



Photo by Andy Dunning

Stacy Pearsall served two tours in Iraq as a combat photographer.

Probing war's effects on women

Award-winning military photographer Stacy Pearsall served two ground combat tours in Iraq, and was twice wounded by improvised explosive devices (IEDs). When she came home in 2007, the retired Air Force staff sergeant would have to cope with the lingering physical and mental effects of the blasts. Among her medical problems: traumatic brain injury, partial hearing loss, pain in her arm and neck, numbness across one side of her body.

Increasingly, military women like Pearsall are getting plenty close to the action. While women are still formally barred from ground combat, they are attached to combat groups and serving with Ranger and Special Forces units, bunking on submarines, participating in cultural support teams in combat areas, and flying attack helicopters.

A recent VA and Department of Defense study affirms that women are being exposed to combat at a significantly higher rate than ever before—and finds that the mental health needs of women who have experienced combat are not significantly different from those of men.

The study, published online in December 2011 in the *Journal of Psychiatric Research*, examined gender differences in combat exposure and military sexual trauma, and the link between these factors and mental health screening results. The researchers looked at the records of more than 7,250 active duty soldiers—roughly 6,700 men and 550 women—who presented for health screenings before and after they were deployed into combat zones.

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Study highlights effective route to employment for Veterans with PTSD

Lori Davis, MD, a physician at the Tuscaloosa VA Medical Center, likes to tell the story of a Veteran with posttraumatic stress disorder who had once run his own construction company. He fell on hard times and had to give up the business. Through a VA program, he found a job at a home and garden center doing something he loved—helping customers with plants and garden supplies. He did so well, the manager wanted to make him supervisor of the department.

That's when his PTSD almost became an issue. Supervising others caused him stress. It led to conflicts. To make matters worse, "He saw it as a weakness on his part that he did not want to accept the

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Photo by Presh Studios

Inside PTSD: VA researcher's book offers compelling account through Veterans' stories

The word “anthropologist” may conjure images of researchers trekking through tropical jungles or mountain villages to explore exotic, faraway cultures. But the work of medical anthropologist Erin Finley, MD, MPH, has taken her to one of the United States’ hubs for military personnel and Veterans: San Antonio.

Finley is an investigator with the Veterans Evidence-based Research Dissemination and Implementation Center (VERDICT) at the South Texas Veterans Health Care System. She is also an adjunct assistant professor of clinical epidemiology at the University of Texas Health Science Center at San Antonio.

What brought her to Texas in 2006 was the desire to learn more about posttraumatic stress disorder among the men and women returning from Iraq and Afghanistan. She had previously studied trauma—and its link to physical and mental health—in settings ranging from Guatemala and Northern Ireland to drug clinics in the southern U.S. Now the focus was on Veterans.

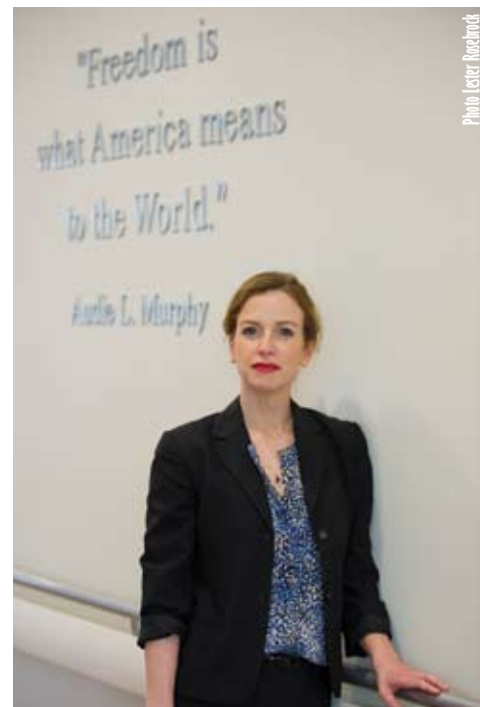
Her extensive interviews and other research resulted in the publication of a book: *Fields of Combat: Understanding PTSD Among Veterans of Iraq and Afghanistan* (Cornell University Press, 2011). The following Q&A with Finley is based on an interview she did with fellow anthropologist Daniel Lende, PhD, and Finley’s own blog posts. The full interview is available at <http://blogs.plos.org/neuroanthropology> and has been adapted with permission.

What is the overall theme of the book, and what was your aim in writing it?

The book is built around Veterans’ own stories of combat and its psychological aftermath. But *Fields of Combat* then goes on to put those experiences into social and cultural perspective, examining the history of PTSD, military and VA responses to PTSD, and how Veterans negotiate complex and often contradictory cultural messages around PTSD in making decisions about treatment-seeking and recovery. The goal is to put PTSD into context for a wider audience.

You’ve said the book examines “a revolution that has been ongoing over the past several years in the PTSD treatment provided by VA.” Could you explain.

For many years, much of what was widely understood about PTSD—our cultural ideas about PTSD—was influenced by the fact that the clinical and research communities had not yet developed the scientific knowledge to understand what causes PTSD, how it works within the body and the mind, and how best to treat it. As a result, PTSD was thought of as a chronic and disabling illness for which there was no cure. Now that has changed. We have very good treatments available for PTSD, and



The write stuff—Dr. Erin Finley is the author of *Fields of Combat: Understanding PTSD Among Veterans of Iraq and Afghanistan*.

VA has worked to make those treatments available at facilities all over the country.

Even so, many Veterans simply aren’t aware that it is possible to recover from PTSD and so may remain hesitant to reach out for help. By understanding how our cultural messages around PTSD have been shaped by its historical legacy, it becomes easier to understand much of the stigma surrounding the illness and the day-to-day impact this has on Veterans’ coping and treatment-seeking behaviors.

How did you develop the material in the book—the Veterans’ stories, for instance?

My fieldwork was an incredible experience. I settled on San Antonio as a

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promotion,” says Davis. The VA employment specialist stepped in—the same counselor who had helped the Veteran identify his passion for working with plants and developed the garden-center job for him.

“They both went to talk to the employer,” recounts Davis. “It was the specialist who helped the employer see that this Veteran really liked his job and wanted to stay at the same level, and that his reluctance to accept the supervisory role shouldn’t be seen as an avoidance of responsibility. So they maintained him at that level, and he thrived.”

The anecdote illustrates the success of a supported-employment model called “individual placement and support,” or IPS. A recent VA study, published online this month in *Psychiatric Services*, compared the model to the standard vocational rehabilitation program (VRP) that VA offers.

The study included 85 Veterans, ages 19 to 60, all with moderate to severe PTSD. Many also had conditions such as depression and addictions. Some had mild to moderate traumatic brain injury. Many of the men and women had been unemployed for a stretch—on average, about 19 months. After a year of follow-up, 76 percent in the IPS group had gained competitive employment, compared with only 28 percent among the VRP clients. On average, those assigned to IPS had worked more weeks and made more money than the Veterans in VRP.

How the two employment programs differ

In VRP, Veterans work in sheltered, temporary jobs, usually entry-level. The idea is to provide or reinforce basic work skills and habits. This stage is usually followed by a short-term transitional job located within a VA medical center or in the community, but that’s typically where the program ends. For those with PTSD, the program has generally not resulted in competitive, long-term employment.

In contrast, IPS is more person-centered, starting with an in-depth interview to explore the Veteran’s interests and aspirations. “It meets each Veteran’s individual needs and desires, rather than putting them in set-aside jobs that do not have any relevance to their work goals,” says Davis.

The model relies heavily on individualized job development by IPS employment specialists. They spend most of their time in the

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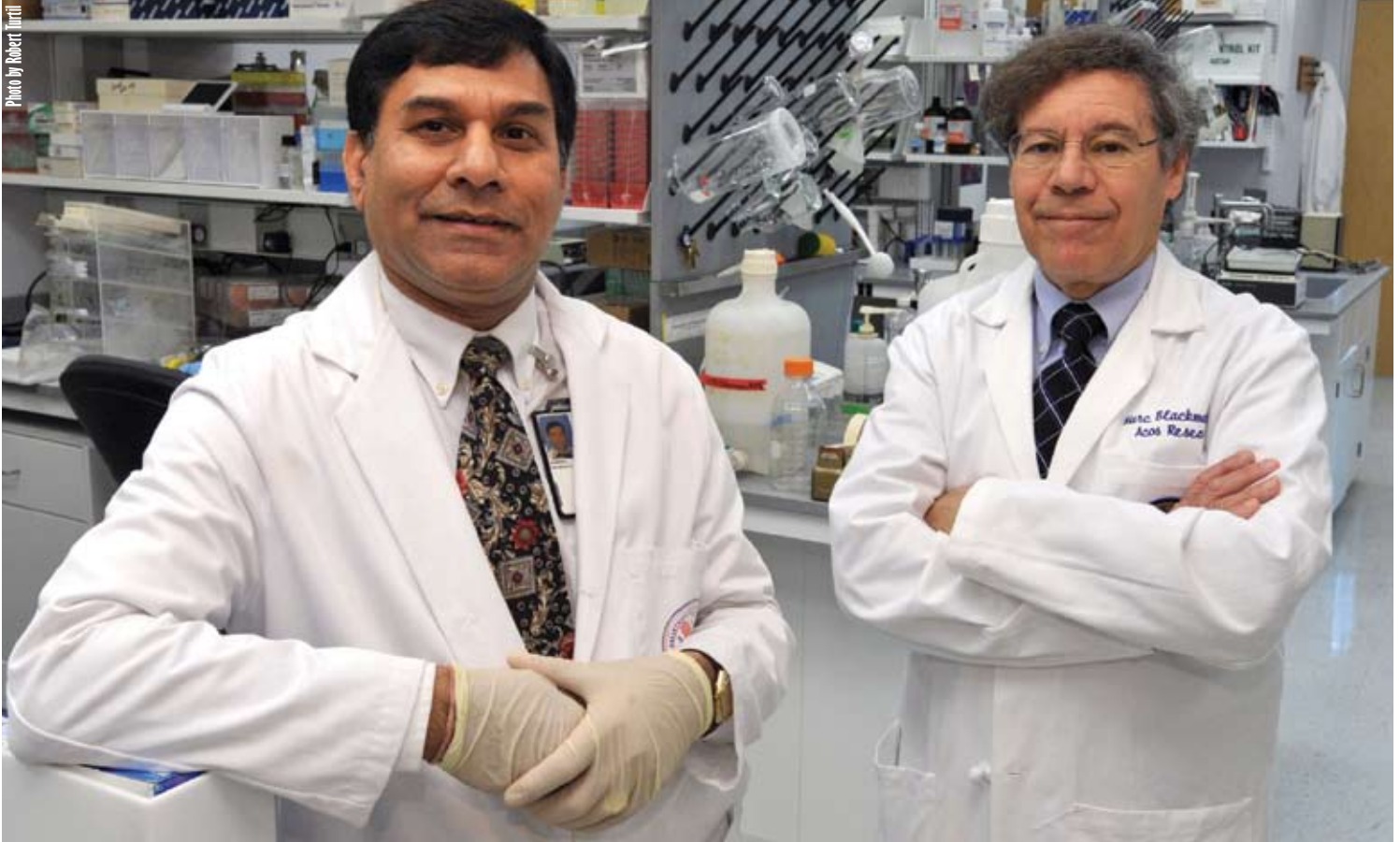


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Photo by Erik Johnson

On the job—Three-quarters of Veterans with PTSD who participated in an “individual placement and support” program as part of a VA study were able to find competitive jobs.



Stalking cancer—Drs. Mahesh Sharma (left) and Marc Blackman are exploring ways to cut off cancer’s blood supply and thereby “starve it to death.”

Stopping tumors by cutting off their blood supply

In 1856, a French clinician named Trousseau made a curious observation: He noted that many cancer patients had excess blood clotting. They would often develop clots in leg-muscle veins—a condition called deep vein thrombosis—or in other areas of the body.

Today, more than 150 years later, the connection between cancer and excess clotting is still largely a mystery to scientists. Does one condition raise the risk of the other? No one can say for sure. But the link is an intriguing clue for researchers like Mahesh Sharma, PhD, director of the Laboratory of Geriatric Endocrinology and Metabolism at the Washington, DC, VA Medical Center. He thinks the pathways involved in blood clotting may point to an important target for new cancer drugs.

“These are very old observations—this isn’t new,” says Sharma. “I’m just trying to put a puzzle together.”

One thing scientists know for sure is that cancer is a hungry disease. It needs new blood vessels to feed it. When a solid tumor

grows in the breast—or in the liver, kidney, colon, prostate, pancreas, or other organs—it is “off the grid,” in a sense: It is cut off from the body’s existing network of blood vessels. To grow and spread, the cancer demands its own “supply route” in the form of new blood vessels.

Clotting goes hand in hand with the growth of new vessels, also known as neoangiogenesis. When a clot forms in a vein or artery, the body instinctively fears a life-threatening stroke or heart attack. It sets in motion a cascade of proteins to break down the clot—and to restore blood flow around the area of the clot, as an extra precaution. “This is nature’s response to protect the host from the catastrophe of blood clotting,” says Sharma.

This restoration of blood flow includes the formation of new blood vessels. And this, notes Sharma, “is just what the cancer wants.” In fact, cancer unleashes proteins to aid the clotting and neoangiogenesis process. In essence, it hijacks the body’s biochemical pathways for its own gain.

Researchers worldwide are attacking the problem from many angles. Sharma's studies over the past decade have led him to focus on a protein called annexin 2, part of the clotting pathway. It helps make an enzyme, plasmin, that acts like a scissor to cut existing vessels with clots. This in turn triggers blood cells to form new vessels.

Unlike other proteins involved in this chain reaction, annexin 2 appears to be activated only when cancer is present. That makes it a prime target for a cancer-killing drug.

The more annexin 2, the more invasive the cancer

When Sharma's group tested breast tissue taken from 150 women with breast cancer, they found "consistently that annexin 2 is correlated with disease progression. Higher levels of annexin 2 correlated with more blood vessels forming, leading to more invasive and metastatic cancer." In contrast, women without cancer showed no annexin 2 in their breast tissue.

Other studies around the world support the idea that annexin 2 is a key culprit in cancer. In one German trial, researchers found that the higher the level of annexin 2 in patients' tumors, the sooner the patients succumbed to the disease.

Sharma believes that if annexin 2 can be blocked—thereby stopping the growth of new blood vessels to support the tumor—the cancer will starve to death.

His lab has developed synthetic antibodies to do the job. They block annexin 2 and thereby thwart the production of plasmin, the enzyme that causes new blood vessels to grow.

Specifically, the type of antibodies being used are monoclonal antibodies, so named



The French connection—The link between blood clotting and cancer, first observed by a French doctor in the 1800s, continues to intrigue oncology researchers.

because they are copied from one type of antibody found naturally in the human immune system. They seek out and destroy one protein—in this case, annexin 2, or ANX II for short.

Antibodies shrink human breast tumors in lab study

In a recent mouse experiment by Sharma's group, sponsored by the Department of Defense, the antibodies had a dramatic effect. "There was a 60 to 70 percent reduction in angiogenesis and tumor growth," says Sharma. The findings appear in the February 2012 issue of *Experimental and Molecular Pathology*.

The study used a technique called xenografting: Human breast tumors were transplanted into mice that were genetically engineered to lack an immune system, so they could not reject the foreign tissue. The method is thought to be more useful than

studying an agent's effect on cancer cells in a Petri dish, or on a tumor that originates within an animal. Still, there's no telling at this point how the therapy would actually work in people. Further studies will be needed before Sharma's group can test the therapy in a human clinical trial.

In fact, even as he looks optimistically to the future of his anti-ANX II antibodies, Sharma sounds a note of caution: He warns that while the mice in his lab showed no adverse effects from the therapy, it could potentially cause complications in humans. For example, it could interfere with normal blood clotting. He admits that there would be little advantage in beating back cancer if the patient would become at risk from bleeding to death from a wound—as in hemophilia.

"These are important questions to answer," acknowledges Sharma.

For now, his group wants to try to replicate findings from studies such as the German trial mentioned above by following patients being treated for breast cancer. How closely do their levels of annexin 2 predict their survival rate? Are the levels tied to genetic factors such as the presence of the breast-cancer risk genes BRCA1 and BRCA2?

Sharma notes that while annexin 2 clearly plays a role in many forms of cancer, he plans to stay focused on breast cancer, especially in light of VA's growing population of women Veterans.

Women's health video

To view a four-minute video featuring women's health researcher Elizabeth Yano, PhD, MSPH, of the Greater Los Angeles VA Healthcare System and the University of California, Los Angeles, visit www.hsrd.research.va.gov/news/video/default.cfm.

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community, networking and developing job possibilities geared to their clients' interests and backgrounds. The job coaching and other follow-up is more intensive in the first few months; it then tapers off as the Veteran gets stabilized in the work setting. Job development continues even once the Veteran is placed, as "the first job is often not the best job," notes Davis. "We want the Veteran to be in a situation where he or she feels motivated to continue."

Davis points to another key difference: "There's a strong integration of the IPS specialist with the PTSD treatment team, rather than the silo treatment model of conventional VRP." The IPS specialist visits the Veteran at least weekly in the workplace and reports back to the mental health treatment team on any issues that need attention.


Davis explains how this interaction typically plays out: "The medications might not have been particularly bothersome while the Veteran was at home, but in the workplace he finds he can't tolerate some of the sedation. So the meds have to be changed due to the demands of the work environment. Or, the Veteran could be feeling more anxious, and the medication—or counseling—could change based on that."

VRP, with its highly structured approach, has its proponents within VA, but IPS has been gaining popularity. Past studies on IPS, however, have focused on Veterans with severe mental illness—namely schizophrenia and bipolar disorder—and largely excluded those with PTSD. The IPS study published this month is the first to be conducted exclusively in Veterans with PTSD. Davis and others say they are now committed to building the evidence base showing the effectiveness of IPS for this population.

Her team is now planning a multisite trial—another comparison between IPS and VRP. "We want to have 10 or 15 VA sites,

and several hundred Veterans. We want urban and rural Veterans, and all the other aspects of diversity that come with a larger trial. We want this to be the definitive trial to build the evidence base for IPS as an effective employment model for those with PTSD."

And what do employers get out of hiring Veterans through the program?

Under a new law passed in November 2011, the "Returning Heroes Tax Credit," businesses receive tax credits for hiring unemployed Veterans. But these incentives didn't figure in the VA study, which ended about a year ago. Says Davis: "There was a lot of support from employers, many of whom were Veterans themselves. The employers appreciate IPS because it's almost like a built-in employee-assistance program. They feel reassured in taking the chance on a Veteran with PTSD or another disability because they know they have the support." 

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research site because the city has such a large population of Veterans and active duty Service members. My methods included semi-structured interviews and structured surveys conducted with a variety of Veterans, including males and females from all branches of services, Veterans of Vietnam and the first Gulf War as well of Iraq and Afghanistan, and Veterans who had been diagnosed with PTSD as well as those who had made a very smooth transition back into civilian life.

I also had the opportunity to interview family members and clinicians and community service providers working with active duty Service members and Veterans, and to [observe] events throughout the San Antonio area. The end result was a portrait of PTSD that was kaleidoscopic and complex, and which revealed that there is no one way of viewing or experiencing posttraumatic stress. The task then became how to convey that complexity to the reader, and the best way seemed to be to let Veterans and other participants speak for


themselves as much as possible.

What is the book's take-home message? What actions do you believe are needed?

There are two steps in particular that we should take, both of which require a shift in the cultural messages circulating around what PTSD is and what it means.

The first requires shifting the cultural dialogue around PTSD, which for many years has been largely negative. PTSD has developed a reputation for being chronic and disabling, in part because for many years we simply didn't have the knowledge base required to treat it effectively. Now that we have solid evidence for the effectiveness of treatments like prolonged exposure therapy and cognitive processing therapy, it is important to begin shifting the messages around PTSD to reflect the fact that it need not be a lifelong illness.

We would never expect someone who has been through a trauma to be the same afterwards as he or she was beforehand—just as we would never expect that anyone who has been through any experience of great suffering would remain unchanged—but with proper treatment, someone with PTSD can look toward much-improved quality of life and even full recovery within a relatively short period of time.

The second step requires shifting the way that many of us think about people living with PTSD, who still encounter the stigma of being thought cowardly or weak. It's sort of bizarrely ironic when you think about it, given that individuals with PTSD are those who have been through some of the most extreme and horrifying circumstances in human life—and have survived. Far from being weak, they have often proven themselves to be heroes, to be truly extraordinary people. The more we recognize the strength of trauma survivors and provide them with the kinds of treatment and support that make the most of that strength, the more likely we are to see positive coping and care-seeking and real recovery for the majority of those affected. 



Therapy insight—New research suggests that prolonged exposure therapy, a form of psychotherapy that is widely used in VA as a firstline treatment for posttraumatic stress disorder, may be just as effective even when patients have mild to moderate traumatic brain injury, along with PTSD. See item below.

In pilot study, Veterans with PTSD and traumatic brain injury benefit from prolonged exposure therapy

In a small pilot study at the Tampa and Minneapolis VA medical centers, Veterans with posttraumatic stress disorder plus mild to moderate traumatic brain injury showed substantial benefit from prolonged exposure therapy. The treatment is one of two types of psychotherapy used widely in VA to treat PTSD, but some clinicians have been reluctant to use it for PTSD patients who also have TBI. One concern is that these Veterans may be less able to tolerate the distress associated with exposure therapy, in which patients emotionally relive their traumas in a safe, controlled manner. Another concern is that the patients' cognitive limitations might render the therapy less effective. But in the study, which involved 10 Veterans, the therapy was "highly effective in reducing the symptoms of PTSD," write the authors. They note that only a few modifications were needed—such as the use of electronic calendars and smartphones as memory aids, and additional session time or follow-up phone calls. But the authors say these changes are helpful even for those with PTSD but no history of TBI, as these patients often experience anxiety and tenseness that can make them distractible and forgetful. (*Journal of Head Trauma Rehabilitation*, January 2012)

Marijuana less harmful than tobacco—at least to lungs

A 20-year study by researchers with VA, Kaiser Permanente, and several universities found that people who occasionally smoke marijuana do not suffer lung damage the same way cigarette smokers do. In fact, their lungs may even benefit slightly. But the researchers warn that heavier marijuana use could be riskier. Stefan Kertesz, MD, the study's senior author and a physician-investigator with VA and the University of Alabama at Birmingham, said, "Marijuana is still an illegal drug, and it has many complicated effects on the human body and human functioning." Kertesz and colleagues used data from the Coronary Artery Risk Development in Young Adults (CARDIA) study. The effort involved more than 5,000 black and white men and women from Birmingham, Chicago, Minneapolis, and Oakland who were recruited when they were between the ages of 18 and 30 and followed from 1985 to 2006. Over a third reported using marijuana at some point—similar to what other U.S. studies have found. Tobacco use at any level was found to harm air flow and lung volume, whereas light marijuana use actually had a slight beneficial effect. Even moderate marijuana use—one joint daily for seven years—resulted in no lung damage. Heavier or longer-term marijuana use may in fact harm the lungs, said Kertesz, but the study did not include enough heavy marijuana users to draw that conclusion. (*Journal of the American Medical Association*, Jan. 11, 2012)

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Psychologist Shira Maguen, PhD, of VA and the University of California, San Francisco, was the study’s lead author. “While women technically are not supposed to serve in direct combat, [our] research demonstrates that, in reality, they are experiencing combat at a higher rate than we had assumed,” she says. “At the same time, it shows that men and women really don’t differ in how they react to the stresses of combat.”

Maguen and colleagues looked at four combat-related traumatic experiences: killing; witnessing someone being killed; seeing dead soldiers and civilians; and injury. They believe their study is the first to include gender as a variable in examining responses to these experiences among Veterans who have returned from Iraq and Afghanistan.

While men reported greater exposure to high-intensity combat experiences, 4 percent of the women reported having killed an enemy; 9 percent reported witnessing a killing; 31 percent reported having been exposed to death; and 7 percent were injured in a war zone.

Maguen’s team found that men and women in combat screened positive for



In harm’s way—Air Force photographer Stacy Pearsall (left) served two ground combat tours in Iraq and was twice injured by IEDs.

posttraumatic stress disorder at the same rate: 18 percent. However, women injured in combat were more likely to screen positive for PTSD than injured men.

Men who served in combat were more likely to report that they had a drinking problem, while women in combat were more likely to report symptoms of

depression. And, while women reported having experienced sexual trauma at a higher rate than men (12 percent versus 1 percent), there was no gender difference in the response to having undergone the trauma—both men and women experienced PTSD and depression as a result.

Read more online: www.research.va.gov/currents