



AT THE FOREFRONT

While traditional X-rays have long been the standard for detecting stress fractures in Soldiers, a nuclear medicine protocol being used by the General Leonard Wood Army Community Hospital's (GLWACH) Radiology Department provides a better alternative. SPECT-CT can now find stress fractures far earlier than X-rays are able. This technology is a fusion of Single Photon Emission Computed Tomography, or SPECT, which is usually used for nonmusculoskeletal imaging, and low-dose computed tomography. Together, these technologies help radiologists more accurately grade stress injuries for severity. GLWACH has used SPECT-CT on trainees at the Training and Doctrine Command facility at Fort Leonard Wood with excellent results.

A UNIQUE APPLICATION

"SPECT-CT is typically not employed in the manner it is here at Fort Leonard Wood," noted Maj. Mustafa Ali-Khan, GLWACH radiology chief. "The use of SPECT fusion imaging, although not unique to Army Medicine, is unique to its application in its dedicated capacity in musculoskeletal imaging at a Training and Doctrine Command facility, in the manner employed here at Fort Leonard Wood," he said.

Traditionally, injured Soldiers in training are given an X-ray and then sent back to continue training if an injury is not visible. Undiscovered stress injuries can progress and then become discovered at a later date as a more serious insufficiency fracture or stress fracture.

"SPECT-CT fusion imaging has worked well in the training environment to mitigate the overall number of bad outcomes with respect to evolving stress injuries," said Ali-Khan. "We have every reason to believe that other installations with SPECT equipment, as well as other branches of the military with high training populations subject to bone stress injuries, could use our SPECT-CT fusion imaging protocol with a high success rate, as well."

NEW IMAGING TECHNIQUES

The U.S. Army Medical Research and Materiel Command's Telemedicine and Advanced Technology Research Center (TATRC) is managing a project that uses a new dimension in imaging technology for traumatic brain injury (TBI). Using advanced magnetic resonance imaging methods and susceptibility weighted imaging and mapping, or SWIM, the Army's partner in this project is exploring ways to improve diagnosis and outcome prediction of mild TBI.

ADVANCED IMAGING TECHNOLOGIES IMPROVE DETECTION CAPABILITIES.

The technology detects minute levels of vascular damage in the form of bleeding, clots and reduced levels of oxygenation that advance the understanding of brain injury, particularly related to trauma. While many investigators have focused on arterial changes related to brain injuries, this research has remained focused on the veins, an often overlooked component of the vascular system that may better help diagnose these injuries.

"This study is just one example of the promising research that TATRC supports," said Col. Karl Friedl, TATRC director. "Collaborations among the investigators we bring together may lead to creative solutions we hadn't imagined," he added.

ONGOING ADVANCES

U.S. Army physicians with an interest in the innovative use of imaging play a key role in the advancement of research. This opportunity allows them to not only provide essential assistance to our nation's warriors, but also to develop as health care professionals in a supportive and highly resourced environment.

The Army's work in advanced imaging is one example of the numerous innovations you'll find as part of our team. Across many different disciplines, we're leading the way - while offering physicians opportunities to explore specific areas that interest them and grow their careers.

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