Groundbreaking technology will revolutionize blood pressure measurement

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This is the CASPro blood pressure measurement device. Credit: University of Leicester

In a major scientific breakthrough, a new blood pressure measurement device is set to revolutionise the way patients' blood pressure is measured.

The new approach, invented by scientists at the University of Leicester and in Singapore, has the potential to enable doctors to treat their patients more effectively because it gives a more accurate reading than the current method used. It does this by measuring the pressure close to the heart – the central aortic systolic pressure or CASP.

Blood pressure is currently measured in the arm because it is convenient however this may not always accurately reflect what the pressure is in the larger arteries close to the heart.

The new technology uses a sensor on the wrist to record the pulse wave and then, using computerised mathematical modelling of the pulse wave, scientists are able to accurately read the pressure close to the heart. Patients who have tested the new device found it easier and more comfortable, as it can be worn like a watch.

Being able to measure blood pressure in the aorta which is closer to the heart and brain is important because this is where high blood pressure can cause damage. In addition, the pressure in the aorta can be quite different from that traditionally measured in the arm. The new technology will hopefully lead to better identification of those who will most likely benefit from treatment by identifying those who have a high central aortic systolic pressure value. This will be especially important for younger people in whom the pressure measured in the arm can sometimes be quite exaggerated compared to the pressure in the aorta.

A key question is whether measurement of central aortic pressure will become routine in clinical practice. Professor Williams said: "it is not going to replace what we do overnight but it is a big advance. Further work will define whether such measurements are preferred for everybody or whether there is a more defined role in selective cases to better decide who needs treatment and who doesn't and whether the treatment is working optimally"

Professor Bryan Williams (center) and Health Minister Andrew Lansley (right) with Ph.D. student Daniel Timms (left) are at the opening of the University of Leicester Cardiovascular Biomedical Research Unit. Credit: University of Leicester

The University's close collaboration with the Singapore-based medical device company HealthSTATS International ("HealthSTATS") has led to the development of this world-first technique for more accurate blood pressure measurement.

The research work carried out by the University of Leicester was funded by the Department of Health's National Institute for Health Research (NIHR). The NIHR has invested £3.4million with a further £2.2million Capital funding from the Department of Health to establish a Biomedical Research Unit at Glenfield Hospital, Leicester, dedicated to translational research in cardiovascular research. The work, led by Professor Bryan Williams, Professor of Medicine at the University of Leicester and consultant physician at University Hospitals of Leicester NHS Trust, has the promise to change the way we measure blood pressure.

Professor Williams, who is based in the University of Leicester's Department of Cardiovascular Sciences at Glenfield Hospital, said: "I

am under no illusion about the magnitude of the change this technique will bring about. It has been a fabulous scientific adventure to get to this point and it will change the way blood pressure has been monitored for more than a century. The beauty of all of this, is that it is difficult to argue against the proposition that the pressure near to your heart and brain is likely to be more relevant to your risk of stroke and heart disease than the pressure in your arm.

"Leicester is one of the UK's leading centres for cardiovascular research and is founded on the close working relationship between the University and the Hospitals which allows us to translate scientific research into patient care more efficiently. Key to our contribution to this work has been the support from the NIHR without which we would not have been able to contribute to this tremendous advance. The support of the NIHR has been invaluable in backing us to take this project from an idea to the bedside. Critical to the success of this project has been the synergies of combining clinical academic work here with HealthSTATS and their outstanding medical technology platform in Singapore. This has been the game-changer and I really do think this is going to change clinical practice."

This is the CASPal blood pressure measurement device. Credit: University of Leicester

Dr. Choon Meng Ting the Chairman and CEO of HealthSTATS said: "This study has resulted in a very significant translational impact worldwide as it will empower doctors and their patients to monitor their central aortic systolic pressure easily, even in their homes and modify the course of treatment for BP-related ailments. Pharmaceutical companies can also use CASP devices for clinical trials and drug therapy. All these will ultimately bring about more cost savings for patients, reduce the incidences of stroke and heart attacks, and save more lives."

Health Secretary Andrew Lansley said:

"I saw this new technique in action in Leicester when I visited a few months ago. This is a great example of how research breakthroughs and innovation can make a real difference to patients' lives. We want the NHS to become one of the leading healthcare systems in the world and our financial commitment to the National Institute for Health Research reflects this.

"I believe patients deserve the best treatments available and science research like this helps us move closer to making that happen."

Professor Dame Sally Davies, Director General of Research and Development and Interim Chief Medical Officer at the Department of Health, said:

"This is fantastic work by Professor Williams and his team and I am delighted to welcome these findings. I am particularly pleased that the

clinical research took place at the NIHR Biomedical Research Unit in Leicester. NIHR funding for Biomedical Research Centres and Units across England supports precisely this type of translational research, aimed at pulling-through exciting scientific discoveries into benefits for patients and the NHS by contributing to improved diagnostics and treatments."

Provided by University of Leicester