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April 17, 2008, 1:10 pm

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Pentagon Seeks Battlefield Device to Diagnose Brain Injury

Posted by Theo Francis

Roadside bombs have made brain damage a grim hallmark of modern war. A [RAND study](#) out today says 320,000 U.S. troops may have suffered brain injuries in Iraq and Afghanistan — and less than half say they were ever evaluated by a doctor.

Even where there's no unconsciousness or visible head wound, mild brain damage, without prompt treatment, can cause lasting problems.

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U.S. soldiers investigate the scene of a bomb explosion which targeted a U.S. military vehicle April 2006 in Baghdad, Iraq. (Photo: Associated Press)

So how to tell if a soldier is just shaken up, or if he has a concussion needing quick attention? Brain scans aren't realistic in a battle zone; and thorough field tests can take 15 minutes or more (see a Navy version of the [clinical practice guideline](#) for managing concussions). Besides, symptoms of concussion or other mild traumatic brain injury are often easy to confuse with psychological problems and post-traumatic stress disorder.

The Pentagon's answer: A gizmo that could evaluate a soldier in seconds. And the Defense Department is giving the [Brain Trauma Foundation](#) \$4.6 million over four years to come up with a device that can do just that—and is rugged enough to function in Iraq. It's part of \$300 million Congress set aside for research into traumatic brain injury and psychological health.

The battlefield-ready version isn't finished. When it is, it'll probably include goggles or a visor attached to a PDA. But at

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its heart will be a tiny, high-resolution camera and software to measure how well the soldier can track a red dot traveling in a small circle. How consistently the eye tracks the dot— both initially, and then while the patient concentrates on a simple task, like remembering five words — indicates how much damage was done, said [Jamshid Ghajar](#), the foundation's president and a clinical neurosurgeon at [Weill Cornell Medical College](#).

Here's the science behind the gizmo: When a person's head whips suddenly — whether from a bomb blast or a car accident — the brain whips around as well. Even if the brain doesn't slam into the skull and bruise, the sudden motion can create tiny tears in the connections between parts of the brain governing attention. Those tears can cause memory and attention problems, too. And in some cases, the injuries predispose the untreated victim to much more serious brain damage from subsequent concussions.

Some concussions are obvious. Others aren't, especially in a chaotic environment, says Col. Tony Carter, a U.S. Army colonel, former surgeon and interim director for strategy and planning at the Pentagon's new [Defense Center of Excellence for Psychological Health and Traumatic Brain Injury](#).

Concussion victims may appear to be doing fine — until stressed, when their attention can collapse. (See the [Mayo Clinic's concussion rundown](#).) As Col. Carter put it: "They may not respond appropriately in circumstances in which, if they had not had their bell rung, they would have responded just fine."

One way to gauge the extent of the damage is to measure variations in the brain's timing; the more variation, especially while the subject is concentrating on something else, the greater the damage, Ghajar told Health Blog. His research has measured these correlations, using a version of the eye-tracking test, with damage visible in specialized brain scans of civilian head-trauma patients.

"When you're paying attention to something, you're actually predicting what happens," Ghajar said. "Without timing, you can't pay attention, you can't learn, you can't function in the outside world."

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Money well spent. We owe them much more.

Comment by Dan - April 17, 2008 at [2:42 pm](#)

This is wonderful news for both civilians and soldiers.

Comment by AmericanTech@itsBest - April 17, 2008 at [2:52 pm](#)

We need to make sure this kind of device stays out of the hands of liberal trial lawyers. They will just use this method of

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WSJ's Health Blog offers news and analysis on health and the business of health. The lead writer is Jacob Goldstein. He came to The Wall Street Journal from the Miami Herald, where he was a medical writer. Scott Hensley, who covered the drug industry as a reporter for the Journal for seven years, is the editor and also a contributor. The blog also includes contributions from other staffers at the Journal, WSJ.com and Dow Jones Newswires. Write to us at healthblog@wsj.com.

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diagnosis to justify billions of dollars corporate America will have to pay to those who have been “injured”.

Comment by Tort Reform - April 17, 2008 at [3:11 pm](#)

They’ve obviously kept any such device out of the hands of your doctor TR.
Regards, Dick G

Comment by Dick G - April 17, 2008 at [3:24 pm](#)

I had a traumatic TBI last summer — here in NYC, playing softball of all things. I was lucky. Mine was relatively mild (barely registering on the Glasgow Coma Scale).

Tort Reform: Getting such an injury made me delve into the background to such injuries. It is much more serious and unrecognized than it should be. If the military makes such a device available, I expect all trauma centers — as well, I hope, as any profession, college, and high school football team — would get one. If you’re worried about trial lawyers, deal with tort reform, TR. Just get such a device into the hands of doctors. Pronto.

Comment by Suffered a TBI Last Summer - April 17, 2008 at [3:48 pm](#)

I can see it now...large insurance companies pay out very little as one’s brains taps out in the “green” on the “jell-o-meter”. “Your brains, sir, were only mildly shaken. Not enough here for us to pay out for any long-term treatment. Your premium, on the other hand, will now jump to the Hazardous Customer level. Have a great day!”

Comment by Big_Insurance - April 17, 2008 at [4:41 pm](#)

AN intersting product which is in clinical trials is SYBD’s Oxycyte. A small Phase-IIa test recently showed a marked improvement on TBI patients. A much larger test has been submitted to the FDA for approval and the Dod is funding part of the costs of the test.

Comment by Al M - April 18, 2008 at [9:54 am](#)

This is pure nonsense. The DoD could have been diagnosing these injuries 7 years ago with available technology. 15 minutes is sufficient time to take a rating.

The DoD does not want to deal with paying diability.

Comment by DC - April 18, 2008 at [10:00 am](#)

Synthetic Blood International (SYBD) has another Gov funded effort, Oxycyte, which will hopefully help when a patient or soldier is diagnosed with TBI. These two products look like a great one, two punch!

Comment by Damabe Inc - April 18, 2008 at [10:05 am](#)

A Sony Wii with an Army/Marine coded “do you have a Concussion Game”-Diagnoses in 90 seconds.

Comment by Ex-Part Timer - April 18, 2008 at [1:42 pm](#)

The Dept. of Defense has also issued a multi-million dollar grant to research the effects of Oxycyte on TBI. Oxycyte is a therapeutic oxygen carrier manufactured by Synthetic Blood International (SYBD), which is currently in clinical trials.

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In the Phase 2A trials, nine patients with TBI were tested. Although there was an expectation of 60% mortality among these very seriously injured patients, only two of the nine who had received Oxycyte died. Much to the doctor's amazement, all of the other seven are back at work now.

Here's a link to a recent article in the Miami Herald about one of the patient's success story:

<http://www.miamiherald.com/1057/story/459521.html>

And here's a link to a segment that WIRED SCIENCE on PBS ran about Oxycyte: Blood Simple: PBS special on Oxycyte

Additionally, the Navy has also issued a grant to SYBD to test Oxycyte for the treatment of decompression sickness (the "bends").

SYBD is planning on starting Phase 2B testing shortly and plans to study, with the assistance of the DOD grant, a total of 300 patients.

Comment by lolofox - April 18, 2008 at [4:16 pm](#)

Again, here's the link to the PBS Wired Science segment on SYBD's Oxycyte:

http://www.pbs.org/kcet/wiredscience/story/65-beyond_blood.html

Comment by lolofox - April 18, 2008 at [4:19 pm](#)

The excellent RAND study described the overall numbers. Each one of their statistics is a person. For stories of some of the individual vets who are affected, see [click here](#).

Comment by Ken Farbstein - April 19, 2008 at [10:15 pm](#)

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