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Wanted: Robots to Evacuate Wounded Soldiers

A Pentagon study looks at the future technology for evacuating wounded soldiers, including UAV rescuers, human hibernation, and more.

By Sharon Weinberger



AirMule

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On the battlefield of the future, a wounded soldier could be scooped up by a robot, placed in a specially equipped drone, and then flown to the closest manned-medical center, where he or she is diagnosed with automated equipment that can deliver treatment without human intervention. Of course, that brings up the question: If robots can do all that, will there be human soldiers on the battlefield?

Air Mobility Command, the military command in charge of aeromedical evacuation of wounded troops, recently announced that it was looking to commission a study on the future of evacuating soldiers from the battlefield. The Pentagon is asking government contractors, as well as their own engineers, to come up with ideas for technologies to be deployed not for the next military conflict, but looking three decades into the future. "The results of the study should be imaginative and revolutionary, not simply evolutionary," Air Mobility Command said in its release, which ticks off robotics, suspended animation, and even spaceflight as a few of the potential ways wounded troops could be evacuated in the future. The military says it is looking for "science fact, not science fiction." So speculating on the nature of future warfare, such as the possibility of remote-controlled battles, is

okay, but the concepts must be "reasonable."

Brig. Gen. Bart O. Iddins, Command Surgeon for Headquarters Air Mobility Command, says this move is simply part of long-term strategic planning. That said, he acknowledged the unusual nature of this approach, which seems to conjure up images of robots placing soldiers in hibernation pods. "While strategic planning studies are common across the armed forces, this study is the first of its kind focused specifically on patient movement and en route casualty care," Iddins says.

So what might the future look like? One major area of development is evacuation by UAV. NATO has a task force, called **Research Technology Group 184**, which is looking at how to create an unmanned air ambulance. Germany, Israel, the United States, and the United Kingdom are all taking part, looking at the types of unmanned air vehicles that could be used as well as the legal and certification requirements that would be needed. There are any number of unmanned aircraft, both current and future, that could be used for medical evacuation, including the **K-MAX**, the Little Bird, and the Fire-X.

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There are also Israel under development with aeromedical evacuation in mind, like the AirMule, developed by the Israeli firm Urban Aeronautics. The AirMule is a vertical takeoff and landing aircraft that uses internal lift rotors, allowing it to land in urban areas inaccessible to helicopters. The idea is that a medic or someone on the battlefield could call for the AirMule, which would be dispatched like a taxi and travel to the injured soldier guided by GPS, then land guided by a laser designation or perhaps a beacon signal. The company expects to demonstrate a fully autonomous flight test by the end of this year, which would involve having the aircraft take off, travel, land, and return. The aircraft will be ready to be deployed at the end of 2015, according Janina Frankel-Yoeli, the company's vice president for marketing.

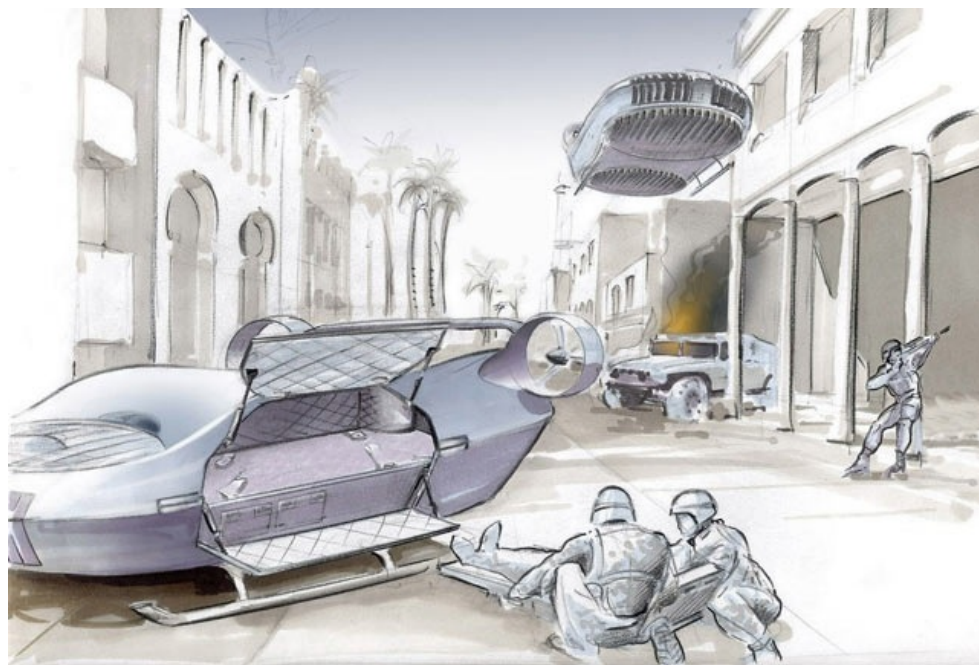


Illustration of the AirMule.

"The most likely initial customer will be the Israeli Defense Forces," she says. But, she adds, "it's not likely that [the] first thing they would use it for is medical evacuation." It's still too early for the military to accept loading a patient on an unmanned aircraft, Frankel-Yoeli says. "Initially it would be for cargo delivery."

There are also any number of research projects looking at robotic rescue, such as the U.S. Army-funded [Battlefield Extraction Assist Robot \(BEAR\)](#), a humanoid robot that would literally scoop up a casualty in its arms and carry him or her away from the battlefield, avoiding the need to put human lives in danger. Iddins says there are also advances underway in the realm of handheld diagnostics and automated life support.

And, of course, the military really is looking at suspended animation. "[A]n artificially induced 'hibernation-like' state is another promising medical intervention in which a trauma victim's physiologic deterioration is dramatically slowed or 'suspended' in order to buy time during evacuation to a higher level of medical care," Iddins says. This work is more than theoretical, DARPA is already funding [university experiments with pigs](#) to see if this sort of hibernation state would be useful for humans.

This study, Iddins says, is not designed to lead directly to selecting or funding any specific technologies. So don't count on suspended animation quiet yet. "[I]t is important to realize," says Iddins, "that the results of this initial futures study may indicate the need for further study and investigation." However, he says, "[R]obotic-assisted surgery is already commonplace, and robotic battlefield treatment and battlefield extraction of casualties is on the horizon."

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