

New study confirms value of cardiac output monitor

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(Medical Xpress) -- A new Australian study has confirmed the accuracy of a modern non-invasive cardiac output monitor that can replace a 40-year-old standard in this field.

The collaborative paper by researchers at The University of Queensland School of Medicine, the Florey Neuroscience Institute and the University of Melbourne compared the current accepted method of measuring [cardiac output](#) with a non-invasive accurate ultrasound monitor called USCOM.

The current gold standard cardiac monitor is the Pulmonary Artery Catheter (PAC), which involves insertion of a catheter into a patient's neck or groin.

The catheter is then positioned in their arteries through the heart before heating or cooling the blood.

Alternatively, the newer USCOM method simply involves placing a small [ultrasound probe](#) on the chest.

Professor Malcolm West, a Professor of Medicine at The University of Queensland School of Medicine and a paper co-author said: "The USCOM device is a simple method for accurately and non-invasively measuring central circulation a goal of cardiology for many years.

"To be non-invasive is a great advantage over the PAC.

"To be non-invasive and more accurate, means the device has the potential to change the way we approach management of many cardiovascular diseases including sepsis, heart failure and hypertension."

Lead author, UQ School of Medicine PhD student Rob Phillips said the new study added to the growing global body of independent evidence

which demonstrated that the USCOM device offered critical care clinicians a new gold standard for cardiovascular monitoring which could replace costly and dangerous catheter-based technologies.

"It confirms that the growing worldwide USCOM user base has the very best tool available to guide lifesaving cardiovascular treatments and improve the management of critical and widespread diseases," Mr Phillips said.

The peer-reviewed paper was published recently in the *Critical Care Research and Practice* journal.

The researchers surgically implanted accurate measurement devices onto the great cardiac [arteries](#), and then monitored their cardiac output using USCOM and PAC at rest and as medications were introduced.

They found that USCOM had a 1 per cent error compared with the surgical device, while the PAC error was 17 per cent, and that USCOM was six to eight times more accurate than the PAC for detecting changes associated with the common drugs used in cardiovascular management.

USCOM's non-invasive system uses external ultrasound similar to that used in pregnancy.

The ultrasound signal bounces off the red blood cells as they flow across the cardiac valves, the site of true cardiac output, and producing a unique echo from which the device then counts the cell echoes with extremely high accuracy allowing high fidelity cardiac output measurement.

Because of its accuracy the USCOM monitor is most useful for diagnosing circulatory abnormalities and guiding the standard interventions of fluid inotropes and vaso-active therapies.

The USCOM monitor has many clinical applications ranging from paediatrics, critical care, anaesthesia

and emergency medicine.

New USCOM research is now being focused on improved understanding the great global healthcare challenges of sepsis, heart failure and hypertension, and their treatment.

More information: Download paper - www.hindawi.com/journals/ccrp/2012/621496/

Provided by University of Queensland

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