

## Reaching out to provide PTSD care

### Telehealth studies span seas, mountains

When Leslie Morland, PsyD, began work at the VA Pacific Islands Health Care System nine years ago, much of her time was spent flying. The scenery was nice—looking down over white-sand beaches and shimmering blue ocean waters—but the mission was critical: providing counseling to veterans with PTSD and other issues who lived in far-flung Hawaiian or Pacific islands.

“I flew to Hilo twice a week, Kona once a week, and Guam periodically,” says Morland, a psychologist with the Honolulu division of VA’s National Center for PTSD.

Today, Morland still flies now and then, but more of her time is spent seeing patients on a video screen. She is the “telemental health” lead for her VA region.

She is also one of several VA researchers exploring the use of videoteleconferencing (VTC) in PTSD care.

In a typical VTC setup, a group of veterans meets in a room at a VA community-based outpatient clinic, along with a facilitator. They are all visible on camera to the person at the other end: a psychologist or other trained therapist, usually based at a VA medical center. The therapist can see all the group members, although catching the nuances of facial expressions and body language may be a bit more challenging.

No technology can replace face-to-face contact, but according to studies by Morland and others, the outcomes with

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Polytrauma care at the Tampa VA.



Photo by Jeffrey Bowen

**Next best thing to face time**—John Fortney, PhD (on screen), and Jeffrey Pyne, MD, are leading a study using videoteleconferencing to provide PTSD care to veterans in Arkansas, Louisiana and California, mostly in rural areas. See sidebar on page 4 for more details.

## Trial compares methods for brain injury rehab

Researchers from the Defense and Veterans Brain Injury Center (DVBIC) have published the results of one of the first studies of its kind: a randomized clinical trial comparing different treatment approaches for those with traumatic brain injury (TBI).

The study appeared in the December issue of the *Archives of Physical Medicine and Rehabilitation*. It compared two rehabilitation approaches: “cognitive didactic” versus “functional-experiential.”

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While the findings suggest pluses to both methods, the cognitive approach resulted in better short-term gains in mental function and was more effective in helping younger patients return to work or school. The functional method led to higher rates of independent living among older patients. Both methods had been validated in prior research but had never been tested head-to-head.

**Long-term gains from both approaches**

“Our results show long-term functional improvements in both groups,” said lead author Rodney Vanderploeg, PhD, a research psychologist at the Tampa VA Medical Center and University of South Florida. At one year after treatment, he said, about 6 in 10 study participants overall were employed and living independently. “This is remarkable,” wrote Vanderploeg and colleagues, “given that none were capable of work or independent living at baseline” and 90 percent had brain injuries that were considered severe.

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**A long road back**—Marine Cpl. Jason Poole, seen here with occupational therapist Daniela Lita, underwent intensive rehabilitation therapy at the VA Palo Alto Health Care System after suffering a brain injury and other severe wounds from an improvised explosive device (IED) in Iraq in 2004.

The study included 360 veterans or active-duty troops, mostly men, with moderate to severe TBI. Enrollment for the study ran from 1996 to May 2003, shortly after the onset of the war in Iraq. As such, most of the participants sustained their injuries not in combat but in vehicle crashes, falls or other incidents.

Meanwhile, though, TBI has come to be known as the “signature injury” of the wars in Iraq and Afghanistan, affecting some 20 percent of injured troops. So the results of the DVBIC study are highly relevant for Department of Defense and VA, although there may be ways in which TBI caused by blasts—the most common scenario in the current wars—differs from brain injuries sustained otherwise.

The trial was conducted at VA’s four main polytrauma centers, in Tampa, Richmond, Palo Alto and Minneapolis. Patients, all in the acute phase of

rehabilitation, were randomly assigned to one of two approaches:

- In the cognitive-didactic approach, the emphasis was on helping study participants relearn thinking skills.
- In the functional-experiential approach, the focus was on giving participants hands-on practice doing everyday tasks.

**Younger patients fare better with ‘cognitive’ method**

Over a month or two, each group received about two hours per day of therapy specific to their study arm. For example, the cognitive group worked on paper-and-pencil or computerized tests that became progressively more difficult, with the explicit goal of sharpening their mental skills. The functional group, on the other

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hand, received extra help going through the physical motions of everyday activities such as dining and grooming.

Each group also received additional physical, occupational and speech therapy in which the therapists used either a cognitive or functional approach. In the cognitive group, therapists offered more verbal instruction and encouraged learning through trial and error. They asked questions such as “How do you think you did?” or “What do you need to do now?” to promote thinking and self awareness. In the functional group, therapists did less verbal teaching and emphasized “learning by doing.” They offered more hands-on, step-by-step support to help patients successfully complete tasks. The aim was to ingrain the physical movements and thereby promote implicit learning.

The researchers tested participants’ cognitive abilities and everyday functioning before and after treatment and one year later. Among the findings:

- **Overall function was similar between the two groups after one year.** For example, in the cognitive study arm, 65 out of 167 participants (38.9 percent) were working or in school. In the functional group, the rate was 68 out of 164 (35.4 percent). The difference was not statistically significant. (Follow-up data were not available on all 360 study participants.)

- **Immediate posttreatment cognitive function was better in the cognitive group.** This was measured with tests in areas such as comprehension, expression, social interaction, problem solving and memory. Cognitive-arm participants also reported fewer memory problems after one year.

- **Younger patients (those age 30 or under) in the cognitive arm had a higher rate of return to work or school than their age peers in the functional arm.** On the other hand, older patients and those with more years of education in the functional arm were more likely to be living independently at one year than similar participants in the cognitive group.

The study authors offered a tentative analysis of why younger and older patients may have benefited differently from the two approaches:

“...These findings suggest that the cognitive treatment not only better enhances cognitive recovery but also lays a stronger foundation for the development of work-related cognitive skills. This effect appears to be most prominent in younger patients, who may benefit more from the higher level of structure and teaching provided in the cognitive approach to treatment. The functional approach generally provided less structure and did not offer problem-solving strategies and approaches. Older or more educated persons, who may already have internalized structure and independence, seemed to benefit more from the direct living skills emphasized in the functional interventions.”

The DVBIC ([www.dvbic.org](http://www.dvbic.org)) is a multi-site center for medical care, clinical research and education on TBI. Funded by the Department of Defense, the program involves clinicians and investigators from DoD, VA, and academic and private medical centers. Since 2007, the center has been part of the newly established Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. —

## Presidential award to VA bone researcher

VA rheumatologist and bone researcher Mary Beth Humphrey, MD, PhD, was among a group of scientists



Dr. Mary Beth Humphrey

from 11 federal agencies who received Presidential Early Career Awards for Scientists and Engineers at the White House on Dec. 19.

The annual awards, established in 1996 by the National Science and Technology Council, recognize top young scientists and engineers for their “innovative research at the frontiers of science and technology” and for their scientific leadership and community outreach.

Humphrey sees patients and conducts lab research at the Oklahoma City VA Medical Center and University of Oklahoma Health Sciences Center. She specializes in “osteimmunology”—a relatively new field that merges bone biology with immunology. She studies osteoclasts, cells that chew away old bone so new bone can be formed. In diseases such as osteoporosis, too many of these cells are active, resulting in bone loss.

Says Humphrey, “Our understanding of the normal signals that can activate osteoclasts will lead to novel therapeutic targets that can be designed to block these signals, thus inhibiting osteoclasts and preventing bone destruction in osteoporosis or inflammatory bone diseases such as rheumatoid arthritis.” She notes that many of the diseases she studies and treats are increasingly common in the VA population.

As part of the award, Humphrey will receive \$125,000 over five years from VA’s Office of Research and Development in support of her research. —

### Recap of TBI conference

Creating a registry of veterans who have suffered a TBI and tracking long-term effects of the condition were among the priorities outlined at an international conference of TBI clinicians and researchers hosted by VA in Washington, DC, on Nov. 17 – 18, 2008. A full summary of the conference appears on the VA research website at [www.research.va.gov](http://www.research.va.gov).

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VTC are about the same as those with in-person therapy. Researchers have seen reductions in PTSD symptoms—usually the main study outcome—but they’ve also seen ample evidence that the technology doesn’t crimp relationships among veterans who are in group therapy together, or between veterans and providers.

Morland’s group recently concluded a study with 127 veterans who had PTSD and needed help with anger management. About half received in-person therapy, while the others participated in video sessions at VA outpatient clinics on Hawaii’s Big Island, Maui or other outlying sites.

“We found both approaches to be clinically effective,” says Morland, “and we found no difference in process variables like trust, satisfaction, cohesion. We had very low attrition.” The psychologist says that “a

**‘Improving access to care for rural populations is a huge priority for VA, and it’s going to put a lot of emphasis on the role of telemental health.’**

—Dr. Leslie Morland, Honolulu division, VA’s National Center for PTSD



big issue with PTSD care is making sure people continue to come to therapy.”

The anger study was a particularly good test of VTC, notes Morland. “One of the research questions we had was whether we could work with a lot of ‘affect’ in the room—a lot of emotion, people getting

angry before they even come into the group. We found it wasn’t a problem.”

In today’s era of Webcams and iPhones, the technology of VTC may seem ho-hum. But there’s a lot of coordination required

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**Arkansas-based study will use interactive video for PTSD therapy**

A number of VA research groups besides Morland’s are doing work in the area of PTSD and telehealth, based in locations from San Diego to Boston.

The research is increasingly important because PTSD accounts for half of the mental health disorders VA treats among veterans of operations Enduring Freedom and Iraqi Freedom—and more than 40 percent of these veterans live in rural areas.

A prime example of the work is a new study led by John Fortney, PhD, with VA’s Center for Mental Health and Outcomes Research in Little Rock. The project will involve 400 veterans from nine community-based outpatient clinics (CBOCs) in Arkansas, Louisiana and California. Telehealth teams including a nurse care manager, pharmacist, psychologist and psychiatrist will use videoteleconferencing to provide cognitive processing therapy and deliver other care and support via telephone.

The group has successfully tested a similar model of depression care. Says Fortney, “It will be more challenging, but

we believe PTSD outcomes can also be improved using telemedicine interventions.”

Nearly a third of VA’s 738 CBOCs already offer mental health care through interactive video. Fortney says these clinical sites are likely to play an even greater role in the future in connecting veterans in rural areas with VA specialists at larger centers—especially for PTSD care.

Fortney points out that cognitive processing therapy (CPT) is one of the evidence-based treatments for PTSD that is particularly well-suited to video sessions. “CPT lends itself well to telemedicine applications because it’s a highly structured therapy and much of the benefit derives from patients completing homework assignments and practicing new skills outside the therapy session,” says the researcher. “These activities occur between interactive video sessions with the therapist and are not likely to be affected by the mode of delivery.”

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before and during each session, says Morland. Her group's anger study proceeded with hardly any glitches. They held 120 video sessions and never had to cancel or reschedule due to technical problems.

She acknowledges that because they were doing a funded study, enough resources were in place to prevent any mishaps, both in terms of staff and equipment. Still, she asserts that with good coordination, VTC can be used smoothly in routine clinical settings.

### Coordination is key

One of the keys, she says, is having an information-technology person on call to troubleshoot technical snags. Another is making sure there is adequate bandwidth. It also helps to make calls between only two points, rather than involving multiple sites. Above all, staff at both ends have to call and email ahead of time to make sure everything is in place.

“When things aren't planned, that's when things can go wrong,” warns Morland. “That's when veterans and providers say, ‘I don't want to do this.’”

It's especially important that the first few sessions go well, she says. “You have only a couple of opportunities to show it will work; otherwise, veterans may start to get frustrated.”

The Honolulu group just launched a new study of VTC for cognitive processing therapy, one of the evidence-based PTSD treatments used most commonly by VA clinicians.

Morland stresses that the research focuses not on validating the treatment itself—it's already been shown effective in many studies—but on showing whether VTC can produce the same results as in-person therapy.

## VA is telehealth leader

The term “telehealth” means providing care, education and support to patients in remote locations through technologies such as videoteleconferencing, telephone, email or the Internet. The term “telemedicine” is usually used more narrowly, encompassing the curative aspect of health care but not educational or preventive programs.

VA has been cited by the Institute of Medicine for its pacesetter work in telehealth, and the agency's researchers have contributed numerous papers to the medical literature documenting that telehealth can be as effective as in-person care.

A complete overview of VA telehealth can be found at [www.carecoordination.va.gov](http://www.carecoordination.va.gov), but here are some examples of how the program works:

- Visiting nurses take digital photos of homebound patients' skin wounds and email the images from their laptops to a secure website, where they are viewed online or downloaded by dermatologists.
- Psychiatrists talk via video with veterans in rural areas who have depression, PTSD or other conditions and make recommendations to the patients' primary care doctors.

She points out that not everyone is an instant believer. “Anytime there's something novel, there's going to be a segment of the population that's resistant.” That's the case with patients and perhaps even more so with the providers who have to deliver the service, she says. Getting their buy-in is crucial to spreading the use of VTC and other telehealth methods in VA. But with VA's increasing needs to serve



Telehealth systems such as this one allow veterans to take their vital statistics at home and transmit the readings via phone lines to VA clinics for monitoring.

- Veterans with diabetes get eye exams at local clinics that have specialized imaging equipment. The images are sent electronically to experts who check for signs of retinal disease.
- VA patients log onto a secure website where they can access key parts of their health record and refill prescriptions.
- Speech pathologists located at VA medical centers use video to provide therapy to post-stroke veterans in rural areas.

veterans in rural areas—and a strong evidence base for psychotherapy for PTSD—even skeptics are finding it hard to deny the promise of telehealth. Further research may win them over for good.

“We need to look at whether we're going to achieve the same clinical effectiveness,” says Morland. “If we are, then we can say this isn't a second-rate service. We know this works.” —

# Restoring consciousness

## Researcher explores how to aid recovery from coma

**D**r. Theresa Pape's work made headlines last fall when she reported how a study participant spoke his first words since suffering a severe brain injury in a car crash almost a year earlier.

Joshua Villa, age 26 when injured, had been in a vegetative state for nearly 10 months when his mother agreed to have him take part in Pape's research on transcranial magnetic stimulation, or TMS.

The treatment involves holding an electromagnetic coil over specific areas of the skull to excite the brain cells beneath the coil.

It was after the 15th treatment—out of a total of 30 sessions over six weeks—that Pape noticed a spike in Villa's responses on a measure called the Disorders of Consciousness Scale. The instrument, developed by Pape, measures an unconscious person's responses to sensory stimuli.

"I couldn't believe that the gains were that dramatic and significant," recalls Pape. "I must have done the analyses 10 times to make sure there wasn't a mistake."

Three sessions later, Villa uttered his first words.

Pape: "There must have been about half a dozen of us in the room, and our mouths just hung open. We all looked at each other thinking, 'Did he just say that?'" A couple of days later, when his mother was with him, Villa said "Mom" and "Help me."

Pape is a researcher at the Edward Hines VA Hospital near Chicago. She also collaborates with staff at several rehabilitation hospitals in the area. Her study involving Villa is available online in

the journal *Brain Stimulation* and will soon be in print.

TMS, developed in Europe in the 1980s, has been used successfully to treat depression, schizophrenia, and other mental disorders. Pape is among the first to explore its usefulness in promoting recovery from coma.

In depression, doctors apply the magnetic coil to an area of the brain called the left dorsolateral prefrontal cortex. Pape's theory is that the same area on the opposite side might be best for those in coma or other unconscious states due to traumatic brain injury.

"My challenge is finding the optimal dose at the optimal site," she says. "I'm trying to maximize efficacy and minimize the potential for adverse events while optimizing the site on the brain. I chose the dose according to safety data from healthy controls and efficacy data from patients with mental illness, but that doesn't mean it's the optimal dose for traumatic brain injury. Likewise, I chose the site according to neurological theory, but that doesn't mean it's the most optimal site."

Only a handful of other researchers in the U.S. are exploring the same general topic: how to promote recovery from coma. So Pape has reached out to other countries, such as Denmark, for collaborators. Her vision is that different groups of researchers will explore different TMS doses and apply the magnetic coils to different sites on the brain. That would speed the research process.

"I would love it if someone chose a different site or dose and studied it," she says.



A TMS coil is held over a specific area of the brain to stimulate the underlying neurons. The woman in the photo was a student of Dr. Pape's.

### Familiar voices may stir brain response

Pape plans additional research on TMS, but she is also exploring other treatments to help people in comas or vegetative states due to brain injury. One example is familiar vocal stimulation.

The treatment works like this: Family members tell stories about events they took part in with their loved one. Transcripts are written, and the families then recite the stories into digital recorders, as if talking to their loved one. Pape offers an example of how the monologues might sound: "Oh, do you remember we went to this wedding and I wore that red dress, and you thought I looked fantastic?"

The therapy is low-cost and as noninvasive as they come, although patients will undergo a brain scan called functional MRI as they listen to the audio. That will allow researchers to check for responses in

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the form of more blood flow to different parts of the brain. Pape expects to activate those areas that normally process familiar voices, such as the temporal lobes and hippocampus.

Her team uses professional audio-editing programs to ensure the right quality and volume—even amid the clanging of the MRI machine.

“We’re talking about them hearing a tone in a person’s voice, an attitude—all the pragmatic cues mediated in healthy people by the right side of the brain. These are the verbal cues that let someone know who’s talking to them without them seeing the person.”

The study will include 45 patients. One group will listen to their families’ stories for four 10-minute sessions daily, for six weeks. A second group will listen to familiar voices less frequently. A third group will receive only “sham” treatment—in this case, the presence of a CD player but no sound. “Everybody’s getting a similar process,” says Pape.

### Families find hope through research

TMS and familiar vocal stimulation might work together, says Pape. TMS would first induce “brain plasticity” by exciting neurons. Over time, TMS could boost the function of axons—the fibers nerve cells use to talk with each other. Dormant neurons could be revived, and new neural networks created. Vocal stimulation could then “shape and guide that plasticity” and help in the recovery of auditory skills.

The other focus of her research, the Disorders of Consciousness Scale, provides a reliable, accurate way to track the effects of various therapies. It may also yield data to help identify factors linked to recovery from coma. Why some patients recover from serious brain injuries while others linger in a coma for many years is still largely an enigma.

“If I had that answer, I’d win the Nobel,” says Pape whimsically.

Her work has taken on special significance for VA, as some 20 percent of troops injured in combat in Iraq or Afghanistan have a brain injury. Most of the injuries are considered mild, and only a relatively small percentage result in long-term loss of consciousness. But for those patients who do remain unconscious, any new hope is welcome. Pape tells how families of the patients in her studies are eager for any advances.

“These families believe, and they believe strongly. They believe in research, and they believe something will be developed. We have one family member who contacts us regularly: ‘Got anything for my loved one yet?’”



**Combating coma**—Dr. Theresa Pape at the Hines (Ill.) VA is exploring the use of transcranial magnetic stimulation and other methods to help patients regain consciousness after severe traumatic brain injury.

### Stimulating the brain

TMS is one of several therapies being studied that use electrical current to stimulate the brain. It is among the least invasive. Other methods include:

**Deep brain stimulation**—Electrodes are implanted in the brain to stimulate specific brain regions. VA researchers who tested the technique for Parkinson’s disease will be publishing their results this month.

**Electroconvulsive therapy**—The process involves inducing a seizure in an anesthetized patient by applying electric current to the brain. It has been found safe and effective for depression and other conditions when drugs don’t work.

## Easing the transition home for Puerto Rican veterans

Nearly 3,000 copies of a Spanish-language booklet developed by VA researchers to help Puerto Rican veterans adjust back to civilian life after deployment were given out at a welcome-home event held recently in San Juan.

Led by Constance Uphold, PhD, ARNP, a team from VA's Rehabilitation Outcomes Research Center (RORC) in Gainesville, Fla., worked with staff and patients at the San Juan VA, as well as with local military support groups, to create a guide that was culturally relevant to Puerto Rican veterans: It was written in the Spanish characteristically spoken in Puerto Rico and its design incorporates the island's flag and symbol—the "coquí," a "singing" frog.

Magaly Freytes, PhD, a RORC postdoctoral fellow and native Puerto Rican, says the focus groups she held with Puerto Rican veterans were integral to the project. "The veterans really appreciated that I could speak to them in their own language. It made them feel comfortable and they were able to communicate more openly."

She said the final product, the first guide of its kind specifically for Puerto Rican veterans, was well-received by both veterans



**Researchers on hand for welcome-home event**—Joining VA Caribbean Health Care System staff at an event held in San Juan to welcome home troops returning from deployment were (in red shirts, from left) investigators Drs. Magaly Freytes and Connie Uphold and public affairs specialist Kristen Wing of VA's Rehabilitation Outcomes Research Center.

and VA staff. "The language and images clearly spoke to this population. They loved the photos, the colors and the inclusion of the beloved coquí. They were grateful for our efforts and couldn't stop thanking us and expressing their admiration for the guide."

An additional 3,000 guidebooks will be printed and made available in early 2009. The project was supported by VA, the Disabled American Veterans and the Nurses Organization of Veterans Affairs Foundation.