

Wearable Beat-to-Beat Blood Pressure Monitor

Provides continuous measurements in extreme environments

Linea Research Corporation has developed a wearable noninvasive monitor that provides continuous blood pressure and heart rate measurements in extreme environments. Designed to monitor the physiological effects of astronauts' prolonged exposure to reduced-gravity environments as well as the effectiveness of various countermeasures, the device offers wireless connectivity to allow transfer of both real-time and historical data. It can be modified to monitor the health status of astronaut crew members during extravehicular missions.

In Phase I of the project, Linea Research demonstrated the feasibility of the device. In Phase II, the company developed and fabricated a field-capable, low-power, lightweight monitor. In addition to supplying monitors to NASA, Linea Research plans to introduce the technology for use in ambulatory, high-acuity, and home-based blood pressure monitors.

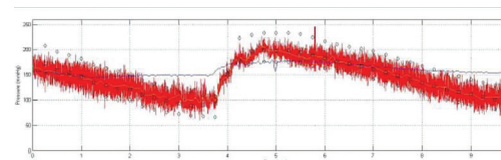
Applications

NASA

- ▶ Medical support for astronauts in reduced- and zero-gravity environments
- ▶ Evaluation of long-term physiological effects of hypogravity and the effects of various countermeasures
- ▶ Support for normal activities and medical emergencies

Commercial

- ▶ Ambulatory blood pressure monitors
- ▶ Home-based blood pressure devices
- ▶ High-acuity (e.g., arterial line replacement) devices



Linea Research Corp. illustration

Phase II Objectives

- ▶ Build a field-capable prototype that can be deployed in space missions:
 - Enhanced optical pulse detection
 - Model-based blood pressure estimation
 - Automated calibration
 - Optimization of algorithm for real-time implementation
 - Wireless connectivity
 - Human factors engineering, miniaturization, and system integration
 - Animal and human studies
 - Field testing of functional prototype

Benefits

- ▶ Enables continuous blood pressure measurement
- ▶ Requires cuff inflation only during calibration
- ▶ Eliminates the need for invasive procedures to obtain blood pressure via arterial lines

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