**A paper from the lab of Dartmouth microbiologist George O'Toole, Ph.D., plus one from a Cornell lab with which O'Toole collaborates, were highlighted as "Editors' Picks" in the journal *PLoS Biology*.**

# Study documents veterans' diagnoses

Mental health conditions are common among men and women returning from military combat, but help for those conditions is not always easy to find. DMS researcher Tracy Stecker, Ph.D., set out to examine exactly how prevalent mental health problems are among combat veterans. Among other conclusions, she discovered a high rate of diagnoses of post-traumatic stress disorder (PTSD), indicating that many veterans are in need of treatment.

**The next most common diagnoses were for depression and PTSD.**

Stecker used a national Veterans Affairs database to examine the incidence of various medical and mental health conditions for combat veterans from 2001 to 2006. The most common diagnosis among veterans who received care at VA medical centers was pain, with almost half reporting pain. The next two most common diagnoses were for mental health conditions: depression (affecting about 13% of patients) and PTSD (about 12%).

**Worse:** To make things worse, Stecker says, many veterans suffering from these and other mental health conditions never receive treatment for them. And it's likely that this assessment underestimates the prevalence of mental health problems.

Stecker published her findings in the journal *Psychosomatics*, highlighting the particularly damaging combination of pain, PTSD, and depression, which often afflict patients together. Stecker says the most effective treatments for PTSD are exposure therapy and cognitive behavior therapy, but the fact that many of these problems can be found together in a single patient, along with self-medication with alcohol and drugs, can make treatment even more difficult than it would otherwise be.

**Pain:** Although most VA medical centers are equipped to deal with pain, not all have psychiatric or counseling facilities. Stecker recommends locating psychiatric staff at pain centers to help treat patients with both diagnoses.

When adequate mental health care is not provided, it can lead to long-term problems. Many veterans are redeployed before ever receiving help, which can make them even more in need of help when they complete their service. And PTSD can sometimes be triggered long after active duty ends. For example, Stecker notes, after Hurricane Katrina struck the Gulf Coast, there was a local increase in the number of Vietnam veterans reporting problems with PTSD.

**Seek:** Stecker says the stigma associated with psychiatric disorders is the primary reason veterans do not always seek treatment, but recent research shows this stigma seems to be decreasing. This could be due to better awareness regarding mental illness, or, says Stecker, because veterans are now "struggling so much with their conditions that stigma is no longer a barrier to attempting to attain help."

She plans to use the findings as the basis for a trial on the use of mental health care by veterans. KATHERINE DAWSON

MARK WASHBURN

**Stecker is based at the White River Junction VA.**

## Count down

In rural America, pediatricians and family doctors are in short supply, according to a study by DMS pediatrician Scott Shipman, M.D., *et al.* Between 1996 and 2006, the number of pediatric and family physicians increased 51% and 35%, respectively, but rural children's access to care remained poor. In 2006, 15 million children lived in areas with more than 4,400 children for each pediatric or family physician. Worse still, almost one million children lived in areas where there were no such physicians at all. Better workforce policies "aimed at reducing disparities in geographic access to primary-care physicians for children" is what's needed, wrote the researchers in *Pediatrics*.

## Overexposure

Cigarette ads may be almost as harmful as cigarettes themselves, suggests a recent study conducted in Germany with help from DMS pediatrician James Sargent, M.D. The study, published in *Pediatrics*, links teens' exposure to cigarette ads to the initiation of smoking. "Our results . . . underline the specificity of the relationship between tobacco marketing and teen smoking" wrote the study's authors. In fact, teens in the highest exposure group were almost 50% more likely to begin smoking during the study than those in the lowest-exposure group.

For a WEB EXTRA with a video and a podcast about the MTT program, see dartmed.dartmouth.edu/sp11/we03.

# Aviation approach saves lives in the OR

"Houston, we've had a problem." That famous line, spoken by Apollo 13 astronaut James Lovell, is an example of the clear, direct communication that is typical among flight crews—and that brought the Apollo 13 astronauts safely back to Earth. Many quality improvement experts in health care have called on hospitals to adopt the communication strategies of aviation, but, until recently, it hasn't been done on a large scale.

**Crew:** From 2006 to 2010, the operating room staffs at 121 Veterans Affairs hospitals nationwide underwent specialized training based on an aviation approach called crew resource management. The result? An estimated 2 fewer people died for every 1,000 noncardiac surgeries, and 151 mistakes—such as operating on the wrong body part—were avoided across all the facilities. That's according to the leaders of the project, psychologist Peter Mills, Ph.D., and his colleagues at the Dartmouth-affiliated VA National Center for Patient Safety field office in White River Junction, Vt.

"I really didn't expect to see a reduction in mortality," says Mills.

Like flying a spacecraft or an airplane, "surgery is this incredible orchestration," says Mills. "All these things have to unfold and be perfect for things to go well."

The Medical Team Training (MTT) Program, as the VA project is called, includes two months of preparation and planning with a designated team at each hospital; a daylong onsite learning session that all surgical staff attend; and four quarterly follow-up interviews with each hospital's implementation team.

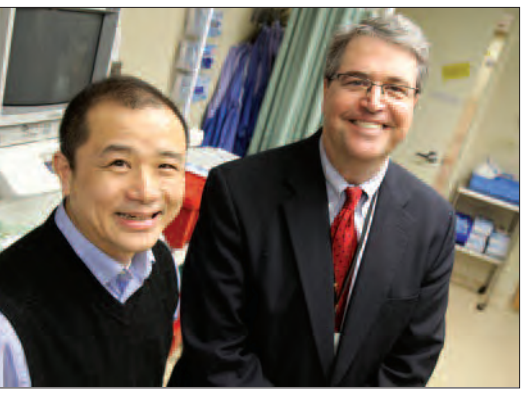
**Risks:** "Clinicians were trained to work as a team; challenge each other when they identify safety risks; [and] conduct checklist-guided preoperative briefings and postoperative debriefings," wrote Mills and his coauthors in the *Journal of the American Medical Association* (JAMA).

The MTT team—which also included statistician Yinong Young-Xu, Sc.D., and nurse Julia Neily, M.S., M.P.H.—compared 74 facilities where training took place to 34 where it did not.

"When we started this program . . . I really didn't expect to see a reduction in mortality," says Mills. Other operating-room training programs have shown improvements in teamwork and even reductions in errors. But MTT is the first one to be implemented on such a large scale, to be studied alongside a control group, and to show that improved communication can actually save lives. "The front line now for patient safety," says Young-Xu, is getting clinicians to communicate better.

**Wane:** Mills and his team plan to follow up to see if adherence to MTT strategies wanes over time. They also hope to adapt MTT to other aspects of hospital care, like handoffs—when the care of a patient is passed from one clinician to another, such as at a shift change.

"The actual things we are training people to do are not complicated," says Mills. "But the key is getting people to do it." Thanks to this study, there's now evidence that—in health care as in aviation—it's worth the effort. JENNIFER DURGIN



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The MTT team included Young-Xu (left) and Mills.

**An issue of the *American Journal of Reproductive Immunology* has been devoted entirely to the proceedings of a symposium held at DMS on the sexual transmission of AIDS. See http://bit.ly/gJz7cU.**

## Additive effect

Hormone replacement therapy, a once-common treatment for the symptoms of menopause, has now been linked to early-stage breast cancer—in addition to invasive breast cancer. That's according to a new analysis by researchers from Dartmouth, San Francisco, and Seattle. The study, published in the *Journal of Clinical Oncology*, examined data from over 2 million mammograms of 700,000 women. "The effect of hormone therapy on breast cancer risk is reversed soon after discontinuation," noted DMS epidemiologist Tracy Onega, Ph.D., and her coauthors. Still, they say such therapy "should be limited to the shortest duration possible."

## Detection projection

Colonoscopies could provide patients with a false sense of security, found a study by DMS's Heiko Pohl, M.D., and Douglas Robertson, M.D. "A significant number of patients undergoing a screening colonoscopy that did not detect cancer actually have a malignant lesion or adenoma that could progress in a short [time]," they wrote in *Clinical Gastroenterology and Hepatology*. The researchers estimate that almost 1 in 500 people who pass a standard screening will develop colorectal cancer within five years—a number that could be lowered by improving adenoma detection, they argue.

**The Dartmouth Atlas of Health Care has gone global. The British National Health Service just published a compendium of variations in its use and distribution of health-care resources.**

# Inducing immunity without autoimmunity

A DMS immunologist came up with a surprising explanation for how an antibody is able to stimulate an immune response against cancer without causing an autoimmune reaction.

Finding the delicate balance between triggering the immune system to attack tumors but not allowing it to attack healthy cells has been a major problem for cancer immunologists. When immune cells called CD8 T cells are called to action, they use antigens—proteins on the surface of cells—as a guide to which cells to kill and which to leave alone. Because tumor cells and normal cells share many antigens, killer T cells often leave tumor cells free to grow.

**"We were just dumbfounded," Turk says of her lab's early results.**

**Cells:** Scientists knew that using an antibody to stimulate a receptor called GITR that's found on many immune cells could create an immune response against a type of skin cancer in mice, but how that happened was unclear. Mary Jo Turk, Ph.D., was curious about the mechanism. She expected to find that the antibody worked by depleting a type of immune cell called regulatory T cells. They suppress the immune system, keeping CD8 T cells from attacking. Having too many regulatory T cells can lead to problems fighting off threats such as cancer, but having too few can lead to autoimmune reactions.

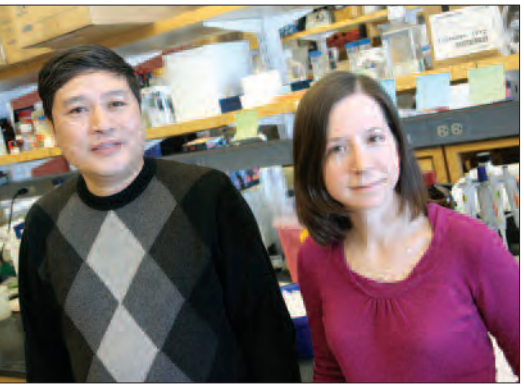
**Mice:** To investigate the mechanism, Turk and her colleagues injected mice with melanoma and treated them with the antibody to stimulate GITR. They then injected the mice with a secondary tumor to see if the combined exposure to the primary tumor and the antibody would provide protection against the secondary tumor. Indeed, the antibody gave strong protection from the secondary tumor without causing an autoimmune reaction. By comparison, when they used a different antibody, one known to deplete the supply of regulatory T cells, they were still able to induce protection against the secondary tumor, but the mice had an autoimmune reaction.

To clarify whether the antibody was working by activating CD8 T cells or by depleting regulatory T cells, they tried a different type of melanoma for the secondary tumor. The antibody did not then provide protection against the secondary tumor—because the CD8 T cells were using the antigens of the primary tumor as a guide to know which cells to attack.

**Spot:** At first, Turk was so surprised that she had a graduate student repeat the experiment over and over. "We were just dumbfounded," she says. Finally she was convinced—when GITR on CD8 T cells is stimulated with an antibody, it leads to the growth of killer T cells that will be able to spot antigens specific to tumor cells rather than to shared antigens.

"You get good, long-lived immunity without autoimmunity, and that has been a big challenge in the field," Turk says.

It's not clear exactly how GITR makes CD8 T cells so much more effective, but her lab is now testing whether anti-GITR will work against a more aggressive form of melanoma. AMOS ESTY



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**Mary Jo Turk (right), pictured with her lab manager Peisheng Zhang, studies cancer immunology.**

## Quality, not quantity

Simply training more physicians might not improve access to health care, found a recent study by DMS's David Goodman, M.D. "Patients living in areas with more physicians per capita had perceptions of their health care that were similar to those of patients in regions with fewer physicians," Goodman *et al*. wrote in *Health Affairs*. They found no significant differences in the number of visits patients had with their personal physician or in their access to tests or specialists. Instead of focusing on increasing the number of physicians, they wrote that "focusing health policy on improving the quality and organization of care may be more beneficial."

## Appendectomy blues

Appendicitis, though highly treatable, may be more deadly for patients in rural areas, found a recent study led by Dartmouth surgeon Samuel Finlayson, M.D. In 36% of rural patients with appendicitis, the organ had perforated by the time they got medical help, compared to 31% of urban patients, wrote Finlayson and his coauthors in *Annals of Surgery*. Perforations are "associated with increased morbidity, length of hospital stay, and overall health-care costs," they noted. The urban-rural gap, they concluded, "suggest[s] disparities in timely access to surgical care." ■