



RESEARCH CURRENTS

Research News from the U.S. Department of Veterans Affairs

Mobility movement

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U.S. Department of Veterans Affairs
Veterans Health Administration
Office of Research and Development



On a southern Afghanistan road in 2010, U.S. Army troops pass by craters that had been created just hours before by improvised explosive devices. IEDs have been the main cause of traumatic brain injuries among U.S. troops in recent wars.

Photo by Kenny Holston/USAF

Hormone findings point to **possible TBI therapy**

Many Veterans suffering from blast concussions may have hormone deficiencies that mimic some of the symptoms of posttraumatic stress disorder and depression, according to researchers with the VA Puget Sound Health Care System and the University of Washington.

The researchers screened 35 Veterans with blast injuries. They found that 42 percent had irregular hormone levels indicative of an underactive pituitary gland—also known as hypopituitarism. The condition can often be controlled by replacing the deficient hormones.

“This could be a largely missed opportunity for successful treatment,” says study leader Charles Wilkinson, PhD, a research associate professor in psychiatry and behavioral sciences at the university, and a research physiologist with VA’s Seattle-based Geriatric Research, Education and Clinical Center.

Wilkinson’s group presented the findings at the Experimental Biology 2013 meeting in April. Some of the data were published in the journal *Frontiers in Neurology* last year.

As many as 20 percent of returning Veterans have experienced at least one blast concussion. Wilkinson says the Department of Defense has introduced clinical guidelines alerting providers to look for hormone problems in blast-exposed Veterans. He says he hopes VA will adopt similar guidelines based on the emerging research.

Wilkinson says past studies suggested that up to half of people who suffer traumatic brain injuries later have low pituitary hormone levels—a drop in the concentrations of at least one of eight hormones produced by the pituitary, a pea-sized gland beneath the base of the brain.

Past research, though, has focused mainly on civilian head injuries, such as from car accidents. The VA–UW study



Dr. Charles Wilkinson looks on as Elizabeth Colasurdo performs a hormone lab test. Wilkinson's group at the VA Puget Sound Health Care System and University of Washington have found low levels of several brain hormones in Veterans affected by traumatic brain injury.

Photo by Chris Pacheco

aimed to learn whether newly returned Veterans who had suffered mild traumatic brain injuries from blasts had similar rates of hypopituitarism.

The researchers took blood samples from 35 Veterans who had received a diagnosis of a blast concussion about a year prior—enough time for hormone changes to become evident. About 42 percent of these Veterans showed abnormally low levels of at least one of the pituitary hormones.

The most common deficiency was in human growth hormone. Low levels can cause symptoms similar to those of PTSD and depression, as well as raise the risk of heart attack and stroke. The second most common problem was hypogonadism—changes in sex hormones that can affect body composition and sexual function.

The researchers also found that some Veterans had abnormal levels of vasopressin and oxytocin. Low levels of oxytocin affect people's ability to bond with others, and vasopressin is linked to other mental health issues. Problems with these hormones, and with growth hormone, could contribute to difficulties with personal relationships, notes Wilkinson.

WELCOME TO OUR NEW FORMAT

As of this issue, *VA Research Currents* is switching to a new format. In the past, print and online editions of the newsletter were produced 10 times per year. Now, we'll post monthly updates to our *VA Research Currents* Web page (www.research.va.gov/currents), and produce an enhanced print edition four times per year—summer, fall, winter, and spring.

The goal of the newsletter remains the same: to provide stakeholders of VA research—including the Veteran community—with news about study findings, new initiatives, major awards, research funding, and other matters of interest. We hope you enjoy the new format and find it easy to read and informative. We invite your feedback at varesearchcurrents@va.gov or through Facebook at facebook.com/varesearch.

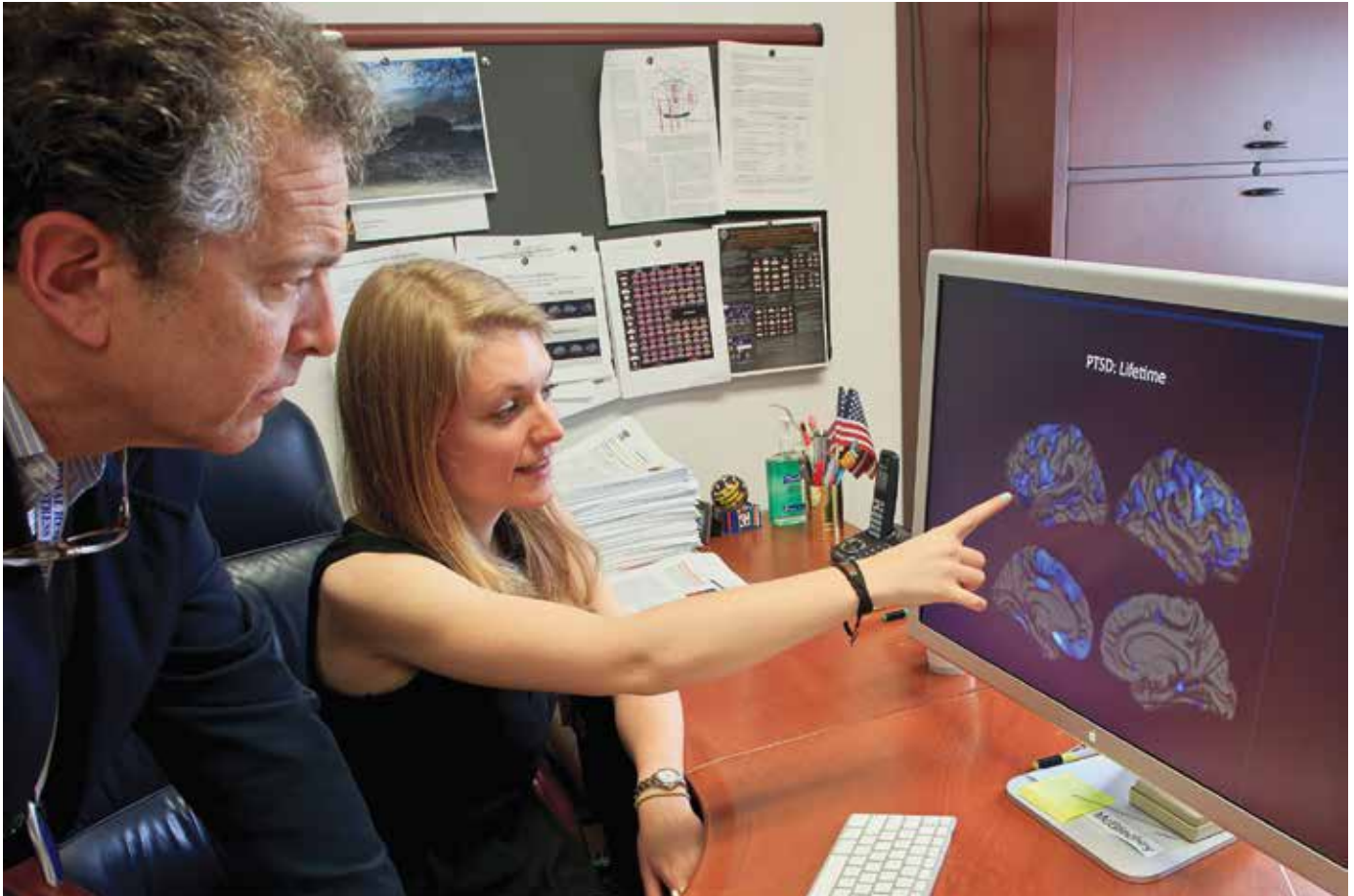
Mitch Mirkin
Editor

The researcher says that even if 10 percent of blast-affected Veterans have hypopituitarism, it's a problem that physicians—especially in DoD and VA—need to be more aware of.

The group is planning further research to document the extent of the problem among blast-affected Veterans. Wilkinson says future studies will use various medical, cognitive, and psychological tests to show the effects of the hormone deficiencies. Ultimately, he says, the group aims to “help develop and refine cost-effective and efficient screening procedures to best select those Veterans who would be most likely to benefit” from hormone evaluations after blast concussions.

VA and the Department of Defense funded the study. Wilkinson's co-investigators were Elizabeth Colasurdo, Kathleen Pagulayan, PhD, Jane Shofer, MS; and Elaine Peskind, MD. ★

Based in part on an American Physiological Society news release.



Dr. William Milberg and Emily Lindemer examine brain MRI images. The scientists are with VA's Boston-based Translational Center for TBI and Stress Disorders.

Photo by Thomas Manders

Study links combat injuries to **changes in brain's cortex**

'Lifetime burden' of PTSD adds to effects

A study by researchers at the VA Boston Healthcare System offers an in-depth look at the effects of combat and other traumas on the brain. The findings are now online in the journal *NeuroImage: Clinical*.

The study included 104 Veterans who served in Iraq or Afghanistan. The researchers focused on the effects of posttraumatic stress disorder on the cerebral cortex—the outermost layer of the brain. Known as the brain's

“gray matter,” the cortex, two or three millimeters thick, plays a key role in memory, attention, and other mental tasks. The cortex loses thickness with normal aging, and research on many brain conditions has generally linked thinning of the cortex to reduced cognitive function.

The study found that both current PTSD and a person's “lifetime burden” of PTSD, or trauma exposure, are associated with reduced thickness in var-

ious areas of the cortex. The findings were based on two MRI brain scans of each study volunteer.

“We believe this is the first study to show clearly the burden of psychological trauma across the lifespan, and to relate this burden to the thickness of the cortex across the entire brain,” says lead author Emily Lindemer, an investigator with VA's Translational Center for TBI and Stress Disorders (TRACTS).

Senior authors on the study were TRACTS director Regina McGlinchey, PhD, and co-director William Milberg, PhD. Both are also with Harvard Medical School. David Salat, PhD, with TRACTS and the Martinos Center for Biomedical Imaging, also worked on the study.

The TRACTS team also looked at how traumatic brain injury compounds the cortical damage. They found “more marked reductions in cortical thickness” when Veterans with PTSD also had a history of at least one traumatic brain injury, in some cases from a blast.

Several past studies have linked PTSD to reduced volume in various brain areas. These include the hippocampus and amygdala, as well as the anterior cingulate, which is part of

the cortex. But findings overall have been mixed. And researchers still aren’t sure if PTSD causes these brain changes, or if smaller volume in certain brain structures is a pre-existing risk factor for PTSD.

The new study doesn’t answer the question directly. But it does suggest that the longer a person lives with PTSD, the more pronounced the effects on the cortex. “The longer an individual lives with a trauma-related psychological burden, the greater the observed reduction in [cortical] thickness will be,” wrote Lindemer and colleagues. They also observed that reductions in thickness were spread across more areas of the cortex in those Veterans who had a longer history of PTSD or trauma exposure. In fact, most Veterans in the study re-

ported having experienced at least one trauma prior to their combat deployment.

According to the researchers, the results show the importance of considering trauma across the lifespan, and not just “a single snapshot of current PTSD symptoms,” when trying to understand trauma’s effects on the brain.

The study was part of ongoing VA-funded research at TRACTS exploring the effects on the brain of combat-related brain injuries, both physical and emotional. To watch a video on the center’s work, visit www.research.va.gov/news/features/tracts.cfm. ★

Agent Orange linked to aggressive prostate tumors

As in his Marine days, Sam Collins is a fighter. He has an aggressive form of prostate cancer that has now come back three times—even after a variety of treatments—but he is not giving up hope.

“The Marine Corps taught me that you keep on fighting. So I keep going,” says the 63-year-old Missouri man.

According to VA policy, Collins, as a Vietnam Veteran, is presumed to have been exposed to the herbicide Agent Orange. Prostate cancer is one of several diseases linked to the herbicide, which contained toxic chemicals called dioxins.

Now, new study data show that Veterans exposed to Agent Orange are not only at higher risk for prostate cancer, but they are more likely to have aggressive forms of the disease—like that affecting Collins. The study appears in the July 1, 2013, issue of the journal *Cancer*.

The study, conducted at the Portland VA Medical Center and Oregon Health and Science University, was based on the records of 2,720 VA patients who had



The U.S. military sprayed more than 19 million gallons of Agent Orange and other herbicide combinations during “Operation Ranch Hand” in the Vietnam War. New VA research has linked Agent Orange exposure to fast-growing prostate tumors.

Photo: U.S. Army



“The Marine Corps taught me that you keep on fighting. So I keep going,” says the 63-year-old Missouri man.

undergone an initial prostate biopsy. Biopsies are usually ordered after abnormal results from a digital rectal exam or prostate-specific antigen (PSA) blood test.

Prostate cancer was diagnosed in a third of the Veterans. The chance of finding cancer was 52 percent higher in those whose records indicated Agent Orange exposure.

Among all the men biopsied, one in six had high-grade, or fast-growing, disease. Exposure to Agent Orange did not raise the risk of low-grade prostate cancer, but it raised the risk of high-grade disease by 75 percent. In fact, exposure to the herbicide doubled the risk of the highest-grade, most life-threatening cancers—those with the highest Gleason scores. Gleason scores are based on the degree of abnormality seen in prostate cells under a microscope.

Another finding from the study: Men who had been exposed to Agent Orange tended to be about five years younger at the time of biopsy than non-exposed Veterans. The researchers say this is another sign of faster-growing cancer.

Senior study author Mark Garzotto, MD, says Agent Orange status could be a valuable piece of information to factor into screening and treatment decisions.

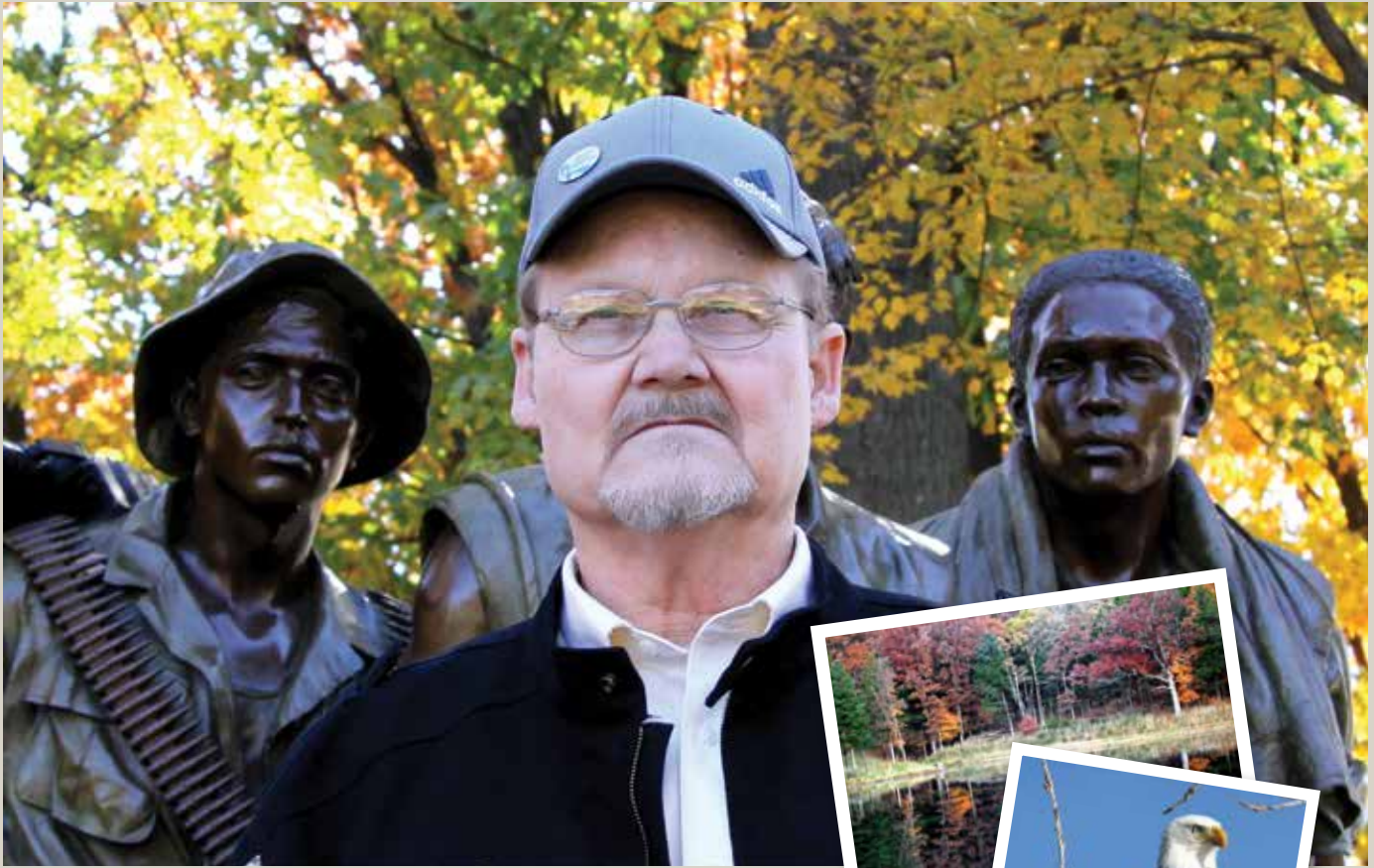
Experts have debated whether all men should be routinely screened for prostate cancer. Critics say current screening methods often lead to false positives—suggestions of cancer where none exists—and in many cases find slow-growing cancers that would be unlikely to cause any symptoms during a man’s life. Nonetheless, men with these slow-growing cancers may still undergo treatment and incur serious side effects. Also, once a cancer is detected, men face tough choices over how aggressively to treat it. One option in early-stage disease is to just closely monitor the

tumor, but many patients worry that this may allow their untreated cancer to spread.

“Having a means of specifically detecting life-threatening cancer would improve the effectiveness of screening and treatment of prostate cancer,” notes Garzotto. He says screening Agent Orange patients is important because it would help zero in on high-grade prostate cancers—those most likely to be lethal. “For these men,” he says, “therapy results in a significant improvement in survival and reduction in the spread of cancer to the bones.” ★

KEY FINDINGS

- Men exposed to Agent Orange had a 52 percent overall higher risk of prostate cancer, compared to non-exposed men.
- Agent Orange exposure did not raise the risk of low-grade prostate cancer, but it raised the risk of high-grade prostate cancer by 75 percent.
- Men exposed to Agent Orange were five years younger, on average, at the time of biopsy.



Veteran Sam Collins of Kansas City, Mo., is seen at the Vietnam War Memorial. The adjacent photos show a sample of his photography, which he sells as part of his fund-raising efforts in support of medical research.

Veteran sells photos to raise funds for VA research

Sam Collins has been through surgery, radiation, chemotherapy, and hormone therapy to treat his prostate cancer. As of now, his high PSA scores show the cancer is still in his system. He has girded himself to continue the battle he has waged since 2005, when his cancer was first diagnosed.

Collins says he still may take part in a clinical trial if a promising experimental treatment comes along. Meanwhile, he has learned to cope psychologically with what he terms an “incurable cancer.”

His mission now, he says, is to “try to help other Veterans.” As part of the cause, he has become a fierce supporter of medical research—particularly within VA.

“I tell people VA is a diamond in the rough. I see research

as the foundation of the medical world. It’s where we create the tools to give to the doctors to help us.”

Among other fund-raising activities, Collins sells his photos at local events and gives all the proceeds to the non-profit foundation that helps support research at his local Kansas City (Mo.) VA Medical Center.

He realizes he himself might not benefit, but that doesn’t stop his efforts.

“VA research does help Veterans, but more important, whatever VA discovers will eventually become part of medical practice in general. It might help our own children and grandchildren.” ★

Easing the pressure

VA-Case Western Reserve team working on simple but elegant solution for preventing pressure ulcers

When it comes to pressure ulcers, an ounce of prevention is worth a *ton* of cure. “It’s always better to prevent a pressure ulcer than to treat one,” says Kath Bogie, DPhil, a researcher at VA’s Advanced Platform Technology (APT) Center in Cleveland.

Bogie’s group, with members at both APT and Case Western Reserve University, is developing a low-tech, high-performance product they hope will help prevent pressure ulcers for the more than 25,000 VA patients with spinal cord injuries, and for all others in the U.S. and worldwide who are long-term wheelchair users.

The product is a seat cushion. The basic idea is not new—there are “high-performance” models already on the market. Bogie’s innovation lies in the materials and design. The group is developing its own low-cost gel filling, along with a modular design that will help save users money. She calls the approach “value-driven engineering.”

“We’ll provide advanced adjustable pressure relief at a much lower cost to VA and other consumers,” says Bogie. “The up-front cost is less due to the cushion materials, and ongoing costs are reduced because the design is modular—so that if one part fails, it can be replaced without having to throw out the whole cushion.”

She expects the annual cost of the new cushion to come out to around \$57 per year, compared to \$128 for existing models. “Our preliminary cost analysis shows that a customer could entirely replace every component of the proposed cushion several times and still have a more cost-effective cushion.”

The gel balls in the APT model should last about six months. A washable two-way stretch cover will be included in the final product.

The group is planning trials with Veterans with spinal cord injury. The researchers will also test the cushions using a machine that creates heat and water vapor, mimicking the sweat and body heat the cushions will endure in real use.



A team at VA’s Advanced Platform Technology Center, in Cleveland, is using advanced gel balls to create a new type of seat cushion to help prevent pressure ulcers among wheelchair users.

Photo by Jason Miller

They’ll also use pressure-mapping technology to study how a load is distributed across the cushion when it’s in use.

The work is funded by VA’s Rehabilitation Research and Development Service. Bogie is also an assistant professor at Case Western Reserve University. Her collaborators include bioengineers Jeffrey Capadona, PhD, with APT and CWRU; and John Lewandowski, PhD, with CWRU. ★

FACTS ABOUT PRESSURE ULCERS

- Pressure ulcers, also called bedsores, are injuries that occur from prolonged pressure on the skin. In wheelchair users, they occur most commonly on the buttocks.
- Early-stage ulcers may be slightly painful and involve subtle changes in skin color. Later-stage ulcers are deep, open wounds that can involve dangerous complications.
- Pressure ulcers form quickly and are often difficult to treat. VA researchers, among others, are developing innovative treatment strategies, some involving electrical stimulation or a type of hydrotherapy called pulsatile lavage.
- Prevention includes various “repositioning” strategies—including cushions and specialized wheelchairs—along with good skin care and nutrition.

Based on information from the Mayo Clinic

Mobility movement

Researchers study the effects of low mobility on older hospital patients—and seek ways to get them moving more

A small but growing number of researchers are determined to improve hospital care—especially for the elderly—by encouraging patients to get up and move around more during their stays.

Cynthia J. Brown, MD, MSPH, is in the forefront. She was recognized earlier this year by the American Geriatrics Society for her work, receiving the group's Outstanding Scientific Achievement for Clinical Investigation Award.

Brown's research has shown that even a few days in the hospital can be a serious setback for older people. A study by her team at the Birmingham VA Medical Center showed that older people, on average, spend about 83 percent of their time in the hospital lying in bed. They spend only 43 minutes per day standing and walking around. Research outside VA has produced similar findings.

The short-term lack of movement takes its toll—and the losses are often permanent.

“There's a population of older people who basically lose their ability to take care of their activities of daily living—to dress and bathe themselves, for instance,” says Brown. “They go home from the hospital less able and end up staying less able, even after they recover from whatever the acute illness was that put them in the hospital.”

Researchers don't completely understand why only a few days spent sedentary in the hospital can have such marked effects on some older people. Brown now has a VA-funded study to look at the issue. “Why aren't people recovering—and is it a subgroup of older people that doesn't recover well?” Brown asks. “That'll help us know whom we really need to be targeting with mobility interventions in the hospital.” The study will include 200 Veterans.

One theory is that some elders are in such a tenuous state to begin with that even a brief hospital stay can trigger irreversible decline.

“The thinking is that there are lots of older adults out in the community who are hanging on by their fingernails to their independence,” says Brown. “Yes, they're able to do things, but it's a struggle. Then they come in to the hospital, and we stick them in bed for three to five days, and that just tips them over the edge. They're not able to recover from that ‘insult’ to their strength and ability.”

Brown, a former physical therapist, points out that even younger people experience some declines from brief periods of low mobility—for example, when they are laid up with the flu for two or three days. “We know from NASA's work that there are changes that start happening in

the human body within 24 hours of getting put in bed. People start losing muscle mass. There are changes in blood pressure, so you're more likely to experience a sudden drop in blood pressure when you stand up, which makes you dizzy.”

In fact, people of all ages are at higher risk of falling when they return home after a few days in the hospital, notes Brown. Among seniors, the problem is more severe.

CAN HOSPITALS CHANGE THEIR WAYS?

Part of the low-mobility syndrome, says Brown, lies in the physical layout of hospital rooms and units. “They're very much designed for the ease of the health care provider and not so much for the patient,” says Brown. “I hope hospitals will look different in the future.”

There are, however, some improvements that can be made now, Brown emphasizes. They have to do mainly with hospital routines.

“If we can at least get our processes of care to look different,” she says, “that would do an enormous amount for older adults.” As things stand now, “The whole environment has been created in such a way that no one wants to get up. There are disincentives to walk.”

Among the simple remedies she proposes:

- “Instead of having just one chair in the room, why not have two, so the patient can at least sit up when he or she has company?”
- “Encourage patients to sit up for every meal.”
- “No one wants to walk without a destination. How about a place that patients—those who are able—walk to for their meal, rather than having breakfast, lunch, and dinner served in bed?”
- “Move the TV around so if the patient wants to sit up to watch, it’s no big deal to do that.” As of now, she says, patients usually have to be lying in bed to get the best view.
- “If someone at home uses a cane or walker, we should keep those aids with them at the hospital. A lot of times, the aids get sent home for whatever reason—sometimes people are afraid they’ll get misplaced. If they’re not going to keep their own, we should have these types of devices available for patients.”

Brown also has little tolerance for the dreaded hospital gown—that invention of modern medicine that has facilitated hospital care but rendered many patients red-faced, wishing they had a third hand just to keep things under wraps.

Says Brown, “Get rid of those hospital gowns and let people wear something that is more comfortable for them to walk around in.” She tells of one study participant, an older woman, who wrote a page-long dia-



Dr. Cynthia J. Brown, of the Birmingham VA Medical Center and the University of Alabama, has been recognized by the American Geriatrics Society for her research focused on preventing falls and increasing mobility among older people, especially during their hospital stays.

Photo by Joseph De Sciose

tribe about the gowns on the back of an interview transcript.

PREVENTING FALLS, BOOSTING MOBILITY: COMPETING GOALS?

There’s also a politically touchy issue: The federal Centers for Medicare and Medicaid Services (CMS), which pays for much of the hospital care received by older people in the U.S., introduced a rule in 2008 that holds hospitals to a zero-tolerance standard when it comes to falls. CMS will not pay for care for injuries related to falls. Brown says the rule has reinforced a hospital mindset that discourages mobility, partly out of concern over falls. “The hospital culture in most places has become, no, we don’t get them up because something bad might happen to them.” VA is less affected by the rule than are

private hospitals, but the culture is pervasive just the same, says Brown.

Another VA researcher, Ronald Shorr, MD, director of the Geriatric Research, Education and Clinical Center at the Gainesville VA Medical Center and a professor at the University of Florida, has a grant from the National Institute on Aging to study the effects—and perhaps unintended consequences—of the CMS rule in U.S. hospitals. For example, are hospitals resorting to physical restraints to try and banish falls? A preliminary analysis by the group found a “small but statistically significant” downward trend in falls just before the new rule kicked in. Now they are looking at what has ensued since it’s been in effect.

Brown says she and Shorr and other geriatricians agree on the need to get older people up and about during

their hospital stay. “As a group,” she says, “those of us who have a really strong understanding of what happens to older people when they are confined to a bed, tend to not argue.”

These experts in elder care insist that preventing falls and increasing mobility during hospital stays are not mutually exclusive goals. Rather, they go hand in hand: Boosting movement can help maintain balance and strength—key factors in fall prevention.

Some doctors have other views. They are wary of what they see as the risks of nudging patients out of bed. Brown recalls the cynical comment of one peer who reviewed a grant proposal of hers, for a mobility intervention: “I don’t see the point of this study. The patients are in the hospital only three to five days, so what difference does it make?”

Meanwhile, Brown makes progress where she can, challenging the entrenched hospital habits that seem most amenable to change. A recent trial of a walking program at the Birmingham VA Medical Center yielded promising results (*see sidebar*).

Some of the measures she pushes for—and has tested—seem like small steps. But they may eventually pay off in a big way for patients.

“So much of it is common sense,” Brown reflects. She adds, only half-jokingly, “I’ve got a whole career based on common sense.” ★

Walking study shows ‘it’s feasible and safe to get patients out of bed’

Dr. Cynthia J. Brown wanted to prove her skeptics wrong when she launched a study of a walking intervention a couple of years ago.

“I have heard—till I’m blue in the face from trying to hold it in and not get mad at people—‘You’re going to make them fall. You can’t let them out of bed.’ That’s why we did the study.”

The trial included 100 older inpatients at the Birmingham VA Medical Center. The Veterans were randomized to one of two groups:

- The control group received care as usual, plus a “friendly visit” twice a day. A study team member came by simply to engage the patient in conversation.
- In the intervention group, each patient was visited twice daily by a team member who used motivational interviewing to try and engage the person in walking. The study personnel helped the Veterans to walk. They provided canes or other aids as needed. They also encouraged patients to set goals—such as walking up and back to the nursing station—“whatever was safe for them,” says Brown. The next day, the staffers would follow up: “How did you do? Were you able to do what you planned?”

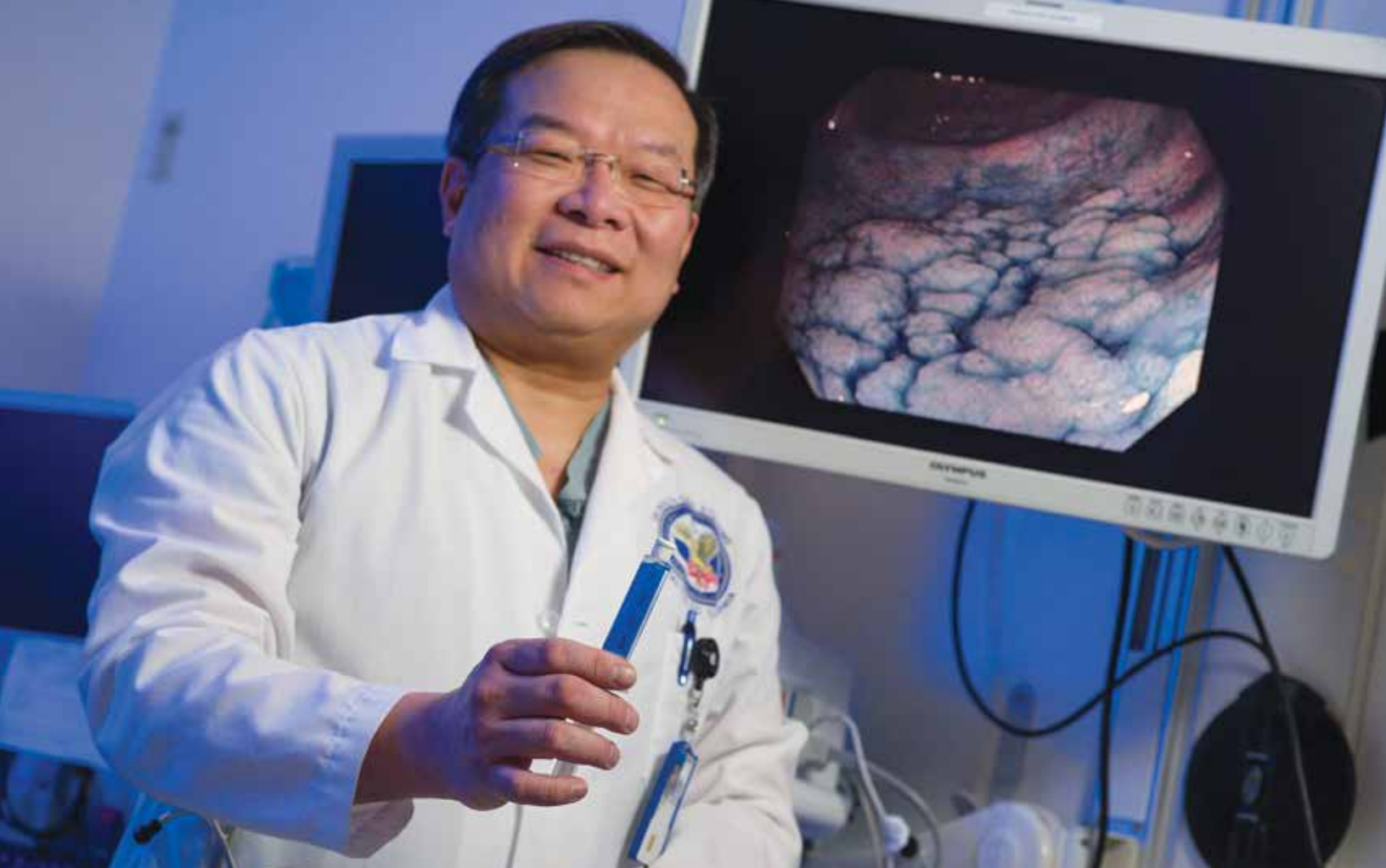
The results aren’t published yet, but Brown shares that “we showed it was feasible. We were able to motivate people and convince them to walk in the hospital. We also showed it was safe. In terms of falls, which was everyone’s concern, there were a total of three falls, in two patients, and they were both in the usual-care group.”

In other words, prodding patients to walk, and getting them excited about doing so, did not increase their risk of falling. As Brown had confidently predicted, those fears did not materialize.

The researchers also found that in the month after discharge, those who had been in the intervention group had less difficulty getting around their communities.

Another lesson gleaned from the study may be especially relevant for today’s economic times: In most cases, it doesn’t take a trained health professional to assist an older patient with walking. “It doesn’t even have to be a hospital employee at all,” notes Brown. “It could be a volunteer or a family member.”

She notes that some instances require extra caution—for example, a patient who is very heavy, trying to walk aided by his 100-pound spouse. But in general, she says, “Families want to help—they just need to know what they can do. We need to do a better job of communicating that to them.” ★



Dr. Roy Soetikno of the VA Palo Alto Health Care System is working to teach other gastroenterologists about a colonoscopy technique that studies show can improve early detection of cancer. It involves spraying a blue dye into the colon.

Photo by Curt Campbell

Colonoscopy blues

VA team says blue-dye method boosts power of colonoscopy to ward off cancer

Roy Soetikno, MD, a gastroenterologist at the VA Palo Alto Healthcare System and Stanford University, calls it a “tragedy” that cancer is missed in about 1 in 6 people with ulcerative colitis who undergo a colonoscopy. Many of those people will die from the cancer.

He says there is an answer. It’s a colonoscopy method his team learned from Japanese doctors. Soetikno and his VA colleagues—including gastroenterologists Tonya Kaltenbach, MD, and Kenneth McQuaid, MD, and pathologist Robert Rouse, MD—are now working to disseminate the method in the U.S. They point to evidence it can save lives.

The technique involves spraying the colon with a blue dye to make it easier to find abnormal growths. Soetikno

and colleagues describe the method in the June issue of the professional journal *Gastroenterology*. The article includes statistical evidence on the technique’s effectiveness, along with instructional videos, a procedural flowchart, and other practice guidelines for doctors. The team hopes the materials will raise awareness and lead to practice changes among U.S. gastroenterologists, in VA and beyond.

FLAT LESIONS COMMON IN U.S.

In 2008, Soetikno and his Palo Alto team published study results in the *Journal of the American Medical Association* showing that flat or depressed lesions, once thought common only in Asian populations, were actually common

in the U.S. as well. The lesions appear as “pancakes on the floor [of the colon],” says Soetikno, and may harbor cancer. Standard colonoscopy often fails to find them. The procedure works well to find pre-cancerous polyps—small raised knobs of tissue. Locating the non-polyp flat lesions is trickier. But the dye helps.

“The dye fills the crevices and glands of the colon,” explains Kaltenbach, also with VA and Stanford. “It highlights the border of the flat growths and the abnormal pattern of their glands.” The initial spray is done with diluted dye. Once a growth is spotted, a more concentrated dye solution is applied. If the lesion still looks suspicious, it is snipped out with the colonoscopy tool and sent to the lab to be checked for cancer.

The dye technique—technically known as chromoendoscopy—is especially effective for those with ulcerative colitis, a form of inflammatory bowel disease. It affects about 700,000 Americans, including up to 1 in 200 VA patients, says McQuaid, with VA and the University of California, San Francisco. The disease increases the risk of colorectal cancer. In this population, flat lesions are more common than polyps. Their growths are also harder to detect because of the damage the disease causes to the mucous walls of the colon.

“In these patients, unfortunately, the flat lesions are much harder to find because the lining of the colon is chronically inflamed. It’s difficult to see the abnormal area,” notes McQuaid. “The blue dye shows the borders and contours of the lesion.”

Soetikno points out that research, including some European studies, shows that the dye method is vastly more efficient at finding cancer in at-risk patients than the conventional method: snipping out random samples of colon tissue for biopsy, “in the hope that one of them catches a growth.”

DYE METHOD ENTAILS LITTLE EXTRA COST OR TIME

In addition to learning how to perform chromoendoscopy, doctors have to learn how to recognize flat lesions. As part of their research, Soetikno’s team has shown that training works to convey the required skills. They published a study last year in the journal *Digestive Diseases and Sciences*, based on colonoscopies of 462 patients, showing that doctors who had been trained to spot non-polyp growths did

“The dye fills the crevices and glands of the colon.”

a better job of finding growths overall, and were three times more likely to find and remove the flat ones.

As a further incentive for doctors to adopt the dye method, Soetikno and his team have simplified it so it is easier to perform. For example, to deliver the dye into the colon, they use a washing pump that is part of the standard colonoscopy kit, rather than a special spray catheter. The added costs are low, says Soetikno—no more than about \$20 worth of dye per patient, and only 11 minutes of extra time during the procedure. The payoff, though, is immense, he says: a “miss rate”—failure to detect precancerous lesions—that is a whopping 93 percent lower than with non-dye colonoscopy, based on the literature review his team conducted for the *Gastroenterology* article.

Soetikno notes that the dye method is now the standard of care in Europe and Australia for at-risk patients—namely, those with inflammatory bowel disease in the colon or rectum. He says “it is very unfortunate that the U.S. has not yet widely adopted the technique. The rate of missed lesions and cancers with standard colonoscopy is sobering. It should serve as a call to improve the quality of colonoscopy in IBD patients, who are at a higher risk for colon cancer.”

He hopes gastroenterologists nationwide will take note of the new article and training materials. He says the statistical evidence backing the procedure is ample and robust, and that now is the time to change practice. “No one has stepped forward to provide the necessary training,” he says. “We are trying to change that.”

Soetikno’s coauthors on the *Gastroenterology* article, in addition to Kaltenbach, Rouse, and McQuaid, include gastroenterologists from the United Kingdom, the Netherlands, and Japan.

To view a 2009 VA video that includes a segment on the work of Soetikno and colleagues, visit www.research.va.gov/news/videos.cfm and click on “Cancer Research.” ★

Online brain training effective, but more evidence needed

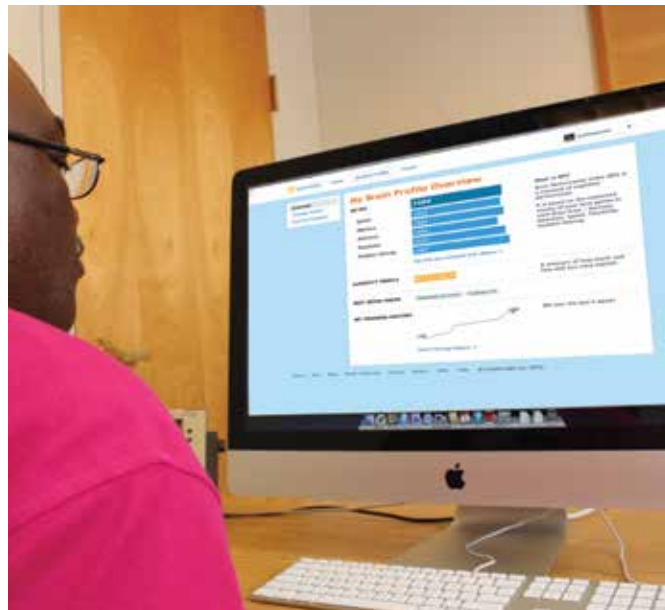
Online brain-training programs such as Braintrain, Cogmed, and Cognifit generally do improve users' cognitive skills, but the results don't always transfer to real-world tasks outside those used in the online training. That's the main finding from a review of more than 20 individual studies that tested the online programs.

The review team included researchers with the VA San Diego Healthcare System; the University of California, San Diego; and Washington State University. They also looked at studies that had tested video games designed to boost cognitive skills.

The online training is marketed mainly to older adults looking to slow the effects of aging on the brain. But it has also been used and studied for populations with health conditions that affect brain function, ranging from attention deficit disorder to multiple sclerosis and schizophrenia. The programs often use colorful and engaging puzzles and games, some with audio instructions or prompts. They include baseline testing and metrics that allow users to track their progress over time. They target brain functions such as attention, memory, and processing speed.

Overall, say the authors of the review study, "The available peer-reviewed literature suggests that computer and video game based cognitive enhancement programs yield the most significant and robust improvements on trained tasks, processing speed in particular. Beyond improvements made on trained tasks, there is moderate evidence to suggest that these methods can generalize to untrained cognitive abilities. ..."

The authors recommend additional well-designed, independent studies to document the programs' actual benefits. Of the 21 studies reviewed, several reported financial conflicts of interest, such as funding by the maker of the software. The reviewers also recommend that future studies include "functional outcome measures" relating to school



Lloyd Clarke, an Army Veteran and IT employee with VA in Baltimore, says he is a regular user of an online brain-training program called Lumosity.

Photo by Mitch Mirkin

performance, work efficiency, or quality of life—all areas that the programs claim to improve.

Quoting from one of the studies reviewed, the authors note that the "popularity of products designed to slow brain aging might have outpaced credible scientific data to show that these interventions are effective." ★

(*Neuropsychology Review*, March 2013)

QUICK STUDY

Where do people look for health information?

- In a survey of nearly 4,000 U.S. adults, 43 percent said the Internet was their first source for health information.
- Other first sources: health care provider (11 percent), print publications (9 percent), or relative, friend, or coworker (3 percent).
- Veterans were nearly twice as likely as non-Veterans to seek health information from a doctor or other provider.

Source: "Old School' Health Information Seeking: Talking to Your Doctor," presented by VA New England Healthcare System researchers at the 2013 Society for Behavioral Medicine meeting.



Dental assistant Freda Reutz (left) and dentist Dr. Ronald Pleis attend to a patient at the Central Arkansas Veterans Healthcare System.

Photo by Jeff Bowen

Dental care linked to **better outcomes for homeless Veterans**

A study of nearly 10,000 Veterans who had taken part in a VA homeless intervention program found that those who had received dental care enjoyed better outcomes in a number of areas.

Those who received dental care were 30 percent more likely to complete the homelessness program, 14 percent more likely to have a job or be financially stable at discharge, and 15 percent more likely to have transitioned to residential housing.

The study included 9,870 Veterans who had been admitted to a VA homeless intervention program during 2008 or 2009. Roughly half received dental care during treatment, while

the others did not. To zero in on the effects of dental care by itself, the researchers adjusted for factors such as the Veterans' demographics and their medical and psychiatric history—including alcohol and substance abuse.

The study authors concluded: "Provision of dental care has a substantial positive impact on outcomes among homeless veterans participating in housing intervention programs. This suggests that homeless programs need to weigh the benefits and cost of dental care in program planning and implementation."

The authors included researchers with VA's national Office of Dentistry

and National Center on Homelessness among Veterans, as well as the Fayetteville (Ark.) and Bedford (Mass.) VA medical centers. ★

(*American Journal of Public Health*, online May 16, 2013)

Those who received dental care were more likely to complete their homeless intervention program.



Pamela Gentry, RN, was one of the Durham VA Medical Center nurses who delivered telephone counseling to patients as part of the Hypertension Intervention Nurse Telemedicine Study.

Photo by Linnie Skidmore

Telemedicine yields good results in hypertension trial

Veterans with hypertension and diabetes were less likely to develop retinal disease—a common diabetes complication—when they received special medication management through a VA study called the Hypertension Intervention Nurse Telemedicine Study.

The same improvement—a 50 percent reduction in risk—was seen when the medication management was combined with behavioral education, delivered by nurses to Veterans via telephone. The behavioral intervention by itself, however, was no more effective than usual care.

The medication management involved collaboration between doctors and nurses. They tracked blood pressure readings sent by the Veterans three times per week via telemedicine devices. Based on the readings and Veterans' individual medical profiles, the study team adjusted medication

regimens per clinical guidelines and a flowchart-like decision-support system.

In the telephone behavioral intervention, nurses counseled the Veterans on sticking to their medication regimens and making healthy lifestyle choices.

The study involved 593 Veterans with high blood pressure, including 252 who also had diabetes. Previous analyses from the study reported modest improvements in blood pressure control in response to both interventions—medication management and behavioral education. Larger effects were seen among those Veterans with poor blood pressure control to begin with, and among African Americans, who made up about half the study population. ★

(JAMA Ophthalmology, online May 23, 2013)

VA researchers recently presented a study on the use of Twitter to help people quit smoking.

Photo: iStockphoto



Twitter and smoking cessation

Researchers with the VA New England Healthcare System studied Twitter accounts geared to help people stop smoking. The most popular accounts, they found, were those focusing on social and emotional support.

Accounts that tweeted mainly news or information had fewer followers.

The researchers identified 130 English-language Twitter accounts focused on smoking cessation. They selected 18 to study—those that had tweeted at least once during the 24-hour period used for baseline information-gathering. They analyzed 900 tweets in all.

Compared with individual accounts, accounts linked to organizations were more likely to tweet reassuring, emotional, or optimistic statements. One example: “Finally, it’s Saturday! Wishing you all a healthy and happy weekend. Make sure to pack it full of motivational activities.”

Organizational accounts were the most popular, accruing more than twice as many followers per day as the non-organizational accounts. They also had more interactions with users.

Popularity was also higher for those accounts that tweeted more open-ended questions, or invitations to participate.

For example: “How many days into quitting are you? Tweet at us, and we’ll share this for inspiration!”

Senior researcher on the study was Thomas Houston, MD, MPH, at the Bedford (Mass.) VA Medical Center, director of VA’s eHealth QUERI (www.queri.research.va.gov/eHealth). The group studies how Web-based and other electronic communication technologies can help improve Veterans’ health. ★

(*Society for Behavioral Medicine meeting*, March 2013)

The study found the most popular accounts to be those focusing on social and emotional support—not news or information.



Bison edges beef in nutrition study

Bison meat has been touted as being healthier than beef. Bison typically graze in grasslands and according to the National Bison Association they are not routinely given growth hormones or antibiotics, as are cattle. Also, analyses have shown that bison meat is less dense in fat and calories than beef and higher in certain nutrients, such as iron and vitamin B-12. It also has a more healthful balance of fats—for example, a higher ratio of polyunsaturated fat to saturated fat.

Clinical evidence of the implications for health, though, has been lacking. A team including researchers at the Cleveland and Salt Lake City VA medical centers put the claims about bison to the test: Fourteen healthy men, average age 34, took part in the study. They each ate a single 12-ounce serving of each meat, and then 10 of them took part in a longer-term phase of the trial in which they ate 12 ounces per day, six days per week, of either bison or beef, for seven weeks. After a 30-day “washout period” to clear their system, the men continued for another seven weeks, switching to the other meat.

When all the lab analyses had been done, the researchers concluded that bison poses less risk to cardiovascular health. For example, following a single beef meal, triglycerides and a marker of oxidative stress called hydroperoxides were elevated, as was a harmful form of cholesterol called oxidized LDL. Also, a measure of artery health called flow-mediated dilation was reduced. After a single bison meal, the increase in triglycerides was smaller, and there was no change in hydroperoxides, oxidized LDL, or flow-mediated dilation. After the long-term diet, several markers of inflammation and oxidative stress were worse from the beef but not the bison diet, although neither regimen had an effect on body weight, percent body fat, or lipids.

The researchers concluded that “in terms of vascular health, bison meat appears to provide a healthier alternative [to red meat].” ★

(*Nutrition Research*, April 2013)



In one phase of the study, volunteers ate beef or bison meat almost daily for seven weeks.

This bison was photographed at Wildlife Prairie State Park in Illinois. VA researchers have confirmed that bison meat is healthier than beef for the heart.

Photo by Ted Lee Eubanks Jr., Fermata/www.byways.org.



Patricia Dorn, PhD, interim director of Rehabilitation Research and Development for VA, received the 2013 Outstanding Alumni Award from Michigan State University's College of Communication Arts and Sciences. Dorn earned her bachelor's in speech and hearing science at the school, and went on to earn advanced degrees in audiology and hearing science. Dorn oversees VA research focused on Veterans' recovery from injury and social re-integration, with an emphasis on areas such as prosthetics and sensory loss.



Robert W. McCarley, MD, won the 2013 Mary A. Carskadon Outstanding Educator Award from the Sleep Research Society. McCarley directs the Laboratory of Neuroscience at the VA Boston Healthcare System, where he is also associate director of mental health. He also chairs the department of psychiatry at Harvard Medical School. A long-time mentor of young sleep scientists, McCarley is credited with major contributions to the study of how the brain controls sleep.



Timothy O'Leary, MD, PhD, was named acting chief research and development officer (CRADO) for VA, succeeding Joel Kupersmith, MD, who stepped down from the CRADO position at the end of May, after eight years.

O'Leary joined VA in 2004, initially as director of Biomedical Laboratory R&D. He later served as deputy CRADO and director of Clinical R&D. Along with his leadership role for VA Research, O'Leary is well-known for his work in molecular diagnostics—the study of genes and proteins within cells. Prior to his VA service, he chaired the department of cellular pathology at the Armed Forces Institute of Pathology, where he expanded the use of molecular genetics and tissue magnetic resonance microscopy. In 2010, he was named editor-in-chief of the *Journal of Molecular Diagnostics*. His own research has focused on gastric tumors, detection of biological toxins, and the changes that occur in tissue specimens preserved in formaldehyde.

O'Leary, the author or coauthor of more than 165 scientific papers and numerous book chapters, is also a reserve member of the Public Health Service Commissioned Corps.

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RESEARCH CURRENTS

Research News from the U.S. Department of Veterans Affairs



DID YOU KNOW?

Dr. William Chardack, a Korean War Veteran who served as chief of surgery at the Buffalo VA Medical Center, was part of the research team that developed the first successful implantable cardiac pacemaker. It was first used in patients in 1960. He collaborated with VA colleague Dr. Andrew Gage and engineer Wilson Greatbatch. Chardack had served in Korea as chief surgeon of the 1st MASH (Mobile Army Surgical Hospital). He won a Bronze Star—and a Croix de Guerre from France—for a battlefield-developed transfusion pump made from the base of an artillery shell.



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