



UNIFORMED SERVICES UNIVERSITY  
*of the Health Sciences*

# 2007 REPORT







## PRESIDENT'S LETTER

This has been an extraordinary and challenging year as the nation struggles to come to terms with the costs of war, and we strive to care for the wounded and their families. USU faculty, staff and students are deeply engaged in developing the skills, technologies and knowledge necessary to provide the best possible care for those in harm's way. It is our job to educate those who protect the health of our soldiers, sailors, airmen and Marines; to further military medical research; and to ensure that health care practitioners are equipped to deal with the unique challenges of military medicine and public health.

USU continues to distinguish itself as a center of excellence in both education and research. Our faculty perform not only as leaders in the military health system, but also in academic medicine. In 2007, the Certified Nurse Anesthetist program in our Graduate School of Nursing was ranked sixth in the nation out of 106 programs by *U.S. News and World Report*. Dr. Gerry Quinnan and Dr. Christopher Broder published an important piece on HIV/AIDS in the *Proceedings of the National Academy of Sciences*. Dr. D. Scott Merrell presented groundbreaking work on *Helicobacter pylori*. The Center for Traumatic Stress, led by Dr. Robert Ursano, had several projects that set the standard of care for those affected by Post Traumatic Stress Disorder (PTSD). We are particularly proud of Alison O'Brien, Ph.D., Chair of the Department of Microbiology, who was elected by her peers to be President of the American Society for Microbiology, the world's largest scientific society. Additionally, research undertaken by our faculty continues to produce important breakthroughs in areas including emerging infectious diseases, epilepsy research and neuroscience.

Our world-class education and training programs have continued to grow in response to the needs of our deployed troops and their families. The university launched an ambitious new program designed to address mental health care needs. In its first year of operation, the Center for Deployment Psychology trained more than 500 psychologists and social workers to provide superior mental health care to military personnel and their families.

USU continues to play a significant role in shaping our nation's health care. Our alumni hold key positions in the military and public health systems, from commands at major military medical centers to leadership positions at the Food and Drug Administration. Many are directing medical teams and providing critical care and rehabilitation services for our nation's soldiers, sailors, airmen and Marines deployed to Iraq and Afghanistan at Landstuhl Regional Medical Center, Walter Reed Army Medical Center, the National Naval Medical Center and other locations central to medical care in the current conflict.

In this report, we have focused on some of the many USU students, faculty and staff who share a distinctive commitment to service. Whether they come from a military career, from the service academies or from other parts of government, academic or private sectors, USU personnel embody the ideals of service to others and to the nation.

**Charles L. Rice, M.D.**

# A HISTORY OF SUCCESS

The American military medical community has produced significant research and clinical advances through the years. The First World War saw the massive application of modern medicine including immunization, advanced surgery, use of motor ambulances, management of shock and treatment of psychiatric disorders. World War II brought widespread use of penicillin, mobile hospitals and extensive use of military medics on the front lines.

Today, military medicine continues to lead the way in research and clinical care. The Uniformed Services University of the Health Sciences (USU) plays a pivotal role in conducting military medical research, and providing consultation and education programs that help the country face the many challenges of a nation at war.

The university is engaged in a wide array of research and training in areas such as traumatic brain injury (TBI), Post Traumatic Stress Disorder (PTSD), emerging infectious diseases and supporting the continuum of care from battlefield through rehabilitation to return to the workforce.

## “WEST POINT” OF MILITARY MEDICINE

At the end of World War II, the United States military discharged more than 10 million men and women. Among those who left service were thousands of physicians who returned to civilian practice. Years later, recognizing the urgent need for career military physicians, Congressman F. Edward Hébert (D-LA) introduced legislation to establish a “West Point for doctors”—a university operated by the Department of Defense (DoD) to foster a strong military medical system.

USU was established by Congress in 1972. The university’s curriculum is similar to that of its civilian counterparts, but it also provides additional specialized educational elements geared towards producing career uniformed officers.

Today, one in four active-duty physicians are USU alumni. University graduates serve in key capacities, including significant leadership positions, critical to the successful operation of the military medical and public health systems. Among the roles in which alumni have distinguished themselves are as members of the White House Presidential medical detail, heading terrorism and disaster emergency preparedness and response teams and providing care and medical leadership during overseas military operations. USU’s relevance is considerable, more so today than at any point in its history. In a rapidly changing world, university graduates are shaping the future of military and public health.

## PREPARING FOR THE FUTURE

The university educates and trains essential health care providers to face today’s challenges, and it is deeply committed to the future of military medicine. Congress’ approval of the 2005 recommendations

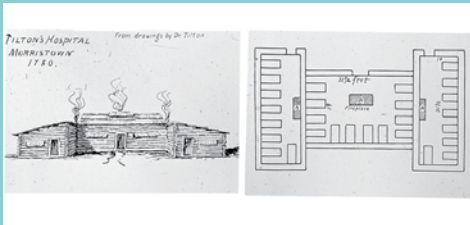
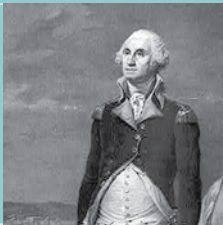
of the Base Realignment and Closure committee paves the way for the university’s future as a state-of-the-art academic health center. Combining Walter Reed Army Medical Center and the National Naval Medical Center—with USU at its academic core—the Walter Reed National Military Medical Center will create a world-class academic health system that offers the highest quality care, distinguished health education and exemplary basic and applied research.



**“While approximately one quarter of all new physicians entering the military today are USU alumni, they have a disproportionate impact on military leadership by dint of their specialized training and preparation as leaders.”**

*S. Ward Casscells, III, M.D.,  
Assistant Secretary of Defense for Health Affairs (pictured center)*

1777  
The Continental Army is immunized against smallpox per General George Washington's orders.



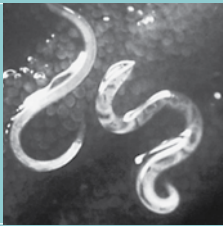
War of 1812 (1812-1815)  
Dr. James Tilton, Physician General, advocates small, dispersed hospitals with good ventilation, which improves the health of soldiers.

1833  
William Beaumont publishes his classic work on the physiology of digestion, which eventually becomes the cornerstone of modern gastroenterology.

Civil War (1861-1865)  
Jonathan Letterman, Medical Director, Army of the Potomac, creates the echeloned system of patient evacuation and care, which remains the basis of civilian and military casualty care worldwide.



1899  
The New World hookworm, a significant cause of anemia in Puerto Rico, is discovered, leading to a significant reduction in hookworm disease.



1900  
The mosquito is identified as the yellow fever vector.



1904-1914  
Yellow fever is controlled in the Panama Canal Zone, making construction of the canal possible.



1909  
An effective typhoid immunization is developed.

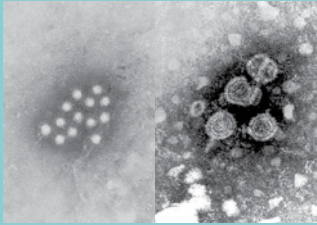
1910  
An anhydrous chlorine method to purify drinking water is introduced and the technology is used worldwide.



World War I (1914-1918)  
A variety of medical techniques to improve soldiers' survival rates are developed, including wound treatment, blood transfusions, reconstructive surgery and physical therapy.

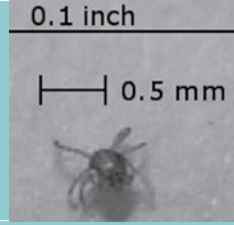


World War II (1939-1945)  
Major medical developments include the prevalent use of penicillin, widespread use of mobile hospitals to support troops close to the front lines, aero-medical evacuation to ensure speedier medical care and extensive use of military medics on the front lines.



1944  
Hepatitis A and B are differentiated and gamma globulin treatments are established.

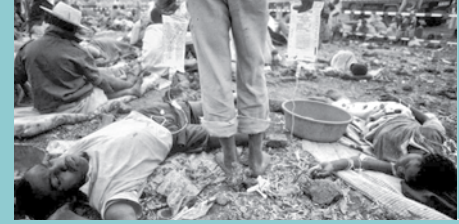
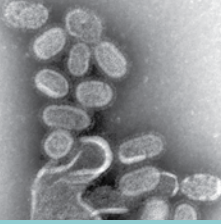
1947  
Scrub typhus transmission problems are resolved and chloramphenicol treatment introduced.



Korean War (1950-1953)  
The Mobile Army Surgical Hospital (MASH) is introduced. Hospital ships equipped with helicopter landing pads are introduced as a method for quick-response medical attention, changing the ships' roles from medical transports to floating hospitals.



1957  
The vaccine strain for influenza A virus is isolated.



1958  
The cholera oral rehydration regimen is implemented, dramatically reducing mortality.

1960  
An attenuated vaccine against Venezuelan Equine Encephalitis is developed.

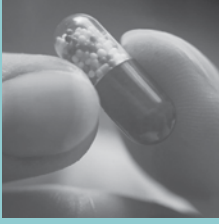


1961  
The Tri-Service Armed Forces Radiobiology Research Laboratory is established.

1962  
Rubella virus is isolated at the Walter Reed Army Institute of Research.

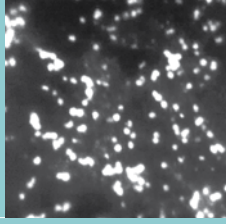


1965  
Antibacterial cream to treat patients with extensive burns is developed.



1967  
An oral adenovirus vaccine, which safely provides immunity in one dose, is developed.

1970  
A polysaccharide vaccine against group C meningococci is developed.



1972  
The Uniformed Services University of the Health Sciences (USU) is established in Bethesda, Maryland.



# SCHOOL OF MEDICINE



USU's F. Edward Hébert School of Medicine (SOM) is a traditional medical school with a curriculum enhanced by specialized education, training and research that prepares graduates to provide leading-edge medical care in even the most challenging environments. A primary mission of military medicine is keeping troops healthy, so a core educational focus is on health promotion and disease prevention. USU attracts a diverse array of students from all over the country, each of whom has something special in common—they are among the leaders of their generation, dedicated to serving the nation through careers in the DoD or Public Health Service.

## UNIQUE EDUCATION

The SOM's curriculum is designed to educate students to provide outstanding care in even the most extreme settings—to practice good medicine in challenging environments. The unique four-year program is year-round and is roughly 700 hours longer than that of other medical schools. This additional education largely focuses on epidemiology, health promotion, leadership and field exercises, disease prevention and tropical medicine.

The uniformed services offer the same specialty options enjoyed by students at civilian schools, as well as unique opportunities in areas including preventive and public health medicine. Additionally, concentrations are available in service-unique practice areas, such as aerospace medicine,

undersea medicine, global infectious diseases and disaster medicine.

A military-trained cadre of physicians is crucial to our country's security and well being. SOM graduates support national health and preparedness in many ways, from providing expert medical attention on the front lines to caring for service members and their families at medical centers at home and abroad. Others are called upon to act as "medical ambassadors," sharing knowledge to help other countries enhance their health care infrastructures and services. The U.S. Public Health Service also values this training because it enables graduates to manage medical operations in both military and civilian settings.



Sunny Ramchandani, M.D., is an internist and an Assistant Professor in the Department of Internal Medicine. Academically first in his class at the U.S. Naval Academy and a graduate of both the Harvard University School of Public Health and Yale University School of Medicine, Ramchandani is quickly distinguishing himself as a researcher, clinician and teacher.

Dr. Ramchandani recently published a paper with colleagues at Johns Hopkins University that was subsequently used by the government of India to enhance anti-retroviral therapy delivery. In 2007, he also traveled

to Afghanistan with USU's Center for Disaster and Humanitarian Assistance Medicine as part of their initiative to help strengthen its health care infrastructure.

**"USU is the central resource for academic military medicine. If we're out in the field conducting research, if we want to pursue new areas of investigation, if we want to enhance training or change curricula based on real-world experience...no matter what we need, the university is the first place we connect with... The synergy that USU shares with the U.S. military allows the university to offer opportunities that aren't available at any other academic medical center in the country."**

## DISTINGUISHED FACULTY

The School of Medicine faculty is comprised of uniformed personnel and civilians with a wealth of experience. Among the faculty are internationally renowned leaders in their fields, all with a singular commitment to protecting our nation's health. Additionally, USU faculty offer unique perspectives

as many of them have experienced the kinds of deployment situations they are preparing their students to face. Recently deployed faculty provide their students with immediate access to the latest developments in military and emergency medicine.

## UNIQUE CLINICAL TRAINING

In the third year of their SOM educations, students take part in six-week clerkships at top-level military treatment facilities or civilian hospitals in the Washington, D.C., area or other locations throughout the United States. In 2011, the Walter Reed National Military Medical Center, a new state-of-the-art academic health center, will become the university's primary teaching hospital.

In their fourth years, SOM students take the unique military contingency medicine course, which culminates in the training exercise Operation Bushmaster. Students spend the remainder of the year undertaking clinical rotations among the specialty areas they are considering for residency training.

## M.D./PH.D. PROGRAM

USU's M.D./Ph.D. program is designed to prepare students for careers as physician-scientists in academic medicine, biomedical and clinical research and clinical practice. The program combines a rigorous basic science graduate curriculum, including original research, with superior clinical training and integrated activities.

**“When I decided to go to medical school I knew USU would be my top choice. My dad graduated in 1992 and has served 15 years as a military doc. Coming back into the USU community has been great...the warmth and support are the same. I feel confident that I will receive a top-notch medical education, and, as a mother, that my family will take away good memories as well.”**

*Second Lieutenant Meghan Ozcan, class of 2011*

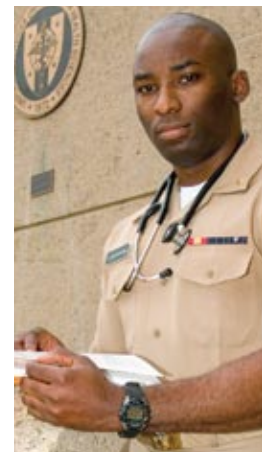


Second-year School of Medicine student Second Lieutenant Christian Labra, a West Point graduate, was an artillery officer deployed to Iraq when he broke both of his legs and his pelvis in a combat-related incident. While recuperating at Landstuhl Regional Medical Center in Germany, Labra became increasingly interested in the medical care he and his fellow service members received. His doctor was a USU graduate.

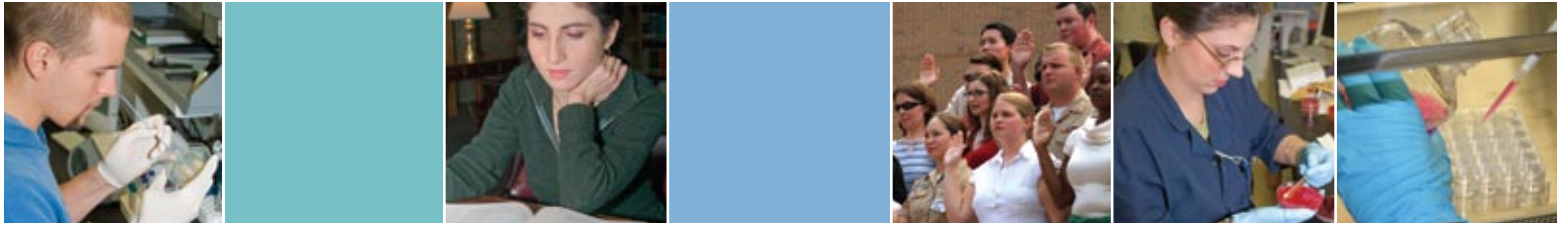
**“This school instills in its doctors an ideal of service, to the nation and to our fellow man.”**

**“I was impressed with the different programs the university has to offer. How many other schools have courses in tropical medicine?”**

*Lieutenant Obinna Ugochukwu, class of 2007*



# GRADUATE PROGRAMS



Graduate education is an important and integral component of the academic mission and scholarly environment at the university. Students who receive graduate degrees from USU have the opportunity to make significant contributions to the advancement of health and science in both public and private institutions.

The university offers graduate degrees in the biomedical sciences and public health. Doctor of Philosophy degrees are offered in nine areas ranging from emerging infectious diseases to clinical psychology. The university offers both a Masters and Doctor of Public Health degree and has a physician-scientist (M.D./Ph.D.) program.

The Graduate Program in the Biomedical Sciences at USU currently has 169 full-time students. Most of the graduate programs are open to civilians, who are eligible for stipends and have no service obligations.

USU's nationally recognized civilian and military faculty is comprised of leading educators and world-renowned scientists. The proximity of the campus to the metropolitan Washington, D.C., area attracts quality faculty members and students, many of whom collaborate with scientists at nearby research institutes such as the National Institutes of Health, Walter Reed Army Institute of Research and the Naval Medical Research Center.

USU students benefit from the military's overseas network of research laboratories. Many of the faculty members have conducted research at these field sites, and they bring these real-world experiences to the classroom. In addition, graduate students have opportunities to study at overseas laboratories, which are located in Africa, Asia and South America.



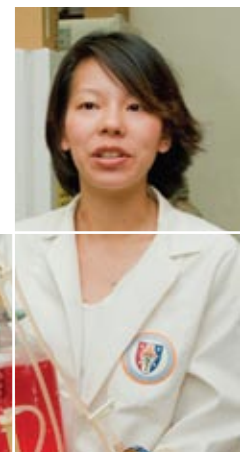
**“USU put me into a graduate student situation where I was encouraged to pursue my own research interests. I was not a ‘worker’ in my advisor’s laboratory, but an actual contributor to the research. This allowed me to step into a faculty position right after graduation.”**

*Ali Weinstein, Ph.D., Deputy Director, Center for the Study of Chronic Illness and Disability, George Mason University, class of 2007*

Overseas research opportunities and experiences add depth and variety to the curriculum.

**“I liked the idea of an interdisciplinary program where my professors and mentors came from diverse scientific backgrounds. I was also drawn to the smaller size of the graduate school where I would receive more individual attention and instruction...”**

*Julie Wu, Molecular and Cell Biology program*





The university offers the following graduate programs:

Interdisciplinary Ph.D. Programs

- Emerging Infectious Diseases
- Molecular and Cell Biology
- Neuroscience

Departmentally-based Ph.D. Programs

- Clinical Psychology
- Environmental Health Sciences
- Medical Psychology
- Medical Zoology
- Pathology

Doctor of Public Health (Dr.P.H.)

Physician-Scientist (M.D./Ph.D.) Program

Master of Science

- Public Health
- Molecular and Cell Biology

Master of Public Health

Master of Tropical Medicine and Hygiene

Master of Military Medical History



## Central Location for Collaboration

The university's close proximity to the National Naval Medical Center, the National Institutes of Health and the National Library of Medicine provides a rich and unparalleled environment for education and research. Additionally, USU is situated close to the I-270 Biotechnology Corridor,

Walter Reed Army Medical Center, Walter Reed Army Institute of Research and the Naval Medical Research Center, which enables frequent interactions with some of the world's premier researchers at seminars and conferences, as well as guest lectures at the university.

# KNOWLEDGE



Katharine Bossart, Ph.D., USU class of 2003, conducted her dissertation research in the laboratory of internationally renowned microbiologist Christopher Broder, Ph.D., Director of USU's Emerging Infectious Diseases graduate program. Her work focused on two novel emerging paramyxoviruses—the Hendra and Nipah viruses. After graduation, Dr. Bossart started a new post-doctoral position at the Australian Animal Health Laboratory in Geelong. Since moving to Australia, she has worked on many different viruses, from vector-borne pathogens such as West Nile virus to those that require the highest level of biological containment, including Hendra and Nipah. As part of this work, she has traveled and collaborated with scientists throughout Australia and internationally in India and Borneo.

**“The personal interaction with the faculty not only increased the depth of knowledge, but also enabled critical thinking applicable to complex problem solving. As graduate education at USU is closely affiliated with the military and the NIH, international experience and knowledge relating to infectious disease overseas was incorporated into the curriculum in a personal, hands-on way. For all of these reasons, I believe USU provided a unique education and environment, which helped me gain the skills and knowledge that I use every day.”**

# GRADUATE SCHOOL OF NURSING



The USU Graduate School of Nursing (GSN) provides the nation with highly skilled advanced practice nursing professionals pursuing careers in the federal and military health care systems.

GSN faculty members are dedicated to educating and mentoring the next generation of clinical experts, leaders, scholars and researchers in nursing.

## SIGNATURE CURRICULUM

The GSN's curriculum is designed to provide a comprehensive education that prepares students to deliver the highest quality care and services in a broad range of settings, from the clinic to the battlefield. The areas of focus encompass Operational Readiness in Changing Environments; Population Health and Outcomes; and Clinical Decision-Making

in the Federal Healthcare System which are woven throughout all programs within the school.

In this way, graduates of the GSN are uniquely equipped to become not only outstanding nurses, but also leaders in their fields, ready to take on a diverse range of challenges and succeed in any environment.

## MASTER OF SCIENCE IN NURSING (MSN) PROGRAM

Masters students take part in a program that provides education and training to equip them for advanced roles in both acute and primary care settings. The program emphasizes health promotion, disease prevention, case management, emergency preparedness, patient safety, administration and perioperative and anesthesia services.

Program options include Perioperative Clinical Nurse Specialist (CNS), Family Nurse Practitioner and Nurse Anesthetist.

The GSN has a wealth of military and civilian accredited clinical practice sites for each of its masters program options.

## PH.D. PROGRAM

USU's Ph.D. program in nursing emphasizes the conduct of nursing research significant to the federal sector. The distinctive curriculum encompasses areas of basic, applied and translational nursing sciences that form the scientific underpinnings of military operational readiness and force protection. It also addresses issues surrounding the sequelae of military service and population health issues within the federal and military health sectors. The program prepares students as research scientists, scholars, leaders and educators. Practicum opportunities include research at the university and federal or military agencies.

Ph.D. areas of concentration are nursing science; research; statistics and designs; and federal and military health care policy and issues.





**“I did an MPH here in 1987 because I was ready to ‘stretch’ out of my role as an ICU nurse. That degree gave me the opportunity to work in HIV clinical research at NIH during the challenging early years of the epidemic. Now I work in an equally challenging arena—public health policy and program development for the Department of Veterans Affairs. It became time to stretch again, and now I’m back, working on my Ph.D!”**

*Victoria Davey, R.N., M.P.H., classes of 1987 and 2009, Deputy Chief Officer, Public Health and Environmental Hazards, Department of Veterans Affairs*



**“Although I had the opportunity to attend a civilian university, USU was my first choice. I’m certain the camaraderie and faculty support I’ve encountered in the GSN is unmatched by any other university.”**

*Lieutenant Lina Badura, class of 2007*

## Nurse Anesthesia Program Sixth in the Nation

In 2007, *U.S. News and World Report* ranked the USU Graduate School of Nursing Certified Registered Nurse Anesthesia (CRNA) program sixth out of 106 national programs. USU’s CRNA graduates practice anesthesia at state-of-the-art medical centers, in the field with Special Operations teams and ground forces, on board ships, in the air and at remote locations around the world.

## MEDMARX

USU’s Graduate School of Nursing was approached by the U.S. Pharmacopeia—the official public standards-setting authority for all prescription and over-the-counter medicines, dietary supplements and other health care products manufactured and sold in the United States—to collaborate on a medication error reporting system. Students from three consecutive years of USU’s Perioperative CNS classes were asked to utilize their clinical

expertise and critical thinking skills to analyze a six-year data set from MEDMARX—the world’s largest error reporting program. The students provided analysis and interpretation, and also made recommendations to improve the quality and safety of perioperative patient care.

The students’ findings and recommendations were published nationally as a white paper, and have garnered significant attention. This work has impacted perioperative standards and medication safety guidelines, and has shaped material in a perioperative drug reference manual.



Colonel Linda Wanzer (right), Assistant Professor and Program Director of the Perioperative Clinical Nurse Specialist Masters program, and Perioperative Nursing Consultant to the Army Surgeon General, provided primary oversight for the students during their work on the MEDMARX project.

**“USU’s GSN exposes students to once-in-a-lifetime collaboration opportunities and exceptional learning experiences.”**

# FIELD EXERCISES

As part of their education, USU students take part in a number of field exercises that prepare them to practice medicine in challenging environments and exercise the leadership skills they will need as uniformed officers.

## ANTIETAM ROAD MARCH

First-year medical and nursing students participate in a memorable educational experience designed to teach them the tenets of battlefield health care. The students travel to Antietam National Battlefield near Sharpsburg, Maryland, the infamous site of the bloodiest one-day battle in American history. They take part in a six-mile road march, stopping at designated stations where local Civil War re-enactors

discuss conditions and battlefield strategies, and where USU faculty members discuss medical aspects of the battle. The exercise underscores the school's distinctive curriculum, and for students with no prior military experience, is their first experience walking cross-country in controlled movements by platoons, and wearing load-bearing gear.

## OPERATION KERKESNER

Operation Kerkesner is designed to teach critical military skills in a simulated battlefield environment. The four-day exercise provides training in areas including land navigation, hand-to-hand combat, firearms training and use of military vehicles and radios. It also gives students a chance to experience some of the challenges of providing medical care in harsh environments, including starting an IV in a field setting

and triaging and treating fellow service members while "under fire."

Approximately half of USU students have no prior uniformed services experience. Operation Kerkesner provides essential military skills training and serves as an introduction to the challenges of practicing battlefield medicine.



Commander John Love, M.D., graduated from the USU School of Medicine in 1994 and has experienced two deployments to Iraq. He was invited to return to the university to assist with Operation Bushmaster.



**"It's not just an exam. Everything you learn is definitely applicable to what you do out there."**

*- as quoted in the Chronicle of Higher Education*

## OPERATION BUSHMASTER

Many USU graduates credit Operation Bushmaster with providing some of the most helpful and memorable training they received while at the university. The exercise is the culmination of and practical exam for the rigorous Military and Contingency Medicine (MCM) course, taken by all fourth-year School of Medicine students, as well as some students in the Graduate School of Nursing.

The MCM course augments students' clinical knowledge with specialized medical education covering a broad range of military-relevant topics, including advanced trauma life support, preventive medicine, patient care in flight, military medical ethics and combat stress control. Students then are put to the test during a four-day simulation exercise at Fort Indiantown Gap, Pennsylvania.

Throughout Operation Bushmaster, students live in field conditions, working in groups of roughly 15 to run medical units under continually changing conditions. The students set up sites where they

receive "casualties" (played by first-year students), suffering both routine illnesses and battlefield injuries. Students are evaluated by USU faculty on their medical knowledge and leadership abilities as they rotate through positions as commander, executive officer, medical officer and ambulance team leader. When not under evaluation, students fill in as medics, radio operators or security personnel, and spend time working in a deployable medical facility. They also take part in a combat stress rotation designed to familiarize them with and give them an opportunity to "treat" combat-related mental health issues.

The event culminates in a dramatic nighttime mass casualty exercise in which students are placed in the scenario of responding to a platoon that has sustained significant casualties. Under stressful, changing conditions, the students must find the "wounded" and triage them, treat them and arrange for their evacuation.



In total darkness, with only the voices of the "wounded" to guide them, the students must locate and retrieve casualties.

**"No other medical school expects their students and graduates to be able to perform individual and mass casualty care under fire. The skills learned throughout this month-long experience have been applied directly on the battlefield."**



### Critical Training

Captain Glenn Burns, M.D., is an Assistant Professor in the Department of Military and Emergency Medicine. A USU graduate, Dr. Burns participated in the Military and Contingency Medicine course and Operation Bushmaster as a student and saw its lessons at work during his emergency medicine residency and a tour in Iraq with the U.S. Special Operations Command. Now he is an instructor in the department that runs the course.

# LEADERSHIP

USU creates scientists and health care practitioners who are prepared for a range of exciting careers in service to the nation. From clinics and field hospitals to laboratories and classrooms, the university's many exceptional graduates routinely distinguish themselves as leaders in their respective fields.

## Military Leadership

Major General Thomas Travis, M.D., a USU alumnus, was selected recently to command Wilford Hall Medical Center. Previously, he was Command Surgeon, Headquarters Air Combat Command at Langley Air Force Base. Dr. Travis is one of the Air Force's few pilot-physicians, and his distinguished career has included command of the U.S. Air Force School of Aerospace Medicine, Malcolm Grow Medical Center and the 79th Medical Wing, Andrews Air Force Base.

**"I am very proud to be a USU graduate! Medical personnel have never been more clearly a part of this nation's combat power, and USU and its graduates have contributed greatly to that capability."**



## Public Health

USU alumna Captain Kimberly Mohs, M.D., is a member of the U.S. Public Health Service, working at the Northern Navajo Medical Center in Shiprock, New Mexico. Dr. Mohs is the Medical Director of the Center's Diabetes Education and Counseling Center; Chair of the Internal Medicine Department; and Executive Director of the Radiation Exposure Screening and Education Program.

**"For me, the Indian Health Service has provided both an excellent diversity in patient care and a wonderfully rewarding patient population. The staff of the Indian Health Service are extremely dedicated to improving patient care and making strides forward in public health, despite many fiscal and logistical challenges. My education at USU was definitely a good preparation for this exceptional experience."**

## Medical Preparedness

Captain (ret.) Kevin Yeskey, M.D., a graduate of the USU class of 1983, was selected to become Deputy Assistant Secretary and Director of Preparedness and Emergency Operations within the Department of Health and Human Services. Prior to this appointment, Dr. Yeskey held a principal advisory role on matters related to public health and medical preparedness as a member of the Office of Public Health Emergency Preparedness at DHHS. He also has held a number of key disaster-related positions, including Director of USU's Center for Disaster and Humanitarian Assistance Medicine.





## Medical Diplomacy

USU alumnus Colonel Donald Thompson, M.D., Command Surgeon for the Combined Security Transition Command, was awarded the Ghazi Mir Bacha Khan High Medal by Afghan President Hamid Karzai. Dr. Thompson was given the award in recognition of his contributions to efforts to improve the health care delivery system for both service members and civilian in Afghanistan.

## Medical Care

Major Tony Leonard (top) is a 2003 graduate of USU's Family Nurse Practitioner program. He is stationed in Iraq along with Major Joseph Candelario (bottom), also a GSN alumnus. They work to ensure the health of their battalion, and also provide care for members of the Iraqi Army, interpreters, contractors and Iraqi civilians.

**"I have had the opportunity to instruct Iraqi medics, as well as Iraqi nurses and medical providers. They are so eager to learn... There is a big knowledge gap in medical care there, which we are trying to close... I am thankful for the education I received at USU... The skills taught and the ability to think critically prepared me well to provide excellent nursing care."**

*Major Tony Leonard*



## International Work

Major Aaron Holley, M.D., a graduate of USU, is a Pulmonary and Critical Care Fellow at Walter Reed Army Medical Center.

**"I was able to spend a month in Kenya as part of a pulmonary and critical care fellowship working at a tuberculosis clinic in a rural district hospital. The U.S. doesn't have many active TB cases, so this was a great opportunity to enhance my training. I toured several different hospitals in the area, gave lectures and helped teach local students and physicians-in-training. I felt uniquely prepared to handle some of the unusual cases I saw because USU has an entire course dedicated to the study of parasitology."**

# FACULTY

USU's distinguished faculty includes world-renowned researchers and internationally accomplished clinicians, each of whom is dedicated to furthering medical research and practice, as well as sharing their knowledge, skills and experience for the benefit of USU students. The faculty is comprised of an outstanding group of military service members and civilians.

The faculty is dedicated to the shared mission of ensuring our nation's health and well being by helping to create tomorrow's leaders in federal and military health care. This significant goal fosters a highly collaborative atmosphere in which faculty often work on a multi-disciplinary level to advance both education and research.

## Neil Grunberg

Neil Grunberg, Ph.D., is a Professor in the Department of Medical and Clinical Psychology. His specialty areas include tobacco and nicotine use, drug abuse and stress. He has published more than 140 scientific papers on these topics, with an emphasis on the effects of nicotine on body weight, food consumption, attention and stress. In addition to his research and teaching responsibilities, Dr. Grunberg mentors graduate students in medical and clinical psychology, as well as neuroscience.

Dr. Grunberg has received multiple awards for his research and teaching, including the prestigious Society of Behavioral Medicine Distinguished Scientist award. Most recently, he received the 2006 Building Partnerships for Better Health Award from the USU Center for Health Disparities and the 2007 Carol J. Johns Medal for outstanding contributions to the faculty and educational programs at USU. Dr. Grunberg also received the U.S. Surgeon General's Medal for his work as scientific editor for the well-known Surgeon General's report that showed that nicotine is addictive, and the Surgeon General's report on the health benefits of smoking cessation.



## Preparing Students for Success

Deborah Bowen, Ph.D., Chair of the Department of Social and Behavioral Sciences at Boston University, is a 1986 graduate of USU and former student of Dr. Grunberg. She has been recognized for her work in cancer and health behavior change, and served as principal investigator on several NIH-funded grants on health behavior topics including breast cancer risk communications and dietary change. Among her many professional honors, Dr. Bowen has been named Outstanding Health Psychologist by the American Psychological Association.



**“My experiences at USU prepared me both intellectually and practically for an academic career in public health. Intellectually, I had the privilege of receiving training that was both challenging and rigorous. Practically, having the opportunity to apply health and medical psychology to the settings of military medicine and health promotion led me to see how my field could be relevant in many contexts, including urban and international settings.”**

USU fosters a highly collaborative atmosphere in which faculty often work on a multi-disciplinary level to advance both research and education.



## Bruce Schoneboom

Colonel Bruce Schoneboom, Ph.D., a graduate of the USU School of Medicine's neuroscience program and an Associate Professor in the Graduate School of Nursing's Department of Health Systems, Risk and Contingency Management, recently returned to USU from a one-year voluntary deployment to Afghanistan. As senior ranking officer, Dr. Schoneboom was selected to serve as the commander of the 14th Combat Support Hospital detachment at Forward Operating Base Salerno. There, he put his military training and medical expertise to use leading a team of 38 surgeons, registered nurses and a variety of allied health technicians who provided care for U.S. military service members and other coalition forces, and for Afghan civilians.



**“Throughout the military medical system, in the clinical environment, the senior people are usually from or have graduated from USU. Whether explicit or implicit, leadership is woven throughout everything we do here. We are educating the future leaders within the military health care system.”**

# EXPERIENCE

## Anthony Beutler

The U.S. military is developing practices and training to help prevent orthopedic injuries. USU clinician/researcher Major Anthony Beutler, M.D., a faculty member in the Department of Family Medicine and head of the new USU Injury Prevention Lab, is the principal military investigator on a National Institutes of Health-funded study on knee injury prevention. Knee injuries are some of the most common injuries among special operations personnel and recruits undergoing basic training.

Dr. Beutler is conducting the study in conjunction with the University of North Carolina, Chapel Hill Injury Prevention Research Center. In the initial phase of the study, he and his colleagues are assessing incoming students at the U.S. Military Academies. They will follow these students throughout their tenures at the academies and will analyze the data to establish prospective markers for injury risk. The goal is to eventually use this information to develop an injury prevention program that will address the most common injuries in the U.S. military.

**“Through this collaboration with UNC, we are using their expertise in epidemiology and biomechanics and are applying it to a military population. Not only do we hope to maximize readiness and minimize time lost due to injury within the military system, but we believe our results can be broadly applied in civilian settings.”**



# UNIVERSITY LIFE

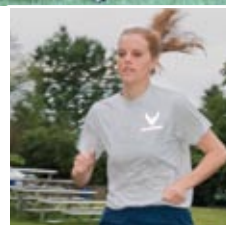
In many ways, USU is very much a traditional university, with student clubs and organizations, athletic teams and social activities. However, there is also a very special atmosphere at the university. At USU, there is an inimitable and pervasive spirit of teamwork not only among students, but also among faculty and staff. It is this sense of a shared purpose, camaraderie and commitment to service that distinguishes the university from other institutions.

## CAMPUS LIFE

USU students can take part in a number of athletic activities, including soccer, rugby and hockey. Students actively participate in a variety of interest groups, many affiliated with national sponsoring organizations, which provide opportunities to learn about careers and foster interest in medical specialties such as aerospace medicine, emergency medicine, surgery, family medicine and undersea medicine.



Student members of the Gamma Chapter of Alpha Omega Alpha—the national honor medical society, and one of the many student groups at USU—tutor and assist other students as they adjust to the rigors of medical school. The Student Spouses Club promotes a sense of community and support. The club holds many events throughout the year and activities for each class. Dining In and Dining Out are annual traditional military social events for USU students, families and associates.



## DEBT-FREE EDUCATION

Many attending other medical and graduate programs incur significant debt due to student loans. USU is unique in that students pay no tuition or fees. In fact, most students receive salaries or stipends.

Medical students enter the university as commissioned officers in one of the four uniformed services: Army, Navy, Air Force or Public Health Service. No prior service is required. Students receive the full salary and benefits of a uniformed officer throughout their four years at the university in exchange for a seven-year active duty service commitment.

Students in the Graduate School of Nursing are all active-duty uniformed nurses or nurses in federal civilian service. They continue to receive their regular salaries while at USU.

Those in the Graduate School are a mix of civilians and uniformed officers. Civilian students may receive stipends, and uniformed graduate students continue to receive their regular active-duty pay and benefits while attending the university.

## USU STAFF

USU's faculty and staff are comprised of officers and enlisted personnel, as well as civilians. This dedicated cadre of individuals is united by their commitment to service.



## SUPPORTIVE ENVIRONMENT

Students, faculty and staff at USU are dedicated to serving their nation. This commitment creates a distinctive sense of camaraderie and attitude of teamwork evident throughout the university. Students, faculty and administrators work together to achieve the goal of maintaining a cadre of uniquely trained physicians, nurses and scientists.

USU is committed to fostering diversity and maintaining an inclusive environment in which all students receive the tools and resources necessary to succeed. Many USU students are married, and the university provides a welcoming atmosphere and support system for both students and their families.



The University Family Health Center is dedicated to providing comprehensive personal and family-centered care to active-duty students and other DoD beneficiaries assigned to USU and their families.

## CENTRAL LOCATION

The USU campus is surrounded by park-like woodlands adjacent to the National Naval Medical Center (NNMC) and across the street from the National Institutes of Health. The new Walter Reed National Military Medical Center is scheduled to open on the NNMC campus in 2011.

Most students live close to the university and have access to mass transit facilities, making it easy to take advantage of the many cultural, educational and social activities in the Washington, D.C., metropolitan area.

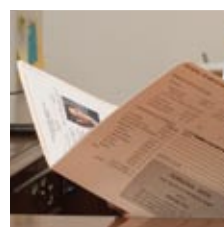
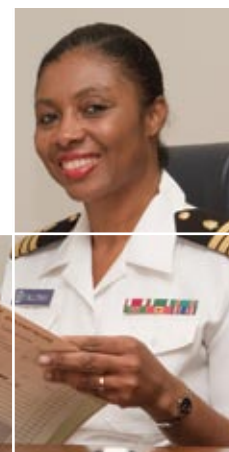


The U.S. military is the most racially and ethnically representative organization in the United States. USU seeks to have this diversity reflected in the military's cadre of health care practitioners and are working closely with undergraduate institutions, various interest groups and the Association of American Medical Colleges to attract more under-represented minorities to careers in medicine, and specifically to USU and a career in military or public health medicine.

Uniformed students, faculty and staff are representative of all services—the Army, Navy, Air Force and Public Health Service.

**“We at USU strive to have our student body reflect the diversity in the military.”**

*Commander Margaret Calloway, M.D.,  
Associate Dean for Admissions and  
Recruitment*



# YEAR IN REVIEW

Throughout the year, USU hosts a variety of educational, military and social events. These include lectures from distinguished scientists, service-oriented special occasions and campus-wide observances.

## RESEARCH WEEK

USU's annual Research Week is designed to promote research by faculty and students at the university and its affiliate institutions and to provide increased opportunities for interdisciplinary collaboration. The event informs the local scientific community, partnering institutions and other federal agencies about research projects being conducted at, and in conjunction with, USU. The poster presentations, invited speakers and panels exemplify the university's unique role in public health and military research.

In 2007, USU was honored to welcome Anthony Fauci, M.D., Director of the National Institute of Allergy and Infectious Diseases, as the plenary speaker.



## WU AND LEONARD AWARDS



As part of the university's Research Week, two USU faculty members were recognized for their unique and fundamental contributions to advancing research in their fields. Chou-Zen Giam, Ph.D. (left), received the Henry Wu Award for Excellence in Basic Research for his work on the human retrovirus HTLV-1, which causes adult T cell leukemia. Shiv Srivastava, Ph.D. (right), received the James Leonard Award for Excellence in Clinical Research in recognition of his discoveries regarding the over-expression of the ETS-related gene-1 in prostate cancer. The researchers reported their findings in the prestigious publications *The EMBO Journal* and *Oncogene*, respectively.



## MEDICAL MASTERPIECES: ART OF A SURGEON

In 2007, USU had the distinction of hosting a collection of original paintings and sketches by renowned medical illustrator Frank Netter, M.D.. Dr. Netter, a surgeon by training, was a U.S. Army officer during World War II and was placed in charge of creating graphic training aids, largely used to teach combat first aid and survival skills, and to train x-ray technicians. He went on to become the world's foremost medical illustrator, with his artwork serving as the standard by which all others are measured. Netter once was hailed by *The New York Times* as, "the medical Michaelangelo."



Dr. Alan Seyfer, USU Distinguished Professor of Anatomy, Physiology and Genetics and Air Force 2nd Lt Joshua Gustafson were instrumental in arranging the exhibit.

## WAR HERO ADDRESSES STUDENTS

Congressional Medal of Honor Recipient Lieutenant Colonel Alfred Rascon addressed USU medical students. Rascon received the award for his actions as a medic in Vietnam, which included shielding wounded soldiers' bodies with his own. He was so heavily injured in battle that he was not expected to survive.



## USU CELEBRATES 28TH COMMENCEMENT



In 2007, USU celebrated its 28<sup>th</sup> commencement, with Vice Admiral Donald C. Arthur, M.D., Navy Surgeon General and Chief of the Navy's Bureau of Medicine and Surgery, providing the commencement address. The School of Medicine and Graduate School of Nursing awarded more than 200 doctor of medicine and other scientific graduate degrees.

## BRIGADE COMMAND CHANGE

Colonel John Wempe, M.D., assumed command from Lieutenant Colonel John Maurer of the USU Brigade—the military leadership component within the university and USU's link to the broader military community. The Brigade is comprised of roughly 250 faculty and staff members from all branches of the Armed Services. Brigade personnel play a key role in helping USU students become leaders in a military environment.



## EXPANDING UNIVERSITY FACILITIES



USU broke ground for its new academic center, Building E. Among those participating in the ceremony were Hawaii Senator Daniel K. Inouye; Maryland Senators Paul Sarbanes and Barbara Mikulski; Maryland 8th-District Congressman Chris Van Hollen; Assistant Secretary of Defense for Health Affairs William Winkenwerder, Jr. M.D.; Acting Surgeon General of the United States Rear Admiral Kenneth Moritsugu, M.D.; National Naval Medical Center Commander Rear Admiral Adam Robinson, M.D.; John Lowe, President-CEO of the Henry M. Jackson Foundation for the Advancement of Military Medicine; members of the USU Board of Regents, administration, faculty and senior representatives from Grimberg Construction.



# YEAR IN REVIEW

## FIGHTING FOR LIFE

USU has been referred to as “military medicine’s best kept secret.” However, with a new film focused on the university, the school will not remain a secret much longer.

“Fighting for Life,” a documentary by two-time Academy Award-winning filmmaker Terry Sanders, is a portrait of American military medicine. The film tells the story of USU and shows students at the university who are on their journeys towards becoming military physicians and nurses.

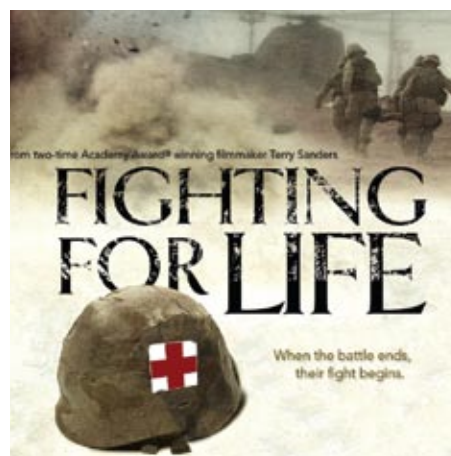
The gripping documentary uses compelling footage, including images from the current conflicts in Iraq and Afghanistan, to illustrate the ways in which U.S. military medical personnel around the world work tirelessly to care for those in harm’s way, and in particular the key role USU plays in educating these doctors. It premiered at a private screening at the Smithsonian Air and Space Museum in May, and enters broad release in the fall of 2007.

The film was initiated by the Friends of USU—an all-volunteer membership group incorporated in Maryland as a 501(c)3 organization. Led by a



“When I first visited USU, I was immediately struck by the quality, maturity and idealism of the students; the energy, excellence and clarity of faculty lectures; the high ethical component running throughout the school; and the dedication and generosity of faculty and staff toward the students.”

*Terry Sanders, Producer and Director*



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volunteer board of directors and working in close collaboration with the Henry M. Jackson Foundation for the Advancement of Military Medicine, Friends of USU seeks to support and promote public awareness of the university. Friends President Thomasine I. Alvarez was the driving force behind the production of the film and is the Executive Producer. Her son attended USU and was deployed to Iraq. Her husband, Everett Alvarez, Jr., is the chair of the university’s Board of Regents.

Many members of the USU community—students, faculty, alumni and staff—are featured in this full-length docu-drama including Drs. Paul Pasquina, Gina and Warren Dorlac and Stephen Davies.

### Lieutenant Colonel Paul Pasquina, M.D.

A graduate of West Point and USU, in 2003 Dr. Pasquina was selected to be the Chairman of the Physical Medicine and Rehabilitation Service and shortly thereafter was instrumental in helping to form



*class of 1991*

the U.S. military’s Amputee Program at Walter Reed Army Medical Center.

“The thing that keeps me going is the attitudes of our patients. To see these soldiers push the limits of medicine and of rehabilitation has been incredible to watch and to be a part of.”

## Colonel Warren Dorlac, M.D. and Lieutenant Colonel Gina Dorlac, M.D.

Both graduates of USU, the Dorlacs serve at Landstuhl Regional Medical Center in Germany, where patients are sent directly from Iraq and Afghanistan. She is the Medical Director of the Combined Intensive Care Unit and he is the Trauma Medical Director.



class of 1989



class of 1989

**“The devotion for me is... these soldiers and Marines and seeing what they’ve sacrificed. If they can do that for our country, then we all should do as much as we can, because they’ve given so much more.”**

*Lieutenant Colonel Gina Dorlac, M.D.*



## Stephen Davies, Ph.D.

Dr. Davies is an Assistant Professor in the Department of Microbiology and Immunology at USU. His interest is in understanding human diseases, particularly traditionally overlooked tropical diseases that afflict billions of people worldwide, such as schistosomiasis. Dr. Davies’ laboratory is funded by the National Institutes of Health and the Department of Defense.

**“Schistosomiasis affects around 200 million people. We’re hoping that our work will lead to the design of new drugs or vaccines.”**

**“The film shows how much we need [USU], with its focused mission to teach medical students and graduate nurses to practice good medicine in bad places.”**

*Bernadine Healy, M.D., former director of the National Institutes of Health and president and CEO of the American Red Cross, writing in her U.S. News & World Report health column*



## NOBEL LAUREATE PRESENTS PACKARD LECTURE



2002 Nobel Prize in Physiology of Medicine recipient Sydney Brenner, Ph.D., visited the university to present the annual David Packard Lecture. A pioneer in genetics and molecular biology, among his many groundbreaking accomplishments, Brenner established the existence of messenger RNA and demonstrated how the order of amino acids in proteins is determined. The Packard Lecture is USU’s premier invited lecture.



*First-year students receive their medical coats in a ceremony marking “White Coat Day.”*

# READINESSES

Military readiness requires physicians and other personnel with specialized training in military medicine, disaster medicine, combat casualty care, tropical medicine and related disciplines. USU contributes to medical readiness and disaster response by training thousands of health care professionals annually through its continuing medical and nursing education programs. USU also serves as a central resource for DoD and the nation by providing consultative services and expertise on a wide array of military-related topics.

## CONTINUING HEALTH EDUCATION

USU's Office of Continuing Education for Health Professionals offers the only program of its kind in the military health system, with six accreditations—for physicians, nurses, psychologists, social workers, pharmacists and health care executives. The office offers state-of-the-art training opportunities, organizes and executes DoD medical treatment facility-based activities, organizes courses, workshops and Internet continuing education and runs regular conferences.

The Military Training Network conducts advanced cardiac life support, pediatric advanced life support and advanced trauma life support classes. It also manages training programs embedded within military units around the world.



**“Continuing education directly supports the readiness of our military members. Because of increased availability of quality continuing education, healthcare providers are more prepared to take care of troops who are in harm’s way.”**

*Captain Jaime Luke, R.N.  
Senior Executive Director for Continuing Health Education*



USU is world-renowned for its leadership and scholarship in disaster planning, preparedness, response and recovery.

## COUNTERING THE EFFECTS OF EMOTIONAL TRAUMA

USU's Center for the Study of Traumatic Stress (CSTS), which operates in conjunction with the Department of Psychiatry, conducts research, education, consultation and training on preparing for and responding to the psychological and health effects of traumatic events. The Center's multi-disciplinary approach integrates science, clinical care and community needs, preparedness and public education. Center Director Robert Ursano, M.D., Professor and Chair of the Department of Psychiatry, is world-renowned for his leadership and scholarship in disaster planning, preparedness, response and recovery. Staff members have expertise in disaster psychiatry, military medicine and psychiatry, social and organizational psychology, neuroscience, family violence, workplace preparedness and public education.





## NEW CENTER FOCUSES ON DEPLOYMENT-RELATED MENTAL HEALTH CARE

Physical wounds are sometimes not the only injuries sustained by military personnel. Combat trauma, Post Traumatic Stress Disorder (PTSD) and challenges related to reintegration after deployment can be serious issues that require specialized care. Deployment also can be a significant stress on family members. The new USU Center for Deployment Psychology (CDP) plays a key role in the Military Health System's approach to dealing with mental health effects of deployment on service members and their families.

The American Psychological Association worked closely with Congress to establish the program at the university. The Congressionally funded program will educate military and civilian health care professionals about how to provide appropriate and effective care for deployment-related mental health issues. The Center's mission is to develop a well-trained cadre of psychologists, psychiatrists and social workers to treat members of the military community.



(left to right) Dr. Charles L. Rice, President, USU; Dr. Cynthia Belar, American Psychological Association; Congressman C.W. Bill Young; Dr. David Riggs, Director, CDP; Dr. David Krantz, Chair, USU Department of Medical and Clinical Psychology.

CDP staff are developing and conducting behavioral health courses, instituting research, making recommendations and drafting proposals that to support deployment-related policies and program development. They are also working to increase awareness regarding deployment-related behavioral health needs among service members and their families. CDP is working closely with other USU programs including the esteemed Center for the Study of Traumatic Stress, as well as well-known researcher David Krantz, Ph.D., Professor and Chair of the Department of Medical and Clinical Psychology.

### Helping Families During Military Deployment

CSTS Associate Director Stephen Cozza, M.D., contributed to the development, by Sesame Workshop, of a new outreach kit designed to help young children of service members deal effectively with the stresses of

military deployments. Titled "Talk, Listen, Connect: Helping Families During Military Deployment," the kit addresses the challenges and concerns children experience during various stages of deployment, and includes a DVD featuring the Sesame Street Muppets.



### Courage to Care for Me

In 2007, CSTS launched the *Courage to Care for Me* campaign as part of their broadly successful Courage to Care initiative—a health communication campaign designed to educate professionals and laypersons in a timely manner about topics related to military-unique health care, homeland security and national health issues. *Courage to Care for Me* is designed to raise awareness of the strength and courage required in parenting during stressful times. The goal is to help clinicians and family advocacy professionals reinforce the values of positive parenting, especially to new mothers in military settings.

A *Courage to Care For Me* "onesie" is imprinted with the campaign logo and accompanied by a tag that asks "Why Courage?" The tag explains that parenting during times of war involves courage at home, just as on the battlefield.

# RESEARCH

In addition to providing world-class educational opportunities, USU is dedicated to visionary military and public health-relevant research and has a reputation as a worldwide center of excellence in areas such as disaster medicine, infectious diseases, preventive medicine, tropical medicine and adaptation to extreme environments.

University researchers conduct investigations to ensure military health and readiness, and for the broad benefit of humankind. Collaboration is key, with USU scientists conducting clinical and laboratory investigations side-by-side with leading researchers at federal and private institutions in the U.S. and around the world.

## IMPROVING BLAST INJURY OUTCOMES

Currently, improvised explosive devices are the most common cause of combat injuries. Blasts frequently result in traumatic brain injury, as well as chronic disabilities that can affect everyday functions. The most frequently occurring symptom of blast traumatic brain injury (BTBI) is memory impairment.



injury (BTBI) is memory impairment.

An interdisciplinary team of USU researchers led by Christine E. Kasper, Ph.D., R.N., a Professor in the Graduate School of Nursing and faculty with the Office of Nursing Services at the Department of Veterans Affairs Central Office, received a three-year grant from the VA to

characterize the cellular, molecular and behavioral consequences of moderate and severe BTBI. The researchers also will test their theory that treatment with an anti-inflammatory medication, along with behavioral stimulation, will produce neuro-regeneration leading to better patient outcomes. This is a departure from the traditional approach of severely limiting the amount of stimuli to which a patient with TBI is exposed.

The cross-disciplinary research team includes Denes Agoston, M.D., Ph.D., an Associate Professor in the Department of Anatomy, Physiology and Genetics, and Neil Grunberg, Ph.D., a Professor in the Department of Medical and Clinical Psychology. Colonel Geoffrey Ling, M.D., Ph.D., Director of the Division of Critical Care Medicine, Vice Chair of the Department of Neurology and a Professor in the Departments of Anesthesiology, Neurology and Surgery and Joseph Long, Ph.D., at the Walter Reed Army Institute of Research, are also collaborators.

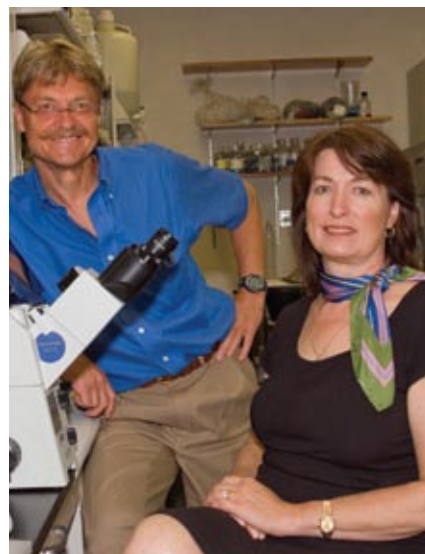
## Collaborating for Success

Its close proximity to prestigious research institutions, including the National Institutes of Health, affords USU faculty and students singular opportunities to interact. They have a deep sense of shared mission among themselves and others within the military health system, lending itself to an extraordinary team spirit rarely found at other educational institutions.

**“The wealth of research opportunities here is mind blowing... You have to cross cut if you want your research to have clinical relevance. Everyone here is so welcoming about collaborations and talking about research. It’s a joy.”**

**Students at USU benefit from this atmosphere and location, as well. “One of my doctoral students is back and forth at NIH all the time... Some of my students are also working on a study we’re doing with the Armed Forces Radiobiology Research Institute...”**

*Christine E. Kasper, Ph.D., R.N.*



## ADVANCING THE SCIENCE OF NEUROLOGICAL DISORDERS

As reported widely in the media, on January 29, 2006, while reporting in Iraq, ABC news anchor Bob Woodruff was severely injured when his vehicle hit a roadside bomb near Taji. After receiving a life-saving craniectomy in Balad performed by far-forward neurosurgeons, he was airlifted to the Army hospital in Landstuhl, Germany, and then on to the National Naval Medical Center (NNMC) in Bethesda, Maryland, all within 72 hours of the blast.

Upon arrival at NNMC, a team including clinician/researcher Lieutenant Colonel Rocco Armonda, M.D., USU Class of 1990, performed a cerebral angiogram on Woodruff to ensure he had no evidence of neurovascular injury. Dr.



Dr. Armonda (right) and a patient

Armonda is an interventional vascular neurosurgeon/intensivist with USU's Comprehensive Neuroscience Program (CNP) and is a member of the faculty of the

Department of Surgery. The reporter emerged from a five-week medically induced coma, and 10 days later, was able to return home for further rehabilitation. Armonda traveled to New York to assist with Woodruff's cranioplasty using a military computer-manufactured acrylic plate and injectable bone "paste." Woodruff returned to NNMC one year later while filming an ABC News special report chronicling his injury and subsequent recovery.

The CNP is a multi-site, collaborative clinical research program working to improve the prevention, diagnosis and treatment of neurological disorders, with a focus on acute care. Program researchers examine neurological issues from a broad perspective that encompasses not only basic research, but also real-world applications. The initiative is a collaborative effort among Walter Reed Army Medical Center (WRAMC), NNMC, Conemaugh Health System, USU and the Henry M. Jackson Foundation for the Advancement of Military Medicine, under the direction of Colonel William Campbell, M.D., Chair of Neurology at USU.

## EXTENDING RESEARCH COLLABORATIONS

USU is working to increase research collaborations with the National Institutes of Health. University faculty not only seek out new research relationships, but there is also a growing exchange between NIH personnel and USU faculty. These collaborations have attracted scientists from many of the institutes, among them the National Institute of Allergy and Infectious Diseases (NIAID).

Johnan A. R. Kaleeba, Ph.D., is a virologist and Assistant Professor in the USU Department of Microbiology and Immunology. He came to the university from NIAID to continue his scientific studies on mechanisms by which DNA tumor viruses infect and alter the growth of host cells leading to cancer. Dr. Kaleeba's work at NIH culminated with the discovery that a protein normally involved in protecting cells against inflammation is also co-opted as an entry receptor for a new herpesvirus that is associated with Kaposi's sarcoma, the most common cancer among people with weak immune systems. His work was published in the prestigious journal *Science*.

Now at USU, Dr. Kaleeba is developing novel approaches to harness the body's own anti-inflammatory defenses as a mechanism to attenuate the emergence of virus-associated syndromes, with the ultimate goal of developing treatments for such illnesses.



## EXPLORING RADIATION RESISTANCE



Radiation resistance is an important area of study in many respects, from devising mechanisms of radioprotection to cleaning up nuclear waste. USU researchers, lead by Department of Pathology Associate Professor Michael Daly, Ph.D., have made significant strides in research related to the radiation-resilient bacterium *Deinococcus radiodurans*.

*D. radiodurans* has long been known to be capable of withstanding extremely high doses of ionizing radiation. In a groundbreaking study released in 2007, Daly and collaborators from institutions including the National Institutes of Health uncovered evidence pointing to a potent form of protein protection as the mechanism through which the bacterium protects itself.

These results likely will cause a shift in *D. radiodurans* research, changing the focus from previously held theories regarding DNA damage and repair.

In prior work on the organism, Daly and colleagues collaborated with the Pacific Northwest National Laboratory to develop improved methods of studying the bacterium. The organism had been engineered previously by another scientific team to attack pollutants often found at radioactive sites. The technologies created by Daly's team allowed scientists to obtain extensive protein identification information that could lead to methods of using the *D. radiodurans* as a tool for bioremediation. The results of the study were published in the leading journal *PLoS Biology*.

# DEDICATION

## USING GENOMICS TO UNDERSTAND DISEASE PROCESSES

Cystic fibrosis (CF) is the most common life-limiting genetic disease in the U.S. The disease manifests when a child receives one mutant CF gene from each parent. Roughly five percent of the U.S. population carries a copy of the mutant CF gene, making the disease relatively common in the military dependent community, and therefore relevant to military medical research. Harvey Pollard, M.D., Ph.D., Professor and Chair of the USU Department of Anatomy, Physiology and Genetics, and his team received a \$14 million award from NIH to use proteomics to advance CF research.

Pollard's lab is making significant progress on several fronts, including developing new technologies to study proteins. Current methods focus primarily on mass spectrometry, which identifies proteins that

occur in abundance. Many investigators believe that the crucial disease-specific proteins are those that occur in low levels. Pollard and his team have therefore developed a new antibody microarray technology that is highly sensitive and can detect these less abundant proteins. The Pollard lab now uses both technologies in parallel to get a complete view of as many of the proteins as possible.

The group is applying its new protein analysis technology to the study of several other important diseases, including prostate cancer, breast cancer and heart disease. They are conducting this research in collaboration with partners including Johns Hopkins University, NIH and the Lombardi Comprehensive Cancer Center at Georgetown University.



## USU RESEARCHERS FIND BROAD-SPECTRUM DEFENSE AGAINST HIV-1

Research conducted at USU suggests that it may be possible to develop a vaccine that protects against the myriad strains of the HIV virus. This groundbreaking study titled: "Extensively Cross-Reactive Anti-HIV-1 Neutralizing Antibodies Induced by gp140 Immunization" appeared a spring 2007 online edition of *Proceedings of the National Academy of Sciences*.

To be effective, an HIV vaccine must induce the body to produce cross-reactive antibodies that can neutralize multiple strains. USU Professors Captain Gerald Quinnan, Jr., M.D., and Christopher Broder, Ph.D., and their colleagues at USU attempted to elicit these broad-range antibodies by immunizing

with a particular HIV-1 surface protein, designated R2 gp140, and an immune response-boosting component. The researchers tested antibodies generated by the immunizations to determine their effectiveness in neutralizing the infectivity of a variety of HIV-1 strains. Antibodies produced as a result of immunization neutralized all 48 strains of HIV-1 tested. The results are encouraging for vaccine development, because they showed that it is possible to elicit a broad-spectrum antibody response. This research was supported by a grant from a number of collaborators including the National Institutes of Health/NIAID and the Henry M. Jackson Foundation for the Advancement of Military Medicine.



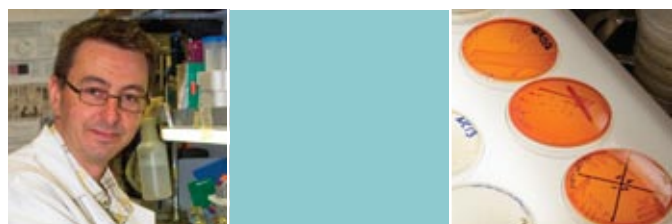
Drs. Gerald Quinnan (left) and Christopher Broder (center) talk with Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases.

## LINKING DIET TO GASTRIC DISEASE

Many people have never heard of *Helicobacter pylori*, yet more than half of the world's population is infected with the bacteria. *H. pylori* is the main cause of peptic ulcer disease and a major cause of gastric cancer, although most people with *H. pylori* don't have obvious symptoms. Roughly 20 percent of people younger than 40 and 60 percent of people older than 60 are infected with the bacteria. A team of researchers including D. Scott Merrell, Ph.D., Assistant Professor of Microbiology and Immunology, showed that high concentrations of salt in the stomach seem to stimulate increased activity in the bacteria, raising the risk of serious gastric disease.

Epidemiological evidence has long implied that there is a connection between *H. pylori* activity and diet, but until now, the majority of research has focused on the effects of diet on the stomach rather than on the

bacteria's response to specific components of a person's diet. As part of an NIH-supported project, Merrell's team examined the effect of a high-salt diet on *H. pylori*'s growth and gene expression. The researchers deduced that high levels of salt *in vitro* cause a defect in cell division. Further, they found increased transcription by two genes that induce virulence in *H. pylori*. This could help to explain the increased risk of disease previously shown to be associated with a high-salt diet among *H. pylori*-infected individuals. The team presented the study results at the May 2007 general meeting of the American Society for Microbiology.



# AFRRI

## ARMED FORCES RADIOBIOLOGY RESEARCH INSTITUTE

It is imperative that the military and the larger medical community, indeed, the nation, be prepared for the threat of nuclear or radiological attack. A component of USU, the Armed Forces Radiobiology Research Institute (AFRRI) provides unique expertise and capabilities in the field of radiation biology. Researchers there are working on novel assessment and treatment technologies to protect both military and civilian populations.

### EXPOSURE LEVELS AND HEALTH RISKS

A nuclear or radiological attack could result in mass casualties and would likely cause a range of acute and long-term health consequences. Research conducted at AFRRI is improving the ability to rapidly assess an individual's exposure to radiation.

Scientists at AFRRI are creating new approaches to classical biodosimetry, which is based on cytogenetic damage, for casualty triage soon after exposure. One area of study focuses on developing dose-assessment assays that use transportable equipment to test easily obtained samples, such as hair, fingernails, urine or a drop of blood. Utilizing innovative approaches, they are also improving the accuracy, dose range, ease of use and speed of biodosimetry.

To ensure the health of our service members, AFRRI scientists established a new approach to assessing the potential health effects of militarily relevant metals that may become embedded as shrapnel. Researchers evaluate the acute and long-term health risks of metals, such as depleted uranium and tungsten alloys, and explore potential treatments for any adverse effects.



# EXPERTISE

### MEASURES TO COMBAT RADIATION EXPOSURE



AFRRI scientists provide research results and expertise to the U.S. Government and the DoD in the field of radiation biology and help inform and develop policies and national response plans. For example, in collaborations with the international scientific community, AFRRI acts as a catalyst to publish medical and technical information based on data from nuclear accidents and incidents in other countries. Such information can be used to direct rescue operations, including those resulting from terrorist actions or industrial nuclear accidents.

Researchers are also investigating treatment options to protect both service members and civilians in a variety of radiation exposure scenarios. Using their understanding of the mechanisms of radiation damage, AFRRI scientists are pursuing new and improved pharmacological approaches to prevent the health-degrading and potentially life-threatening effects of ionizing radiation. Making use of novel cellular and molecular approaches and complex physiological systems, the researchers are working to move these potentially life-saving drugs from discovery through the FDA approval process.

## PROVIDING EDUCATION ON MEDICAL EFFECTS OF IONIZING RADIATION

AFRRI's Military Medical Operations department supports the U.S. Armed Services by providing medical and operational personnel with up-to-date information concerning the biomedical consequences of radiation exposure, how the effects can be reduced and how to manage casualties. At the Medical Effects of Ionizing Radiation course, students receive a unique education on the

hazards of ionizing radiation, radiation pathology, human exposure resulting from radiation accidents, consequences of nuclear weapons detonation and nuclear accident response by government organizations. They also hold an annual scientific updates meeting to share the most recent findings in the field with military and civilian personnel, health care providers and operational planners.

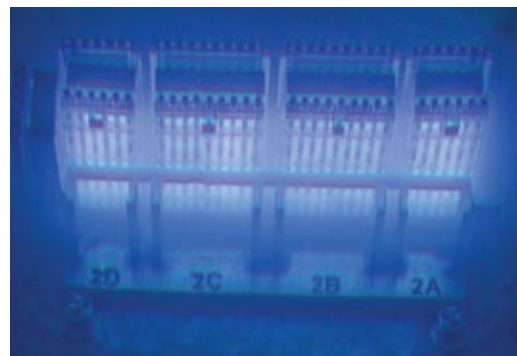
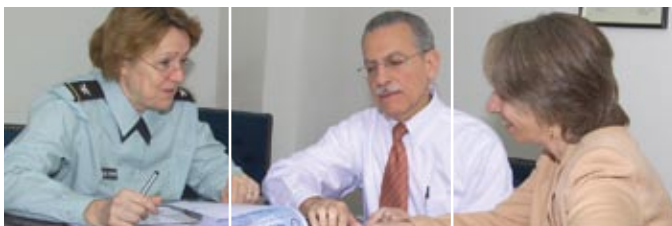


The Medical Effects of Ionizing Radiation course is the most comprehensive training available on this topic, and is the only graduate-level course in the DoD for training health care professionals in the management of uncontrolled ionizing radiation exposure.

## UNIQUE RESEARCH FACILITIES

AFRRI's specialized research facilities and resources—designed specifically for small-scale research purposes—provide scientists with a variety of radiations, energies and dose rates. This enables researchers to conduct targeted research on the effects of ionizing radiation, and allows them to simulate field conditions and determine the effects of combined injuries. Its medium-sized research reactor, high-energy irradiation facility and low-level irradiation facility are licensed by the Nuclear Regulatory Commission.

AFRRI has a team of scientists ready to deploy in case of a nuclear event. They are subject matter experts on how to manage casualties in such situations.



# COURAGE

## CENTER FOR DISASTER AND HUMANITARIAN RESPONSE

The U.S. military is increasingly called on to support domestic and international disaster response and other humanitarian assistance efforts, which often involves providing medical care in austere environments and in developing countries. The Center for Disaster and Humanitarian Assistance Medicine (CDHAM), which operates within USU's Department of Military and Emergency Medicine, serves as a central resource for the DoD, other government agencies and international partners.

Headed by Robert Darling, M.D., a graduate of the USU class of 1985, CDHAM's staff has expertise in a broad range of areas, and its academic setting enables a multidisciplinary approach to disaster mitigation. The program is engaged in a full range of initiatives aimed at improving preparedness and response. Many of these efforts are undertaken with foreign military and civilian agencies, as well as other leading U.S. academic medical centers.

The center supports the U.S. military with a wide range of health-related activities around the world. CDHAM works with the Global Emerging Infections Surveillance and Response System (DoD-GEIS) on a pandemic influenza program, serving as a resource for commanders in the field. The center is collaborating with the U.S. Southern Command to create a sustainable HIV/AIDS prevention program for Caribbean defense forces in seven countries. Staff members also are working with the government of Chad on a landmine assistance program to help government and military forces provide care to victims of landmines.



In May of 2007, two researchers with CDHAM published a study showing that many residents of FEMA-created trailer parks housing persons displaced by Hurricane Katrina are facing serious and persistent mental health issues. According to the study, which appeared in the *Annals of Emergency Medicine*, major depression is a pervasive problem, with suicide attempts among trailer park residents at a rate 78 times higher than the national average. The researchers, Lynn Lawry, M.D. and Michael P. Anastario, Ph.D., used a global humanitarian aid perspective to assess a number of factors, including mental health, for the purpose of informing recovery efforts.

In 2007, a CDHAM team traveled to Afghanistan to help coordinate efforts to devise strategies to create a long-term health care infrastructure by helping to rebuild the civilian medical system and expanding health care expertise within the country. Efforts include working with Afghan National Security Forces to help them develop their health care infrastructure and conduct health care training programs.



The Center's staff has expertise in a broad range of areas, and its academic setting enables a multidisciplinary approach to disaster mitigation.

*Jim Holliman, M.D., was part of a CDHAM team that travelled to Afghanistan.*





## NATIONAL CAPITAL AREA MEDICAL SIMULATION CENTER

The National Capital Area Medical Simulation Center houses some of the most advanced medical simulation technologies in the world. At the Simulation Center, students undertake critical clinical and surgical skills training, including taking part in exercises involving live simulated patients, high-fidelity patient mannequins and virtual reality computer-enhanced task trainers. The center conducts roughly 8,000 simulations each academic year, and its resources are available to all university medical and nursing students, interns, residents and others in the USU community.

### Immersive Virtual Environment

The center is home to a cutting-edge Wide Area Virtual Environment (WAVE). Most computer-based medical simulators focus on individual training, but in reality, most medical care is administered in teams. The WAVE creates a realistic environment in which groups of students can train together to care for the injured during combat situations. The initial prototype system creates a 3-D environment, complete with an advanced sound system, that immerses participants in a battlefield setting. The

WAVE also can be used to simulate disaster, biological attack and other mass casualty scenarios. It is one of the only facilities of its kind in the world.

### Surgical Simulation

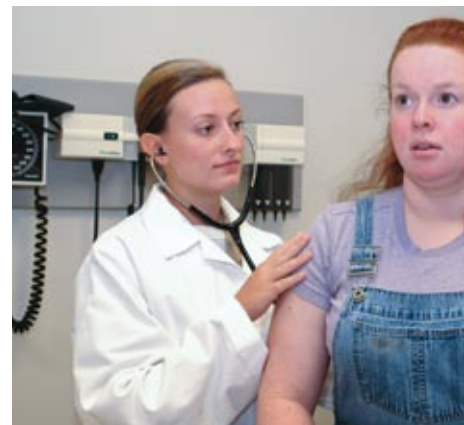
The center's Surgical Simulation Laboratory includes a full-scale operating room, as well as a virtual reality room, which provide realistic scenarios for trauma and surgical training. The operating room is equipped with computerized, high-fidelity human patient mannequins, and the virtual reality room houses computer-enhanced task trainers that enable students to practice surgical procedures, endoscopic skills and laparoscopic techniques.

### Clinical Skills

The Simulation Center's Clinical Skills Teaching Laboratory includes 12 patient examination rooms where standardized patients, played by actors, help students hone their communication, interpersonal, professional, physical exam and diagnostic reasoning skills. Faculty monitor the encounters and provide students with critical feedback.



The Simulation Center uses state-of-the-art technologies to conduct specialized clinical and surgical skills training. By graduation, USU students will have taken part in roughly 40 different simulations.



# LOOKING AHEAD

U.S. academic medicine is facing a myriad of challenges—a predicted 30 percent shortfall in the number of physicians within the next 20 years; fewer competitive undergraduates applying to medical school; concern about student debt and its limitation of choice of practice; continued lack of diversity among student bodies; curricula taxed by the ever-growing complexity and scientific challenges of medical practice; and the challenge and practicality for faculty of balancing the enormous demands of acting as physician, teacher and scientist. At the same time, health care and biomedical research have never been more exciting and fulfilling.

USU faces many of the same issues as civilian academic health centers, with the critical difference that USU students face neither debt nor limits on practice and career. The university's curriculum is, and has always been, focused on keeping troops healthy. This gives a special niche that the university will continue to emphasize in both education and research programs. The university is at an extraordinary moment in history. Due to the recommendations of the 2005 Base Realignment and Closure committee, the DoD will create on this campus, and with USU as its educational core, the "academic health center of the 21<sup>st</sup> Century." Leaders in the National Capital Area are hard at work developing the new Walter Reed National Military Medical Center (WRNMMC), scheduled to open on the National Naval Medical Center campus—the home of USU—in 2011.

USU's role in this new medical center presents a tremendous opportunity not only for the Military Health System, but also for the nation's academic health system. The joining of four uniformed services, co-located with a health sciences university, on a

campus adjacent to the National Institutes of Health, with its unparalleled research and clinical services, will allow U.S. medicine to create a new model of an academic health center. WRNMMC will be a focal point of federal investment in the health sciences at a single site and will allow USU to provide an education for future uniformed services practitioners and researchers that is informed by the very latest research on emerging health problems.

The DoD will create on this campus, and with USU as its educational core, the "academic health center of the 21<sup>st</sup> Century."

Success will depend largely on flexibility and innovation. The university must learn to cross with grace and ease the boundaries of service—Army, Navy, Air Force or Public Health Service, within and beyond the Department of Defense and Department of Health and Human Services. It must engage civilian academic health centers in meaningful partnerships and connect with NIH researchers, grant them access to the military's extraordinary clinical research population and databases, and in turn gain expanded access for the military system to state-of-the-art treatment and protocols.

The nation has invested billions of dollars in public health. The creation of WRNMMC is a first step in pooling resources and developing shared visions to serve a single mission—ensuring military and public health worldwide.



*Members of the original 2006 - 2007 flag council for National Capital Area integration efforts included: (left to right) Major General Kenneth Farmer, Jr., M.D., Commanding General, North Atlantic Regional Medical Command; Charles Rice, M.D., USU President; Rear Admiral Adam Robinson, M.D., Commander, National Naval Medical Center; Brigadier General Thomas Travis, M.D., Commander, 79th Medical Wing.*

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