Learning to Care for Those in Harm’s Way
New initiative aims to improve quality, reduce cost of care for critically ill patients

by Sharon Holland, managing editor

Service members are surviving catastrophic combat injuries because of advances in body armor, the far-forward deployment of advanced medical resources, and the integration of an adaptive health care system that can rapidly effect change. However, because there is limited precedence for caring for such complex and life-threatening injuries, the costs for critical care of these types of injuries can skyrocket. A new DoD-led and -funded initiative has been launched, aimed at improving clinical outcomes and reducing the cost of care for critically ill patients for the benefit of both military and civilian healthcare systems.

The Surgical Critical Care Initiative, or SC2i, was established at the Uniformed Services University under the leadership of Navy Capt. (Dr.) Eric Elster, chair of the university's Normal M. Rich Department of Surgery. The university will partner with the Naval Medical Research Center, Walter Reed National Military Medical Center, Emory University, Duke University, and DecisionQ to develop decision-making tools for the management of complex and critically injured patients and will translate these advances into clinical practice.

SC2i investigators will analyze data collected in standard practice in both the military and civilian health care systems, leveraging lessons learned from recent conflicts to establish tools that support clinical decision-making and accelerate assessments, ultimately saving thousands of health care dollars.

The Department of Defense-funded initiative will undertake a number of projects across several disciplines, including integrated research platforms across all of the partnering institutions and rapid turnaround of innovation into deliverable products. Some of the initial areas that SC2i will focus on include wound closure, targeting severe infections, decompensation in the intensive care unit, and decisions surrounding surgical interventions in traumatic brain injury patients.

“A decade of conflict has resulted in the lowest mortality rate in the history of conflict despite an increasing injury severity. As a result, the injury patterns that we are presented with are among the most complex and challenging seen in modern medicine. The aim of this effort is to change critical care by enhancing decision-making by making better use of information. This is a direct benefit from the experience gained in taking care of wounded warriors over the past decade,” said Elster.
Old drug brings new promise for PTSD-related nightmares
by Christine Creenan-Jones, editor

Every day, thousands of American service members relive the trauma of war in their sleep. They hear explosions, see the carnage of battle erupt around them and feel the crushing weight of a painful combat memory resurface in their dreams.

Unfortunately, frequent nightmares are common among service members with post traumatic stress disorder. Moreover, they disrupt sleep, which can magnify the daytime symptoms of PTSD and stymie the recovery process significantly.

“Although psychotherapy is the best treatment for PTSD, it’s less impactful when a patient is tired, irritable, anxious or unable to concentrate because recurring nightmares continuously disrupt their sleep,” said Army Lt. Col. Jess Calohan, program director for the Psychiatric Mental Health Nurse Practitioner Program at the Daniel K. Inouye Graduate School of Nursing.

In 2005, Calohan began working with Dr. Murray Raskind, who discovered that a largely obsolete blood pressure medication called prazosin appeared to be effective for treating PTSD-related nightmares.

In his own practice, Raskind, director of the Northwest Network Mental Illness Research Education and Clinical Center at Veterans Affairs, used prazosin to treat Vietnam War veterans with PTSD.

Theoretically, the drug blocks the effects of adrenaline in areas of the brain thought to be responsible for causing nightmares during sleep. Raskind found that prazosin was tremendously successful at improving sleep quality and other PTSD-related symptoms.

Still, Raskind wondered if prazosin would also work on active duty service members. Their combat experiences were different and they weren’t as far removed from the fight as the Vietnam War-era patients in his study.

Raskind, Calohan and colleagues partnered to investigate prazosin’s cross-over efficacy. In two separate VA-funded studies, active-duty soldiers with PTSD reported experiencing better, more restful sleep while taking prazosin. Furthermore, in many cases, the combat-related nightmares that amplified other PTSD symptoms were eliminated altogether. This led to vast improvements in overall PTSD treatment for the soldiers Calohan treated at Joint Base Lewis-McChord in Washington and at frontline clinics in Iraq and Afghanistan.

“Before our research, prazosin was a level C on the Strength of Recommendation on the VA/DoD clinical practice guidelines, a system that measures the quality and consistency of evidence for using a medical intervention. Now, it’s a level B but we fully expect prazosin will move up to a level A soon,” Calohan said.

Level A is the highest rating on the SORT scale. It’s reserved for interventions validated by high-quality, evidence-based studies. The team’s compelling work is reaching for the top of the scale through research results and professional accolades. In fact, their study was the most read article in the September issue of last year’s American Journal of Psychiatry. It was also lauded as the Number One Innovation in Psychiatry for 2013 by the New England Journal of Medicine.

Furthermore, in an effort to continue improving patient care, Calohan is currently using his expertise to shape the way rising military healthcare providers deliver care to service members with PTSD.

“Now that I’m here at USU, I’m able to review the prazosin literature and its application in clinical practice with my students. It is definitely a good thing because I’m educating providers about an effective method for treating sleep disturbances related to PTSD,” said Calohan.

Nightmares are common side effects of post traumatic stress disorder. To combat this troubling symptom, Lt. Col. Jess Calohan, program director for the Psychiatric Mental Health Nurse Practitioner Program at the Daniel K. Inouye Graduate School of Nursing, conducted a nightmare reduction initiative to improve treatment for service members with PTSD.
Scientists have long known that a number of bacteria reside in the nose, and those who carry the pathogen *Staphylococcus aureus* in their noses are at a higher risk for developing skin and soft tissue infections, or SSTI. However, until now, no one has been able to determine why some *S. aureus* carriers develop infections while others do not.

The nose is the primary *S. aureus* reservoir in humans and nearly 80 percent of the time an individual’s colonizing strain is the same strain that causes subsequent remote skin infections. Given this association, researchers at the F. Edward Hébert School of Medicine at the Uniformed Services University postulated that the population of *S. aureus* in an individual’s nose may harbor valuable clues regarding SSTI susceptibility that had not yet been described. This is of particular interest to the military, as it is well known that soldiers in training are at increased risk of developing an SSTI.

In research findings presented at the 114th General Meeting of the American Society for Microbiology in Boston, Ryan Johnson, a graduate student at USU, and his mentor, D. Scott Merrell, PhD, an associate professor in USU’s Department of Microbiology and Immunology, in collaboration with USU’s Infectious Disease Clinical Research Program, collected nasal samples and cultures from 86 infantry soldiers at Fort Benning, Ga. For those individuals among the 86 who developed SSTIs, the researchers also collected samples and cultures from within the soldiers’ skin abscesses.

Using a high-throughput DNA sequencing strategy, the microbial composition of each sample was determined. The biodiversity of the bacterial population in each nose was compared between individuals colonized and/or infected with Methicillin-Resistant *S. aureus*, Methicillin-Sensitive *S. aureus*, and those individuals that were culture-negative for *S. aureus*. The researchers observed a significantly higher percentage of a type of bacteria known as Proteobacteria in the noses of individuals who did not develop SSTI, suggesting that Proteobacteria may be protective against the development of SSTIs. Furthermore, *S. aureus* carriers had a unique nasal microbiome that differed from non-carriers.

Establishing a nose “marker microbiome” associated with development of SSTI infections may pave the way for focused preventive treatments that target the microbiome, rather than *S. aureus* itself.

The scientists believe this study will aid in the design of future prophylactic procedures that can help prevent SSTI, particularly in the setting of military training, and help influence how health care providers think about and treat these complex and diverse infections.

Funding for this project was provided by the Department of Defense.
Finley selected as Junior Employee of the Quarter

by Christine Creenan-Jones, editor

Netina Finley, an administrative officer at the F. Edward Hébert School of Medicine, was selected as the Junior Employee of the Quarter at the Uniformed Services University.

Finley, who provides administrative support to both the Neuroscience and Molecular and Cell Biology Graduate Programs, was chosen for this honor because she excels in all of her workplace responsibilities, which include scheduling meetings, maintaining files, updating university websites, balancing department budgets and assisting graduate students with multiple professional and personal tasks.

“Ms. Finley was one of the first people I met when I arrived at USU. She helped orient me to GEO (the Graduate Education Office), taught me about using cards at the copy machines, provided information regarding mass transportation benefits and helped me feel welcome at the university,” said Ensign Kyna Pak, a graduate student in USU’s Department of Medical and Clinical Psychology.

Moreover, Finley’s expertise is also utilized for student recruitment and orientation purposes. Not only does she prepare materials, but Finley also helps organize open houses and other academic events at USU. Impressively, this work and her many other responsibilities, were completed during a period of significant transition for the university’s Graduate Education Office.

“The last several years were difficult for the GEO since a dramatic turnover of staff occurred and hiring restrictions limited the number of new staff. Ms. Finley stepped in and filled the void in an exceptional manner, handling all aspects of GEO business,” said Finley’s supervisors, Drs. Mary Lou Cutler and Sharon Juliano. “Her ability to step up and into a situation with little guidance permitted GEO to function at the heightened state inherent in the beginning of every school year.”

Although for Finley, prevailing during a challenging time is reward enough, she is both humbled and honored to be recognized by the USU community.

“Having been selected as Junior Employee of the Quarter truly means a lot. It’s like the faculty, staff and students of GEO, MCB (Molecular and Cell Biology), NES (Neuroscience), EID (Emerging Infectious Disease) and MPS (Medical and Clinical Psychology) are saying ‘thank you,’ we recognize all that you do. I am truly appreciative for the nominations by so many,” Finley said.

Goodie lauded as “top scientist” by Scientist Professional Advisory Committee

Courtesy article

Public Health Service Cmdr. Jeffrey Goodie, a clinical psychologist and associate professor in the Department of Family Medicine at the F. Edward Hébert School of Medicine, was selected as the 2014 Derek Dunn Memorial Senior Scientist of the Year for his professional achievements, leadership and commitment to the United States Public Health Service Commissioned Corps.

The Scientist Professional Advisory Committee of the U.S. Public Health Service established the Scientist of the Year Awards in 1995 to recognize officers of the Commissioned Corps of the PHS in the Scientist category whose professional career and work performance have resulted in significant contributions to the health of the Nation and to the mission of the Corps.

This is the second consecutive year that a recipient from USU has received the award. Last year, Public Health Service Cmdr. Sara B. Newman, deputy chief of the Office of Risk Management for the National Park Service, a 2002 graduate of USU’s Doctor of Public Health program, earned the prestigious recognition.
Burke selected as Senior Employee of the Quarter
by Christine Creenan-Jones, editor

Mary Ann Burke, a program administrative specialist in the Office for Student Affairs, was selected as the Senior Employee of the Quarter at the Uniformed Services University.

Burke, a long-time USU employee, was lauded for managing the first and second-year medical support programs at the F. Edward Hébert School of Medicine. In this role, Burke helped more than 160 students register for the National Board of Medical Licensing Examination. This was an especially challenging task because at the time, several USU students were completing clinical rotations at military hospitals across the country. Furthermore, changes in the curriculum reduced the time students had to prepare for the USMLE from six to four weeks.

“Ms. Burke readily took on a large role in managing student readiness and preparation. She coordinated student placement into study programs, arranged for practice exams, and scheduled appointments for follow-up counseling sessions with advisors. Her commitment to making the best of a challenging situation yielded unprecedented results, including the most successful Step 1 testing results in USU history. Our overall class average for the exam was a 230, well above the national average and a full 12 points above the previous school record. In addition, our pass rate was an almost perfect 99.4 percent, another school record. Ms. Burke’s proactive efforts and determination contributed much toward this accomplishment,” said Army Col. (Dr.) Lisa Moores, associate dean for Student Affairs, in her nomination letter.

The new curriculum also necessitated other changes, including a way to recognize outstanding academic performance after letter-based grades gave way to a more favorable pass-fail system.

“With Ms. Burke’s capable assistance, we collected and analyzed module and clerkship performance distributions and were able to establish a fair and accurate approach to academic awards. Once done, Ms. Burke took full responsibility for producing award certificates, and the program and script for two student ceremonies,” said Moores.

Burke was also recognized for the way she paired incoming medical students with members of the first-year class to facilitate a smoother academic transition.

In creating sponsor matches, she considered each student’s background, special requests and individual needs to encourage more effective partnerships.

According to Burke, advocating for students in this manner and playing a role in their journey through medical school is one of the best parts of her job.

“I enjoy working closely with the medical students and seeing their transition from when they first arrive on campus until they leave us four years later,” she said.

Know somebody at the Uniformed Services University who deserves recognition? Is your department involved in cutting-edge work? Are you an alumnus with an interesting story to tell? Share your ideas with Pulse staff members by e-mailing Christine.Creenan-Jones@usuhs.edu. Your suggestion could be featured in an upcoming issue of USU’s official newsletter.
AOA at USU: More than a society
by Navy Ensign Hugh Lyford and Army 2nd Lt. Bart Wilkison, third-year medical students

The Maryland Gamma Chapter of the Alpha Omega Alpha Honor Medical Society gathered at the Bethesda Marriott to recognize their newest inductees, which included 13 students from the Class of 2015 F. Edward Hébert School of Medicine; five residents; four alumni and four faculty members.

Dr. Arthur Kellermann, dean of the SoM, was the keynote speaker. In his address, Kellermann urged the new AOA members “not to accept what you cannot change, but to change what you cannot accept.”

His message was fitting given the history of AOA, which was founded in 1802 by a group of physicians desiring to bring a spirit of excellence to medical education at all levels and to help ensure all physicians were “worthy to serve the suffering.”

Earlier in the evening, outgoing chapter president and USU alumnus, Army 2nd Lt. Alex Knobloch, recounted some of the initiatives undertaken by the Class of 2014 to improve the educational and professional development experiences for students at USU through AOA membership. Specifically, AOA established a program of student-to-student panels to help with the various transitions in the medical school journey. These included preparing for the rigors of matriculation during orientation week for new students, moving from the pre-clerkship to the clerkship periods for the second-year students, and the intricacies of the military match process for the third-year students. The chapter also successfully coordinated and conducted the popular Military Specialty Night, an annual event that provides USU and local Health Professions Scholarship Program students an opportunity to learn about the various graduate medical education programs throughout the military and an opportunity to network with program leaders and personnel.

To close out the evening, incoming chapter president, Navy Ensign Hugh Lyford, thanked the graduating members of the class of 2014 for their service to USU and AOA. He vowed to continue their initiatives and defined the goals for the class of 2015 to include: leading the society in efforts to build on the outgoing class’ success by expanding mentorship opportunities, improving access to research projects and establishing a tradition of philanthropy within the chapter by promoting volunteer work with a local charity group in need of assistance.

Although students can only be elected to the chapter during the spring of their third year or the fall of their fourth year, all USU students are encouraged to participate in any AOA event or initiative held throughout the year.

To learn more about Alpha Omega Alpha Honor Medical Society, visit the Gamma Chapter’s website at www.alphaomegaalpha.org/uhealth.html.

An app a day may help keep the doctor away: New smart phone app study open for PTSD enrollment
by Sharon Holland, managing editor

Exposure to traumatic events can result in sleep disorders, depression, hyper-vigilance, increased irritability, anger and other changes in those who have experienced trauma. Now, researchers at the Uniformed Services University’s Center for Neuroscience and Regenerative Medicine (CNRM) are conducting a study using smart phone applications to help address these issues and build resilience in military service members and their families.

The GETSmart, Guided Education and Training via Smart Phones to Promote Resilience study is now open to all active and retired military service members, as well as their family members, who may be experiencing stress after military deployment, an act of violence, or even a natural disaster. Study participants will use smart phones or tablets and a variety of different applications on a daily basis for six weeks to help relax and to think or act in ways that can better relieve stress. Study enrollees can participate from anywhere, at any time, making it easy to participate, especially for those who are in remote locations.

“It has long been said that prevention is the best medicine, and rather than wait for PTSD to develop, we hope this study will show that by helping those who have some symptoms, but not full PTSD, we can decrease those symptoms and decrease the risk of developing full PTSD,” said Dr. Michael Roy, principal investigator of the CNRM-funded study.

For more information on this and other CNRM studies, please visit www.cnrmstudies.org.
AFRRI, NASA research reveals how zero gravity affects astronauts
by MC3 Laura Bailey, writer and photographer

Scientists at the Armed Forces Radiobiology Research Institute and the National Aeronautics and Space Administration’s Langley Research Center met in Hampton, Va., earlier this year.

The meeting explored possible areas of collaboration between NASA Langley and AFRRI. Also in attendance were representatives from NASA Headquarters in Washington, D.C., and Johnson Space Center in Houston.

“There’s a big problem looming for human space travel and that’s radiation,” Dr. Mark Whitnall, a scientific advisor at AFRRI. “Right now it wouldn’t be safe to send someone to Mars because of the amount of radiation exposure. Astronauts who visit the international space station spend a long time there. They are not allowed to go up in space again if they’ve had one visit to the international space station because of their radiation exposure.”

Research could help change this, said Whitnall. That’s where AFRRI could play a role. The institute’s resources, facilities and decades of experience in radiobiology have the potential to further advance the space program and possibly allow astronauts to make more than one visit to international space stations or even travel to Mars.

Research at NASA is geared toward engineering and the physical environment. It has a need for radiobiology research which requires resources NASA doesn’t have at its fingertips, according to Whitnall. In order to supplement their research program, NASA supports funding programs for biologists at universities and government agencies.

Researchers at NASA are especially interested in the interactions of radiation and low gravity environments and the possible synergistic effects on astronauts.

“Dr. Lynnette Cary (a staff scientist at AFRRI) has been collaborating with Dr. Lisa Scott Carnell of the NASA Langley Research Center on the effects of combined chronic low dose radiation and simulated microgravity on cultured human cells in support of NASA’s Human Research Program,” said Whitnall. “The studies were performed in AFRRI’s low dose rate cobalt gamma facility. To simulate microgravity, Drs. Cary and Scott Carnell used a bioreactor designed by NASA that constantly rotates the cells to maintain a free-fall environment. The researchers combined this set-up with a 3-D cell culture scaffold, developed by Dr. Scott Carnell, that mimics the in vivo environment. The effects on gene expression in mesenchymal stem cells were observed using quantitative polymerase chain reaction microarrays. Preliminary results revealed changes in a number of genes associated with stress and toxicity.”

This experiment makes it possible for the researchers to see how cells will react to low or zero gravity conditions. It provides a better understanding of what an astronaut’s body encounters in space, said Cary.

Interests in AFRRI’s research capabilities stem from a need to protect astronauts. Not only is NASA looking at how radiation affects its astronauts, but it also seeks possible treatments for radiation exposure.

“There’s a possibility we could be traveling to Brookhaven, N.Y., to an accelerator that produces protons that mimic those produced in a solar proton event,” said Whitnall. “We could also be trying out some of our radiation counter-measure drugs that we’ve shown work pretty well against gamma rays and neutrons. I’m really curious to know how all these genes and cells and tissues are affected by these different qualities of radiation because we don’t understand a lot of the mechanisms. It’s fascinating to see how cells cope with all these challenges.”
Army Capt. Kevin Hayes arrived at the Uniformed Services University in January and became the Company Commander of the Daniel K. Inouye Graduate School of Nursing soon after. In this new role, Hayes is responsible the professional development, training and readiness of more than 180 uniformed students.

With so many duties, Hayes is sure to encounter obstacles throughout his tour at USU. Still, Hayes is confident he’ll prevail as a member of the GSN leadership team. After all, he’s already served in several key leadership positions on the Bethesda campus.

“I was stationed at the university from 2002 until 2007. Back then, I was enlisted and working in the Department of Military and Emergency Medicine as an Operations NCO and NCOIC for the Department of University Information Systems. It was a great tour that motivated me and afforded me opportunities,” he said. “During my undergraduate years, I felt compelled to do more for the society that helped cultivate my development, so I decided to apply for a commission.”

After earning a Bachelor of Science in Computer Studies from the University of Maryland University College, Hayes was selected for Officer Candidate School under the leadership of Army Col. Charles Serio, USU’s brigade commander at the time.

As an officer, Hayes has served in military hospitals across America and on Iraq’s frontlines twice, once to Baghdad as the medical supply officer in charge, and once to Talil as the chief of patient administration, where he coordinated more than 600 aeromedical patient movements and 150 urgent/priority medical evacuations for ill and injured patients, resulting in countless saved lives and limbs.

“Both of my deployments have been exceptionally rewarding experiences. I learned a lot about medical operations in theater. I also witnessed firsthand the sacrifices people are willing to make in order to serve their country. I believe that nothing in life is more gratifying than rendering a service that is not only your passion, but simultaneously allows you to serve both your country and the individuals committed to protecting the values for which it stands,” he said.

Hayes is bringing the same dedication to his new, but familiar assignment at USU through a leadership style informed by decades of diverse military experience. He’s also seizing more opportunities to succeed in the Army. Currently, Hayes is pursuing a second master’s degree from Texas A&M University.

“I definitely believe in the value of a good education. It has greatly enhanced my abilities, and it will benefit all of the officers enrolled at USU,” he said.

As company commander, Hayes will get to know many of them on a personal level. He’ll also get more opportunities to work with USU students and alumni at future assignments, as well. As a medical service corps officer, he will continue working in the same professional circles as the dentists, physicians and nurses who graduate from USU.

“I was happy to return to Bethesda for several reasons. I enjoy working in a joint-service environment, and I also understand the value of serving in a community of military health-care providers. I’ll be surrounded by them for the length of my Army career, so coming here is an amazing opportunity for me to both learn and lead,” he said.
Private First Class Dennis Aguilar, a veterinary technician for the Department of Laboratory Animal Medicine at the Uniformed Services University, donates blood during the spring blood drive in the Sanford Auditorium Lobby, May 27.