The Four Factors That Influence Biological Aging

Sex, body mass index, smoking and depression all affect biological age.

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A new report from eLife suggests that male sex, smoking, being overweight and suffering from depression all increase biological, or physiological, age, which refers to how old a person's body functions or behaves (as opposed to chronological age).

For the study, researchers evaluated blood samples from nearly 3,000 people taking part in the Netherlands Study of Depression and Anxiety.

Next, scientists used computer modeling to generate discrete signs of biological aging based on five values: the length of telomeres (little caps on the end of chromosomes that shorten as people grow older), epigenetics (chemical changes to DNA), gene levels and changes to metabolites and proteomics (proteins expressed by a genome).

Researchers linked these five indicators to sex and lifestyle factors as well as physical and mental disorders, such as depression.

Investigators determined that only three of the five criteria for biological aging significantly interacted in humans to the point that an increase in one indicator also matched an increase in another. In addition, researchers noted overlapping and distinct links between certain signs of aging and particular lifestyle factors or diseases.

Findings revealed that the factors most consistent with more advanced biological aging were male sex, having a high body mass index (BMI), smoking and having metabolic syndrome, a cluster of conditions that occur together and increase one's risk for heart disease, stroke and type 2 diabetes.

Additionally, measurements of epigenetics, gene levels and proteomics linked depression to more advanced aging, which suggested that mental and physical health affect biological age.

"Our work suggests that biological aging indicators largely track distinct but partially overlapping aspects of the aging process," said Brenda Penninx, PhD, a professor of psychiatric epidemiology at Amsterdam UMC and the study's senior author.

“Taken together, our findings contribute to the understanding and identification of biological age determinants—important for the development of outcomes for clinical and population-based research,” she added.

For related coverage read, “Despite His Advanced Age, Justin Gatlin is a Peak Performer” and “Smoking May Speed Up Your Biological Clock.”

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