

New tool to improve blood pressure measurement

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Image: Imperial College London

Scientists at Oxford University have developed a new way of estimating our true underlying blood pressure that overcomes common problems in a clinical setting which can lead to misleading results. Their work is published in the journal *Hypertension*.

Blood pressure measurement is frequently used by medics to understand our health, and dangerously high [blood pressure](#) (hypertension) can lead to serious conditions like heart attack or stroke. Blood pressure levels fluctuate throughout the day and can easily change as a result of stress, physical activity and even talking. Readings are usually taken in a doctor's clinic, but these measurements are often different from those taken at home, which are considered to be more reflective of your true underlying blood pressure level.

Study leader Dr James Sheppard said: 'One phenomenon where readings are higher in the clinic than at home is referred to as the ['white coat effect'](#). This can lead to people being started on blood pressure lowering treatments they do not really need. A reverse effect is also seen - some patients have lower readings in the clinic than they would in normal life, meaning that they can miss out on treatment that they could potentially benefit from. Understanding and accounting for the scale of these home-clinic differences would improve diagnosis and treatment.'

The team therefore analysed data from more than 2000 patients, looking at factors including age, gender, [body mass index](#), alcohol consumption and tobacco use. They also studied a number of 'blood pressure characteristics' from multiple readings taken in the clinic, including the difference between the first and last readings and the rate of change in blood pressure among others. Data from around 900 patients was used to build a model, identifying factors that affected the difference between home and clinic blood pressure readings. The model was then validated by checking against the data from the other patients in the study.

The result is a prediction model that uses three separate blood pressure readings taken in a single consultation and basic patient characteristics to give an adjusted [blood pressure reading](#) that is significantly more accurate than existing models for identifying hypertension.

Dr Sheppard explained: 'We compared the accuracy of our model to the current UK NICE guidelines and those in use in the USA, Canada and Europe. It correctly classified 93% of cases, compared to the next best, the NICE guidelines, which correctly classified 78% of patients.'

'Correctly classifying people as hypertensive or not is important for patients - ensuring that those who need treatment get it. Perhaps just as importantly, this approach prevents those patients displaying a white coat effect from being put on treatment which they don't really need. This

approach has the potential to save large amounts of money for the NHS by avoiding unnecessary treatment in those with the white coat effect. It may also lead to fewer patients suffering from heart attacks and stroke, by treating [patients'](#) blood pressure more effectively.'

Provided by University of Oxford

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