

A novel method for simultaneously measuring blood pressure and arterial stiffness

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Arterial stiffness due to is a major contributor to cardiovascular disease but is very difficult to measure. It also can influence blood pressure readings since these rely on the time taken for arteries to return to normal volume and flow after compression. A new method for measuring arterial stiffness has been reported in BioMed Central's open access journal *BioMedical Engineering OnLine*. This simple, non-invasive, calculation is able to interpret standard oscillometric measurements to quantify both arterial stiffness and blood pressure simultaneously.

Not only does arterial stiffness increase hypertension but hypertension can exacerbate arterial stiffness in a self-perpetuating spiral. Arterial stiffness is also associated with [type 2 diabetes](#) and is involved in the development of the [circulatory problems](#). However, arterial stiffness can be addressed, if caught early enough, by diet and exercise so early detection is essential. Typically [arterial pressure](#) is measured using tonometry or ultrasound but both of these are difficult to perform and consequently are often inaccurate.

Researchers from the National Institute of Advanced Industrial Science and Technology (AIST), Japan, determined arterial stiffness using the relationship between cuff pressure and arterial volume. This was calculated using pulse pressure (systolic - diastolic) and the amplitude of cuff [oscillations](#). Readings were combined to produce an arterial stiffness index (API). To test the validity of this new method, API results from over 100 volunteers were compared to arterial stiffness determined by pulse wave velocity (tonometry) and carotid arterial compliance (ultrasound).

Dr Hidehiko Komine explained, "Interpreting oscillating blood pressure provided the same

accuracy of measurement for arterial stiffness as either of the established methods. Not only did API match brachial arterial stiffness measured by tonometry but it also correlated with ultrasound measurement of the stiffness of arteries supplying the heart. This means that, using the oscillating cuffs already in place in many clinical settings, API could provide an early indicator of cardiovascular disease."

More information: Non-invasive assessment of arterial stiffness using oscillometric blood pressure measurement, Hidehiko Komine, Yoshiyuki Asai, Takashi Yokoi and Mutsuko Yoshizawa, *BioMedical Engineering OnLine* (in press)

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