Timely transfusion test

Laser system to speed patient blood delivery

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MELBOURNE researchers have developed a way to slash the time to analyse results from the vital blood test needed before a blood transfusion.

The Monash University breakthrough, using laser technology, reduces the time needed to process the blood sample from up to 15 minutes to less than a minute.

The world-first discovery paves the way for faster and more accurate delivery of replenishing the blood stocks of trauma victims, pregnant women, those undergoing cancer treatment and surgical patients.

Every day around the country almost 3000 blood transfusions are needed.

Before a blood transfusion can be given, a blood test is needed to confirm someone's blood group and also whether their blood carries antigens.

Blood is either Rh-positive or Rh-negative and antigens can also develop on the surface of red blood cells in response to previous blood transfusions. These factors can cause transfusion reactions and limit the blood donor pool.

The blood sample needs to be incubated at exactly 37 degrees to be analysed.

Lead researcher and physicist Clare Manderson, of Monash's Bioresource Processing Institute of Australia, said present methods of incubation, which used heating blocks of hot water baths, were time consuming and could delay treatment.

Teaming with Victorian-based emergency medicine manufacturer Haemokinesis, the Monash researchers have used infra-red lasers to safely heat the blood sample to the desired temperature in less than 30 seconds.

"The best thing about lasers is they're high energy so they can heat quickly, precisely and gently, without damaging the blood," Dr Manderson said.

"Laser incubation is faster and more sensitive, so we can get stronger positives more quickly."

The findings were published in the journal *Nature's Scientific Reports*.

The researchers are now working on a more advanced prototype, on the path to ultimately developing a handheld laser device to analyse blood at the patient's bedside.

"Any setting where there is major blood loss — trauma, childbirth, major surgery — this antibody testing is vital for saving their life," she said.

Associate Professor Christoph Hagemeyer, of Monash's Australian Centre for Blood Diseases and who was not involved in the research, said finding an accurate and rapid way to heat blood would be useful for cutting-edge "lab-on-a-chip" technologies

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Krish, 6, in awe of Brian Donnelly's large sculpture featured in NGV's latest exhibition, KAWS: Companionship in the Age of Loneliness. Picture: ALEX COPPEL