

Genetic risk, not anesthesia exposure, impacts cognitive performance

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A recent study of more than 2,000 identical twins found that medical problems early in life, rather than the neurotoxic effects of anesthesia, are likely linked to an individual's risk for developing learning disabilities. The study's findings, reported in the journal *Twin Research and Human Genetics*, contradict research published earlier this year, which concluded that receiving anesthesia younger than age four is associated with subsequent learning problems.

Robert Althoff, M.D., Ph.D., director of behavioral genetics at the University of Vermont's UVM) Vermont Center for [Children, Youth & Families](#), along with colleagues Meike Bartels and Dorret Boomsma from VU University in the Netherlands, examined the relationship between [anesthesia](#) exposure and cognitive performance, but controlled for genetic association by using a sample of 1,143 identical Dutch twin pairs (2,286 children total). The research team grouped the participants into children who had anesthesia exposure before age three and those who had not, in order to facilitate the identification of twin pairs where both had been exposed to anesthesia, where neither had been exposed to anesthesia, or where only one member of the pair had been exposed to anesthesia. The twins' cognitive outcomes were measured using a standardized national exam administered to all children in the Netherlands at about age 12.

"While there was a difference in cognitive outcomes between children who had been exposed to anesthesia versus children who had not, there was no difference in cognitive outcomes between [identical twins](#) where one was exposed to anesthesia and the other was not," said Althoff, who is also assistant professor of psychiatry and pediatrics at UVM. "This indicates that exposure to anesthesia is not itself associated with worse cognitive outcomes, but rather is likely a marker of risk for later learning problems."

According to the study's authors, "classical twin studies have been informative in uncovering the underlying genetic and environmental contributions to intelligence in general and to learning disabilities specifically." The team suggests that in future related studies, screening for learning problems should take place before a child undergoes surgery, in order to establish whether or not the problem is already present.

Source: University of Vermont

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