



TECHNOLOGY

Noninvasive Aortic Blood Pressure Measurement for Prediction of Cardiovascular Disease Risk

OVERVIEW

Background

Cardiovascular disease (CVD) is the number one cause of death in the US and the world, with an estimated 32.8% of deaths in the US having cardiovascular (CV) related factors. Ailments such as hypertension, atherosclerosis, myocardial infarction (heart attacks), and heart failure are all related to CVD. There are many ways of diagnosing potential cardiovascular issues, but blood pressure (BP) monitoring is one of the only measurements that can be taken outside of a clinical setting. BP monitoring is often the key diagnostic method for CV diseases. Therefore, it is important to retrieve as much information as possible from BP monitoring. Another method, wave reflection analysis, which measures how blood travels through the CV system, can be used to measure aging of the CV system via the post-systolic load on the heart. However, previous methods have not been able to measure BP waves without aortic pressure or blood flow information, which requires invasive procedures.

Innovative Technology

Researchers at the University of Maryland have developed a method to determine forward and backward BP waves from two peripheral BP measurements without aortic BP and flow information. This method allows for noninvasive measurement of aortic BP, aiding in the diagnosis of multiple CV diseases. By measuring BP at two different peripheral locations, central aortic BP can be estimated. Once the peripheral and aortic pressures are known, it is possible to decompose these pressures into forward and backward pressures by measuring the change in BP at two points over the time it takes a pressure waveform to travel through the arterial tree. Using this information, it is possible to run a wave reflection analysis. This innovation will allow diagnosis of some cardiovascular diseases in a non-clinical setting, and allow clinical diagnosis to take place noninvasively, making diagnosis less costly and less stressful on the patient.

APPLICATIONS

- Diagnosis of many cardiovascular diseases, including hypertension and atherosclerosis
- Monitoring of the health of cardiovascular systems

ADVANTAGES

- Noninvasive method that can be implemented with two blood pressure cuffs
- Does not require blood flow information
- Can be implemented with existing monitoring equipment

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Additional Information

INSTITUTION

University of Maryland, College Park

PATENT STATUS

Patent(s) pending

LICENSE STATUS

Available for exclusive or non-exclusive license

CATEGORIES

- Healthcare
- Diagnostics

EXTERNAL RESOURCES

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