



A Device for Noninvasive and Continuous Blood Pressure Measurement at the Superficial Temporal Artery



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Clinical Challenge

Cardiovascular disease is the leading cause of death in the United States, with an annual mortality of over 600,000 and a morbidity of 11.3% in the U.S. adult population. Systemic blood pressure is one of the most important indicators of cardiovascular health, but current blood pressure monitoring technologies vary considerably in accuracy, safety, stability, and temporal resolution.

Solution

A novel device is presented, which measures blood pressure noninvasively and continuously through arterial tonometry at the superficial temporal artery (STA). The device includes the following features:

- Stable, headphone-inspired form factor that adjusts easily from person to person using a combination prismatic and rotational joint
- Embedded stepper motor and pressure sensor, which apply force to flatten the STA and continuously measure the wearer's blood pressure
- Wireless design and Bluetooth communication which connects to a remote display on the user's laptop
- App-based interface which allows the user to calibrate the device against a blood pressure cuff measurement and monitor their blood pressure in real time for hours at a time



Performance

Preliminary testing demonstrated improved stability (reduced drift) over previous STA tonometry devices and a more consistent measurement than the blood pressure cuff. The blood pressure band is suitable for clinical or home use, and with continued iterative development, this technology may soon give physicians and patients a powerful new tool for monitoring cardiovascular health.

