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The Air Force's Parachuting Medics Are Jumping With a Genius New Triage Tool

How wireless vital sign monitors will save lives on the battlefield.



By Eric Tegler Dec 11, 2015 @ 3:59 PM Military Research **EVO PDF Tools Demo**



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Air Force parascuemen are combat medics who jump into action looking to save lives, whether they're thrust into a humanitarian disaster or a battlefield. They might scuba dive, rock climb, or even snowmobile into hostile territory. Frequently they parachute, and for the last few months they've been jumping with a new wearable device and wireless sensor kit called BATDOK, the Battlefield Airmen Trauma Distributed Observation Kit.

Picture an Air Force special operations pararescue jumper (PJ) flying into a combat zone. Upon landing, he moves to a collection point where the wounded have gathered. He swiftly goes to each patient and places small sensors on their chests, arms, and fingers which begin wirelessly feeding their vital signs to a tablet or smartphone mounted to his chest or wrist. While he's checking on



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patients down the line, his device vibrates signaling an alert. He looks at the screen: the second patient's heart rate is dropping. The PJ runs to that person and performs chest compressions, saving a soldier's life.

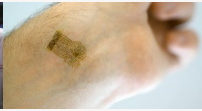
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The ability for medics out in a remote locale to treat more than one patient at a time is a game-changer, says Gregory Burnett.

"Before BATDOK there was one PJ for one patient, and the pararescueman had to be in very close proximity to that patient to see the micro-display on the vital sensor," Burnett says. "BATDOK allows the pararescueman to be away from the patient and to monitor multiple patients simultaneously."



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Burnett is the chief engineer for a technology demonstration program called BATMAN (Battlefield Air Targeting Man-Aided Knowledge), which includes BATDOK. The kit is the result of work by a team of four developers, several engineers, and experts with the Air Force's 711th Human Performance Wing, Human Effectiveness Directorate, at Wright-Patterson Air Force Base in Ohio.

At its core, BATDOK combines a custom Android app with any FDA-approved wireless monitoring sensor. The app can run on a tablet, a smartphone, or the small pulse oximeter computer that PJs already carry when they jump.

"We don't have to use a smartphone or tablet. They're just the cheapest devices which run the Android platform," says Air Force First Lieutenant Max Gabreski, one of BATDOK's software developers. The team tried to take advantage of existing technology wherever they could, and not just by using Android. The wireless sensors, for example, link to the app via Bluetooth or 802.11 Wi-Fi connections.

"Once the pararescueman arrives on scene and places a vital sensor onto a patient, he simply hits a 'connect' button [on the device]," Gabreski says. "We take care of the pairing and authentication. If the sensor is on and transmitting, the BATDOK phone handles all the connectivity issues, freeing up the

pararescueman's mental load."

On whatever device the medic uses, BATDOK appears as a dashboard that shows every patient and their key vitals, including heart rate, blood oxygen, blood pressure, and the time that has passed since the medic checked on the patient. Burnett says it was important to make the interface as intuitive as possible, so that the PJ gets just the info that he needs and isn't inundated with extraneous data. That way, Burnett says, "he can quickly reference the display and make decisions based on his own medical training and techniques, tactics, and procedures."

The decision-making might include quickly switching from medic to soldier mode. "For example, a PJ might abruptly become security, suppressing enemy fire," Burnett says, "but he still has awareness of what the patient status is. If a patient begins to crash, he receives a vibration visual or audible alert and can divert [to the patient] as needed."

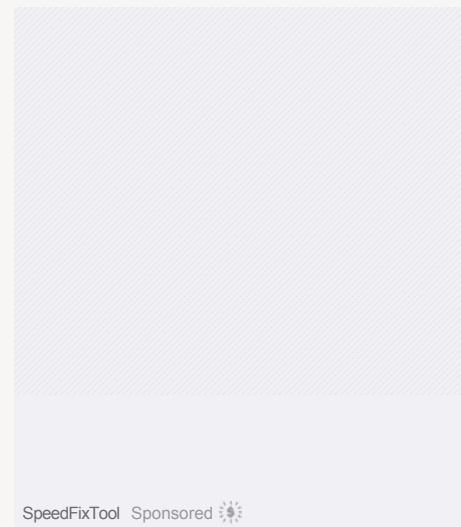
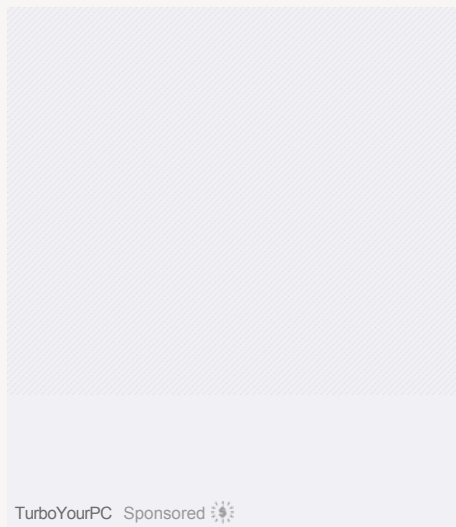
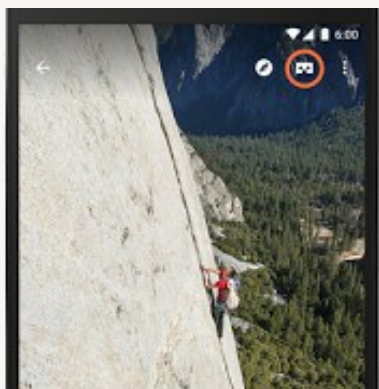
BATDOK is currently in trials with pararescuemen at Air Force Special Operations and Air Combat Command. In addition to receiving data from wireless sensors, it can also send data to forward hospitals or other medical units via a PJ's secure tactical data network radio. Gabreski says the team is working to secure the near-field communications (Bluetooth or Wi-Fi) that the sensors use, and integrating these with a new tablet that the Air Force will issue to pararescue jumpers.

"Up to now, there has been very little advancement in point-of-injury care," Burnett says. "BATDOK affords a growing capability at the point of injury where our pararescuemen begin the 'golden hour' of care."

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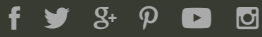
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