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Global DOD system closes gap between battlefield, medical experts

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SAN DIEGO -- The Department of Defense yesterday showcased a telemedicine system that allows diagnostic X-ray photos of personnel deployed almost anywhere in the world to be quickly viewed by a trained radiologist, thanks to a global, secure network.

Robert de Treville, program manager for the Army Picture Archive Communication System (PACS) program office at Fort Derrick, Md., said the teleradiology network could make the difference between life and death for combat casualties by zipping a digital X-ray from the battlefield to a trained radiologist at one of 15 locations around the world.

The technology, shown at the annual Healthcare Information and Management Systems Society conference here, allows the Defense Department to send the image to the radiologists rather than sending them to remote locations, maximizing a key medical resource, de Treville said.

Although he declined to say whether the U.S. Army or other defense agencies have deployed the teleradiology system to the Middle East, where the U.S. has marshaled close to 150,000 troops for a possible war with Iraq, de Treville said the Army PACS program could support operations in that region.

The Army PACS program office, part of the [Army Medical Research and Materiel Command](#), headquartered at Fort Derrick, has already deployed teleradiology systems in combat environments for U.S. forces in Afghanistan and Kosovo, de Treville said. These forward-deployed systems link back over the department's Nonclassified Internet Protocol Router Network to radiologists at eight stateside hospitals operated by the Army or U.S. Navy and seven



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overseas hospitals operated by the Army, U.S. Air Force or Navy.

The Defense Department faces a high attrition rate for its radiologists -- the Air Force, for example, will see its pool of roughly 170 radiologists cut in half within a year as the highly trained specialists opt for civilian life -- and de Treville said the global network allows the three services to maximize their talents by overcoming numerous time zones and distance. For example, he said, an Army radiologist in Afghanistan not only interprets images from personnel locally, but also reads and makes diagnoses from X-rays or computerized tomography (CT) scans over the network from stateside hospitals or major Defense Department medical facilities in Europe.

The effort has already resulted in at least one lifesaving remote diagnosis, de Treville said. Last year, an Army radiologist in Kosovo was scanning routine images shipped from his home hospital at Fort Bragg, N.C. As he looked over one image, he spotted a ruptured appendix and quickly alerted medical personnel back in the U.S.

The Army PACS program office built its tri-service teleradiology network around image management, compression and encryption software from [Medweb](#) in San Francisco, de Treville said. Dr. Peter Kilcommons, Medweb's CEO, said the software runs on easy-to-use Cobalt servers from Sun Microsystems Inc. The servers are based on Intel Corp. processors rather than Sun's RISC architecture.

Kilcommons said he chose the Cobalt servers for the teleradiology system because they're easy to set up by nontechnical personnel. "I wanted something as easy as turning on a light switch," said Kilcommons, who showed how easy it is to set up Cobalt servers, which feature an LCD panel that walks a user through the initialization process.

The Medweb Linux-based software takes images from any digital medical device -- X-ray, CT scan or ultrasound -- then helps users on each end manage the transmission process over what could very well be satellite-based narrowband battlefield communications pipes. For example, Medweb can compress an 80MB digital file at a 13-to-1 ratio at its point of origin, which should be readable by the radiologist at the other end, he said.

The high compression ratio wouldn't interfere with the reading of a simple bone fracture, Kilcommons said. But in the case of a cardiac scan or brain scan, a radiologist would probably want a higher-resolution image, which is available with a simple mouse click on the image. That results in the automatic retransmission of that particular image without compression.

Medweb uses [FreeS/Wan](#) Linux IPsec software to ensure the integrity of the medical information sent over a nonsecure Defense Department network, Kilcommons said. Transmissions are encoded with 168-bit triple Data Encryption Standard encryption, he said, and that can be ratcheted up as high as 1,024-bit triple DES.

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