

Early interventions may improve long-term academic achievement in young childhood brain tumor survivors

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Children who survive a brain tumor often experience effects from both the cancer and its treatment long after therapy concludes. Scientists at St.

Jude Children's Research Hospital found very young children treated for brain tumors were less prepared for school (represented by lower academic readiness scores) compared to their peers.

This gap persisted once survivors entered formal schooling. Children from families of higher socioeconomic status were partially protected from the effect, suggesting that providing early developmental resources may proactively help reduce the [academic achievement gap](#).

The findings are [published](#) in the *Journal of the National Cancer Institute*.

"Even in very young children, we found academic [readiness](#) was starting to lag behind healthy children their age," said corresponding author Heather Conklin, Ph.D., St. Jude Department of Psychology and Biobehavioral Sciences member and Section of Neuropsychology chief. "They were gradually falling behind their same-age peers in academic fundamentals, such as learning their letters, numbers and colors."

Previous research has focused on [school-aged children](#), but this is one of the first studies to examine academic readiness after brain tumor treatment in infants and young children (less than 3 years old). The scientists uncovered the gap in readiness skills by following a group of 70 patients who had been treated for brain tumors over time.

Six months after diagnosis and annually for five years, "we found an increasing gap between these [young patients](#) treated for [brain tumors](#) and their typically developing peers because their academic readiness skills were not developing as fast," Conklin said.

Even though the scientists observed gaps between the children's abilities as they aged, it was present early and had predictive power. "Early academic readiness was predictive of long-term reading and math outcomes," Conklin said. "The effect isn't temporary. These children

don't just catch up naturally."

Intervening early may protect academic readiness and achievement

While presenting a challenge, the findings also offer a strategy to address this problem: [early intervention](#). Since the difference in academic readiness arises early after treatment, intervening then, as opposed to in [elementary school](#) (when most conventional interventions begin), may improve outcomes.

"We now know that we don't need to wait until patients are struggling with math and reading; we can intervene earlier," Conklin said. "We showed that the variability we're seeing early on predicts longer-term academic skills, which highly suggests earlier interventions will be beneficial and make a real difference."

Early interventions need to be informed by what increases vulnerability to or protects against the academic readiness gap to succeed. The researchers looked at the factors involved, such as treatment type and demographics, and found only one characteristic mattered.

Socioeconomic status protects and suggests early interventions may work

"The only clinical or demographic factor we found that predicted academic readiness was socioeconomic status," Conklin said. "Being from a family of higher socioeconomic status had a protective effect on children's academic readiness."

The finding that higher [socioeconomic status](#) is partially protective suggests that investing in resources to replace lost early enrichment

experiences can mitigate the readiness gap. By increasing access to those replacement opportunities, more children could be protected.

"We know that being away from their [home environment](#), caregivers, daycare, play dates, parks and early [intervention](#) services during these critical developmental years is probably having a negative impact on very young patients," Conklin said.

"Our results suggest that families can make play meaningful, and by making little changes in how they interact with their child, with the support of their medical team and receiving appropriate resources, they may be able to make a difference in their child's cognitive and academic outcomes."

More information: Somekh et al. Academic Readiness among Young Children Treated for Brain Tumors: A Multisite, Prospective, Longitudinal Trial Get access Arrow, *Journal of the National Cancer Institute* (2024). [DOI: 10.1093/jnci/djae194](https://doi.org/10.1093/jnci/djae194)

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