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doi: 10.1097/ANA.0000000000000882. Epub 2022 Dec 6.

Impact of Anesthetic Exposures on the Neurocognitive Profiles of Pediatric Brain Tumor Survivors: A New Direction for Research and Multidisciplinary Collaboration

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PMID: 36745177 PMCID: PMC9902741 (available on 2024-01-01)

DOI: [10.1097/ANA.0000000000000882](https://doi.org/10.1097/ANA.0000000000000882)

Abstract

Primary brain tumors are the most commonly diagnosed solid tumors in children, and pediatric brain tumor survivors experience lasting, pervasive deficits of neurocognitive functioning. Repeated exposure to anesthetic drugs is a necessary component not only of surgical resection but also of multimodal cancer care for the youngest patients with brain tumors. The potential for anesthetic neurotoxicity to worsen neurocognitive outcomes in this vulnerable group, therefore, warrants our attention and further study through multi-disciplinary collaboration. This review discusses neurocognitive functioning in pediatric brain tumor survivors, highlighting the findings of a recent study of children with tumors of the posterior fossa which identified treatment-related risk factors for neurocognitive difficulties, with those undergoing multimodal therapies (eg, chemotherapy and irradiation) experiencing the greatest deficits compared with healthy controls. The role of anesthetic neurotoxicity in long-term outcomes among pediatric brain tumor survivors is also reviewed.

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