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Hawaii studies use virtual reality to treat post-traumatic stress

The view through the Humvee's windshield, its windows coated in a fine layer of dust, went from bad to worse as the military vehicle rumbled down a city street in Iraq.

A red sport utility vehicle cut in front of the Humvee. Then a man crossing the street in the neighborhood of two- and three-story buildings did the same.

Later, a white sedan swerved in the road and several bullets impacted the windshield on the passenger side.

As if that wasn't enough, an orange fireball erupted off the front right fender as the Humvee hit a roadside bomb — the No. 1 killer of Americans in Iraq and Afghanistan.

For combat veterans, it's a white-knuckle ride — even if it is in a virtual reality world back in the otherwise soothing environs of Hawai'i.

For about four years, research psychologist Sarah D. Miyahira has been studying the effectiveness of using virtual reality "exposure" therapy on U.S. service members with post-traumatic stress disorder.

Virtual reality also is used at Schofield Barracks for returning combat soldiers, she said.

still experimental

Miyahira's efforts with active-duty service members have been conducted at the Spark M. Matsunaga VA Medical Center on the grounds of Tripler Army Medical Center.

"It's a novel treatment that's still really — the jury is out on as to how effective it really is," said Miyahira, the principal investigator on the virtual reality study.

The Pentagon is expanding its use of virtual reality exposure therapy, and Walter Reed Army Medical Center in Washington, D.C., and the Naval Medical Center San Diego also have conducted studies, the Army said.

Dr. Robert McLay, research director for mental health with the Naval Medical Center, said at the 2010 American Psychiatric Association annual meeting that exposure therapy has proven effective in the treatment of PTSD.

The think tank RAND estimated in 2008 that 31 percent of U.S. troops returning from Iraq and Afghanistan had a mental health condition or reported experiencing a traumatic brain injury from events such as roadside bomb explosions.

"We took the approach that seems to work best and we tried to make it better," Medscape Medical News reported McLay as saying.

"We asked if we could use a simulator to help subjects confront their fears in a controlled way, to tolerate it gradually as the clinician pushed forward."

Miyahira started out with a \$1.3 million Office of Naval Research grant. In Hawai'i, the PTSD Virtual Reality Exposure Treatment study is being expanded to include veterans who have left military service.

sound and motion

Some soldiers with PTSD from deployments in Iraq and Afghanistan are referred to the Hawai'i program to see if they want to take part, Miyahira said. The intervention therapy consists of 10 sessions, nine of which use the virtual reality simulation.

Participants wear a headset projecting mainly Iraq convoy scenarios and a 360-degree view that changes depending on where a service member is looking.

Headphones re-create the sounds and a chair with a sub-woofer speaker system replicates some of the feel of a convoy. Miyahira said it's an effective combination.

"Some soldiers, all they can do for the first couple sessions is just sit in the Humvee, because they have such a strong emotional response to it," she said.

The convoy scenarios are based on feedback from soldiers and Marines.

A psychologist sits next to a participant, and respiration and heart rate are monitored.

"Soldiers externally are very controlled," Miyahira said. "But internally, they could be really charged up. We've never had anybody become so emotionally charged that they just stand up in the chair or are weeping. But some are gripping the chair and some are breathing quickly."

The goal is to elicit specific memories of the events that traumatized an Iraq or Afghanistan veteran — something that many with PTSD behavioral problems try desperately to repress, Miyahira said.

Sometimes there's anger. Other times it's guilt at not being able to do more for a buddy.

"There's a lot of avoidance of memories of stimuli that trigger those memories because it's so hard for them to re-experience that — and by avoiding it, they can't really deal with the issues that surround it," she said.

The convoy scenarios aren't overly graphic or detailed, by design. Service members with PTSD create their own detail, often recalling elements from the videos that aren't actually there.

Therapist at hand

Therapists constantly talk to participants, who are asked about their level of stress on a scale of 1 to 10, Miyahira said.

Over the past several years, about 30 active-duty service members have participated in the treatment study at the VA center, she said. Miyahira said she's not done with data collection on the effectiveness of using virtual reality for PTSD.

"My guess is that it will be a very good tool to use, but in and of itself it's not a panacea," she said. PTSD is "really complex," and the military "is trying to hit this at all different levels."

"Virtual reality helps you to at least get to some of the information they've been repressing or avoiding," Miyahira said. "The avoidance is what keeps (therapists) from really being able to work on the issues that keep (service members) staying in the same place as when they left (combat)."