

# Seizures linked to surgery drugs can be prevented by anesthetics, study finds (Update)

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Two drugs commonly given during cardiac surgery can lead to convulsive seizures, but anesthetics can help cut the risk, according to new research from the Faculty of Medicine at the University of Toronto.

Patients undergoing complex heart operations or trauma surgery are often given tranexamic acid (TXA) and aminocaproic acid (EACA) to reduce blood loss. But Faculty of Medicine researchers found these drugs are associated with a four-to-six-fold increase in post-operative seizures. The risk is highest for cardiac surgery patients – between three and seven and a half per cent have seizures after arriving in the intensive care unit.

"Many Canadians are treated with these drugs, particularly TXA, each year to decrease bleeding and help patients avoid blood transfusions. Surgeons and anesthesiologists need to be mindful that these drugs can be pro-convulsants," says Beverley Orser, Professor of Physiology and Anesthesiology at the University of Toronto and Canada Research Chair.

"To decrease a patient's risk of seizure, it's critical to adjust the dose of TXA and EACA. In some cases where the risk of seizures is high, it is advisable to maintain a certain level of anesthetic sedation until the drugs wear off," says Orser, a staff anesthesiologist at Sunnybrook Health Sciences Centre.

Seizures can cause long-term, permanent neurological problems, increase the risk of stroke and prolong a patient's recovery time.

Clinicians had long been perplexed as to the cause of seizures associated with the use of TXA and EACA. Irene Lecker, a PhD candidate in Orser's laboratory, discovered that these drugs interfere with a naturally occurring anticonvulsant in the brain, glycine, and that widely used anesthetics reverse this interfering effect.

David Mazer, Professor and Vice-Chair of Research in the Department of Anesthesia at University of Toronto and co-investigator on the study, says this research will change the way these drugs are used around the world.

"Now that we understand what's happening inside the brain and the mechanism behind the seizures, we can treat patients better," he says.

Dr. Orser is using these findings, now published in *Journal of Clinical Investigation*, to work with the Sunnybrook Health Sciences Centre team to develop a new practice of drug administration during and after surgery.

**More information:** Tranexamic acid concentrations associated with human seizures inhibit glycine receptors, *Journal of Clinical Investigation*, 2012.

Provided by University of Toronto

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