



UNIFORMED SERVICES UNIVERSITY
of the Health Sciences



2011 REPORT

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MESSAGE FROM THE PRESIDENT

The Uniformed Services University of the Health Sciences' (USU) efforts to support the Military Health System expand each year, reflecting our commitment to address the Services' needs wherever and whenever we can.

While it's not possible to share every triumph or write about each breakthrough happening on this campus in a few dozen pages, the 2011 Annual Report does highlight some of the year's most significant accomplishments with a special focus on USU's centers, a cornerstone of this great university.

Our programs deserve special recognition because they transform world health in so many positive ways. Right now, hundreds of multidisciplinary professionals are shaping science, curing diseases, mending physical and mental wounds, reaching out to communities in need, developing partnerships, and teaching lessons across the globe for a better, safer and healthier world.

Many of these vast accomplishments are showcased in this report, including a look at ways the National Capital Area Medical Simulation Center and the National Center for Disaster Medicine and Public Health are using cutting-edge methods for training and educating providers.

This report also highlights some of USU's diverse research, from the novel posttraumatic stress research happening at the Center for the Study of Traumatic Stress to looking at traumatic brain injury with new purviews at the Center for Neuroscience and Regenerative Medicine.

The University's Armed Forces Radiobiology Research Institute (AFRRI) is an important focal piece of this year's report as well. The institute, one of only a few radiobiology research centers in the United States, demonstrated its value, after a triad disaster—earthquake, tsunami and nuclear disaster—struck the northern coast of Japan, causing many deaths and widespread damage. Experts from AFRRI deployed to Japan and brought with them significant knowledge and expertise.

So many other important things happen at USU every day. Our centers and corridors are filled with creative thinkers and doers, eager to make a difference in the world and push military medicine to new heights. Turn the pages, learn about some of them here, and discover the unique and special learning environment that is USU.



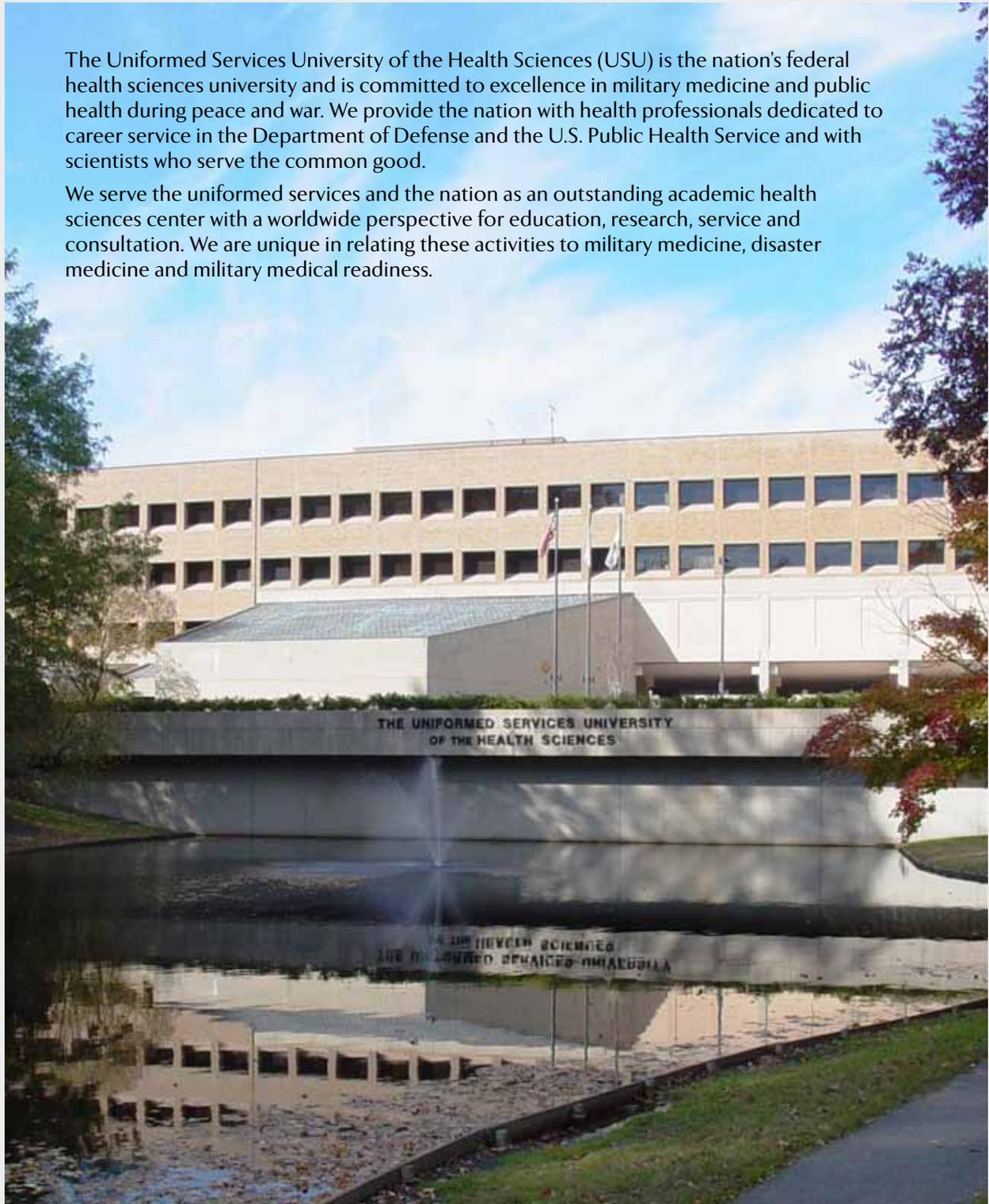
A handwritten signature in black ink that reads "Charles L. Rice". The signature is fluid and cursive, with a prominent flourish at the end of the name.

Charles L. Rice, M.D.

MISSION

The Uniformed Services University of the Health Sciences (USU) is the nation's federal health sciences university and is committed to excellence in military medicine and public health during peace and war. We provide the nation with health professionals dedicated to career service in the Department of Defense and the U.S. Public Health Service and with scientists who serve the common good.

We serve the uniformed services and the nation as an outstanding academic health sciences center with a worldwide perspective for education, research, service and consultation. We are unique in relating these activities to military medicine, disaster medicine and military medical readiness.





EDUCATION



From the School of Medicine and the Graduate School of Nursing to the Postgraduate Dental College and graduate programs, the education offered at USU prepares students for the unique situations that await them once their education is complete.

All of the schools continually look for ways to build on the University's commitment to educational excellence. In 2011, the School of Medicine overhauled its curriculum to add new modules that include hands-on clinical training with real patients, while the Graduate School of Nursing prepared to launch its first class of Doctor of Nursing Practice students. Students in USU's Graduate Education programs learn the fundamentals of biomedical science so they can move health care in new directions while officers in the Postgraduate Dental College gain advanced skills at satellite campuses across the nation.

USU's broadened scope is helping ensure a healthier force today and tomorrow for the benefit of our nation.

USU's School of Medicine uses a custom curriculum to teach students unique skills that can be harnessed in hospitals and battlefields, on ships and planes, and every other place servicemembers go. As a result, the physicians who graduate from this University are ready to take on the biggest challenges of military medicine and public health.

Innovative challenges at USU, through field exercises, specialized coursework and unique summer operational experiences—complemented by classroom learning, research and clinical rotations—builds USU students' knowledge and confidence. This formula has led to world-class patient care, scientific discovery, policy and leadership.

A Flight for Life

University alumnus, Air Force Lieutenant Colonel Dan Bruzzini, M.D. (SoM '94), demonstrated how effective a USU education can be in challenging situations when he boarded Delta Flight 750 on Sept. 1 in Biloxi, Miss. Halfway through the trip, Bruzzini's attention was diverted from his book to the midsection of the massive Airbus 320.

"Is there a doctor onboard?" a flight attendant asked. Bruzzini, a neonatologist by trade, quickly stepped up.

"I volunteered and so did a paramedic sitting in front of me," he said. Bruzzini soon discovered a dire situation.

An elderly passenger named Tom, on the way to his grandson's wedding, was fighting for life. His pulse was irregular and his skin was turning blue. He was disoriented and his vision was gone.

Barely holding on, Tom was having a massive heart attack—35,000 feet in the air.

"Conditions were bad. There wasn't much space to move around inside the

cabin and the plane's life-support equipment wasn't up to par either," Bruzzini said.

Bruzzini—educated and trained by USU and the military to practice medicine in tough situations like this—began supplementing Tom's oxygen and monitoring his blood pressure.

Their hands-on approach worked. Tom's vital signs began improving, but he was still experiencing chest pain. Once it was safe, Bruzzini gave Tom two doses of nitroglycerine to help regulate his blood pressure and pulse.



Bruzzini continued monitoring Tom until the plane landed in Georgia and local paramedics took over.

"I didn't expect any of this to happen when I boarded my flight that morning, but I'm happy I had the right kind of training to help," he said. "I've had many great instructors who taught me to never let an imperfect situation stop me from practicing good medicine."

"I'm happy I had the right kind of training to help."



In With the New

Ensign Christopher Shank, a first-year medical student, felt like a doctor from the very beginning of the 2011-2012 school year. Less than a month into the program, the young officer from New York was already interviewing patients, visiting their homes and completing physical examinations.

These assignments—once reserved for more advanced students—are now being introduced much earlier because the School of Medicine is using a brand-new curriculum for the Class of 2015 called “Molecules to Military Medicine.”

Although hugely successful, the original program was recently transformed to give students a more comprehensive experience, starting the moment they step foot on campus.

“These hands-on experiences have been really valuable, because they help contextualize my classroom instruction



in a very personal, meaningful way,” Shank said.

The school has also shifted from using discipline-based courses to integrated modules, a more synthesized approach for teaching medicine.

“The use of integrated modules will help our students understand military

medicine from many different angles, because it couples knowledge of the basic and clinical sciences with the practical aspects of operational medicine,” said Air Force Colonel Arnyce Pock, M.D., director of the Office of Curriculum Reform. “This strong foundation cultivates better healers and problem solvers in the end.”

Soldier Sets Sail On Navy Career, Again

The University attracts a diverse group of students with unique experiences, including Ensign Sean Simmons, who traveled a very unusual course to USU’s School of Medicine. After graduating from the Naval Academy in Annapolis, Md., Simmons spent most of his Navy career on ships. By age 23 he was leading a 40-man division on the guided missile destroyer, *USS Curtis Wilbur* (DDG 54).

“It was challenging work but it was incredibly rewarding, too. I felt like I could accomplish anything in the Navy,” Simmons said.



A few years later he left “ship work” to try out for the Navy SEALs—a specially trained group of sailors who carry out some of America’s most important and dangerous missions.

However, the program was tough and unforgiving. Simmons had difficulty managing his leadership responsibilities in the cold and “rang out” during winter “Hell Week.”

But his drive was still there. Later, as an ROTC instructor at the University of Pennsylvania, he made the “radical” decision to trade his Navy commission for an Army enlistment.

Fourteen months later, Simmons had completed all six legs of the Army’s rigorous Special Forces Qualification Course. He served back-to-back tours in Iraq and Afghanistan, in direct action missions and training commandos for combat.

For Simmons, four years in the trenches was enough. He re-commissioned into the Navy and later enrolled at USU. He quickly discovered a strong interest in both emergency and family medicine—two boots-on-the-ground disciplines.

“I can stay operational in both of these fields, and I want to be out there with the troops,” he said. “They are who I’ll always be.”

National Capital Area Medical Simulation Center

University students get real-world training in a risk-free environment at the National Capital Area Medical Simulation Center (SimCenter). This 30,000-square-foot facility is one of the country's most advanced medical simulation centers. Here, learners are able to practice important surgical and clinical skills without real-life consequences.

The SimCenter also has an 8,000-square-foot virtual reality theater designed to train teams of learners in stressful situations such as combat, mass casualties and humanitarian disasters. In this theater, learners provide care



and lead teams in realistic practice for the frontline care USU alumni are trained to provide in dangerous places. This can happen in a simulated field hospital or in the

trenches, with sound machines creating a whirl of bullets and grenades whizzing and exploding nearby.

Virtual medical environments and administrative areas complete the SimCenter. These spaces support several programs at the University, including haptic and visual perception research, 3-D imaging technology and task trainers designed to create environments that feel and look real.

Second Chance at Life: SimCenter Offers Unique Training Environment

Things go wrong in operating rooms every day. Doctors' blades slip, poor communication leads to complications, patients receive too much anesthesia—the list is endless.

These results can also be deadly, except on Army Lieutenant Colonel Shad Deering's, M.D., tables at the National Capital Area Medical Simulation Center (SimCenter) in Silver Spring, Md. In his operating rooms, everyone gets second and third chances.

A flat line or too much bleeding here simply means the University's up-and-coming medical students need more practice. With the push of a button and a little reprogramming, patients at the SimCenter—computerized mannequins and specialized task trainers—are ready for round two.

"Our simulators respond to treatment the way real patients do, except there are no serious consequences if things go awry," said Deering, who came onboard recently as the center's new director of the human patient simulator division. "That's why the SimCenter is a good place to make mistakes and learn from them, so we can perform better in hospitals—where it matters most."

It's also a place to learn important fundamentals like surgical technique and teamwork in multidisciplinary

settings. Honing these skills, under the watchful eyes of seasoned instructors like Deering, a USU alumnus himself, has proven long-term benefits.

"Simulation education is a very dynamic, hands-on way of learning important concepts. It can also lead to better, safer patient care, according to recent data," he said.

"Training students with this technology, therefore, is not only an effective learning modality, but it's also the right thing to do."



Nurses have always played a very personal role in military health care. In most cases, they spend more time treating wounded warriors than anyone else in the hospital's wards. They're also important first responders for our military—caring for patients in dangerous locations.

For this reason, many patients consider nurses the cornerstones of quality care in the Military Health System. Especially in today's complex world, increasingly, nurses are expected to take on bigger, more important roles. The University's Graduate School of Nursing provides the advanced education needed to carry out this crucial work. Nurses learn these higher-order, military-unique skills while earning a master's or doctorate degree—so they can make an even larger difference in base hospitals, research facilities, classrooms and other locations to assist servicemembers in need.

Carving New Paths

Like the students she teaches at USU, retired Rear Admiral Carol Romano, Ph.D., associate dean for academic affairs for the Graduate School of Nursing (GSN), spent most of her career in uniform.

As chief nurse, acting deputy surgeon general and chief of staff for the U.S. Public Health Service, Romano had many opportunities to work closely with USU's leadership. She was impressed by the University's mission early on and quickly developed a strong appreciation for the unique lessons taught on the campus.

Romano joined the University's senior faculty shortly after retiring from the Public Health Service. Now, one of her biggest responsibilities is spearheading a major transformation to grow several master's-level nursing programs into an even more rigorous Doctor of Nursing Practice (DNP) degree.

"The University will matriculate its first class of DNP students in 2012," she said. "They'll receive advanced training in the clinical aspects of military nursing, health policy, informatics, population health, health economics and systems leadership."

Developing the new curriculum has been a long and exacting process. Romano organized a survey of 1995-2009 alumni to highlight the strengths and weaknesses of nursing education at USU.



"According to survey responders, the GSN has prepared good nurse corps leaders who have left our programs ready to hit the ground running," she said. "Graduates also referenced the quality of our faculty in their responses, calling them 'caring,' 'helpful,' 'dedicated' and 'experienced.'"

"We learned a lot about ourselves from GSN alumni. We're excited to roll out a DNP curriculum with the GSN faculty informed by our alumni experiences," she said. "Our faculty and graduates are the real experts, after all, and part of the reason why I came to USU in the first place."

"Our faculty and graduates are real experts."



Dean Hinshaw Achieves Academy Of Nursing 'Legend' Status

Ada Sue Hinshaw, Ph.D., dean of USU's Graduate School of Nursing, was selected as a "Living Legend" by the American Academy of Nursing (AAN).

Annually since 1994, AAN has named "Living Legends" to recognize extraordinary lifetime achievement. Living Legends must have been an active or emeritus fellow for at least 15 years and have made extraordinary and sustained contributions to nursing and health care throughout their career. They also must continue to influence the profession.

Hinshaw has been a leader in the Academy since her initial induction as an AAN Fellow in 1978. She was elected to serve as AAN president in 2001.

In a League of His Own

Major Jarold "Tom" Johnston, a Graduate School of Nursing student in the doctorate program and the Army's only male midwife and lactation consultant, has been the go-to guy for thousands of new mothers and fathers with questions about pregnancy, labor and baby care for the past six years.

Still, Johnston does not consider himself unique or a pioneer. He's just doing a job he loves and helping military families in the process.

"Midwifery wasn't my first choice, and I even considered turning the assignment down," he said. "But, I'm glad I didn't, because I love my work."

Johnston attends uncomplicated births and teaches new parents all sorts of useful skills, including proper breastfeeding techniques. He admits several of his patients are surprised to learn he's a board-certified lactation consultant, but it does not take long for most women to look past his gender.



"It's a perception thing more than anything else. There are plenty of male gynecologists, after all, and their work is just as sensitive and personal as mine," he said. "People accept them, no questions asked, because in the end, most people just want a competent, professional caregiver—woman or man."

Whether intentional or not, Johnston has moved nursing boundaries for the Army by integrating a field as old as time. Now, he is hoping to move ground in a new discipline. At the University, Johnston is combining his love for midwifery and human lactation with cell biology. "If you understand how cells work, you understand how life works," he said.

Today's graduate students are discovering new ways to shape tomorrow's health care through stimulating, thought-provoking work in USU's classrooms and laboratories.

Students in each program learn fundamental science and conduct original research, building a foundation of knowledge that leads to breakthroughs in many areas of biomedical science, from neuroscience to infectious diseases.

Researchers who have graduated from USU have already made innumerable contributions to modern medicine, including for deadly diseases such as Ebola, Nipah and Hendra viruses, and identifying possible biomarkers for hidden injuries such as posttraumatic stress disorder.

Current students are also making huge strides. Many are presently working alongside leading scientists, both on campus and at premier research facilities such as the National Institutes of Health.

This work is paving the way for major innovations and improved systems of care. It also brings credence to the quality of scholarship in USU's graduate education programs, which have been recognized as some of the nation's very best.

A New Kind of Education: Master's in Health Care Administration and Policy

Three years ago, USU entered new academic territory when the graduate programs added a Health Administration and Policy (MHAP) master's degree to its catalog. The two-year program expanded the University's mostly clinical footprint into the policy and economics end of medicine for the first time.

"MHAP graduates will have several important responsibilities," said Navy Commander Glen Diehl, Ph.D., the program director. "They'll manage hospitals, establish new policies and carry out countless other behind-the-scenes responsibilities to keep things running smoothly."

This broadened scope supports an important part of military medicine. At the helm of hospital leadership teams, administrators affect almost every operational aspect of military medicine, from overseeing all levels of personnel to balancing the hospital's budget.

"The program's faculty—seasoned experts with lots of hands-on experience in hospital administration and policy—have set the bar really high, because they know how important it is to have strong leaders supporting America's wounded warriors at a decision-making level," Diehl said.

A combination of conventional and more creative teaching methods prepare MHAP students for this work. After laying a solid foundation, professors give their students, who are Navy and Air Force officers, the opportunity to guide classroom instruction through open forum talks. Legislative role-playing exercises transform ensigns and captains into senators and

presidents, teaching important lessons about the symbiotic relationship between health and government. Students must also complete a year-long residency before graduation.

"Students are immersed in settings where they can really learn the nuts and bolts of administration and policy for 12 months," Diehl said. "So they can leave USU with both the knowledge and experience to make a powerful difference for America's troops at treatment facilities around the world."



Inspired Leadership

One of USU's early pathfinders, Eleanor (Lee) S. Metcalf, Ph.D., associate dean of Graduate Education, arrived at the University in 1977, and her passion for her job, especially her roles as teacher and mentor for USU's budding scientists, remains undiminished.

"If I can get across to students that they need to develop several basic skills to become good scientists, I think I've done my job," Metcalf said. "Not only do they need to learn how to conduct the experiments, they need to learn critical thinking skills in order to design interpretable experiments. They also need to learn how to write, present their data and read the literature."

Metcalf's family's background drew her to the science bench early on. Her father, a professor at The Johns Hopkins University, and her mother, a chemist, "talked science" with Metcalf every day. This foundation helped cultivate a deep-rooted fascination for the "living" disciplines of science.



An immunologist by training, Metcalf has spent much of her research career investigating the pathogenesis of salmonella infections and diseases.

Her work is lauded in the scientific community. In 2011, Metcalf and Scotty Merrell, Ph.D., a USU professor of microbiology and immunology, published a

paper in *Infection and Immunity*. They were also awarded a provisional patent for several salmonella strains described in the paper—some of which Metcalf hopes could be used as vaccines.

HJF Names Three Fellowship Winners

The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc. (HJF) awarded fellowships to three outstanding USU doctoral students for the 2011-2012 academic year.

Jeremy Gilbreath, center, a fourth-year graduate student in the Emerging Infectious Diseases Program who is investigating the structure and function of the ferric uptake regulator protein, Fur, received the Val G. Hemming Fellowship. He works in the laboratory of Scotty Merrell, Ph.D., focusing on the regulatory mechanisms of the gastric bacterial pathogen *Helicobacter pylori*.

Camden Elliott, right, a fifth-year student in the Medical and Clinical Psychology Program at USU, received one of two Henry M. Jackson fellowships.



Elliott is completing her thesis project in the laboratory of Marian Tanofsky-Kraff, Ph.D. Her dissertation project is a feasibility study assessing a new intervention involving parent training in the prevention of pediatric obesity.

Kerry Whittaker, left, a sixth-year student in the Medical and

Clinical Psychology Program, also received a Henry M. Jackson fellowship. She is completing a project in the multidisciplinary field of cardiovascular behavioral medicine in the laboratory of David Krantz, Ph.D. She is focusing on the relationship between positive psychosocial factors and improved cardiovascular health.

The University has always focused on total wellness for servicemembers. This includes developing sophisticated programs for teaching advanced practice military dentistry—an art that melds innovation and science at USU's Postgraduate Dental College.

The college—formed by Army, Navy and Air Force schools—combines education, research and dynamic residency opportunities to cultivate excellent clinicians ready to serve a mobile force—at home and abroad, during war and peace.

Programs vary by school, but several options are available for USU students wishing to specialize in advanced fields such as comprehensive dentistry, periodontics, prosthodontics, oral and maxillofacial surgery, endodontics, and orofacial pain.

Officers in these programs learn many diverse skills, from mastering surgical techniques for perfecting a warrior's smile to creating facial implants for wounded servicemembers to discovering new methods for diagnosing, treating and preventing diseases.

Art, Science Combine to Restore Dignity to Wounded Warriors



Navy Lieutenant Commander William Wilson, D.D.S., has treated hundreds of injuries over the years. His patients—many of them wounded in combat—have lost teeth, eyes, ears and other body parts. But Wilson helps make them whole again through both an art and science that took years for him to master.

The Navy officer is part of a growing field called maxillofacial prosthetics—a discipline where dentists like Wilson use blocks of silicone, tubes of paint and other supplies to create realistic facial implants.

Though often tedious, Wilson is passionate about his craft and enjoys teaching University students this art at the Naval Postgraduate Dental School in Bethesda, Md., where he is chair of the Maxillofacial Prosthetics Department.

"Maxillofacial prosthetics is a fascinating subspecialty," he said. "Experts in this field work hard to improve lives and restore confidence to some of America's greatest heroes. Educating the new generation to take on this challenge has been very rewarding for me, because I'm passing on important skills to help mend our fighting force."

His work creates a higher quality of life for servicemembers while putting a new face on modern dental medicine.

Open Wide: A Look Inside USU's Newest School

The Postgraduate Dental College added a new Army school in 2011 that offers students a Master of Science in Oral Biology with a focus on comprehensive dentistry, a military-unique specialty that increases clinical skills and knowledge across many spectrums of oral health care.

Like all USU programs, the new dental curriculum weaves strong didactic and clinical threads



with robust research requirements and military readiness. Army Colonel Robert Manga, D.M.D., oversees the new school, which has comprehensive dentistry programs in North Carolina, Texas and Hawaii.

Although distance separates all three Army teaching sites, they are united by a shared mission to help servicemembers through advanced practice dentistry. Manga, a comprehensive dentist himself and experienced officer, understands the weight and honor of this duty. "My job is wonderful, because I help soldiers feel better," he said. "Restoring a person's smile is a priceless feeling. I can't imagine doing anything else."

General Dentistry Residents Provide Humanitarian Care

As part of the military-unique curriculum, residents and staff of the two-year Advanced Education in General Dentistry residency program at Lackland Air Force Base in Texas have been actively involved in humanitarian missions. The program is designed to prepare general dentists to comprehensively treat patients and is part of the newly accredited Air Force Postgraduate Dental School.

The Postgraduate Dental School is a unique collaboration between USU and the 59th Medical Wing at Wilford Hall Medical Center, part of the San Antonio Military Medical Center. The humanitarian missions, called Medical

Readiness Training Exercises, deliver medical and dental care to underserved populations around the world while providing unique training to medical and dental providers.

In 2011, the residents and staff of the program joined medical providers for two-week missions in Haiti and the Dominican Republic directed by the U.S. Southern Command. During a mission to the Dominican Republic, the six-member dental team (three dental officers and three enlisted technicians) completed more than 1,100 dental procedures on more than 800 dental patients at three sites.

Overseas Experience Offers Students Unique Perspectives

Students at USU's Postgraduate Dental College leave campus to practice advanced dentistry at top-notch facilities during their residencies. They also have opportunities to help underserved communities on humanitarian missions. As part of his coursework, Army Captain Alex Smith, a student in the comprehensive dentistry program at the Army Postgraduate Dental School in Hawaii, deployed to Papua New Guinea. While there, Smith cared for local residents by performing basic oral procedures, including tooth extractions.

Smith's experience abroad is good preparation for life after graduation. USU alumni travel extensively and must be able to practice in challenging places.





Prestigious National Survey Recognizes Several USU Programs

Several programs at USU were ranked among the nation's very best in a recent issue of U.S. News & World Report.

Among those lauded, the Graduate School of Nursing's anesthesia program placed fifth of more than 100 institutions surveyed. Several factors contributed to this impressive overall rating, including peer reviews and expert analysis of the program's curriculum, faculty and student bodies.

"The military has a long history of producing some of the best nurse anesthetists in the country, and USU plays a vital role in training many of these providers to care for our nation's finest," said Navy Commander Robert Hawkins, director of USU's Nurse Anesthesia Program. "The success of our nurse anesthesia program



wide breadth and depth of the nationally recognized scholarship available at the University.

is due in large measure to the outstanding support we receive from both the University administration and the federal uniformed services."

Medical research, primary care and nursing at USU also scored high on the annual survey of graduate schools. The year's broad showing—up from the previous surveys—highlights the

Center Helps Dispel Myths of Student Veterans

Nearly one million servicemembers and veterans attend public and private universities and community colleges across the country each year. Many of these students use campus health care facilities for their primary care. In these cases, the intersection of military culture and campus life requires special awareness and planning to appropriately support this unique student population.

Ted Bonar, Psy.D, chief of Continuing Education Programs at the Center for Deployment Psychology, spearheads the mission to ensure these places are well-prepared to serve veterans and servicemembers. His creation and delivery of the day-long University Counseling Center Core Competency Program, or UC4, addresses the deployment cycle, its stressors, community reintegration dynamics, posttraumatic stress disorder and cognitive-behavioral health treatments in university settings. Along with compelling material and lectures, Bonar facilitates a group exercise where participants craft veteran-friendly action plans for academic environments.



"In UC4, we try to dispel stereotypes and myths of student veterans. We get to have an expanded conversation about what coming back to campus is really like for those who have served," Bonar said. "We talk about the good and the bad, their resilience and strengths, as well as their vulnerabilities. This is a program that is designed to make people open their eyes."

The need and demand for UC4 is growing by leaps and bounds. Since its launch in May 2010, the program has been presented at 26 host universities for more than 800 clinical counselors from 175 institutions. More than 500 nonclinical personnel from departments such as financial aid, student affairs and academic advising have also attended Bonar's course. Close to 100,000

servicemembers and veterans attend the various campuses where UC4 has been taught, including Virginia Tech, San Diego State University, Indiana University and the University of Texas at San Antonio.

Antietam Road March

First-year students travel each spring to visit the Antietam National Battlefield in Sharpsburg, Md., for an up-close look at Civil War medicine—the origin of modern-military triage.

Their textbooks come alive at the site of the bloodiest one-day battle in American history, as USU instructors and Civil War historians in period costume bring form to important medical lessons from the past.



The road march includes a first-hand look at how Army surgeon Jonathan Letterman developed a three-stage casualty management system for treating badly injured soldiers. Variations of this lifesaving method are still being used on today's battlefields in Afghanistan.

Other lessons from Antietam, such as the importance of clean, healthy living conditions in military camps, have important contemporary applications for USU students, many of whom will likely go on to manage and lead medical teams and facilities after graduation.

Developing a sophisticated understanding of contagious diseases gives students the skills necessary to prevent the spread of deadly infections—a prolific killer during the Civil War—in the modern military hospitals they will one day command.



University students also get an insider's look at powerful military strategy



throughout their six-mile journey across Antietam's storied fields. The march stops briefly at key points along the trail—Sunken Road, Burnside Bridge and Dunker Church—because battle tactics at these sites helped change the outcome of America's deadliest war.

Operation Kerkesner



Although USU is a competitive university with a solid academic base, most individuals pursue studies at the University because they have a strong calling to serve their country. They want to heal warriors as Army, Navy, Air Force or Public Health Service nurses and physicians.

Learning the complex tenets of uniformed service and medicine simultaneously, however, is a difficult undertaking, especially for students with no military

experience, but the University expertly weaves principles from both professions into one dynamic curriculum.

Operation Kerkesner, a five-day learning experience, melds both worlds through innovative, hands-on teaching that focuses on decision making in a field setting. First-year medical students learn skills like proper techniques for hand-to-hand-training, small squad movement and



leadership while also learning basic triage principles and tactical combat casualty care in operational environments.

As a result, students have more skills and confidence at the end of Operation Kerkesner. They can start IVs quickly in the field, pitch their own tents, navigate unknown terrain with only a map and

compass to guide them, evacuate wounded warriors, and lead platoons to victory before their first year at USU concludes.

Operation Bushmaster

At some point in their military careers, USU graduates may deploy to countries torn apart by war or natural disaster. Work challenges take on new meaning during these times when unpredictable obstacles disrupt ordinary practice in powerful ways.

Still, generations of USU nurses and physicians have excelled in dire situations because the University's entire curriculum is rich with military-specific skills. However, some of the most meaningful instruction takes place during Operation Bushmaster, the culminating



experience for the Military and Contingency Medicine course.

The University's faculty, many of them seasoned military officers with extensive deployment experience, end the course by creating a realistic warzone on a forest-bed-turned-mock-battlefield in central Pennsylvania.

University students must prove they have what it takes to be leaders and healers in tough times, amid the simulated chaos of dwindling medical supplies, gruesome war injuries and life-threatening conditions.



Like a real deployment zone, students must staff a battalion aid station at Operation Bushmaster and receive casualties day and night for 72 hours.

Faculty members evaluate students' performance in various military medical roles during Bushmaster. To the instructors, solid leadership skills are just as important as technical know-how, because the next time these graduating students deploy, it will be for real.

Personalized Education

Teaching at USU is a nostalgic experience for Army Major Thomas Rawlings, assistant director of the Perioperative Clinical Nurse Specialist (PCNS) program in the Graduate School of Nursing. Known for his personal approach in



the classroom, he is also a PCNS graduate from the Class of 2006, the second group to complete the nation's only perioperative nursing program.

In the classroom, Rawlings draws important lessons from his professional experiences to give students an insider's look at perioperative nursing in the military. He has travelled the globe extensively, healing warriors in operating rooms at major military hospitals and forward operating bases in the field.

While deployed, Rawlings cared for thousands of badly injured detainees and supervised a 15-person multidisciplinary medical team at the 31st Combat Support Hospital in Baghdad. He saved many lives and earned a Bronze Star Medal in Iraq for exceptional military service in the process.

"I gained a lot of confidence while studying at USU. The entire program was helpful, but the operational readiness and leadership aspects were particularly relevant," he said. "I've used these skills many times throughout my military career and now I'm teaching them to USU's up-and-coming leaders."

Faculty Advocates

How can I be a good officer? What is PTSD? When should I use a tourniquet?

Faculty members on USU's campus answer these and other military-unique questions in their classrooms every day. University students lean on this valuable knowledge—a convergence of medical know-how and military experience—to keep them moving at a cutting-edge pace.

Recognizing the greater responsibility that USU instructors shoulder, Drs. Brian Reamy and Sandra Bibb, deans of faculty affairs, have become faculty advocates.

Well-suited for these newly created jobs, both leaders have a multidimensional understanding of the University, having lived what they now teach in the School of Medicine and Graduate School of Nursing, respectively.

"As an Air Force doctor, I always saw USU as the center of military medical education, because faculty members here pass down the unique values of our uniformed corps," Reamy said. "It would be impossible to gain the same experience at another university, from different instructors."

Reamy and Bibb help bring teaching innovations to the forefront by organizing several thought-provoking



professional development seminars throughout the academic year. During these sessions, leading experts share some of academia's most progressive advancements with the learning community.

RESEARCH & CONSULTATION



Researchers at USU are developing defenses against the physical and psychological effects of war, confronting the difficulties of diagnosing and treating posttraumatic stress, improving natural disaster education, and developing vaccines against diseases that threaten the lives and health of servicemembers.

University scientists, researchers and professors are among the most respected in their fields. They are conducting groundbreaking research in military-relevant areas in laboratories on and off campus.

Protecting Horses—and Humans—From the Deadly Hendra Virus

Australia is battling a disease that threatens humans and livestock alike—the Hendra virus. But thanks to more than a decade of work by Christopher C. Broder, Ph.D., and his USU research team, the South Pacific nation is poised to win that fight.

The team has created a horse vaccine to prevent the virus and a monoclonal antibody to treat Hendra infections. “The vaccine is extremely safe and we have shown it to be remarkably effective in preventing Hendra infection and infection by its close relative Nipah virus,” said Broder, professor and director of the University’s Emerging Infectious Diseases Graduate Program.



A member of the paramyxovirus family, a highly infectious agent that emerged from flying foxes, the Hendra virus has killed four people and more than 40 horses since its emergence in 1994. A horse vaccine is crucial to break

the cycle of Hendra virus because the cycle starts in flying foxes and spreads to horses and then to people.

To develop this important vaccine, USU worked in close collaboration with the Commonwealth Scientific and Industrial Research Organisation in Australia and HJF. The National Institutes of Health funds the research.

Center for Neuroscience and Regenerative Medicine

The University’s Center for Neuroscience and Regenerative Medicine (CNRM) was established as a federal intramural research program to study traumatic brain injury (TBI) and psychological health in combat casualties. During the past four years, the center has become a catalyst for groundbreaking discovery, largely because it crosses disciplines, research departments and boundaries to move science forward.

More than 200 investigators from USU, the National Institutes of Health, Walter Reed National Military Medical Center, Naval Medical Research Center, Armed Forces Institute of Pathology and other federal agencies collaborate within the CNRM on wide-ranging TBI projects, from diagnostics and imaging to rehabilitation and evaluation programs.



The center’s broad expertise has led to many advances across the TBI spectrum, and a new brain repository created by the CNRM is leveraging these gains further. The repository is an important research tool for understanding how TBI affects the brain and ways to mitigate or repair this damage.

The center’s broad expertise has led to many advances across the TBI spectrum. Daniel Perl, M.D., director of CNRM’s Neuropathology Core, has established a state-of-the-art laboratory that will include a new brain tissue repository. The repository will be dedicated to research on the acute and long-term effects of TBI among military personnel, and is an important research tool for understanding how TBI affects the brain and ways to mitigate or repair this damage.

“This will be the only brain repository of military traumatic brain injury serving the research community. We need to characterize the nature of the effects on the brain for high explosives such as IEDs [improvised explosive devices]. It is only through the knowledge gained studying these cases that we will be able to come up with rational approaches to diagnoses, treatment and prevention,” Perl said.

Understanding PTSD

Diagnosing posttraumatic stress disorder (PTSD) is difficult. Servicemembers do not always report their symptoms or make the proper connections between emotional trauma and the body's response to extreme stress, especially since negative physical reactions often occur weeks, months or even years later.

In these unreported cases, clinicians have little recourse, because there are no effective laboratory tests for identifying PTSD. But Army Colonel David Benedek, M.D.,



and Lei Zhang, M.D., researchers at USU's Center for the Study of Traumatic Stress (CSTS), are working to improve screening standards by identifying potential biomarkers for PTSD in the DoD-funded Traumatic Stress and Biomarkers in a Military Population Study.

Benedek, Zhang and their CSTS co-investigators found a measurable difference in p11 mRNA protein levels between soldiers reporting PTSD symptoms and blood samples from patients with other disorders—a distinction that could lead to a major breakthrough in diagnostic assessment.

“If biomarkers are identified, physicians will be able to definitively diagnose PTSD through blood and saliva samples, instead of using more ambiguous symptom checklists and patient self-reports,” he said. “Furthermore, biomarkers will help us detect the PTSD earlier so treatment can begin sooner and troops may begin to heal faster.”

The disorder affects thousands of people each year, and susceptibility increases for people with combat experience—exactly the population Benedek is evaluating at Ft. Bragg, a major deployment hub in North Carolina.

“Military members willingly go into harm's way to protect our country, so it's our job as uniformed medical professionals to find better, more innovative ways to help them feel better when they return home emotionally or physically injured,” he said.

Part of this effort includes identifying biomarkers for resilience. Trauma affects people differently, even servicemembers in the same platoon who share similar frontline experiences.

“Some people develop PTSD, others don't,” Benedek said. “If we know what keeps some people healthy, perhaps then, we can prevent the PTSD from occurring in the first place.”

Center for the Study of Traumatic Stress

Traumatic events can have profound effects on servicemembers and their families. Suicide, depression, posttraumatic stress disorder and other psychological injuries and behavioral health risks are prevalent in military populations. The University's Center for the Study of Traumatic Stress is shedding new light on the body's response to trauma through translational research.

The center is especially focused on the effects of war, natural disaster, terrorism and public health threats—the kinds of traumatic events impacting soldiers today. The center is also working on developing pharmacological interventions to help prevent and treat psychological wounds—important measures for a healthier fighting force.

Center for Prostate Disease Research

Since 1991, USU's Center for Prostate Disease Research has shaped the way medical professionals identify and treat prostate cancer, a complex disease affecting thousands of men around the world.

In fact, the CPDR was the first group to publish findings that demonstrated African-American males have higher prostate-specific antigen levels, a potential sign of prostate cancer. This research led to optimized PSA screening guidelines for African-Americans, which were published in the *New England Journal of Medicine* and featured on several major networks, including ABC News and CNN.

Around the same time, researchers at the center were also defining the role p53—a tumor-suppressing gene—played in prostate cancer progression and gene therapy strategies. This important breakthrough was followed up with the creation of the Multidisciplinary Prostate Cancer Clinic at Walter Reed Army Medical Center and the Defense Department's first Prostate Cancer Quality of Life Study for military beneficiaries.

Current research at the CPDR continues shedding light on prostate cancer. The center's team has developed an antibody that detects ERG proteins, a promising



biomarker for prostate cancer, with a high degree of specificity. Moreover, the antibody was also used to identify the presence of ERG proteins with an unprecedented 99.9 percent accuracy rate.

This novel discovery, combined with CPDR's many research projects, is moving new boundaries across the prostate cancer spectrum, from earlier diagnostics to better first-stage treatments.

Infectious Disease Clinical Research Program

The Infectious Disease Clinical Research Program (IDCRP) was established in 2005 through an interagency agreement between the National Institute of Allergy and Infectious Diseases and USU. The program is a compilation of multiple clinical research sites at 10 major military treatment facilities, from Germany to Hawaii. Team members work across the vast IDCRP research network to study HIV and other infectious diseases affecting military troops.

Currently, the IDCRP has more than 60 research projects under way, including a novel investigation into the long-term outcomes of war-related trauma infections in servicemembers from Operations Iraqi Freedom and Enduring Freedom and overseas travel-related infections that occur in DoD travelers. The program's network also



created a respiratory disease consortium to study H1N1, a dangerous virus that reached pandemic status in 2009.

Other recent IDCRP successes include a study on latent tuberculosis infection that informed testing policy for new Army recruits; HIV data collected by the center was used in a modern revision of the U.S. government's disability ratings for HIV-infected individuals; and IDCRP protocols on skin and soft-tissue infection prevention strategies (hygiene-based and vaccine) were instrumental for identifying a military requirement for a *Staphylococcus aureus* vaccine.

This work and other IDCRP achievements resulted in a highly favorable review from an external scientific committee that found, "The IDCRP is an excellent, well-managed program addressing important health threats to military preparedness, the nation's biodefense and the broader spectrum of infectious diseases. Since its inception, the IDCRP has made impressive beginning strides in developing the infrastructure and network to conduct clinical research, which has allowed the execution of high-quality, programmatically relevant protocols."



Human Performance Resource Center

Finding ways to improve or optimize human performance is important to USU and the military, because achieving one's personal best leads to greater success for all types of military operations. This understanding led to the creation of USU's Human Performance Resource Center in 2006.

The center promotes wellness by collecting and sharing current information about human performance optimization (HPO), from physical fitness and nutrition

to environment and mind tactics. Staff members—who include nutritionists, fitness scientists, education specialists, researchers, medical technicians and many other multidisciplinary experts—work collaboratively to showcase contemporary, evidence-based HPO findings.

The center translates and disseminates this information to warfighters, commanders, medical personnel and researchers to improve all aspects of military health and performance.

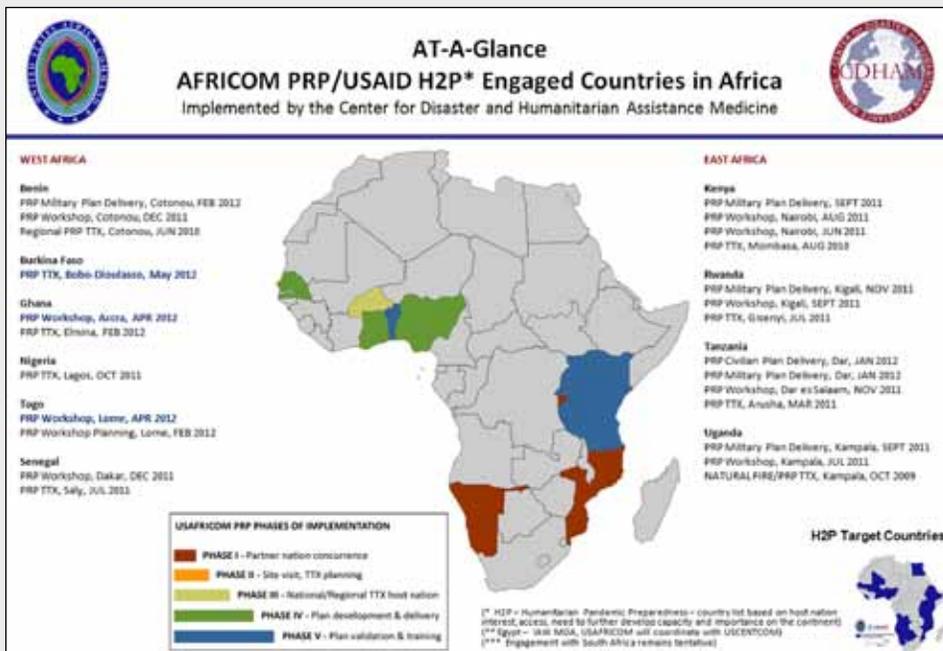
Center for Disaster and Humanitarian Assistance Medicine

Experts at USU's Center for Disaster and Humanitarian Assistance Medicine (CDHAM) frequently travel to foreign countries to help international communities overcome health care problems through outreach, education and community service. During the past 13 years, CDHAM has achieved a global footprint with important consultation happening across the globe, from the Philippines to Ghana to the United States and beyond.

The Pandemic Response Program was one of CDHAM's largest and most collaborative projects under way in 2011. The program, developed in partnership with U.S. Africa Command and the U.S. Agency for International Development, assists military forces in African partner nations develop pandemic disaster response plans. Team members provide training, legal support and technical assistance and conduct baseline reviews. They also help

identify and purchase equipment needed to move emergency planning forward.

So far, the program has been highly successful. Benin, Kenya, Rwanda, Tanzania and Uganda have completed pandemic disaster response plans. CDHAM will work with Burkina Faso, Ghana, Nigeria, Senegal and Togo on similar projects in 2012 to ensure a more heightened global security.



National Center for Disaster Medicine and Public Health

The National Center for Disaster Medicine and Public Health (NCDMPH) was established in 2008 and has been leading the way in education, training and research in disaster medicine and public health preparedness ever since.

Now in its third year of existence, NCDMPH has launched a number of well-received projects aimed at improving specific areas of disaster education and training, including humanitarian assistance knowledge, the disaster health workforce and pediatric disaster preparedness.

In 2011, NCDMPH hosted the Pediatric Disaster Preparedness Curriculum Development Conference. The resulting report has gained significant coverage among the pediatric preparedness community.

The center has also been heavily involved in assessing and improving the disaster knowledge of medical personnel participating in the U.S. Southern Command's



Operation Continuing Promise, a goodwill humanitarian and civic assistance mission to foreign countries.

The center also spearheaded the Workforce Project, a comprehensive assessment of the individuals who comprise the domestic natural disaster workforce. This initiative

helped shed light on the complexity of disaster missions from a personnel perspective.

"These three initiatives allow us to address the fundamental tenets of our mission—whose education we are coordinating, what are the competencies needed by that workforce and what does the response team need to know," said Kenneth Schor, M.D., acting director of NCDMPH.

Unique Radiobiology Expertise

Dozens of American military teams deployed to Japan in 2011 after an 8.9-magnitude earthquake and powerful tsunami struck the country's northern coast. Thousands were killed, entire cities were destroyed and two nuclear plants in Fukushima were badly damaged, raising global concerns over possible radiation leaks.

Experts from the University's Armed Forces Radiobiology Research Institute (AFRRI) were among those called to help. The team helped manage the nuclear end of the triad disaster by advising top-ranking military officials and Japanese leaders about the various aspects of radiation safety and health.

Navy Ensign Lee Alleman and Air Force Captain Brian Livingston, lead figures on AFRRI's response team, provided hands-on guidance. They measured the radiation levels in military aircraft and vehicles used during humanitarian missions near the Fukushima nuclear plants.

Alleman and Livingston collaborated with a team of multidisciplinary professionals from the institute and other government agencies to safeguard the military's equipment and prevent further radiation contamination in Japan.

"Our reachback is incredible at AFRRI," Alleman said. "We are the only agency in the world with such broad knowledge in so many different areas of radiobiology, from dosimetry to countermeasure development to emergency preparedness and beyond."





FUTURE



Although grounded in tradition, the academic programs at USU shift in response to innovations in education and changes in learner's needs. Outmoded teaching methods quickly fall by the wayside as faculty members continually seek better ways to inspire their students.

The University has always been a focal point for military medical education, and this focus will continue guiding its leadership and purpose in the future. Methodologies may change with time, but USU's unique mission will remain the same: equipping graduates with the expertise and confidence to provide specialized, first-class care to our nation's servicemen and women.

After 40 Years, Still Educating Our Nation's Finest

In 1972, Congress approved the Health Professions Revitalization Act establishing the Uniformed Services University of the Health Sciences. Forty years later, this important medical university continues to meet its founding mission of providing educational excellence in military medicine and public health. The school has earned a reputation as an outstanding academic health sciences center with a worldwide perspective on education, research, service and consultation.

Though many recognized the need for a military medical school with the dwindling medical corps resulting after World War II, Louisiana Congressman F. Edward Hébert spent years leading the effort to create the University. When the idea received favorable attention from powerful decision makers, legislation was drafted to create the nation's first federal medical university.

Founding members set high standards to ensure the University would be a center of academic and scientific excellence. Faculty and students would be competitively chosen, the curriculum would be grounded in educational and scientific rigor, the learning environment would harness collegiality and peer review, and above all else, USU would commit itself to high standards of medical professionalism.

Shortly after USU's founding, President Richard Nixon appointed 15 members of the Board of Regents and Army Colonel Anthony Curreri, M.D., became the first president of the University in 1974. The University's mission quickly began taking

shape and a flagship campus was needed to accommodate USU's vision.

The Board of Regents appointed a site-selection committee that chose 100 acres of wooded land on the grounds of the National Naval Medical Center. The central location near a military medical center and the National Institutes of Health continues to encourage collaboration with renowned scientists in top laboratories.

The University has evolved significantly since the charter class of 29 officers graduated in 1980, and now includes a Graduate School of Nursing and Postgraduate Dental College. Nearly 5,000 physicians and hundreds of health care professionals and scientists have earned degrees from USU's graduate education programs, Graduate School of Nursing and the Postgraduate Dental College. And University faculty and research staff have procured more than 500 patents or pending patents to spread research results and advance medicine.

From modest beginnings, the University has become a center of excellence in education and training, consultation, and research. Between 1999 and 2009, USU had the largest growth in federally funded research of any university in the nation.

As USU celebrates its 40th anniversary in 2012, much has changed, but its mission of educating health care professionals dedicated to career service in the Department of Defense and U.S. Public Health Service remains as vital as ever.



Partnering in the Fight Against Cancer



With the creation of the Walter Reed National Military Medical Center adjacent to the USU campus, the University sees extraordinary clinical and research opportunities in the years ahead.

One of the most significant is the establishment of the Comprehensive Cancer Center at the Bethesda, Md., base. Several military cancer research and clinical care efforts have coalesced at the site, including USU's Center for Prostate Disease Research, Clinical Breast Care Project and Gynecologic Cancer Center of Excellence.

"The center represents a merging of research capabilities," said Army Colonel Craig Shriver, M.D., interim director and professor, USU Department of Surgery. The endeavor will "accelerate progress against cancer through collaboration."

"Our vision is to conduct innovative research and state-of-the-art clinical care for the military and its beneficiaries," he added.

The program will strive to be designated as a comprehensive cancer center by the National Cancer Institute. Only 41 facilities in the U.S. have earned the coveted designation, which recognizes facilities for their clinical and scientific excellence. Shriver anticipates the designation will require about seven to eight years to complete.

Creation of the new cancer collaboration at Walter Reed began with an extensive analysis of current capabilities. A group of military medical experts met to identify the differences between the current state of patient-focused cancer services and resources in the National Capital Region and those required for a world-class cancer center within the Walter Reed National Military Medical Center.



In addition to research and treatment, education will also play an integral part in the center. Officials anticipate educational outreach to patients and their families, as well as mentorships and internships for physicians and researchers.

The center stretches across almost an entire floor of a newly constructed building on the base. By centralizing several military cancer programs in one location, officials believe they will better integrate clinical services to allow for improved patient treatment.

"Cancer care services are a barometer of the clinical health of the Walter Reed facility," Shriver said. "The provision of better care and research will positively affect the entire medical center."

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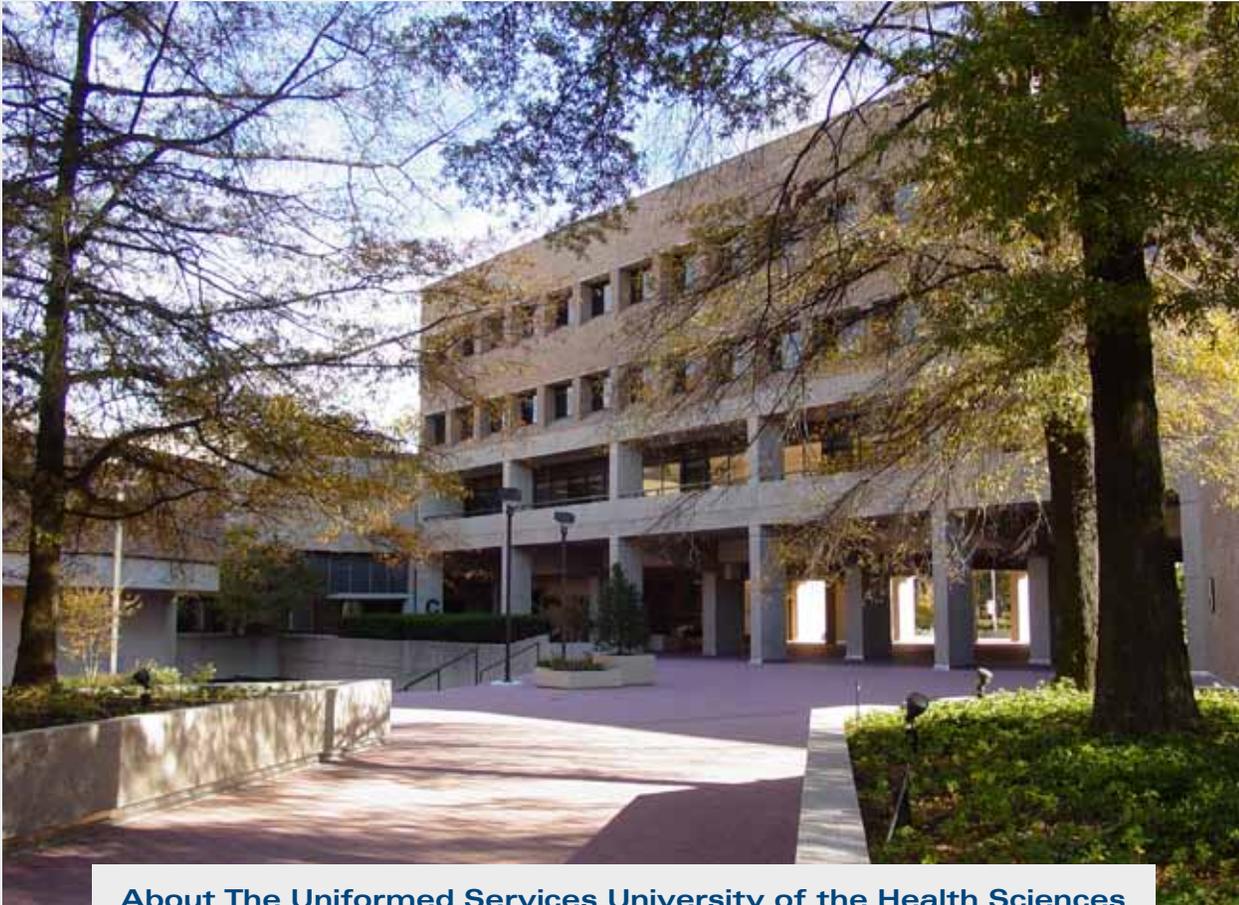
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The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.
produced this publication.



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