

Study finds connection between cardiac blood test before surgery and adverse outcomes

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PJ Devereaux is a professor of medicine at McMaster University and a cardiologist of Hamilton Health Sciences. Credit: Hamilton Health Sciences

A common cardiac blood test done before surgery can predict who will experience adverse outcomes after most types of surgery, says an international study led by Hamilton researchers.

Globally, of the 200 million adults who undergo [major surgery](#), 18 percent will experience serious cardiac and [vascular complications](#) including death within 30 days following their intervention, such as hip and knee replacements, bowel resections and abdominal aortic aneurysm repair.

"Any type of [surgery](#) has the potential to cause damage to heart tissue, through [blood](#) clot formation, long periods of inflammation, or bleeding," said study lead, Dr. PJ Devereaux, professor of medicine, cardiologist at Hamilton Health Sciences (HHS) and scientific lead for perioperative research at McMaster University and HHS' Population Health Research Institute (PHRI).

The VISION study looked at whether levels of a cardiac blood test, NT-proBNP, measured before surgery can predict cardiac and vascular complications. Higher levels of NT-proBNP, which can be caused by various anomalies in the [cardiac muscle](#), such as stress, inflammation or overstretch, can help identify which patients are at greatest risk of cardiac complications after surgery.

The study included 10,402 patients aged 45 years or older having non-[cardiac surgery](#) with overnight stay from 16 hospitals in nine countries.

"As a result of these findings, doctors can predict who is at greater risk of heart attacks and other negative vascular events after surgery," said Dr. Devereaux.

This phase of the VISION study builds upon six years of research studies to understand pre- and post-operative factors that lead to cardiac complications.

"This simple blood test can be done quickly and easily as part of patient's

pre-operative evaluation and can help patients better understand their risk of post-operative complications and make informed decisions about their surgery," said first author of the publication, Dr. Emmanuelle Duceppe, internist and researcher at the Centre Hospitalier de l'Universite de Montreal (CHUM), Ph.D. candidate in clinical epidemiology at McMaster University, and associate researcher at PHRI. "This blood test is twenty times cheaper than more time-consuming tests such as cardiac stress tests and diagnostic imaging."

Results of this simple [blood test](#) may inform the type of surgery the patient will undergo, such as laparoscopic or open surgery, the type of anesthesia used during surgery and who will require more intense monitoring post-operatively.

Blood [test](#) results can also reduce the need for pre-surgical medical consultations for patients that show no risk for cardiac complications.

"Heart injury after non-cardiac surgery is emerging as an important health issue requiring attention. Using CIHR funding, the research group led by PHRI and Dr. Devereaux, has clarified the association between an elevation of a common biomarker and the risk of per-operative morbidity and mortality," said Dr. Brian H. Rowe, Scientific Director, Institute of Circulatory and Respiratory Health, Canadian Institutes for Health Research.

Study data was published today in *Annals of Internal Medicine*.

Provided by McMaster University

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