

Old blood as good as fresh in patients with life-threatening illnesses

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Credit: public domain

Just like milk and many other foods, blood used for transfusions is perishable. But contrary to popular belief, new research shows that blood stored for three weeks is just as good as fresh blood - findings published today in the *New England Journal of Medicine*.

The large clinical trial provides reassuring evidence about the safety of blood routinely transfused to critically ill patients. Supported by the Canadian Critical Care Trials Group and countless nurses, blood bank technologists, transfusion medicine and critical care physicians, Drs. Jacques Lacroix (Sainte-Justine University Hospital Research Center), Dean Ferguson and Alan Tinmouth (both of The Ottawa Hospital), and Paul Hébert (Centre de recherche du centre hospitalier de l'Université de Montréal) led a team of dozens of researchers from 64 Canadian and European centers.

The researchers undertook the Age of Blood Evaluation (ABLE) study, a randomized double-blind trial to compare mortality after 90 days in intensive care patients transfused with either fresh blood (stored for an average of six days) or older blood (stored for an average of 22 days). A total of 2,430 adults participated in the study, including 1,211 patients in the fresh blood group and 1,219 in the older blood group.

Tony Brett, a 48-year-old Ottawa man, is glad to have participated in the ABLE study while he was being treated for a life-threatening infection (sepsis) at The Ottawa Hospital. "Not only did blood transfusions help save my life, they also helped keep my mother alive, as she required many blood transfusions over the years, due to a blood disorder. I have also donated blood many times, so it is great to see that people are doing rigorous research to make sure that our blood supply is as safe and effective as possible", said the patient.

"Current blood bank practice is to provide patients with the oldest blood available. Some doctors, however, feel that fresh blood is better", said Dr. Paul Hébert, an intensive care physician-scientist at the Centre de recherche du CHUM and professor at the Université de Montréal.

The findings are unequivocal: "There was no difference in mortality or organ dysfunction between the two groups, which means that fresh blood

is not better than older blood", said Dr. Dean Fergusson, a senior scientist at the Ottawa Hospital Research Institute and the University of Ottawa.

Specifically, 423 patients died within 90 days post-transfusion in the group of patients who received fresh blood, compared to 398 patients who died in the group that received older blood.

"Previous observational and laboratory studies have suggested that fresh blood may be better because of the breakdown of red blood cells and accumulation of toxins during storage. But this definitive clinical trial clearly shows that these changes do not affect the quality of blood", said Dr. Alan Tinmouth, a physician and scientist at the Ottawa Hospital Research Institute and the University of Ottawa.

According to current standards, blood is stored up to 42 days. But many doctors have begun to ask for fresh blood in recent decades, thinking that it's the right thing to do. This is made difficult because of a limited supply and because blood collection agencies and hospital blood banks distribute blood on a "first-in, first-out" basis to avoid wastage.

"Canadian Blood Services is very pleased to see the publication of the ABLE study. The study supports our current inventory management practices for patients receiving transfusions in the [intensive care](#) setting", said Dr. Dana Devine, chief medical and scientific officer at Canadian Blood Services.

Blood transfusions save lives, affirm the authors. There is no need to worry about the safety of the age of blood routinely used in hospitals. The same research team is conducting a clinical trial in pediatric [patients](#). "This study should verify whether children react to fresh blood and older [blood](#) transfusions in the same way as adults", said Dr. Jacques Lacroix of the Sainte-Justine University Hospital Research Center and

professor at the Université de Montréal.

More information: The study, "The Age of Blood Trial in Critically Ill Adults", is published online in the *New England Journal of Medicine* on March 17, 2015.

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