

Blood test identifies increased risk of death following noncardiac surgery

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A simple blood test can help identify people who are at high risk of dying within the month after non-cardiac surgery, a study by McMaster University researchers has found.

Knowing who is at risk through the test called Troponin T (a protein marker of heart injury) can help physicians target patients who need enhanced observation or interventions, says the major study published today in the [Journal of the American Medical Association](#). Currently, troponin levels are not commonly measured after surgery.

Worldwide, more than 200 million adults have major non-cardiac surgery each year. Despite the benefits of surgery, many patients suffer serious complications and more than one million of those patients die within the first 30 days after surgery.

The results are from the VISION study, the largest international prospective study evaluating complications after surgery.

VISION enrolled 15,133 [adult patients](#) in North and South America, Asia, Australia, and Europe who had a Troponin T measurement daily during the first three days after surgery. Patients were followed in hospital and at 30 days after surgery.

"VISION demonstrated that a simple [blood test](#) strongly identifies which non-cardiac surgery patients are at high risk of dying in the next 30 days," said Dr. P.J. Devereaux, VISION principal investigator; associate

professor of medicine, [clinical epidemiology](#) and [biostatistics](#) of the Michael G. DeGroote School of Medicine at McMaster University and cardiologist at Hamilton Health Sciences.

Devereaux said the results also demonstrated that most patients did not die until an average of six or more days after their Troponin T blood test was identified as elevated. "This holds out great hope that there is time to intervene."

Surgery activates pathways of inflammation, stress, and clotting that predispose the heart to injury. As a result, many patients suffer heart attacks after surgery. The majority of these patients, however, will not experience chest pain. "Evidence from this study supports experts who have advocated the use of troponin blood tests after surgery."

Based on guideline recommendations, many laboratories consider a Troponin T measurement >0.04 ng/ml abnormal. VISION demonstrated that Troponin T (TnT) values below the commonly used threshold of 0.04 (i.e., 0.02 and 0.03) were strongly associated with 30-day mortality.

Devereaux said the VISION study suggests that one in 25 patients with a peak TnT measurement of 0.02, one in 11 patients with a peak TnT measurement of 0.03-0.29, and one in six patients with a peak TnT measurement >0.30 will die within 30 days of surgery. The data also suggests that myocardial injury detected through [Troponin T](#) elevations may explain 42 per cent of deaths that occur after surgery.

"Given these results, worldwide more than 10 million adults may suffer a prognostically relevant heart injury after surgery each year," said Devereaux.

He said although there is encouraging observational data that aspirin and statins save lives in patients suffering heart injury after surgery, clinical

trials are needed to establish whether interventions can alter patients' risk of death based upon an elevated troponin measurement after surgery.

"This study has substantial potential to change how patients are monitored after surgery," said Dr. Jean Rouleau, scientific director of the Institute for Circulatory and Respiratory Health of the Canadian Institutes of Health Research.

"These results hold substantial promise that through measuring troponin blood tests after [surgery](#), physicians can identify which [patients](#) are at high-risk of dying and this can allow them to consider enhanced monitoring and interventions in an attempt to improve outcomes. This is a good example of how a carefully conducted clinical study can impact on patient care," Rouleau said.

"This study had more than 60 international funding sources. Such efforts are rare, but large studies like VISION are essential in order to have enough data to see signals clearly and to make progress," said Dr. Salim Yusuf, a professor of medicine of the Michael G. [DeGroote](#) School of Medicine; vice-president of research at Hamilton Health Sciences and a member of the VISION Steering Committee.

More information: *JAMA*. 2012;307[21]:2295-2304.

Provided by McMaster University

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