

Young Cancer Survivors May Age Faster at the Cellular Level and in Brain Function

The good news is that young survivors may be able to reverse the accelerated aging, according to a researcher with the new study.

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Survivors of childhood cancer show accelerated aging at the cellular level and in [brain function](#), such as memory, attention and information processing, according to a new study published in [Nature Communications](#). The study, led by investigators at the University of Rochester Wilmot Cancer Institute and St. Jude Children’s Hospital, adds to ongoing research on the long-term effects of cancer treatment on survivors.

It’s known that [young cancer survivors](#) are more likely to experience neurocognitive and brain deficits later in life if their treatment directly affected the central nervous system, including the brain. But a growing body of research is finding that other cancer treatments that damage DNA, such as [chemotherapy](#), may also affect the central nervous system.

“Young [cancer survivors](#) have many more decades of life to live,” said Wilmot Cancer Institute investigator AnnaLynn Williams, PhD, the study’s corresponding author, [in a press release about the study](#). “If these accelerated aging changes are occurring early on and setting them on a different trajectory, the goal is to intervene to not only increase their lifespan but improve their quality of life.”

Williams added that related research at Wilmot points to ways young cancer survivors may be able to reverse this accelerated aging, including exercising, quitting smoking and improving nutrition.

For the study, researchers compared biological samples and cognitive assessments of about 1,400 adults who received cancer treatment as children between 1962 and 2012 with nearly 300 samples from adults who did not have cancer. Most of the childhood cancer survivors had [acute lymphoblastic leukemia](#) or [Hodgkin lymphoma](#)—two types of blood cancers—and were treated with radiation and chemotherapy.

The study excluded people who received stem cell transplants, didn’t speak English, had cognitive impairment or brain injury unrelated to cancer or had a central nervous system tumor.

Regardless of whether the cancer treatment targeted the brain, the cancer survivors showed more aging at the cellular level, as indicated by epigenetic markers, such as changes in DNA structure and cell or tissue damage. The researchers also found a link between higher biological age and brain function: Survivors with more cellular aging performed the worst on memory and attention tasks.

“Given that epigenetic changes are modifiable, understanding the relationship between biologic and cognitive aging may inform targeted interventions to mitigate neurocognitive limitations in long-term survivors of childhood cancer,” wrote the study’s authors.

The study is part of a continued effort by researchers like Williams to improve the quality of life of cancer survivors and better understand accelerated aging from cancer treatment.

To learn more about efforts to help childhood cancer survivors, read “[With Pediatric Cancer Survival Rates on the Rise, Researchers Look to Help Survivors](#)” and “[Revisiting a Safer Alternative to Toxic Chemotherapies](#).” Plus, the 2026 annual statistics report by the American Cancer Society includes data on survivorship. For more, read “[More People Than Ever Survive Their Cancer Five Years or More](#).”