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On-the-spot lifesaver

Gadget buys time in an emergency

ALANAH FROST

A WORLD-first portable gadget could help save patients from bleeding to death in instances of major trauma, including serious car crashes or shark attacks.

Monash University engineers have designed a diagnostic testing device that measures the concentration of a blood-clotting protein in the body.

The protein, called fibrinogen, is needed to clot the blood and prevent major haemorrhaging and blood loss.

In accidents or events of significant body trauma fibrinogen levels can quickly drop, which puts the patient at risk of complications and death. It means an immediate boost of the protein must be administered.

The only way to test a patient's fibrinogen levels, however, is in hospital but researchers hope the Monash device could be used at the emergency site to quickly alert first responders when a fibrinogen injection is needed, which would give them enough time to stabilise the patient.

"We want to allow the paramedic to be able to provide the emergency fibrinogen where it is needed, within the first half an hour," Gil Garnier, who worked on the design, said. "That's when it matters.

"This test is a gift of time — more time for the doctor, the paramedic, to treat the problem."

The handheld device is made from a glass slide, Teflon film and a piece of paper and can test protein levels in just four minutes.

It combines a swab of the patient's blood with an enzyme solution on the slide, separating out the blood plasma and allowing it to clot before a strip of paper is placed on top.

The further the blood moves down the strip, the lower the fibrinogen concentration.

Professor Garnier said about two million people were at risk of dying from low fibrinogen levels in trauma circumstances every year across the globe.

"Time is life," he said. "We've showed it's possible (to test) and now our dream is to develop something robust and commercialised for every ambulance in Australia, and then the world, to have this test."

Clare Manderson, a chemical engineering research fellow and co-author of the study, said the design was a "game changer".

"Our capacity to develop this diagnostic using cheap and readily available materials means it can be easily commercialised for use across the world," she said.

"It will also ease pressure on emergency departments knowing that this lifesaving treatment can be delivered on site and in quick time."

The testing device was developed through a collaboration between Monash's Department of Chemical Engineering and BioPRIA (Bioresource Processing Institute of Australia) and Melbourne-based company Haemokinesis.

Testing results were published this week in journal, ACS Sensors.

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