INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Non-Invasive, Continuous, Accurate and Cuff-Less Measurement of Blood Pressure Using a Wearable Ring

TECHNOLOGY NUMBER: 2020-205

Technology ID
2020-205

Category
Medical Devices
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OVERVIEW

Wearable electronic device for in-clinic or remote blood pressure monitoring

- A device that is small, sensitive, and requires little power
- Can also be used to evaluate patients for stroke, heart failure, or diabetes

BACKGROUND

Blood pressure (BP) is a key physiological indicator of health, with hypertension serving as a major risk factor for various medical conditions. To date, there is only one clinically validated cuff-less technique to measure BP. Existing techniques that continuously measure blood pressure employ the principle of pulse wave velocity which tracks the speed by which blood travels through the arteries. These cuffless BP techniques suffer from multiple shortcomings including the requirement for two sensors on different locations of the body to measure the pulse travel time, the need to be frequently re-calibrated at least every few hours, and the reliance on inaccurate assumptions about certain physiological factors. As such, the need exists for a device that addresses these shortcomings and provides a practical tool to measure BP accurately, continuously and conveniently.

INNOVATION

Researchers at the University of Michigan have invented a non-invasive sensor that uses analytical algorithms to continuously monitor BP in both healthy and disease patient populations. The sensor is small, inexpensive and low-power. The device wraps around the finger like a ring and generates a waveform that is rich in information about the cardiovascular system, including BP, vascular resistance, and cardiac output. The ring sensor therefore enables on-demand or continuous monitoring that could also impact conditions including stroke, heart failure, and diabetes. The measurement of these clinical variables could reveal long-term trends in individuals or large scale patient groups over the course of years.