

LOOKING OUT—AND AHEAD—FOR AMERICA'S WOUNDED WARRIORS

A Marine injured in Afghanistan works with a trainer. The prevalence of serious injuries among veterans of the wars in Iraq and Afghanistan has raised concerns about long-term health-care costs.

TREATING VETERANS OF PAST WARS at the White River Junction VA Medical Center got James Geiling thinking about the future. “One thing that struck me at the VA, where I’m taking care of Vietnam-era vets, is the long-term medical effects of war injuries,” he says. “And I started to think about what that means for today’s vets.”

In a recent article published in the journal *Military Medicine*, Geiling, a Geisel professor of medicine; Joseph Rosen, a Geisel professor of surgery; and health economist Ryan Edwards discussed the potentially enormous long-term costs of caring for veterans of the wars in Iraq and Afghanistan and what might be done to reduce those costs.

Over 2.3 million active-duty military personnel and reservists have served in Iraq or Afghanistan through September 2011. The Congressional Budget Office (CBO) has estimated the health-care costs for veterans of these wars will be about \$40 billion to \$55 billion through 2020, and estimates of the total health-care costs over the next 30 to 40 years range from \$600 billion to \$1 trillion.

Geiling and his coauthors note that patterns of injury and a higher survival rate than in previous

conflicts both play a role in these estimates. Many veterans of the recent wars survived injuries that might have killed them in previous conflicts. The prevalence of improvised explosive devices (IEDs) in these wars has led to many polytraumatic injuries, such as the loss of multiple limbs, severe facial injuries, traumatic brain injury (TBI), blindness, deafness, or some combination of these injuries. There is also the potential for post-traumatic stress disorder (PTSD), which can be expensive to treat. According to the CBO, about one-fourth of veterans treated from 2004 to 2009 were diagnosed with PTSD.

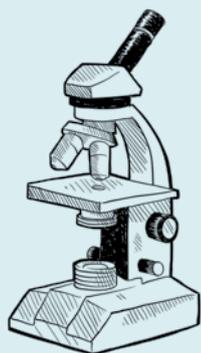
About 50,000 men and women have been wounded in action while serving in Iraq or Afghanistan, and hundreds of thousands of veterans have received treatment from the Veter-

OVERHEARD



As a society, we hand out antibiotics like candy, tossing one life preserver here, one there, assuming the supply is never ending. But it turns out we are, in fact, running out of antibiotics. This will in turn affect our son, who has never taken an antibiotic in his life.

—TIM LAHEY, MD, ASSOCIATE PROFESSOR OF MEDICINE, WRITING IN *THE ATLANTIC*



SIGNATURE FINDING

Research led by associate professor of genetics Michael Whitfield identified gene expression signatures that can accurately identify patients with scleroderma who will respond positively to a particular treatment. There is no known cure for scleroderma—a rare autoimmune disease—and only some patients respond to the one drug often used to treat it. Finding a way to identify those patients who do not stand to benefit could help them avoid unnecessary treatment.

ans Health Administration. By 2035, these veterans will be middle-aged, with health issues similar to those Geiling now sees in Vietnam veterans.

Geiling, who is a 25-year veteran of the Army, argues that being aware of these issues should lead to preventive measures. “We should help an amputee to reduce his cholesterol and maintain his weight at age 30 to 40 rather than treating his coronary artery disease or diabetes at age 50,” he says. “If we treat a veteran’s PTSD at age 21 with counseling and lifestyle interventions, we may help her to reduce suicidal thoughts and avoid the use of tobacco or alcohol. This will save us from having to fund her treatment for chronic obstructive pulmonary disorder or alcoholic liver disease.”

Geiling believes that drawing attention to these issues is important. “Today’s veterans are clearly at risk for long-term illness, and there’s data to show that,” he says. “We just need to think about these things and keep them in mind today so we might prevent them from appearing in 2035.”

NANCY FONTAINE

GLOBAL GRANT

OVER THE NEXT FEW YEARS, George O’Toole, a Geisel professor of microbiology and immunology, will be part of an international team of researchers that takes a new approach to a longstanding problem in biology: how bacteria form colonies called biofilms. The collaboration is the result of a \$1.6-million grant awarded to O’Toole and three other researchers—one each from UCLA, the University of Oxford, and the University of Cologne—by the Human Frontier Science Program, an organization based in France.

Biofilms can be found just about everywhere, and in the wrong setting they can pose significant medical challenges. Bacteria in biofilms are often much more difficult to kill with antibiotics than are free-swimming bacteria, making them very difficult to eradicate when they form on medical devices or in the lungs of people with cystic fibrosis, for example.

O’Toole has spent years studying biofilms, with a particular focus on biofilm formation. “We’ve used a number of different tools, mostly bacterial genetics and biochemistry, to try to understand at a macroscopic level what’s happening,” he says. That work has led to a better understanding of how, at a group level, bacteria form biofilms.

The new collaboration—which includes experts in biophysics, microscopy, and fluid dynamics—will lead to a better understanding of the mechanics of biofilm formation among individual bacteria cells, including how the components of a single cell attach to a surface when joining a biofilm. The researchers will also examine how manipulating the genetics of bacteria



Jon Gilbert Fox

Microbiologist George O’Toole is part of an unusual collaboration that will offer a different perspective on his research.

affects the ability of individual bacteria cells to join biofilms. “It’s bringing to bear a number of different disciplines to tackle a question that has been out there in the field for a while but that no one has been able to really understand at a detailed, mechanistic level,” O’Toole says.

O’Toole is excited to be part of this diverse team of researchers. “Science is really moving in the direction of trans-disciplinary work, where you’re stretching yourself in new directions and each person brings a discrete expertise to the table,” he says. “One good way for making new breakthroughs in a field is by bringing in people with novel perspectives.”

AMOS ESTY

OVERHEARD

Older adults with mental health disorders have greater disability than those with physical illness alone, as well as poorer health outcomes and higher rates of hospitalization and emergency department visits, resulting in per-person costs that are 47% to more than 200% higher. Yet mental health services account for only 1% of Medicare expenditures.

—STEPHEN BARTELS, MD, PROFESSOR OF PSYCHIATRY, WRITING IN THE *NEW ENGLAND JOURNAL OF MEDICINE*