

Brain tumors in childhood leave a lasting mark on cognition, life status

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Brain tumors in childhood cast a long shadow on survivors. The first study of the lasting impact of these tumors -- the most common solid malignancies in childhood -- shows that survivors have ongoing cognitive problems. They also have lower levels of education, employment and income than their siblings and survivors of other types of cancer, according to a report published by the American Psychological Association.

Given the risks now seen to confront survivors of brain (also called [central nervous system](#), or CNS) [cancer](#), programs to support their transition to independent adult life are essential, according to the study in the November issue of *Neuropsychology*.

The findings, part of a massive Childhood [Cancer Survivor](#) Study conducted by nine major medical centers, were based on a study coordinated by Leah Ellenberg, PhD, a clinical faculty member of the David Geffen School of Medicine at the University of California, Los Angeles.

Researchers sent a 25-item neurocognitive questionnaire to cancer survivors at least 16 years after a cancer diagnosis. Some 785 CNS cancer survivors; 5,870 survivors of non-CNS cancers such as leukemia, Hodgkin's disease, and bone tumors; and 379 siblings of CNS cancer survivors returned enough information to analyze. In a significant minority of cases, someone else responded for CNS cancer survivors, an informal sign of the difficulties some may be having, according to the

authors.

The study's four main hypotheses were all supported:

- CNS cancer survivors reported significantly greater neurocognitive dysfunction than their siblings and than survivors of other types of cancer.
- Although the greatest reported problems were in memory and task efficiency (highly rating such items as 'I forget what I am doing in the middle of things' and 'I am slower than others when completing my work'), all aspects of cognition surveyed were affected, including emotional regulation and organization. More than half the CNS cancer survivors reported significant problems with at least one task efficiency item, more than three times as many as among the sibling group.
- The greatest neurocognitive problems were reported by CNS cancer survivors who had significant motor or sensory problems after treatment, who were treated with radiation to their brains, and who had tumors in the brain cortex rather than lower brain regions.
- Those neurocognitive problems were linked to significantly poorer adaptation to adult life, as shown by lower achievement in education and in full-time employment and income, as well as less chance of being married.

Also, medical complications such as stroke, paralysis, hearing impairment, and fluid buildup that required a shunt were more likely to cause problems across all cognitive functions. Brain irradiation in particular affected task efficiency and memory -- though just how much depended on the amount of radiation. And even low-risk brain tumor

patients who had surgery but no radiation were impaired compared to other cancer survivors as a group.

"This [report] underscores the need for continued attention to mitigating the long-term negative effects of CNS malignancies and their treatment," wrote the authors. They voiced particular concern about radiation because it affects the brain's white matter, especially in childhood, slowing cell-to-cell communication and causing sensory, motor or neurocognitive problems.

The authors continued, "It will be important to investigate the benefits of early and consistent use of compensatory strategies, including assistive technology, transitional facilities to promote independent living, and job placement and coaching, to enhance functional outcomes."

More information: "Neurocognitive Status in Long-Term Survivors of Childhood CNS Malignancies: A Report From the [Childhood Cancer Survivor Study](#)," Leah Ellenberg et al., *Neuropsychology*, Vol. 23, No. 6.

Source: American Psychological Association ([news](#) : [web](#))

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