# Head Injuries Push Improvements In Gear

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WASHINGTON — U.S. troops are suffering traumatic brain injuries in greater numbers in Iraq and Afghanistan than in previous wars, prompting studies on better helmets and improved medical treatment and recuperation care.

An area of scientific focus at the Defense and Veterans Brain Injury Center, headquartered at Walter Reed Army Medical Center in Washington, D.C., is how many traumatic brain injuries, or TBI, are direct results from the shock wave of a blast, and not just from the head impacting with the ground or other head and brain injuries wounds caused by shrapnel, for example, said Laurie Ryan, the center's assistant director for research.

In a preliminary study done among troops treated at Walter Reed, scientists analyzed 155 patients wounded in combat in Iraq to see if any showed signs of combat traumatic brain injury. Of the 155 troops, 96, or 62 percent, showed symptoms of minor to severe brain injuries. Of the 96, 88 likely had sustained an injury as a result of a blast, such as an explosion from a landmine, rocket propelled grenade or improvised explosive device, she said.

Ironically, the higher number of wounded might be the result of better protection for troops. "They're surviving their injuries," Ryan said. Physicians are treating more head and extremity wounds because troops are protected better by the new Interceptor flak vests, she said.

Also, Army scientists at Fort Rucker, Ala., developed, and the U.S. Soldiers Systems Command at Natick, Mass., tested the new Advanced Combat Helmet, an improvement over both the special forces' Modular Integrated Communications Helmet, or MICH, and the current Kevlar helmet.

"The Kevlar is great against penetration injuries [such as from a bullet or shrapnel], but doesn't provide much protection … from concussion injuries because it is not well-padded," Ryan said.

The ACH helmet has been fielded for about a year now as part of the Army's Rapid Fielding Initiative. "We're fielding them as quickly as they can be manufactured," said David Nelson, deputy product manager for clothing and individual equipment at Fort Belvoir, Va.

Scientists are interested to know if the helmet is helping curb brain injuries and if not, what improvements might be made, Ryan said.

"We'll be looking to see if, in fact, the newer helmets provide better concussion protection and comparing … new data to the old one in terms of injuries. Our hope is that we constantly improve and our investigations might be used as input for any future helmets."

The NFL, too, is proving advantageous, as military scientists are looking at brain injuries suffered by football players, and studying whether helmet padding provides enough protection to guard against severe injuries, said the center's director, Dr. Deborah Warden, who showed a video clip of a player who took a lateral head pounding and was knocked unconscious on the field.

They are analyzing return- to-play guidelines issued by the American Academy of Neurology to see if any possible "return- to-battlefield" rules should mirror the AAN's, said Warden, who spoke Tuesday with Ryan at the annual weeklong Tricare conference.

According to the AAN guidelines, if a player has no loss of consciousness and symptoms such as headache or vision problems last less than 15 minutes, he can return to play after 15 minutes. If there is no loss of consciousness but symptoms last more than 15 minutes, the player should be out for one week after the symptoms subside. Lastly, if there is any loss of conscious, the player should be out for at least one week.

Some symptoms of brain injury include headache, dizziness, irritability, decreased concentration, memory problems, fatigue, visual problems, sensitivity to noise, judgment problems, anxiety and depression.

And troops who sustain concussions might be returning to the battlefield too early, which could complicate their recovery.

One preliminary study done recently on 14 cadet boxers at West Point showed that even after four days of recovery time after suffering concussions, several showed late simple reaction times of at least 1/10 of a second, Warden said.

Closed head injuries, including mild concussions, often are overlooked, especially when patients are being treated for other injuries that might require immediate medical care, such as severe bleeding or amputations, Ryan said.

But Warden and Ryan cautioned health care providers against ignoring signs of TBI, and encouraged physicians to refer cases to one of seven site participating in the Defense and Veterans Brain Injury Center program. Headquartered at Walter Reed, the two other military are San Diego Naval Medical Center and Wilford Hall Air Force Medical Center at Lackland Air Force Base in Texas. The four VA medical centers participating are in Minneapolis, Minn., Tampa, Fla., Richmond, Va., and Palo Alto, Calif. The Virginia NeuroCare Inc. site in Charlottesville is the sole civilian partner.

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