

National Aeronautics and Space Administration: BioWatch Monitors

Originally designed to monitor astronaut health, BioWATCH monitors multiple vital signs and transmits data to doctors. It can monitor various diseases across levels of acuity, which makes it ideal for patients at home. BioWATCH can dramatically increase a patient's quality of life.

Lead Agency:

National Aeronautics and Space Administration (NASA)

Agency Mission:

NASA's mission is to pioneer the future in space exploration, scientific discovery, and aeronautics research.

Principal Investigator:

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General Description:

Biomedical Wireless and Ambulatory Telemetry for Crew Health (BioWATCH) is a wireless biometric monitoring system originally designed to monitor astronaut health in space. It can measure heart rate, blood pressure, glucose, temperature, joint angle, ECG, and blood oxygenation, and then send the information to doctors on Earth in real time. BioWATCH was developed by ZIN Technologies and The Cleveland Clinic Foundation under NASA Glenn's Small Business Innovation Research Program.

The commercial version of BioWATCH transmits data to doctors wirelessly via cell phone, wireless internet or Bluetooth. It can be configured to monitor various conditions, which makes it ideal for post-surgery patients, participants in clinical drug trials, and home healthcare patients.

Based on the success of the initial prototypes, ZIN and the Cleveland Clinic teamed to deploy BioWATCH in an application monitoring heart rhythm in patients following a procedure designed to eliminate a heart rhythm irregularity known as atrial fibrillation. BioWATCH can be used in applications to monitor patients with histories of heart disease, arterial disease, hypertension, diabetes, pulmonary disease, stroke, myocardial infarction, or sleep apnea.

The technology of BioWATCH allows for transmission of patient data from the patient to a health professional in real time. Since BioWATCH is a small wearable monitor, it can

travel with the patient. All of these features allow for a substantial improvement in quality of life.

Ten percent of Americans over age 70 have a heart condition known as atrial fibrillation (AF), which is treated with anticoagulation drugs that require regular screenings. Typically, patients on these drugs are tested twice monthly for potentially fatal side effects. With BioWATCH patients can be tested daily, and results are available to the doctor instantaneously, reducing the risks. Also, patients facing long rehabilitation from orthopedic surgery can use BioWATCH to track their progress, thereby reducing rehabilitation time and readmission rates.

BioWATCH is a single solution that can affect the quality of life of millions of Americans.

Excellence: What makes this project exceptional?

BioWATCH is the only technology platform that can be used across various diseases and acuteness of symptoms. The real-time data transmission expedites diagnosis and treatment by keeping medical professionals accurately informed about a patient's specific symptoms and conditions. BioWATCH can measure a patient's pulse, blood pressure, glucose, temperature, joint angles and more, and then send the information to a doctor in another location in real time. Its batteries have an operating life more than four times longer than current monitoring systems. It is also much lighter than other systems. Its battery life, small size, and wireless transmission are a few of many factors that make the BioWATCH exceptional.

Significance: How is this research relevant to older persons, populations, and/or an aging society?

Existing monitors allow for only one parameter to be monitored at a time. However, 40 percent of patients who need monitoring have multiple symptoms or complications, which is why BioWATCH's adaptability is so valuable.

The wearable monitor can be used in the car, at home, or outside to monitor cardiac, orthopedic, diabetic, or neurological disease. Remote monitoring technology will allow for increased efficiency of the over-tasked nursing population.

Because many older adults take an active role in monitoring their health, the BioWATCH is a significant product that allows comfortable at-home wellness and peace of mind for any adult concerned about their medical history. Rather than reacting to severe medical emergencies after a patient is already in distress, a patient and his or her doctor may be alerted to potentially dangerous conditions far earlier, enabling the patient to feel empowered while taking a pro-active approach to health and longevity.

Effectiveness: What is the impact and/or application of this research to older persons?

BioWATCH can be prescribed without the need for outside laboratories or technicians. It can reduce the cost or need for hospitalization, improve patient compliance with treatment, improve quality of life, and improve life expectancy.

Innovation: Why is this research exciting or newsworthy?

BioWATCH is the application of a flexible technology to the aging population. Unlike other monitoring products, BioWATCH's innovative technology allows a single monitor to be used in a variety of settings and disease severity. Results can be transmitted easily and wirelessly, without the patient needing to visit a lab or clinic; it allows for a better quality of life by

increasing patient freedom, allowing patients to visit family or travel without missing routine medical testing.