

DHS Science and Technology Directorate

Wireless Patient Monitoring

Why it's Needed

Paramedics and other emergency medical services (EMS) providers often operate in confined spaces and/or mobile situations. They are required to manage multiple tasks, including the monitoring of a patient's vital signs.

Currently, responders must attach numerous wires and instruments to a patient to monitor their vital signs. While the information received from these instruments is displayed on one screen, the entanglement of wires and the process of connecting and disconnecting the patient can be overwhelming and hazardous. In addition, this situation can take up precious time and space in confined ambulatory situations (e.g., the back of an ambulance or an aircraft). A system is needed to provide EMS personnel with a hands-free, wireless technology that monitors all required patient vital signs in one location.

How it Works

The Department of Homeland Security Science and Technology Directorate (S&T) has partnered with Sotera Wireless, Inc. to develop a device that can monitor vital signs without connecting wired sensors from the patient to other equipment. The device will monitor blood pressure, 12-lead electrocardiograms, temperature, and respiration. The system will work with existing devices, including the use of traditional sensor patches attached to a patient that transmit data feeds wirelessly back to a central monitor. Given the various mobile environments that paramedics operate in, the system will be capable of operating in confined spaces as well as "on the go" (e.g., when a distressed patient is moved from the scene of an incident into an ambulance). The system will also use a single monitor that is lightweight and easier to transport than models on the market today.

The Value

This technology will provide paramedics with a hands-free, wireless device to monitor a patient's vital signs, creating a safer environment for both EMS personnel and patients. No longer will first responders have to worry about a mess of entangled wires and a heavy monitor to transport with the patient. If patients require movement up or down stairs or through tight doorways, this wireless monitoring device will pose less snag hazards and will save valuable time and space when hooking up a patient

to sensors. Reducing snag hazards with just one device and a lightweight monitor will allow paramedics to respond to emergency incidents and perform daily operations more seamlessly and effectively.

The technology will also allow end-to-end, real-time connectivity between the emergency medical technician in the field and the emergency room. Data can be forwarded through a remote system from the ambulance to the hospital to give doctors, nurses, and other staff better situational awareness prior to the patient's arrival.

Next Steps

S&T's TechSolutions program, along with San Diego State University Center for Commercialization of Advanced Technology, will work with Sotera Wireless, Inc. to address the requirements for this technology. The requirements were identified by EMS subject matter experts with backgrounds in patient transport and vital sign monitoring. The goals of the TechSolutions program are to field technologies that meet 80 percent of the operational requirements, within a 12 to 18-month timeframe, at a cost commensurate with the proposal. These goals are accomplished through rapid prototyping. Sotera Wireless, Inc. also plans to seek Food and Drug Administration certification for the wireless device. For more information on the TechSolutions program and other resources that S&T has established to assist first responders, please visit www.FirstResponder.gov.



Concept of the Wireless Patient Monitoring Device



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To learn more about Wireless Patient Monitoring, contact SandTFRG@dhs.gov.