Research suggests anesthetics could have long-term impact on children's brains

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A group of anesthesiologists and toxicologists today issued a caution to parents and health care professionals about the use of general anesthetics in children.

Each year millions of infants, toddlers and preschool children require anesthesia or sedation for various procedures. The University of Toronto's Professor Beverley Orser and a team of anesthesiology investigators and toxicologists have analyzed existing animal and human studies for the impact of anesthetics on the developing brain. Animal studies provided evidence of brain injury and long-term behavioral deficits. Previous observational studies of children suggested a correlation between children who had received anesthetics and long-term cognitive impairments such as learning disabilities. Children between the ages of one and three appeared to be at a higher risk of adverse effects.

The clinical studies had many serious limitations that prevented Orser and the team from determining whether anesthetics caused the impairment in children. For example, other factors such as trauma from surgery or pre-existing conditions could contribute to the behavioral deficits. Nevertheless, the group determined there's enough evidence to suggest the need for specific clinical research.

"Anesthetics are generally assumed to be safe for children, and are important for conducting life- saving or other essential procedures. However, our analysis of the available data raised some red flags," said Orser, a Professor in the Departments of Anesthesia and Physiology, and

anesthesiologist at Sunnybrook Health Sciences Centre. "The next step is to start targeted large clinical trials. That's the only way we can determine if or how these drugs are having an impact on a child's developing brain."

A Consensus Statement developed by the experts recommends avoiding anesthetics for children three years and under unless they are needed for surgeries that will lead to better outcomes. "Early interventions through surgical procedures can help children lead healthier lives in the long run, depending on a child's case. Anesthetics are administered by highly trained medical professionals who make decisions about anesthesia and surgery very carefully. Orser suggests that parents who are concerned talk to their child's physicians about the risks and benefits associated with anesthesia.

The SmartTots program, a partnership of the International Anesthesia Research Society and the U.S. Food and Drug Administration, is bringing together a group of international experts who are designing and executing clinical trials and preclinical studies to test the impact of anesthetic drugs on developing brains, and exploring safer strategies to reduce anesthetic injury if needed.

A related article was published today in the *New England Journal of Medicine*.

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