



## APPARATUS AND METHOD FOR CHARACTERIZING ARTERIAL STIFFNESS

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### Overview

Arterial stiffness is strongly associated with elevated risk of cardiovascular disease, kidney disease, cognitive decline, and diabetes. While total arterial stiffness provides important clinical information, the present inventors have determined that arterial stiffness can be usefully decomposed into two components that provide additional insight. The first component, termed structural stiffness, is primarily determined by the structural constituents arterial wall such as elastin and collagen. The second component, termed load-dependent stiffness, relates to a nonlinear change in stiffness with loading by blood pressure which stiffens the arterial wall as the arterial wall expands during the cardiac cycle and experiences increased collagen fiber loading. Recent studies suggest that adults with atypically greater load-dependent stiffness would benefit from more aggressive medical treatment of cardiovascular disease while patients whose arterial stiffness dominated by structural stiffness would fare better using statin and conventional blood pressure medications.

### The Invention

UW-Madison researchers have developed a clinical test to provide clear differentiation between blood-pressure related arterial stiffness and arterial wall thickness related stiffness. They have determined that structural and load-dependent stiffness can be obtained without determining arterial dimensions, eliminating the need for skilled real-time imaging. In one embodiment, structural and load-dependent stiffness is extracted from pulse wave measurements of pressure transmitted through the arteries obtained using arterial tonometry.

#### Tech Fields

- [Medical Devices : Diagnostics & monitoring tools](#)

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