrinsic capacity?

In everyone, intrinsic capacity declines with age, but there are measures that can help to slow that decline.

This study found that people with a high dietary intake of oily fish, and sugar intake that was within recommended guidelines (no more than 5% of total energy intake), were more likely to have a high DNAm IC.

Tunç Tiryaki, board-certified plastic surgeon and founder of the London Regenerative Institute, who was not involved in the recent study, explained the association:

"Oily fish are rich in long-chain omega-3 fatty acidsTrusted Source (EPA and DHA), which have anti-inflammatory, neuroprotective and mitochondrial-supportive properties. These mechanisms are closely aligned with domains of IC such as vitality and cognitive

function. Omega-3s also modulate gene expression related to immune responses and cellular senescence, pathways shown to be enriched in the DNAm IC signature."

"Conversely, excessive sugar intake is known to accelerate glycation, oxidative stress, insulin resistance and chronic inflammation, all of which impair IC," Tiryaki told *MNT*.

"Staying within recommended sugar limits likely supports metabolic flexibility and reduces inflammatory burden, preserving cognitive and physical function. These dietary factors likely influence DNAm IC by modulating epigenetic regulation and immune aging, thus helping maintain functional capacity," he detailed.

How to extend your healthy life years: Expert tips

Holland, Tiryaki, and Rolt recommended a number of measures to help ensure healthy aging. These include:

- following a healthy diet, such as the MIND or Mediterranean diet, that is rich in fresh fruit and vegetables, wholegrains, and healthy fats, such as those found in nuts, olive oil and oily fish
- regular physical activity, including aerobic activity, strength training and balance exercises; Tiryaki emphasized that physical activity "supports locomotion and vitality and influences mitochondrial function and immune health, both of which are linked to IC"
- cognitive and social engagement — keeping your brain stimulated and maintaining social networks are both associated with healthier aging.
- ensuring that you manage stress and any chronic diseases.

Holland told us that the DNAm clock was a major advance in functional aging science: "It links molecular biology with real-world outcomes like mobility, cognition and lifespan. While further validation is needed, especially in older adults with low IC, this study lays the

groundwork for using personalised epigenetic markers to guide interventions in preventive geriatrics, longevity medicine and precision public health."

"DNAm IC reflects not only how long you might live, but how well you might function, and that shift in focus is central to meaningful longevity."

– Thomas M. Holland, MD, MS

Everything in moderation, or "pan metron ariston," as the ancient Greek saying goes. And when it comes to matters of health, a similar philosophy is often touted as the best strategy — whether this be nutrition or exercise.

More and more research shows that staying active is the key to a longer, healthier lifeTrusted Source. But what about intense physical activity? Could professional athletic performance do more harm than good? Or can this intense training actually contribute to an increased life span?

In this episode of In Conversation, we turn the focus to all things extreme exercise and longevity. Based on the findings of a recent study, which found that a select group of elite runners could live around five years longer on average than the general population, *Medical News Today* editors Maria Cohut and Yasemin Nicola Sakay discuss the probable biological mechanisms behind how more extreme forms of exercise, such as 4-minute mile running, affect longevity with an expert in cardiology.

Does putting the human body under a lot of stress, such as in professional sprinting or long-distance running, impact life span? Is there such a thing as too much exercise or too intense? This podcast episode aims to find the answer to the question, "Can extreme exercise prolong our longevity?" and more.

Recent research indicates that extreme exercise may help prolong life span in some people. | Illustration by Andrew Nguyen for Medical News Today

Everything in moderation, or "pan metron ariston," as the ancient Greek saying goes. And when it comes to matters of health, a similar philosophy is often touted as the best strategy — whether this be nutrition or exercise.

More and more research shows that staying active is the key to a longer, healthier lifeTrusted Source. But what about intense physical activity? Could professional athletic performance do more harm than good? Or can this intense training actually contribute to an increased life span?

In this episode of In Conversation, we turn the focus to all things extreme exercise and longevity. Based on the findings of a recent study, which found that a select group of elite runners could live around five years longer on average than the general population, *Medical News Today* editors Maria Cohut and Yasemin Nicola Sakay discuss the probable biological mechanisms behind how more extreme forms of exercise, such as 4-minute mile running, affect longevity with an expert in cardiology.

Joining the conversation is Michael Papadakis, MD, MRCP (UK), president of the European Association of Preventive Cardiology (EAPC), professor of cardiology at St George's, University of London, honorary consultant cardiologist at St George's University Hospitals National Health

Service Foundation Trust, and consultant cardiologist at Cleveland Clinic London in the United Kingdom.

Papadakis shares easy-to-follow advice on how to incorporate more physical activity into our daily lives while discussing the potential health risks and benefits of running and similar forms of professional athletic performance.

News Source:

https://www.medicalnewstoday.com/articles/what-to-know-about-the-blue-zone-diet-and-other-healthy-habits-for-longevity