

World's largest transfusion study in cardiac surgery changes transfusion practices

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Research led by Dr. David Mazer, associate scientist in the Keenan Research Centre for Biomedical Science of St. Michael's Hospital in Toronto, has found that lower thresholds for blood transfusions for cardiac surgery patients compared to traditional thresholds provide positive patient outcomes and safety at six months after surgery. Credit: St. Michael's Hospital

Lower thresholds for blood transfusions for cardiac surgery patients compared to traditional thresholds provide positive patient outcomes and safety at six months after surgery, according to the world's largest research study on this topic.

The research found that in addition to providing good [patient outcomes](#) six months after hospital discharge, the lower threshold—known as 'restrictive [transfusion therapy](#)' - reduces the amount of [blood](#) transfused and money spent on blood per procedure. The higher, traditional threshold is called 'liberal transfusion therapy.'

Physicians who practice the liberal transfusion approach give blood transfusions early in the surgery to prevent [patients'](#) hemoglobin level from falling. Hemoglobin is the protein that allows red blood cells to deliver oxygen to body tissues. Physicians who practice a restrictive approach wait longer to see if the [hemoglobin level](#) remains stable or if the patient has further bleeding.

These findings were presented on Sunday at the European Society of Cardiology Annual Congress in Munich, Germany by Dr. David Mazer, principal investigator on the study, anesthesiologist at St. Michael's Hospital, associate scientist in its Keenan Research Centre for Biomedical Science, and Professor of Anesthesia and Physiology at the University of Toronto, with simultaneous publication in the *New England Journal of Medicine*.

"Our research question was, at what point does the risk of anemia, or the risk of a lower hemoglobin, outweigh the risk of transfusion?" Dr. Mazer said. "We wanted to know whether it is safe to let your hemoglobin go to a lower level before you transfuse. The answer is yes. It'll save blood, make blood more available, reduce costs of transfusion and result in similar or better outcomes."

This work builds on Dr. Mazer's research published less than a year ago in the *New England Journal of Medicine*, which analyzed immediate postoperative patient outcomes. The randomized trial involved more than 5,200 patients at 74 sites in 19 countries and every continent in the world except Antarctica. At the six-month mark, data was available for 96 per cent of the patients.

Dr. Mazer, who co-led this study with Dr. Nadine Shehata, a hematologist at the Sinai Health System, and the research team found no clinical or statistical difference in four patient outcomes (death, heart attack, stroke and new kidney failure), whether the patients had contemporary restrictive therapy or traditional liberal practices. In fact, use of the restrictive transfusion protocol during and after heart surgery may actually reduce the incidence of complications in older patients, including heart attack, stroke, kidney failure and death.

"This research has already started to change transfusion practice around the world," said Dr. Mazer. "With this data at six months, we've proven the longer term safety of restrictive therapy. This approach has already been adopted into guidelines and will likely become the standard of care worldwide."

The large size of this study provides Dr. Mazer and his team additional opportunity to answer several other important questions related to [transfusion](#) and cardiac surgery.

More information: C. David Mazer et al, Six-Month Outcomes after Restrictive or Liberal Transfusion for Cardiac Surgery, *New England Journal of Medicine* (2018). [DOI: 10.1056/NEJMoa1808561](https://doi.org/10.1056/NEJMoa1808561)

Provided by St. Michael's Hospital

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