

JULY 26, 2006

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By Carlos Bergfeld

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A Dose of Virtual Reality

Doctors are drawing on video-game technology to treat post-traumatic stress disorder among Iraq war veterans



SLIDE SHOW >>

Dr. Dennis Wood takes patients on what some might consider an odd journey. He starts off leading them to a military compound in Fallujah, Iraq. He then guides them through an Iraqi marketplace before they accompany a patrol through Iraqi homes. And if he thinks they're up to it, he may even take them onto a battlefield, in the midst of explosions and aircraft flying overhead.

But neither Wood nor the patients is anywhere near Iraq. The therapeutic conflict is part of a virtual reality program developed at the Virtual Reality Medical Center in San Diego and funded by the Office of Naval Research (ONR). It's designed to help personnel returning from the wars in Iraq and Afghanistan cope with so-called acute post-traumatic stress disorder, or PTSD. Brought about by distressing experiences like those in war, PTSD can lead to flashbacks, other psychological ailments, and social problems.

COPING STRATEGIES. A therapist at the Naval Medical Center in San Diego, Calif., Wood monitors patients' heart and breathing rates and even how much they're sweating to see the effect of the virtual environments. The aim is to get patients to draw on their meditation training to regain perspective—and stay calm—when a stimulus causes an emotional response. "The idea being to be in the high-stimulus environment for a long period of time, maintaining low psycho-physiological arousal," Wood says. "The person then can take that learning in the therapeutic environment and transport it out or generalize it to day-to-day life."

There may be a great need for PTSD therapy among veterans of the war in Iraq. A 2004 study published in the *New England Journal of Medicine* estimates that PTSD afflicts about 18% of the troops in Iraq. That study took place early in the war, and the figure now may be higher, says Emory psychiatry professor Barbara Rothbaum. She co-owns Virtually Better, a virtual reality treatment company that has received funding from the ONR to develop and test a version of the therapy. "Things over the past few years have gotten even worse," she says. "I hope we're wrong, but I think everybody's expecting probably a higher rate of PTSD." There are currently 127,000 troops stationed in Iraq, according to the U.S. Defense Dept.

Petty Officer Second Class Armando Guerrero has just completed his third session under the program at the Naval Medical Center. It was his first to incorporate the full virtual reality treatment. A recalled reservist from Texas, Guerrero worked as an equipment operator in the Navy's construction battalion in Iraq. He hopes the virtual reality treatment will help him cope. "Some of it does resemble the real Iraq," Guerrero says. "The only thing they need is the smell."

SUPPLEMENTAL HELP. Soon, therapies like the one he's taking will even have that. Guerrero was part of a program for noncombat personnel. But it's part of a larger \$4 million project funded by the ONR that began in April, 2005, and is designed to test virtual reality treatments for a variety of personnel. One treatment incorporates not only smell but feel as well. A version of the treatment for returning combatants is just now being distributed to various facilities, including academic institutions and military installations such as the Naval Medical Center in San Diego.

Rothbaum is conducting research that she hopes will make that version even more effective. In August, researchers at Emory University will begin studying the effects of combining the virtual reality PTSD treatment with a drug shown to augment virtual reality therapy. The drug, called D-cycloserine, was tested in a 2004 study by Emory

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- The benefits of outsourcing to corporate America far outweigh the costs
- There's an even split between the drawbacks and rewards
- Any benefits are overshadowed by the loss of U.S. jobs
- Unsure

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researchers and significantly enhanced the therapy treating acrophobia, or fear of heights. "After treatment, and then again three months later, the people who got the D-cycloserine reported less fear," Rothbaum says. "After two pills and two sessions, they were doing better than the people who got the placebo." The Emory research project is funded by the National Institute of Mental Health and uses the Iraq treatment developed by Virtually Better and the Institute for Creative Technologies at the University of Southern California.

Rothbaum and other doctors treating PTSD are drawing on lessons learned from the Vietnam War. Virtually Better developed a Virtual Vietnam VR therapy program in 1997 to help Vietnam war vets struggling with PTSD. A congressionally commissioned survey of Vietnam veterans released in 1990 found 30.9% of male and 26.9% of female Vietnam vets had a lifetime prevalence of PTSD.

SENSORY OVERLOAD. But Rothbaum hopes treating soldiers from the current conflicts soon after their combat experience can prevent PTSD later in life. "It's decades after Vietnam," she says. "There's been so much disruption in people's lives. What we're hoping is, if we can get people closer in time to when they served in Iraq, we can treat the PTSD and get them feeling better."

Makers of VR treatments also make heavy use of computer game technology. Some have incorporated graphical and audio elements from a military training video game called *Full Spectrum Warrior* and combined them with newly developed graphics and sound to create the virtual reality treatment environment. "Looking at the video-game industry in general as a source of help and innovation is at least one of my big goals," says Commander Russell Shilling, program manager at the Office of Naval Research. Shilling is no stranger to the games industry. He was the sound designer for the U.S. Army's recruitment game *America's Army*.

Full Spectrum Warrior's designers have taken their game and meshed it with the VR hardware experience of Virtually Better to make an emotionally stimulating program incorporating the sounds, visuals, feelings, and smells from Iraq. "Evoking emotion in a simulation, even in training, is a fairly new idea for us," says Shilling. The simulation uses VR headsets to immerse the patient in the world. It also uses bass shakers that rumble the patient's seat and a smell machine that can create scents.

REALITY BITES. The point is not to retraumatize the patients but to allow the individuals to cope with painful experiences. "The concept here is that by doing this in a very modestly paced manner, the person feels little bits of anxiety as they go through this, but not at a level that overwhelms them," says Albert "Skip" Rizzo, a research scientist at the Institute for Creative Technologies. "Eventually they're actually in the Humvee, driving down the road, and children are by the side of the road, and an IED (improvised explosive device) goes off and there's body parts everywhere." The institute has gotten feedback from therapists and even soldiers in Iraq to develop more accurate versions of the program, he says.

Even with less-than-perfect graphics, PTSD patients respond well to simulations, says Hunter Hoffman, who is leading another ONR-funded project at the University of Washington. "They come out saying that was really powerful, whereas someone who doesn't have PTSD might be less impressed with it," he says. "The patient is actually bringing a lot to that world. They may remember seeing things that aren't actually shown."

Hoffman says his program has gotten off to a slow start due to a very involved training process for therapists. "We're going to go gangbusters once we get started," he says. "We've got our software ready, and we certainly have soldiers."

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Bergfeld is an intern for BusinessWeek.com in Silicon Valley

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Nickname: marvelous

Review: I served in both OEF and OIF (Operation Enduring Freedom and Operation Iraqi Freedom). I have PTSD (Post-Traumatic Stress Disorder). This project should be a preventive measure not a somewhat cure for PTSD. Why is reliving the painful memories any help to PTSD patients. PTSD can only be cured through the surrounding of positive people and time itself. This is more like a pseudoscience to me than actual science.

Date reviewed: Apr 12, 2007 8:31 PM

Nickname: Lucky

Review: It is shown in many studies that treatment of 'releasing' only fans the flames. You should not treat things with themselves. Like anger. Venting only makes anger work. You have to move on and remove negativity with positivity. This is a terrible treatment. Wait six months and see if the soldiers still remember these images, and still have PTSD. Read 'The Art of Happiness' and see what points I am talking about.

Date reviewed: Aug 3, 2006 2:38 PM

Nickname: Phil

Review: What exactly is "so-called" PTSD?

Date reviewed: Jul 31, 2006 10:29 AM

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