USU Medicine

Spring 2003

Uniformed Services University of the Health Sciences

THE EPICENTER OF OPERATIONAL READINESS

Collaborative training at civilian trauma centers • Safeguarding against smallpox
Nurses join Bushmaster • Caring for AIDS orphans • Laser eye surgery increases readiness

The past 18 months resemble no other period in modern history. Fortunately, the Uniformed Services University has spent the past three decades preparing physicians, scientists and public health officials to handle the medical responses to disasters, terrorism and war.

Congress has recognized USU as the national source of expertise in operational medicine and readiness. Our research, education and training programs, highlighted in this issue of *USU Medicine*, have a profound impact on the health and safety of American citizens and others who benefit around the world.

USU's graduates are running training programs at major civilian trauma centers in Miami, Los Angeles and Baltimore that update and sustain the clinical skills levels of military physicians, nurses and technicians required by the Services to ensure readiness in a combat theater of operations. Alumni are refining and using refractive laser eye surgery to improve the visual acuity of soldiers in the field, while our faculty are in the forefront of helping to protect the country's military members, emergency responders and the public at large through a nationwide smallpox vaccination program.

USU graduates and faculty are leading the charge to make our homeland secure and improve our preparedness for and responses to disasters and terrorist events and have made significant contributions on the battlefield. Moreover, the institution has developed a clinical nurse specialist program in perioperative nursing, and our faculty is helping to lead the Nursing Bioterrorism Coalition to develop competencies in this arena.

I am proud to say that the expertise and knowledge found at USU is now being sought by the military and civilian communities around the globe. USU can rightly be called the epicenter of operational readiness.

USU Medicine
The magazine of the Uniformed Services University of the Health Sciences

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Established by Congress in 1972 and operated by the Department of Defense, the Uniformed Services University of the Health Sciences (USU) is the nation's federal medical school and graduate school of nursing. Its mission includes teaching, training and research. USU graduates serve worldwide.

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Contents

2 **Frontline**
Long-time surgery chair steps down after 25 years, and other leadership changes are made in USU departments and programs.

6 **Collaborative Training at Civilian Trauma Centers**
Civilian and military trauma experts collaborate to improve readiness on the battlefield.

14 **Safeguarding Against Smallpox**
Military health care teams lead the charge to safeguard the nation against the potential threat of smallpox.

18 **Operation Bushmaster**
Students in USU's Graduate School of Nursing join Operation Bushmaster for the first time.

20 **Improving the View**
Alumni and faculty apply new technology to enhance combat readiness of fighting forces.

22 **Caring for AIDS Orphans**
Thousands of children in Zimbabwe have been orphaned because of AIDS. One USU faculty member does his part to offer them hope for the future.

24 **Findings**
A USU faculty member develops the world's first mother-baby patient simulator.

26 **From the Field**
Whether onboard a hospital ship, on the battlefield in Iraq, or facing the continued dangers of Afghanistan, USU alumni make significant contributions.

31 **Class Notes**

Norman M. Rich, M.D. – A Legend in Military Medicine

After 25 years of service to USU, retired Army colonel Dr. Norman Rich stepped down as chair of the university's Department of Surgery, a position he held since 1977.

Born in Ray Pinal County, Ariz., Rich received his bachelor's degree and his doctorate in medicine from Stanford University. He went on to complete his rotating internship at Tripler General Hospital in Honolulu in 1961 and a general surgery residency at Letterman General Hospital in San Francisco in 1965.

Throughout his career, Rich has held many leadership positions. Some of them include chief of the Department of Surgery at the 2nd Surgical Hospital in Fort Bragg, N.C., as well as that same position in An Khe in the Republic of Vietnam, 1965-66. He went on to become the first fellow in vascular surgery at Walter Reed General Hospital, l966-67, from which he assumed the position as chief of vascular surgery and director of the vascular fellowship program, 1967-78.

Founder of the USU Surgical Associates, he also formed the American Trauma Society, Society for Military Vascular Surgery, Chesapeake Vascular Society, Southern Association for Military Surgery, American Venous Forum Foundation, Ambroise Pare International Military Surgery Forum, and the International Association of Trauma Surgery-Intensive Care. He has been a member of more than 56 professional societies.

With an academic interest in the management of injured patients and vascular surgery, Rich earned international recognition, lecturing in more than 35 countries, publishing in excess of 300 manuscripts and authoring or co-authoring five books. His illustrious career has also included more than 50 awards and honors, most notably the Legion of Merit, Bronze Star, Republic of Vietnam Gallantry Cross and the Vietnam Service Medal.

On Oct. 11, 2002, USU President James Zimble, M.D., announced that the Department of Surgery would be known as the Norman M. Rich Department of Surgery. In response to that honor, Rich humbly stated that it has

been a privilege to be involved in the exciting development of this unique institution. He will continue as the Leonard Heaton and David Packard Professor of Surgery and will serve as acting deputy chairman for Army Col. David Burris, ('82), who was named interim chair of the Department of Surgery until a search process is completed.

Faculty Notes

Professor of medicine Louis Pangaro, M.D., will chair the Association of American Medical Colleges' 42nd annual Research in Medical Education Conference in Washington, D.C.

Lt. Cmdr. Lisa McCurry, assistant professor, and Brian Crowley, M.D., adjunct associate professor, both in the Department of Psychiatry, have been selected by the American Psychiatric Association to receive the Nancy C.A. Roeske, M.D., recognition for excellence in medical student education.

The *Journal of General Internal Medicine*, in its list of the "best" articles published in the last two years, cited "Treatment of Fibromyalgia with anti-depressants – a meta analysis" (J Gen Intern Med. 2000 Sep; 15[9]: 659-666). It was also cited as the best review article. Authors included Army Lt. Col. Jeffrey Jackson, an assistant professor in USU's Department of Medicine and a 1995 Master of Public Health program alumnus.

Quinnan Selected to Chair Department

U.S. Public Health Service Capt. Gerald V. Quinnan, Jr., was selected to chair the Department of Preventive Medicine and Biometrics following a nationwide search, succeeding Dr. Larry Laughlin in the post. Laughlin was selected as the dean of USU's F. Edward Hébert School of Medicine last spring.

Quinnan came to USU in 1993. He holds academic appointments as a professor of preventive medicine and biometrics, molecular and cell biology, and emerging infectious diseases at the university. He is an expert in virology and infectious diseases and has served as a member of the Department of Defense Select Panel on Biological Warfare Vaccine Research and Development, a consultant to the Pan American Health Organization, the World Health Organization and the Centers for Disease Control and Prevention, among other entities.

The new chair earned his Doctor of Medicine degree, cum laude, in 1973 from St. Louis University School of Medicine in Missouri, and completed his medicine residency, followed by an adult infectious disease fellowship, at Boston University Medical Center in Massachusetts. He is a fellow of the Infectious Disease Society of America and a diplomate of the American Board of Internal Medicine.

Interdisciplinary Program Chair Selected

On Jan. 10, School of Medicine Dean Larry Laughlin announced the appointment of Jeffrey M. Harmon, Ph.D., as director of the interdisciplinary graduate program in molecular and cell biology. Harmon succeeds Dr. William Gause who served in this position from 1995 until his recent appointment as vice chair of the Department of Microbiology and Immunology.

The faculty of the molecular and cell biology program comes from 11 basic science and clinical departments. Their research programs reflect a wide range of interests, including the molecular virology of HIV pathogenesis, the function of the immune system, and the mechanisms by which cells sense, process, and respond to a variety of normal and abnormal stimuli. These programs attract extensive funding from the National Institutes of Health, the National Science Foundation, and a host of other public and private agencies and provide molecular and cell biology students, who come from all over the world, with the opportunity to receive training in virtually every cutting-edge area of modern biomedical research.

Harmon, a professor in the Department of Pharmacology, received his doctorate in radiation biology and biophysics from the University of Rochester in 1976, and was a Damon Runyon-Walter Winchell Fellow in Cancer Research in the laboratory of biochemistry of the National Cancer Institute from 1976 to 1978. His own research is

directed at elucidating the mechanisms by which steroid hormones regulate the expression of specific genes in cancer cells and understanding how cancer cells become drug-resistant.

Wanzer Appointed to Head New Nursing Degree Program

Army Lt. Col. Linda J. Wanzer has been named the director of the new perioperative clinical nurse specialist master's program option offered by the USU Graduate School of Nursing.

Wanzer came to the university from Landstuhl Regional Medical Center in Germany, where she was chief of the operating room and central material supply. While there she also served as perioperative consultant for readiness issues in support of 212th MASH (Mobile Army Surgical Hospital) contingency and training missions.

Wanzer led the way in patient safety innovation and productivity at the unit, institution and regional levels, spearheading standardization efforts focused on the creation of a non-punitive environment for reporting medical errors and a framework for improving systems and processes. The perioperative risk aversion/patient safety initiatives she instituted were highlighted in "Patient Safety: A Perioperative Competency Module," as well as in a guide published on the Web page of the Association of Operating Room Nurses.

Last year Wanzer was selected to be a member of the AORN Presidential Commission for Patient Safety, working with the nationwide perioperative community, including the American College of Surgeons and the American Nursing Association, to develop and standardize patient safety initiatives.

Wanzer has published and made numerous presentations on robotics in surgery, sterilization, patient safety and her experience as a perioperative consultant and educator for a humanitarian mission in Lebanon. Her "Surgical Sentinel Event Alert Safety Guidebook" has been submitted to AORN for publication on the Patient Safety First Web site. Currently, she is also involved in the design of a tri-service perioperative consultant Web page to enhance communication across service lines.

New Chair of Biochemistry and Molecular Biology

With more than 25 years as a faculty member at USU, Paul Rick, Ph.D., was selected to lead the Department of Biochemistry and Molecular Biology. Rick joined the university in 1977, after completing a postdoctoral fellowship at the University of Connecticut Health Sciences Center. He received his doctoral degree in biochemistry in 1971 from the University of Minnesota and, Rick said, his subsequent fellowship enabled him not only to grow as a biochemist but also to develop as a molecular biologist and educator.

During the past two and a half decades, Rick's research interests have been primarily focused on the processes involved in the assembly of cell-surface structures in bacteria. His lab works to define the genes and enzymes involved in the assembly of the enterobacterial common antigen of gram-negative enteric bacteria. He and the members of his laboratory have made great progress in defining the function of this unique polymer. Funded steadily since 1984 by National Institutes of Health grants, Rick has received intramural support from USU as well. Graduate students and postdoctoral fellows who worked in his lab have received training in the application of biochemical and molecular biological approaches to research.

School of Medicine Dean Larry Laughlin described Rick as a "distinguished scientist and faculty leader at USU, and well respected within our community" who will continue to be a strong contributor to the faculty leadership.

Retired U.S. Army Gen. Barry R. McCaffrey, the Olin Distinguished Professor of National Security Studies at the United States Military Academy, West Point, N.Y., visited USU recently to discuss the military commander's expectations of the medical officer. His talk, geared primarily to medical students, centered on the medical officer's role in taking care of troops and the challenges that they will face in providing health care.

USU Research Recognized in Science's 'Top Ten' Breakthroughs

USU investigators Ignacio Provencio, Ph.D., and Mark Rollag, Ph.D., and their colleagues in the Department of Anatomy, Physiology and Genetics, were one of five independent research teams that discovered a "brand new class of light-responsive cells in the mammalian retina that connect directly to the brain's clock." In recognition of this discovery, *Science* magazine cited their work in the Dec. 20, 2002, issue in an article entitled "Breakthroughs of the Year."

USU's team advanced understanding of how light resets the circadian clock, the internal timepiece that regulates daily patterns of behavior and physiology. As a result of their findings, scientists are closer to developing treatments for deployed soldiers and others who suffer from fatigue associated with jet lag. The application of new treatments, once developed, will have a tremendous impact on operational readiness issues in all branches of the uniformed services.

Strengthening Medical Education

Research assistant professor Janice L. Hanson, Ph.D., education section, Department of Pediatrics, was awarded a three-year grant from the Bureau of Health Professions, Health Resources Services Administration, Department of Health and Human Services. The project funded by the grant entitled "Collaborative Competency-Based Medical Education," will develop and implement strategies for teaching and evaluating communication and professionalism competencies in the pediatric and family medicine clerkships at USU. Hanson and Virginia Randall, M.D., an associate professor in the Department of Pediatrics, work with a group of parent and patient advisors to the medical education program as part of an ongoing project funded by the Josiah Macy, Jr. Foundation. The new funding from the Bureau of Health Professions will support an expansion of this work and the involvement of additional advisors from diverse backgrounds and with varied medical experiences. These advisors will work collaboratively with Hanson and other faculty members in the pediatrics and family medicine departments to define behavioral markers of professionalism, develop new teaching activities, and help teach and evaluate those activities.

Trauma Training

from the City to the Battlefield

It is 1 p.m. on a warm and beautiful day in Miami. Tourists bask in the sunshine on the world-famous beaches while a few miles away the inner-city neighborhoods buzz with activity of a different sort. On a street corner tempers flare and an anonymous immigrant falls to the ground, beaten into unconsciousness, a baseball bat to the head the weapon and method.

Within minutes, "John Doe" is airlifted by the Miami-Dade Fire Rescue to the Ryder Trauma Center of the University of Miami/Jackson Memorial Hospital.

Inside the center, as doctors, nurses, medics and students tend to the needs of the patients already in-house, pagers go off and teams of health care professionals materialize from all corners to meet the critically injured patient being delivered by medevac helicopter.

Meanwhile, more than 1,000 miles to the north, and 3,000 miles to the west, similar scenarios play out in the casualty receiving rooms of the University of Maryland R. Adams Cowley Shock Trauma Center in Baltimore, and the Los Angeles County Hospital-University of Southern California Medical Center, with military health-care teams among those playing an important role.

Trauma: A History

Merriam-Webster Dictionary defines trauma as "an injury to living tissue caused by an extrinsic agent." According to Trauma Services of Tyler, Texas, trauma is the fourth leading cause of death among Americans of all ages, and kills more people under age 45 than any other disease or illness today. However, just over 50 years ago, a physician's experience in treating traumatic injuries was primarily limited to service in the military – wartime trauma.

USU adjunct surgery professor Dr. Michael DeBakey, along with Dr. Fred Rankin, at that time produced a series of surgical volumes, *Surgery in World War II,* that became the basis for military medical preparedness and led to the establishment of the U.S. Army–Baylor College of Medicine Research Center in Houston, Texas, through a grant from the Army surgeon general's office. The center became a regional hub of trauma activity, giving birth to the phrase "trauma center."

Several years later, in the 1960s, additional trauma centers were established through the program in Illinois and in Maryland, and it was through these institutions that civilian hospitals began to benefit from the military research and experience in burns, shock, gun shot wounds and numerous other injuries.

During the Vietnam War, many physicians were called into military service, draining these centers of their trauma expertise. Their loss was the military's gain, however, as these surgeons tended to mass numbers of traumatic injuries in the combat theater of operations. Over time, these wartime veterans have retired or left the military, leaving concerns about the readiness of military surgeons to manage combat injuries. In the last 30 years, real wartime trauma experience for military physicians has been limited, with Operation Desert Storm being the last major event–it only yielding about one and one-half trauma surgeries per doctor in a 24-hour period. Although each service wanted its physicians to be prepared to operate in combat, opportunities for training in-house in the hands-on care of trauma patients have been limited.

Joint Trauma Training Center

While working on his master's degree in health care administration, USU charter class ('80) alumnus, then-Lt. Col. Cass Conaway, developed the concept of a collaborative military-civilian centralized trauma team site where the Army's forward surgical teams could rotate, not as individuals but as whole units.

The concept was launched in December 1997 by Conaway with the support of then-Maj. Gen. James Peake, who was the commander of the Army Medical Department Center and School in San Antonio, Texas. Simultaneously, the Government Accounting Office published a report recommending military personnel use civilian trauma centers as a source for medical readiness training. In September 1998, a 30-day pilot rotation and study was conducted at Ben Taub General Hospital in Houston, bringing together physicians, nurses, nurse anesthetists, medics and administrators for the team training. "The pilot study was hugely successful and all three services, in February 1999, agreed to establish the Joint Trauma Training Center at Ben Taub General Hospital," Conaway said.

The center opened in July of that year, and during the next two years, forward surgical teams from each service rotated through with great success. Unfortunately, the patient throughput was not sufficient to sustain the program at Ben Taub, but according to Conaway, each military branch decided to expand the Joint Trauma Training Center concept and opened its own service-specific trauma training center in 2002.

The USU Connection

Drs. Bill Beninati, Tom Knuth, and Peter Rhee have a lot in common. All are graduates of USU – Beninati in '88, Knuth in '84, and Rhee in '87 – all sub-specialize in trauma and critical care, and each heads his service's trauma training program.

Lt. Col. Beninati is a pulmonologist and the medical director of the Air Force CSTARS program at the R. Adams Cowley Shock Trauma Center in Baltimore. Knuth, an Army colonel, is a trauma surgeon who runs his service's program at the Ryder Trauma Center in Miami, and Rhee, also a trauma surgeon, is a commander who spearheads the Navy's program at L.A. County Hospital–USC Medical Center in Los Angeles. While each believes a separate program should be maintained for each service, they all agree on a shared goal of ensuring that military medical professionals have clinical skills necessary to sustain themselves on the battlefield and are adequately prepared to work together as a team in combat.

Army Trauma Training Center

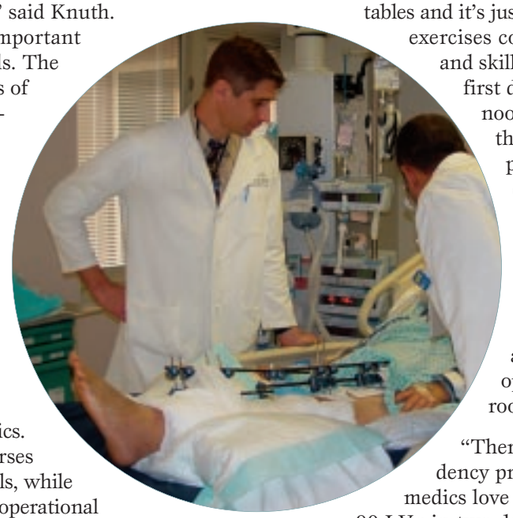
Tucked away on the ground floor of the Julio Iglesias Wing of the Ryder Trauma Center are the offices of the Army Trauma Training Center. Several cubicles lining both sides of one room make up the main staff office, while down the hall and around the corner Knuth's office sits near the trauma center's operating suite. The center is located on the sprawling 16-acre compound that encompasses the University of Miami School of Medicine, Jackson Memorial Hospital, a variety of shops and fast food restaurants, and a Veterans Administration medical center. Jackson Memorial is a 1,500-bed teaching hospital with a $1.4 billion operating budget, according to Knuth, with 88 operating rooms and a reputation for significant expertise in organ transplants.

Ryder Trauma Center is one of only three freestanding trauma hospitals in the nation, with Baltimore's Shock Trauma and Las Vegas' University Medical Center the other two. Ryder has a trauma resuscitation unit with five bays and six critical care observation beds, and six trauma operating rooms that simulate the forward surgical team environment where vehicle accidents, gunshot wounds, stabbings, industrial accidents and crush injuries – the same type of injuries seen in military combat zones – are seen, making Ryder an ideal site for a military training program. Down the hall is Jackson Memorial Hospital's emergency room that sees 130,000 patients per year, including lower acuity trauma patients that provide good training for Army staff.

The Army Trauma Training Program was established in January 2002, with seven full-time staff members. Knuth is the only physician assigned to the program. He is assisted by a nurse anesthetist, intensive care unit, emergency room and operating room nurses, a non-commissioned officer, and a medical service corps administrator.

Program attendees, referred to as "rotators," all have assignments as members of an Army forward surgical team, those who provide front-line medical care during combat. They train together as an established team, which is an important aspect of the program.

"We focus on the team approach," said Knuth. "Team dynamics is every bit as important to patient outcome as clinical skills. The leadership and organizational skills of the team leaders are just as important as their clinical skills. They can be the best doctors or nurses in the world, but unless they can manage the chaos of the situation, the patient suffers."



Each 20-person team is comprised of three general surgeons, an orthopaedic surgeon, an operating room nurse, emergency room nurse, intensive care unit nurse, two nurse anesthetists, an administrator, and 10 enlisted medics. Knuth said the physicians and nurses come primarily from Army hospitals, while the medics are usually assigned to operational units. In addition, the Army program trains reserve component forward surgical teams.

"Two-thirds of the deployable force are reservists," said Knuth. "We recognized right away that we needed to train to one standard."

The active duty teams complete a 30-day rotation, while the reservists, whose civilian jobs are not typically in medicine, stay for two weeks. At first, the program was geared only to active duty members, but midway through the first year, Knuth said, there were cancellations because of deployments. He was approached by the commander of the 3rd Medical Command in Miami, who asked if he would allow a reserve team to fill in the gap with a two-week rotation.

"At first I thought it might be too disruptive," said Knuth, "but Dr. [Stephen] Cohn, the chief of trauma and critical care [at Ryder], said 'if you think you can do it, do it.' We've had to tighten up the program in order to make the two weeks meaningful, and we're not quite there yet, but it's getting better with every rotation."

The Army program starts out with an assessment of skills and leadership abilities, for which feedback is provided. They look for availability, communication, teaching, mentoring and assertiveness qualities in team members. "Team skills do not necessarily come naturally," Knuth said. "They have to be practiced and developed just like everything else, and if you can measure it, you can manage it."

One way to measure abilities is in the lab. Knuth explained that the Army program works in conjunction with the University of Miami School of Medicine's physiology lab to create a mass casualty situation on the rotators' first day.

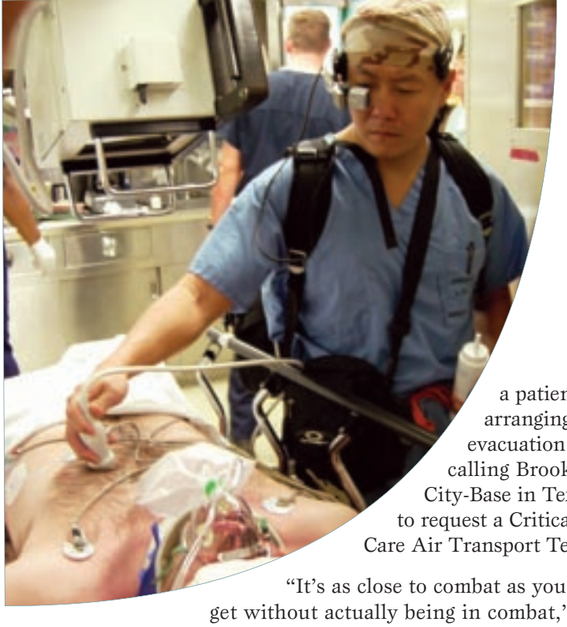
"We create a combat scenario and tell them to expect casualties. They triage, resuscitate and operate. There are two tables and it's just like a forward surgical team. It exercises command and control functions and skills," said Knuth. "We do it on the first day, after orientation. It starts at noon and is a six-hour exercise. At the end of the exercise, we have a pretty good idea of the team's capabilities."

Knuth said the Army program members have a great working relationship with their civilian counterparts at Ryder. In fact, enlisted medics rotating through are given their fill of training opportunities in the emergency room.

"There is no emergency medicine residency program here," Knuth said. "The medics love it. One Special Forces medic did 90 I.V.s in two days. They also do four 24-hour shifts with the Miami-Dade Fire Department – three ground rotations and one air. There is no excuse to leave here without being absolutely comfortable with all of their skills."

The program also includes several Army-only training days. "Army Bay Day" is a day during which the Ryder staff turns over responsibility for a trauma bay to the rotators. One intensive care unit trauma bay can accommodate four patients, and a medic and nurse are paired in each bay. The civilian staff is on hand to maintain the center's standards, Knuth said, "but they are extra accommodating to allow the Army rotators to get the experience they need." On "Army O.R. Day" the rotating operating room nurse and scrub technicians manage all elective surgical cases in a room for the day.

At the end of the rotation, teams experience the "Super Bowl," an event invented by Conaway. During a 48-hour period, all patient activity is turned over to the Army. The civilian staff is present, but the Army makes all the management decisions involved in patient resuscitations, operations, and recovery. In addition, rotators go through a "notational evacuation" exercise that involves admitting



a patient and arranging for evacuation by calling Brooks City-Base in Texas to request a Critical Care Air Transport Team.

"It's as close to combat as you can get without actually being in combat," Knuth said. The "Super Bowl" tests team leadership abilities and assesses work/sleep cycle capabilities. "It's like Bushmaster with real patients," he said. "Every team so far has gone through a transition. They start at a certain level of confidence that always grows. They are dead tired at the end of these 48 hours, but you can see in their faces that they have confidence in themselves that they will be able to do their jobs on the battlefield. That's really what it's all about."

LAC+USC: Navy Trauma Training

According to Cmdr. Rhee, the trauma center located at the 600-bed L.A. County Hospital + USC Medical Center has the highest volume of trauma cases in the country: over 7,000 per year. "It's an absolute zoo," he said, and the perfect place to locate the Navy Trauma Training Center.

Rhee heads a 10-person naval staff that also includes an anesthesiologist (Lt. Cmdr. Orlando Ricci, USU '93), orthopaedic surgeon, emergency physician, emergency room nurse, intensive care unit nurse, operating room nurse, operating room technician, independent duty corpsman, and an administrative medical service corps officer, all of whom reported for duty in May 2002. The first group of rotators arrived in September and since then four additional classes have been trained.

Navy teams consist of 24 members: 12 "green" who are assigned to forward resuscitative surgical suites (FRSS) or shock trauma platoons, and 12 "blue" who are members of fleet surgical teams aboard casualty receiving transport ships. Rhee said the FRSS teams are those who are deployed far forward on the battlefield, and shock trauma platoons are even closer to the front lines. He also said that while surgeons have a very important role on the team, it's "more about nurses and corpsmen. Corpsmen and nurses form the basis of the team."

The NTTC trains teams just prior to deployment. Rotators spend a month in the program that consists of didactics, case studies, skills stations, and simulations with mannequins, as well as plenty of hands-on trauma patient care.

"Ninety-nine percent [of the rotators] have not had any recent trauma experience when they get here," Rhee said, "but they are much better prepared when they leave. Because the Navy hospitals do not routinely take care of trauma patients, the trauma experience in the Navy during peacetime is not adequate. The training is good, but without real-life experience, it is sub-optimal. If you were hurt in a car accident or shot, wouldn't you like to be taken to a trauma center where there are experienced people around to help you? You wouldn't want to be taken to a small community hospital where things can get chaotic. We provide just-in-time training and experience before their global deployment. We owe it to our friends and family who are out there ready to take a bullet for our country to ensure that our medical providers are as good as we can get them."

Rotators work five days a week and on average 12 hours per day. Surgeons are on call every three days. NTTC staff suggest that "personnel who are not prepared academically, mentally, and physically will jeopardize the team, the mission, and most importantly, patient care" and recommend that only those who are "100 percent medically ready and deployable" should be considered for the training program.

Just as the Army does, the Navy's program includes "O.R. days." The hospital opens a separate operating room and staffs it with Navy personnel. In addition, throughout the program, Navy team members get emergency room experience and rotate through the intensive care and burn units, the operating room, and also ride with ambulance crews.

Rhee believes that the services should maintain separate trauma training programs. "We teach a lot of didactic information for the Marine Corps and the Navy that is not applicable to the Army and the Air Force. We can cross-train if necessary for logistical purposes, but I think it's perfect the way it is. Blunt trauma and critical care transport is handled by the Air Force. The Army's expertise is in general surgery and humanitarian missions. The Navy is meant to take care of trauma way up forward."

CSTARS and Shock Trauma

The Air Force Trauma Training Center, referred to as "CSTARS," is located within the University of Maryland's R. Adams Cowley Shock Trauma Center in Baltimore, a 210-bed freestanding hospital facility located in the shadow of the Orioles' Camden Yards baseball stadium and only a few blocks from the waterfront. The center sees between 6,500 and 7,000 patients annually; 100 percent of them admissions who arrive via state police helicopter, paramedic ambulance or are transferred from hospital intensive care units.

The CSTARS–Coalition for Sustainment of Trauma and Readiness Skills–program is comprised of 14 full-time Air Force staff members. In addition to Beninati, there are six physicians (including USU alumni Maj. Jeffrey Johnson ('93), a trauma surgeon, and Maj. Shawn Varney ('93), an emergency physician); a nurse anesthetist (Capt. John Killpack, GSN '02); intensive care unit, trauma, and operating room nurses; two medical technicians; and one administrative officer. Although most hospital staff members at Shock Trauma wear their trademark pink scrubs, CSTARS staff is readily identifiable through lab coats embroidered with the Air Force insignia.

According to Beninati, during Maj. Gen. Paul K. Carlton's term as Air Force surgeon general there was a big thrust toward making Air Force medical centers major operational medicine platforms. The Readiness Skills Verification Program, or RSVP, was established and one of its major tasks was to develop a list of critical skills that health care providers would need when deployed, so they could hit the ground running in the combat theater of operations. The end result was that a significant gap was identified between battlefield skills needed and those that health care providers actually possessed.

"You tell a doctor that he needs to be current (for wartime standards), but then you send him to a hospital with no trauma patients. You have to give him a solution to bridge the two platforms," Beninati explained.

'Devil Docs' are Battlefield Angels

CNN reported on the work of Navy doctors, dubbed 'Devil Docs,' travelling with U.S. Marines on the front lines of the war in Iraq. The doctors, part of a shock trauma platoon, work in a mobile operating room, under austere conditions, performing surgery on soldiers and Iraqis alike.

Captain John Perciballi ('83), the unit's chief surgeon and a clinical assistant professor at USU based at Pensacola Naval Hospital, made it clear that the most severely wounded front-line fighters are treated first, whether they be allies or enemies. Because of the austere circumstances and temporary facilities, they have to "really pick and choose those critically injured patients that have to be taken care of now." The scope of work rivals any large trauma center in the U.S.

Baker at the Front Again

In an Associated Press (AP) article dealing with the "golden hour" of trauma for U.S. Navy surgeons in Iraq, USU alumnus Cmdr. Bruce Baker ('86) again demonstrated his knowledge of operational medicine. He also reported from the field in Afghanistan in the inaugural issue of *USU Medicine* (Winter 2002).

Baker, an anesthesiologist, was quoted in the AP article about his ability to provide a high level of care in medical tents in hot, dusty southern Iraq, although he must work with different equipment, including a portable oxygen generator, blood-gas monitor and devices to warm fluids going into patients. He is a member of a forward resuscitative surgical systems team, now operating for the first time ever in combat. With seven years in the design phase, the forward surgical units are truly mobile and replace ones that would have needed a transport plane and landing field to move. This surgery team can move using four trucks and can set up or tear down in an hour. The unit includes two surgeons, an anesthesiologist, a nurse, operating technicians and corpsmen who are able to handle as many as 18 patients in a 24-hour period.

As expected, the doctors treat all critically wounded people, whether they are Iraqi, American or British. These patients represent 15 to 20 percent of those wounded in battle who would otherwise die if critical care is not provided within the "golden hour." Baker described it as "damage-control surgery" and, for the Iraqis in particular, immediate surgery stemmed blood loss and led to survival.

The solution was CSTARS. Air Force members assigned to Critical Care Air Transport Teams or EMEDS teams spend between three to four weeks in the program designed to enhance their skills in the care of critically injured or ill patients. Physician assignments last approximately 34 days, while enlisted technicians stay only 21 days. Beninati said the medics' rotation used to be longer, but in their capacity as "extenders," they are subject to nurse licensure regulations in Maryland, limiting their hands-on experience. Now, he said, medics come in and get to do a pre-hospital trauma life support rotation in the trauma resuscitation unit and ride with the Baltimore City Fire Department on their paramedic rigs. According to Beninati, working with the fire department paramedics allows for more hands-on care than the state licensure rules permit when they function under nursing in the trauma center.

Nurses and surgical technicians stay for approximately 25 days and work primarily nights when the "gun-and-knife club" is active in the city. Beninati said they get advanced trauma care for nurses and can earn up to 240 contact hours of continuing education credit. Physicians attend noontime lectures every day, and there is also a military-only journal club for CSTARS participants. Physicians have the potential to earn up to 70 hours of continuing medical education credit, but with call, lectures, and other demands on their time, "it doesn't happen," said Beninati. Medics earn approximately 26 credit hours.

Rotators come in and are integrated into the hospital, just like residents or fellows. When a call comes in, they take a specific position around the table – A, B, C, or D. On the next call, they rotate positions, depending on what kind of case comes in or the level and volume of activity in the trauma unit.

The hospital is notified of an incoming patient through a call on what staff members refer to as the "batphone." When the "batphone" rings, an attending physician is notified, given the information to determine if the patient should be brought in, and whether it will be by ground or air transport. Alphanumeric pagers notify other trauma unit staffers of the patient's arrival, injuries, and status.

The most common injuries seen at Shock Trauma are blunt trauma injuries. Everything needed to treat these patients is available in the trauma resuscitation unit.

"The trauma resuscitation unit has 10 standardized trauma bays, a lab, radiology, CT scan, and six dedicated operating rooms of its own," said Beninati. "We can do everything self-contained in the 'golden hour'" – the critical 60 minutes immediately following a serious injury that determines a victim's survival.

"It's busy," said recent CSTARS rotator Maj. Kris Kordana ('95). "I'm on call every third night on average. The concept is a refresher for ICU skills. Anybody in a mobility position gets to rotate through. I get to do surgical ICU stuff, which theoretically is closer here to doing it deployed. A lot of it is medicine, too. In a deployed situation, it's the internists. We're the intensivists. There's a lot of similarity. I think the goal is to rotate 20 internists a year through here."

Unlike the Army and Navy programs, the Air Force's CSTARS program at Shock Trauma trains only active duty members. A separate, two-week program for reservists is housed in Cincinnati.

In addition to the program's role in enhancing clinical skills, Beninati said they are aiding in homeland security, providing teaching assistance through international engagement missions, and conducting research.

Recently, they participated in a disaster drill with hospital personnel. Through the use of their SPEARR team equipment, Beninati said they were able to set up a portable hospital in the street for decontamination and medical care. "It shows civilians what they can do with a model like this," he said.

And through collaborative training programs in our nation's busiest Level 1 civilian trauma centers, military surgical teams are now better prepared to save lives on the battlefield.

– Sharon Willis

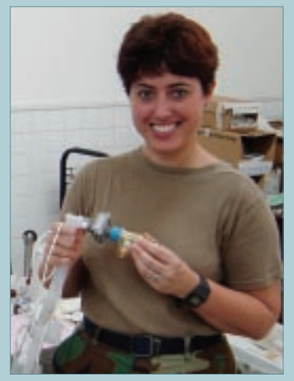
212TH MASH: ALUMNI TREAT CASUALTIES OF WAR

Based in Germany, the 212th Mobile Army Surgical Hospital (MASH), to which a number of USU alumni are assigned, was deployed to Iraq. On a Saturday in April, according to the *Washington Post*, the exchange of fire on the outskirts of Baghdad led to the busiest day since the war began for the 212th, the Army's most forward surgical hospital in Iraq. The dozens of casualties presented shrapnel and gunshot wounds as well as severed limbs.

Maj. David Vetter ('94), an internist assigned to Landstuhl Regional Medical Center, was quoted in the *Post* article about the broad spectrum of suffering seen by this unit, ranging from an American soldier's loss of a finger in a secondary explosion from a blasted tank to the soldiers lost in an airport accident to an injured and bereft Iraqi student whose parents and sisters were killed when a U.S. tank ran over the car in which his family tried to flee.

The number of patients at this 36-bed hospital tent grew beyond capacity following the arrival of medevac helicopters, and U.S. pilots had to give up their cots in order to make room for the wounded. Another USU alumnus, Lt. Col. John Cho ('88), a cardiothoracic surgeon assigned to Walter Reed Army Medical Center, was awakened early and began a series of 15 operations. Doctors said about 60 percent of the casualties were Iraqis, all of whom were brought in and cared for under humanitarian doctrine.

Operational Readiness: GSN Alumna Serves as Member of SPEARR Team



Air Force nurse anesthetist Maj. Adrienne Hargerink (GSN '97) was deployed recently to the Republic of the Philippines in support of Operation Enduring Freedom. As the anesthesia component of a Small Portable Expeditionary Aeromedical Rapid Response (SPEARR) team, her experiences provide insight into the austere and often dangerous environments in which medical professionals must work during the continuing war on terrorism.

The SPEARR team concept was developed and utilized during the multiple terrorist events and disasters of the 1990s. A SPEARR group, comprised of a Mobile Field Surgical Team, a Critical Care Team, and a PAM-ADVON Team (including an aerospace medicine specialist and a public health officer), focuses on emergency stabilization and/or treatment with return to duty or aeromedical evacuation in 72 hours or less.

Before deploying, Hartgerink and fellow members of the SPEARR team trained together on the equipment, a tactic essential to their success. Their mission was two-fold: to provide care for 1,200 American soldiers sent to a remote island in the Philippines and to assist the host nation in the treatment of their own soldiers, including surgical care for Filipino troops wounded in combat against the Abu Sayef and other terrorist groups.

The SPEARR team not only managed combat casualties but also supported local needs. More than 10,000 civilians were served as part of 20 humanitarian missions during their four-month stay. Working with Filipino military and charity groups, much needed medical care and preventive medicine skills were provided, advanced and basic life support classes were taught to hospital staff and local emergency medical technicians, and funds were raised to update a dilapidated pediatric ward.

A week before the team's scheduled departure, a motorcycle bomb outside a local restaurant injured 25 and killed four. Triage was difficult, but most of the casualties could be categorized as minimal or delayed allowing for care of other, more severely injured individuals. Fortunately, the team had been cross-trained, so they were able to relieve each other to get the job done.

Aeromedical evacuation, an important asset in a mass casualty situation, was initiated immediately for the more seriously injured. Faced with a second mass casualty scenario involving 21 Filipino soldiers, the team applied important lessons from their earlier experience. The emergency physician circulated in the operating room, the flight surgeon changed suction canisters, and the general surgeon assisted with orthopedic surgery. Field anesthesia apparatus was adapted to support patient needs. Each team member received the Army Commendation Medal for their lifesaving treatment of the casualties.

The war on terrorism has made it likely that medical personnel of all services will find themselves performing in less than ideal conditions. An Army medical team followed the Air Force SPEARR team, using their equipment and supplies. The joint environment in future scenarios will challenge the uniformed services to fill required medical specialty positions around the globe as well as benefit from sharing increased expertise in caring for wartime casualties.

smallpox and the military

Epidemiologists believe that smallpox was responsible for the deaths of about one billion people during the last one hundred and thirty years.

Consistently ranking among the Centers for Disease Control and Prevention's top six rated potential biowarfare agents, smallpox is an acute, highly infectious disease that is often fatal, and whose origins in humans can be traced back thousands of years. According to the CDC, there are two clinical forms of smallpox. "Variola major is the severe and most common form of smallpox, with a more extensive rash and higher fever. There are four types of variola major smallpox: ordinary (the most frequent type, accounting for 90 percent or more of cases); modified (mild and occurring in previously vaccinated persons); flat; and hemorrhagic (both rare and very severe)."

Smallpox, known only to affect humans as a disease, is spread by prolonged person-to-person contact or through contact with contaminated items such as clothing or bed linens. Persons exposed to smallpox undergo a 12- to 14-day incubation period before symptoms, including high fever, malaise, headache and backache, appear. Victims are usually very ill during this phase, which lasts two to four days. Afterward, a rash develops in the mouth, eventually spreading down the throat through open sores emitting the virus. This is the most contagious time for a person afflicted with smallpox. The rash then appears on the face and forearms before spreading to the trunk, legs and feet. Within a few days the rash forms into pustules – elevated round bumps that are hard to the touch. The pustules crust over and form a scab. As the scabs fall off, pitted scarring occurs in the victims, who remain contagious until the last scab has come off.

There is only one way to prevent smallpox, and that is through vaccination. In 1796, scientist Edward Jenner demonstrated that an infection caused by live cowpox virus stimulates an immune response that protects against smallpox. His discovery was the precursor to today's widely used vaccine.

The majority of people vaccinated are protected within 10 days of inoculation. Even after exposure, the vaccine has proven to be effective. A smallpox vaccination given up to three days after exposure can prevent or reduce the infection, and within four to seven days will offer partial protection or lessen the severity of the disease. After an initial vaccination, protection is said to last between three and five years, and approximately 10 years following a revaccination.

Throughout history, smallpox has influenced outcomes of war. Athens was defeated by Sparta in the Peloponnesian War as a direct result of a smallpox epidemic that killed one-third of the population. In the fighting between the Aztecs and Spaniards, over half of the Aztec empire was killed by an outbreak of smallpox. During the French and Indian wars, the British in North America were the first known forces to use smallpox as a biological weapon, intentionally distributing blankets infected by smallpox patients to initiate outbreaks among American Indians. After a staggering loss of troops in Canada during the Battle of Quebec, George Washington ordered his forces to be protected from the disease, using an early form of vaccination.

A global campaign, begun in 1967 under the aegis of the World Health Organization, succeeded in eradicating smallpox, the last known naturally occurring case appearing in Somalia in 1977. It has been 54 years since the last smallpox outbreak in the United States. A 1975 WHO survey determined that a total of 75 laboratories in the world held scabs or viral isolates from smallpox patients: 29 in Europe, 18 in the Americas, 13 in Southeast Asia, 7 in the Western Pacific, 5 in Africa, and 3 in the Eastern Mediterranean. Because of the significant numbers of laboratories involved, concern existed over accidental exposure. To work with variola, a laboratory should be capable of a biosafety level-3, and preferably a biosafety level-4. Only a few laboratories in the world have such facilities. A WHO expert committee subsequently recommended that all laboratories destroy their stocks of variola virus or transfer them to one of two WHO-referenced laboratories – the Institute of Virus Preparations in Moscow, or the Centers for Disease Control and Prevention. All countries reported compliance. Once the disease was pronounced officially eradicated, the World Health Assembly recommended that routine vaccinations cease. The U.S. stopped giving smallpox inoculations to the public in 1972.

However, in large part due to mistrust of foreign militaries, and in particular the knowledge that the Soviet Union was still vaccinating its military, the U.S. armed forces continued immunizing troops. As reports of complications arising from the vaccination began to surface following the eradication of the disease, concern shifted to how long the military should continue the practice. The Armed Forces Epidemiological Board recommended using it with limitations, and eventually, partly as a result of diminishing stocks of vaccine immunoglobulin used to treat complications from the vaccine, the military only administered it episodically. In 1990, the Department of Defense stopped giving smallpox vaccinations to troops as a rule, except those whose members worked in labs dealing with smallpox, monkey pox, or the orthopox virus.

According to USU assistant professor of preventive medicine and biometrics, Air Force Col. R. Dana Bradshaw, renowned physician D.A. Henderson, who led the WHO efforts to eradicate smallpox, in 1999 published, along with other experts, a seminal article in the *Journal of the American Medical Association* reviewing the potential of the disease as a biowarfare agent. After September 11th, Bradshaw said, planning for smallpox preparedness, including stockpiling and development of new sources for the vaccine, was in high gear. The DoD patterned a program for the military after the CDC's, sending Army Col. John Grabenstein, director of the Anthrax Vaccine Immunization Program (later expanded to the Military Vaccine Program) in the office of the Army surgeon general, to the subject matter experts to help in the process. The result was a 400-page preparedness plan.

Through discussions with the Department of Health and Human Services, Dr. William Winkenwerder, the assistant secretary of defense for health affairs, "decided to push the plan through on a quick turn," said Bradshaw. Winkenwerder asked the Army, Navy and Air Force medical departments for nominees to work for a three-to four-month period on smallpox and pandemic influenza response planning. The result was the DoD Select Agents Response Task Force, to which Bradshaw was assigned along with the Army's Col. Charles Hoke, and the Navy's Lt. Cmdr. Scott Spratt. Grabenstein, and Army Col. Ben Diniega, who is assigned to Winkenwerder's office, provided oversight for the group.

Bradshaw and the other team members concentrated on whom to prioritize for pre-outbreak vaccination, identifying what adverse events might be encountered by the military health care system and what they would expect to see, and making a plan for how to minimize and counter such events. Task force members were also involved in coordinating plans for investigating new drug uses of vaccinia immune globulin and cidofovir (an antiviral potentially effective for smallpox) in conjunction with the U.S. Army Medical Research Institute of Infectious Diseases and logistical planning for so-called "ring" and mass vaccinations in the event of an outbreak.

From Oct. 28 to Nov. 1, 2002, DoD hosted a smallpox preparedness conference in Arlington, Va., training the first 500 military health care personnel and first responders. On Dec. 13, 2002, the planning by DoD, CDC, and

HHS culminated in a speech to the nation delivered by President Bush:

"Today I am directing additional steps to protect the health of our nation. I'm ordering that the military and other personnel who serve America in high-risk parts of the world receive the smallpox vaccine; men and women who could be on the front lines of a biological attack must be protected."

Bush went on to recommend that medical professionals, emergency personnel, and smallpox response teams receive the vaccine as well, on a voluntary, precautionary basis.

Shortly thereafter, the military vaccination program began simultaneously at Walter Reed Army Medical Center in Washington, D.C., the National Naval Medical Center in Bethesda, Md., and Wilford Hall Medical Center in San Antonio, Texas, later expanding throughout DoD. From the outset, medical professionals associated with the DoD vaccine program sought to ensure that information was widely available on the disease, the vaccine, and any potential risks associated with inoculation to alleviate any concerns on the part of military members and their families. Web sites (including www.smallpox.army.mil) were set up, news campaigns were launched, and physicians involved in the program, including USU assistant dean for special projects Navy Capt. Gregory Martin, met with local and state civilian officials to share information with them on what was being seen following vaccination of troops.

Reactions to the smallpox vaccine can range from none at all to death, in rare instances.

"All vaccines cause side effects, but smallpox causes a unique reaction at the vaccination site," said Grabenstein. "After vaccination, a red blister appears that should turn white six to eight days [later]. Then it will turn into a scab." The scab will eventually fall off, leaving a permanent scar.

"Most people experience normal, usually mild, reactions such as a sore arm, fever, headache, body ache and fatigue. These symptoms may peak eight to 12 days after vaccination," Grabenstein said. However, individuals with certain health or other conditions should not get the vaccine, including those with eczema, immune-compromised patients, and pregnant women. People should also not be vaccinated if members of their immediate household have any of these medical conditions. The risk-benefit recommendations concerning vaccination may change in a post-outbreak situation if smallpox exposure is confirmed.

To date, well over 100,000 troops have been inoculated for smallpox with only six serious side effects reported. USU associate professor of medicine Col. Renata Engler runs the Vaccine Health Care Center at Walter Reed and monitors all problems reportedly associated with the vaccine in military members, clinically managing, evaluating and treating those serious enough to be sent her way. Lt. Col. Scott Norton, an assistant professor of dermatology at USU and chief of dermatology at Walter Reed, serves as a consultant to the smallpox program and is developing a hotline system to assist in the management of questions, issues and concerns related to the topic. Norton, who served as an American Academy of Dermatology consultant to the CDC to put together a chart for evaluating patients for smallpox, also developed an algorithm to differentiate chickenpox from smallpox, and continues to work with the CDC to make subject matter expertise available for the hotline system.

Vaccines, including that for smallpox, have saved more lives than antibiotics or surgery and remain one of the most significant accomplishments of modern medicine. USU faculty members are among those working to ensure the safety of our troops and citizens, and those around the world. President Bush, in his December 13th address to the nation, emphasized the importance of their efforts. "Smallpox is a serious disease and we know that our enemies are trying to inflict serious harm. We will continue taking every essential step to guard against the threats to our nation. The actions we are taking together will help safeguard the health of our people in a measured and responsible way."

– Sharon Willis

Smallpox Control in Early America

The Department of Defense and the Department of Homeland Security have recently re-introduced smallpox vaccination for those most at risk in a bioterrorist attack. The military vaccinations are like other military immunizations given by command order–a line, not a medical staff decision. What many people do not know is that this now, almost universal, military medical practice had its origin in the effort to control smallpox in the earliest American army — the Continental Line.

In 1775, following "the shot heard around the world," the Massachusetts militia besieged the British forces in Boston. The Continental Congress meeting in Philadelphia decided to support the New England patriots and appointed George Washington to the post of Commander-in-Chief of the army raised under the authority of the Continental Congress; it was named the Continental Line to distinguish it from the locally supported militia units. Washington rushed to Massachusetts to assume command and began planning a larger war effort. His first target was an invasion of Canada in the hope of gaining further support for the patriot cause. While he laid siege to Boston, smallpox broke out in the city and, as the British drove civilians out of the city, the epidemic spread to the surrounding American army.

Over the preceding half century the practice of variolation had grown increasingly common in English-speaking lands, and some regiments began inoculation with the smallpox, or variolation, among the troops. Washington ordered the piecemeal intervention stopped since it was contributing to the disruption and probably spreading the epidemic.

Variolation, the deliberate inoculation of a person with the matter from a smallpox patient's lesion, spreads the virus cause of smallpox – variola. Because it infects the new host through an atypical route, the body usually has the time to successfully mount an immunological defense. A mild case of smallpox is the typical result; however, the procedure had a case fatality rate that varied between one in 100 and one in 200. All recipients of variolation have an active case of smallpox and so contribute to the spread of the disease if not quarantined. Vaccination, the inoculation with the immunologically related cowpox virus, vaccinia, was introduced by Edward Jenner in 1796. Vaccination was used by public health officials to reduce and finally eliminate naturally occurring smallpox in the 1970s.

INOCULATION

Those who are desirous to take the infection of the SMALL-POX, by inoculation, may find themselves accomodated for the purpose, by applying to.

Stephen Samuel Hawley

Fiskdale, in Sturbridge.
February 7, 1801

N.B. A Pest-House will be opened, and accomodations provided by the first day of March next.

General Washington planned, and the Continental Congress authorized, an invasion of Canada. In late 1775, Maj. Gen. Richard Montgomery led American forces into Canada. Montreal fell in November, but as the army besieged Quebec in December, it was devastated by a smallpox epidemic. As Maj. Gen. Montgomery watched his army melt away, he ordered a desperate assault on the city; it failed and he died before the city walls. The smallpox did not end and, while exact figures are not available, a morbidity estimate of 40 percent of the force and a mortality estimate of 10 percent of the force seem reasonable.

As militia volunteers and short-term enlistees came and went, smallpox was maintained in all the small field armies through 1776 and into 1777. Finally in the dreadful winter of 1777, as the threat of smallpox seemed like it might break the revolution, Washington wrote, "We should have more to dread from it than from the sword of the enemy….." Gen. Washington decided to variolate the Continental Line, ordering the medical department to inoculate those troops currently in quarters at Morristown and all new recruits as they came into the army. Thus, the Continental Line became the first army in history to be essentially smallpox-free by command order. Washington was systematic in reinforcing his order with recruiters and, the next winter at Valley Forge, urged greater diligence on the part of commanders and surgeons because troops were being missed.

In 1812, the Secretary of War would shift the American army to vaccination, and the Prussians, the French and other armies would follow the young nation's lead into the 19th century. New sciences of microbiology and immunology at the end of the 19th century permitted the development of new "vaccines" and, as they proved useful, they were added to the list of immunizations given to the members of the American military establishment.

Dale C. Smith, Ph.D., Professor and Chairman, Department of Military Medical History.

GSN joins BUSHMASTER

Following the terrorist attacks on U.S. soil, the Graduate School of Nursing expanded its educational programs to address the changing nature of threats to both the military and civilians. In January, GSN faculty arranged an interdisciplinary experience in the Military Contingency Medicine Course offered by the Department of Military and Emergency Medicine. This course, unique to USU's medical school curriculum, was designed to enhance the abilities of general medical officers or medical specialists in the air, on land or at sea. Three weeks of didactic content at USU, followed by preparation at Camp Bullis near San Antonio, Texas, culminate in an evaluated experience in a field setting known as "Operation Bushmaster."

The comprehensive training includes advanced trauma life support, care of blast injuries, health care of women in military settings, altitude and dive accidents, pain management, and legal/ethical issues on the battlefield. Since Sept. 11th, a how-to class on successfully working with non-governmental agencies and the news media has grown in importance. Didactic learning in Texas, in classes under the stars and in tents, consisted of nuclear, biological and chemical training, ambulance loading and unloading procedures, radio operations, land navigation, and the role of the combat and civilian medic related to battlefield and humanitarian missions.

In Camp Bullis' field setting, with a scenario portraying a hostile environment, military officers – seven graduate nursing students, 60 medical students from USU, and 11 medical students from Japan and the United Kingdom – were responsible for triage, management, and the evacuation of casualties. For the first time, the weeklong Operation Bushmaster exercise allowed advanced practice nursing students and medical students to work together in a field environment under simulated battlefield conditions.

During the "war" in a mythical country called Pandakar, all students served in a variety of roles, including senior medical officer, commander, radio operator, litter bearer, security officer, and ambulance platoon leader. For a majority of the nurses, this was a continuation of training in austere environments. In their previous years of military service, several nurse officers had been deployed for real-world missions and had already completed courses in trauma nurse critical care and combat casualty care. However, Operation Bushmaster provided a unique clinical and leadership opportunity for GSN students to model the role of an advanced practice nurse in a multidisciplinary setting.

On day one of the "war," participants received their first front-line ambulance with four casualties, all within about 12 minutes. They applied the concepts of "tailgate" medicine, "care first, tents later," 600 miles away in a simulated foreign country. The field scenario focused on treatment of moulaged casualties requiring life-saving interventions. Challenges included locating and organizing immediately needed supplies as well as determining how and when to start interventions such as insertion of chest tubes and needle decompression.

Prior to deploying to the field, students learned and reviewed interventions in a simulated lab setting with mannequins that "bleed" and "breathe." In the field environment, however, challenges arose when the students were informed that the CT scanner would not fit on the Army truck three miles from the front line and alternatives had to be considered. Once they adjusted to a battle situation resulting in devastating wounds, students found themselves triaging and aggressively managing the patients. The threat of biological and chemical agents was more evident than in earlier training. All students were confronted with disease non-battle injuries such as meningitis and malaria. Several of the scenarios provided moral, cultural and geopolitical perspectives, as in the medical treatment of a prisoner of war who, upon release, was killed by the Pandakar "officials."

On the final night of field training, a mass casualty incident permitted students to triage, treat, stabilize and evacuate 36 patients strewn across a 40-meter radius. Among the casualties, students encountered a sucking chest wound, a pregnant woman ready to deliver, and multiple burn patients.

Nurses and medical students developed a greater understanding of the role of the senior medical officer on the battlefield. Using their training, they are better prepared to save the lives of fellow soldiers, sailors, airmen and civilians in a humanitarian or wartime mission. The playing field was leveled as they discovered a common goal expressed as providing "good medicine in bad places." Even the lighter moments—finding ways to boost morale for students far from home—contributed to the synergies and shared challenges of medical students and nurses. Operation Bushmaster added a new dimension to advanced practice nurses' training, truly in the spirit of "learning to care for those in harm's way."

– Capt. Meryia Windisch, USA and Capt. Anthony Leonard, USA

Improving the *View*

Laser Eye Surgery and Operational Readiness

Anyone who wears eyeglasses or contact lenses understands the challenges inherent in improving sight. Eyeglasses fog up, get scratched or broken, misplaced or lost. For members of the military, glasses are a handicap in the rain, cannot be used underwater, and get in the way when firing a weapon or using equipment like night vision goggles. While contacts are an alternative, not everyone can wear them, thanks to discomfort and other problems with their use and, more important, military people are not allowed to wear them in the field.

Thanks to advances in medicine and technology, these are no longer the only choices for people without perfect vision. Following years of research and evaluation, DoD approved the use of refractive laser eye surgery to enhance military readiness, and USU graduates are leading the way in worldwide efforts to correct vision problems for members of the uniformed services.

More than two dozen graduates and numerous faculty of USU's F. Edward Hébert School of Medicine now perform PRK (photorefractive keratectomy) and LASIK (laser-assisted in-situ keratomileusis) at one of seven Navy, five Air Force or eight Army hospitals throughout the U.S. and at Landstuhl Regional Medical Center in Germany.

Among them are Army Col. William P. Madigan ('82), chief of ophthalmology at WRAMC, the Army's consultant to the surgeon general for ophthalmology and the architect of the Army's Laser Refractive Surgery Program, and U.S. Public Health Service Cmdr. Brent Warren ('93), assistant professor of surgery at USU.

"We have the capability to dramatically enhance our fighting forces' combat readiness through application of new technology," said Madigan, who is also ophthalmology division chief at USU. According to Madigan, through the Army's military refractive readiness program, a soldier's vision can be dramatically improved, enabling him to better perform his duties and improving his survivability on the battlefield. "This ultimately makes him a better soldier, increases his confidence and morale, which in turn leads to improved retention of trained and experienced soldiers."

It is estimated that one-third to one-half of soldiers on active duty require some form of optical correction. The cost of supplying and maintaining these optical devices is very high, said Madigan. About one million optical devices were made in 2001 – two pairs of glasses per soldier plus gas mask inserts – at a cost of nearly $24 million.

Besides being very expensive, the disadvantages are numerous. Glasses are incompatible with sophisticated targeting and other headgear, like night vision goggles, that are now available for soldiers, pilots and other service members. They are difficult to see through if a person is working in fog, mist and rain and can easily be scratched, damaged, broken or lost during combat or in a field environment. Contact lenses are not authorized in the field, where the environment is dusty, dirty and muddy. Poor hygienic conditions in the field make it difficult to keep hands clean, and extended hours of continuous operations can lead to overuse of contact lenses. This can lead to red, painful and injured eyes, infection, corneal ulcers, and possible permanent vision loss.

WRAMC's Center for Refractive Surgery was established nearly three years ago to research refractive surgery for the military population, focusing on issues such as night vision and other ways in which refractive surgery can be improved for soldiers' needs. The first laser eye surgery was performed in January 2002. Since then more than 750 patients have been treated.

Both PRK and LASIK surgeries are performed here. PRK involves using a computer-controlled laser directly on the surface of the eye after removing the outer surface cells with an Amoils brush, thereby allowing those cells to grow in again over the reshaped cornea. With PRK, a patient experiences two to three days of pain and sensitivity to light.

"You have to 'bite the bullet' for a few days with this procedure, but it is very simple, and it's safer and less complicated than the second choice – LASIK," said Warren, who also works as a staff ophthalmologist at WRAMC and has performed more than 600 refractive eye surgeries, or about 12-14 cases a week.

With LASIK, a very thin surgical flap is created in the cornea, and the laser delivers the same treatment as PRK, but to the inner tissue of the cornea without entering the eye. The flap is closed at the end of the procedure, but there is a slight risk that the flap may come loose, a problem that is easily fixed. Some surgeons will place a soft contact lens over the flap for 24 hours to prevent wrinkling or movement of the flap. And although having a loosened flap sounds painful, patients describe it as feeling like there is an eyelash in the eye.

"Even though the surgery is a little bit more complicated, LASIK is totally painless with almost instant recovery," explained Warren. "Most people have 20/20 vision the next day, but they need anywhere from two weeks to three months for the flap to heal."

The advantages and disadvantages of both procedures are explained to patients who are permitted to choose the one they prefer. Some patients, however, are candidates for only one or the other and for some, neither procedure would work. Take Army Maj. David Crader, a 36-year old who had been wearing glasses for 28 years and had selected LASIK surgery recently at WRAMC because it was less painful and resulted in improved vision several hours (as opposed to days with PRK) after the surgery.

Said Crader, "I was watching the whole procedure, which took about 15 minutes. I never felt any pain and the doctor told me step-by-step what he was doing. The only negative aspect was that you could smell the laser when it was doing the cutting. It smelled like burnt hair."

Warren said WRAMC has one of the most state-of-the-art laser centers. After much research, doctors there now use an updated version of the original laser they selected. It is one with a small scanning spot and a tracker moving 4,000 times per second, faster than the fastest eye movement. "It locks onto the eye and very precisely delivers the laser beam where it needs to go. The tracking feature is critical to our ability to deliver custom corneal treatments after wavefront analysis of a person's optical system," Madigan explained.

WRAMC has one of the first Ladar wavefront machines in the country, which can improve soldiers' vision significantly. "We can build a footprint of a patient's individual eye with all its aberrations and give a customized treatment," Madigan explained. "This system is currently the only one approved in the U.S. by the FDA (Food and Drug Administration) for linking the wavefront technology with a small spot laser custom treatment. It's a very exciting new field."

USU faculty are also conducting night vision studies to retain qualified aviators. "There is a decrease in the applicant pool for Army aviation, and one of the chief reasons for folks not meeting qualification is they don't meet the physical standards recommended for vision," said Army Lt. Col. Kraig Bower, USU assistant professor of surgery and chief of WRAMC's Center for Refractive Surgery. "These are experienced pilots who came in when they were younger, but their vision has changed over time and now need glasses," Bower said. "Through the Army Laser Research Program, we bring them in, treat them, send them back to flying duty and see how well they can fly." If their vision can be corrected, this increases the applicant pool for aviation training.

"There's also the corneal refractive surgery surveillance program for all other flight personnel, such as air traffic controllers and flight medics," Bower said. "They are enrolled if they've had refractive surgery and are followed to ensure it doesn't impact their flight duties." Bower added that he thinks the benefits of this surgery are a tremendous enhancement in soldiers' quality of life.

Whether at WRAMC or any of the Army, Navy and Air Force hospitals where refractive eye surgeries are performed, USU graduates and faculty are enabling today's military members to perform their duties unencumbered – enhancing operational readiness through improved vision.

– Tech. Sgt. Ann Bennett, USAF

Generation of Hope

His faith, medical training and personal commitment to those less fortunate have inspired Army Lt. Col. Mark Chapin to offer orphaned children a world away an opportunity for a longer life.

Chapin, an assistant professor and director of research for USU's Department of Family Medicine, has been working on a humanitarian project with Zimbabwean physicians through the Community United Methodist Church in Crofton, Md. The goal of the project, dubbed "Generation of Hope," is to provide anti-retroviral (ARV) medications to Zimbabwean children who are orphaned by AIDS.

"If my 10-year old daughter was to contract AIDS through a blood transfusion, her medications and treatment would be provided by the government with no charge through the Ryan White Care Act," said Chapin. "There was a 10-year old girl that we met in Zimbabwe who is HIV-positive and was very near death. It's an injustice that she doesn't have access to those medications, where my daughter would. I can't sleep at night as a person of faith and allow that to continue."

The AIDS epidemic in Zimbabwe is rapidly claiming the lives of people ages 20 to 50, where the spread of AIDS is primarily through heterosexual contacts.

According to the Joint United Nations Program on HIV/AIDS, it is estimated that more than 1.5 million Zimbabweans are living with HIV or AIDS. This year alone, 80,000 are expected to die from the disease. By the end of next year, the number of AIDS orphans in Zimbabwe will top one million. In most parts of the industrialized world, typically no more than one percent of the children are orphaned; in Zimbabwe, it is seven percent. If current AIDS mortality trends continue, fully one-third of Zimbabwean children will be orphans by the year 2015.

"The number of deaths has been so large that people have become numb to its constant presence. It has become a tragic way of life," said Chapin.

"What's happening in Zimbabwe is that there is a whole generation of children growing up without parents," said Chapin. "They don't have any kind of child welfare system like we have here in the U.S. and there are very few orphanages. In a typical rural community, if both parents died, then the care of the child would fall to the extended family. What's happening now is that entire extended families are getting wiped out."

With the decline in numbers of adults in Zimbabwe due to AIDS and the rise in the number of orphans, Chapin explains that it's important to get these ARV medications to the people. ARV medications have been shown to help affected individuals live without symptoms of AIDS. Many AIDS victims who have been near death have shown dramatic improvement shortly after beginning ARV therapy.

"Our project initially was to develop community trusts to care for children orphaned by AIDS, but we have now become aware of the growing problem of these children being more at risk than others for AIDS itself," said Chapin. "One orphanage that our church supports has lost four children since September 2002 to AIDS—almost 10 percent of their children."

The ARV medications, which support the immune system and keep the HIV virus from multiplying, consist of three different types of drugs that work together to keep the AIDS patient healthy. There are sometimes serious side effects of these medications, and it is important that they are taken strictly as directed. Skipping medications can sometimes accelerate the disease by killing off weaker strains of the virus and allowing only the most virulent forms to survive and multiply. This is a major concern in administering medicines to children who may be living in child-headed households with no adult supervision or care.

In the United States, the cost of the ARV medications usually ranges between $12,000 and $15,000 per year. The average annual income for a Zimbabwean is about $450, making the purchase of these medications, in patent form, nearly impossible, although they are available from South African pharmaceutical companies.

Chapin explains that a pharmaceutical company in India is producing a generic type of ARV medication that would cost about a dollar per day. As part of the pilot project, the company will donate medications for up to 20 children. This company has not yet been licensed by the Zimbabwe Medicines Control Board to import the generic ARVs, even though the country's president declared an AIDS emergency in May 2002 that was supposed to allow the import of generic medications and speed the approval process. The Zimbabwe physicians working with Chapin will have to write individual prescriptions for each of the children and then cross the international border and pick up the medications in neighboring Zambia. Once the generic ARVs have been approved for import, the group will be able to do so in bulk and then break down the larger numbers of medicines into individual prescriptions at a pharmacy in Harare that is partly owned by one of the Zimbabwean physicians.

Also, Chapin has found sponsors willing to purchase medications for two Zimbabwean children. He is working with United for Children, a foundation supporting children's education and welfare in Zimbabwe that has agreed to help provide funding for these necessary medications as well.

Chapin plans to apply for funding from the National Institutes of Health under a Comprehensive International Program of Research on AIDS or a National Institute of Children with Health Diseases grant, based on results of the pilot project. NIH has been funding projects to study the epidemiology of AIDS in specific populations in sub-Saharan Africa, as well as innovative projects for prevention, education and treatment. Once the challenge of obtaining the ARV medications has been met, said Chapin, "then we must work with the orphan trust's local schools and churches to provide strategies to ensure that each child gets his or her medications exactly as prescribed." Also, he said, these medications are most effective with children who are well nourished and healthy, other than being HIV positive. The NIH funds would be used to develop a demonstration project that would:

- Do a comprehensive health assessment of the more than 4,000 children in the five orphan trusts supported by the church, to include HIV testing, nutritional status, presence of parasites, and height/weight percentiles.
- Provide ARV medication for those children who are HIV-positive.
- Develop strategies for providing reliable and exact dosing schedules using direct-observed therapy which can be used as a model for the other 996,000 children when larger government-supported programs are resourced.
- Serve as a longitudinal cohort to monitor viral loads, CD4 counts, and health status as the leading edge in treatment and prevention efforts throughout the lifespan.

Chapin has been involved in humanitarian work since the seventh grade when he accompanied members of his home church in Connecticut on a mission to Wilkes-Barre, Pa., to help residents recover from a major flood. Since then, his desire to assist others in need has taken him throughout the United States to places like Appalachia, where he built housing through the Appalachia Service Project, and Shiprock, N.M., where he helped repair homes on the Navajo reservation. But Chapin's efforts have also extended beyond the nation's borders. When assigned at White Sands Missile Range in 1984, he participated in providing a Christmas shopping trip to orphans in Juarez, Mexico, and worked with high-risk children in the military community in a drug abuse prevention program. Later, while serving as clinical director of the Alcoholism Residential Treatment Facility at the 121st General Hospital in Seoul, Korea, he organized a program where he and others visited children at an orphanage every week.

"Our national borders are manmade. I can't rest comfortably in my faith as long as there are children who do not have food, housing, access to health care or education just because they happen to live in a different country," said Chapin. "The solution for peace is to see the world as a single organism. We can't laud our achievements in science, medicine and excesses in lifestyle while people in our global backyard are hungry."

– JO2 Robert Keilman, USN

USU Alumnus Tests New Method to Detect Breast Cancer

A five-year trial is now underway at Walter Reed Army Medical Center to prove the value of "electrical impedance scanning" (EIS) in detecting early stages of breast cancer in women under the age of 45.

Two hundred patients are enrolled so far and the goal is 4,800, said Maj. Alexander Stojadinovic, a surgical oncologist at the Walter Reed Comprehensive Breast Center and USU class of '91 alumnus. He said planning has begun for a Department of Defense study involving 12 sites with an expected enrollment of 20,000.

"The study is not intended to compete with mammograms," said Stojadinovic. He said the clinical research should prove electrical impedance scanning to be a valuable ally to conventional screening methods, particularly in young women.

"The current process of using clinical breast examination alone to screen younger women is widely recognized as deficient," Stojadinovic said.

"Although the risk of breast cancer in women under 50 is low, the incidence is increasing, and breast cancer tends to be more aggressive in younger women," Stojadinovic said.

"It is timely and warranted to pursue this screening trial now at Walter Reed, the Army's only comprehensive breast center," he said.

EIS is able to detect early stage tumors, particularly in young women; 20 percent of the active-duty force is female, 92 percent of whom are women under the age of 40.

"EIS has the potential to identify women at high risk of breast cancer, even if it does not localize a specific lesion," Stojadinovic said.

Tumor tissue differs from normal breast tissue in electrical properties, and electrical impedance scanning detects in five minutes whether further screening is needed.

"The electrical impedance scanning can compliment and enhance the accuracy of mammographic screening," Stojadinovic said.

Nurse Practitioner Abby Rogers, of Walter Reed's Department of Obstetrics and Gynecology, said the American Cancer Society and National Cancer Institute currently recommend that women practice monthly breast self-exams a week after menstruation, get a yearly clinical breast exam, and for women over 40, an annual mammogram.

Women eligible for the trial include non-pregnant military health-care beneficiaries, ages 18 to 45, who have not breast fed or had breast surgery within the preceding three months and who do not have implanted electrically-powered devices. Patients undergo outpatient assessment with electrical impedance scanning.

– Michael E. Dukes, WRAMC Stripe and Nicole Dowell, Army News Service

Battlefield Advancements

With each branch of the service making its own decision about new techniques and products, the Marine Corps has added QuikClot to the first-aid kit of over 14,000 Marines currently deployed to Iraq. QuikClot, a sterile powder used to treat traumatic wounds, reduces blood loss and increases survivability better than the standard military bandage.

Hasan Alam, M.D., F.A.C.S., a trauma surgeon and assistant professor in the Department of Surgery's Trauma Readiness Research Institute, recently spearheaded studies that showed QuikClot had zero percent mortality and a 100 percent survival rate. Alam, who was motivated by the number of troops who bled to death in Somalia before surgeons could help them, and his colleagues tested the substance on 36 Yorkshire swine. The team found that QuikClot converted all of the fatal wounds inflicted into non-fatal wounds; that is, clots formed and none of the swine died. As a result of their findings, the product was field testing with the Marines and is now currently in use in the Middle East. Alam's research was recently featured in a *New York Times* report on changes in battlefield medicine.

Alam also recently obtained a three-year, $1.482 million National Institutes Of Health grant to study resuscitation techniques in severe trauma.

Faculty in the News

Col. John Holcomb, assistant professor of surgery, Howard Champion, M.D., professor of surgery, and Lt. Col. Donald Jenkins ('88), assistant professor of surgery, were featured in a *New York Times* article (April 8, 2003) "Trauma Medicine: Stepchild No More." The article describes potential improvements in trauma care, including development of an artificial blood product.

Cmdr. Ray Costabile, associate professor of surgery, was interviewed by ABC News' Diane Sawyer about treating wounded soldiers in the 47th Combat Support Hospital in Kuwait. A 12-acre facility with 300 beds, intensive care units and state-of-the-art radiology, the expandable operating rooms are equipped to handle everything from neurosurgery to orthoscopic surgery.

USU '83 alumnus and interim chair of the Department of Military and Emergency Medicine, Col. Clifford Cloonan, was interviewed for *Medscape Medical News* in an internet feature entitled "Combat Medicine in Iraq." Cloonan was also featured on National Public Radio and several other media outlets.

Robert J. Ursano, M.D., chairman of the Department of Psychiatry, appeared in the *New York Times, USA Today, Washington Post* and was interviewed by National Public Radio regarding traumatic stress associated with war and captivity.

World's First Female Patient Simulator Developed

Richard Kyle, an instructor in the Department of Anatomy, Physiology and Genetics, has developed the world's first female patient simulator, showing why he is nicknamed "the wizard of patient simulation."

USU has used high-fidelity adult male robotic patient simulators since the founding of its Patient Simulation Laboratory in 1997 and the opening of the USU Patient Simulation Center in Silver Spring, Md., two years later. Last year, USU acquired a child simulator and an adult female birthing body with infant. According to Kyle, to date only one company offers an adult female body simulator, but it lacks high-level simulator functions such as fully interactive cardiopulmonary and pharmacological models with a complete clinical monitoring interface.

To remedy the situation, Kyle said he transplanted the mind, brain, nerves, heart, lungs and blood from the Patient Simulation Laboratory's first high-fidelity male simulator into the otherwise inanimate female form, creating the world's first and only fully functional obstetrical patient simulator. Kyle's creation has the interactive features of the most advanced patient simulators, plus it gives birth.

Kyle said the plan is to use this enhanced capability to not only add obstetrical content to existing courses, but also as the centerpiece for developing an entire range of new obstetrical and neonatal programs.

Kyle and Lt. Cmdr. Darin Via ('91), an assistant professor of anesthesiology at USU and the medical director for the Patient Simulation Laboratory,

recently earned top honors for the third year in a row for their presentation at the Society for Technology in Anesthesia's International Meeting on Medical Simulation. Their study shows a remarkable reduction in error detection time when doctors view clinical monitor data through a prototype head-mounted display.

The concept of presenting critical vital sign data to clinicians in this manner is the basis of a patent application by Kyle and Via. Last year their winning presentation showed acceptance to wearing a head-mounted display in the operating room. Their presentation the previous year showed the value of an eye tracker in evaluating student performance, earning them first place honors.

Tales from the Field

Opting for residency training in dermatology following my graduation from USU in 2000 meant that I would almost certainly have to complete a tour as a GMO (general medical officer). Nearly all of the dermatology residents and staff that I had met needed to do one to match for the ultra-competitive specialty.

Fortunately, I was able to get what I thought would be an excellent GMO job in the local area. The Pentagon had an opening for an Army flight surgeon at its DiLorenzo Tricare Health Clinic. This job would allow me to stay close to the residency program at Walter Reed Army Medical Center and avoid moving my family again. I had begun medical training at USU with 11 years of prior service as a paratrooper and attack helicopter pilot, so I was looking forward to finally having a cushy, rear-area job with minimal danger and adventure involved.

After completing a transitional internship at Walter Reed/National Capital Consortium, I went to Fort Rucker for the six-week Army flight surgeon course and then reported for duty at the Pentagon on Sept. 6, 2001. The Pentagon clinic was indeed a great place to work. The well-equipped facility was nearly brand-new, the people were wonderful, there was plenty of opportunity to treat skin conditions, and I even got my own office. I looked forward to a blissful and relaxing two years of GMO heaven.

If that were how things had worked out, of course, then I wouldn't be writing this article. On my fourth day of work at the clinic, American Airlines Flight 77 slammed into the building and exploded—killing everyone on board and more than a hundred of my coworkers in the Pentagon. My first patient that day was a gentleman who needed a mole evaluated. My next patient was a female lieutenant colonel who was soaked in jet fuel and had most of the hair burned from her head. I intubated her in the center courtyard of the Pentagon about 10 minutes after the plane hit the building.

President Bush spoke at a memorial service at the Pentagon one month after the attack. When the commander-in-chief told those of us in the military to "get ready," I had a feeling that he was talking about more than making sure that we had good haircuts. Just a few months later, my PROFIS unit notified me that I would be going to Afghanistan with them for six months.

PROFIS is the Army system that attaches medical personnel to units of the line for training and deployment. My PROFIS unit, the 229th Attack Helicopter Regiment, was coincidentally the same outfit that I used to fly with as an Apache pilot before I went to medical school. Now I would be working for them as their flight surgeon in support of Operation Enduring Freedom.

Just a few days after the memorial service at the Pentagon marking the one-year anniversary of the 9/11 attack, I left for Fort Bragg, N.C., to start working with my PROFIS unit. An Army attack helicopter battalion owns 24 Apache helicopters and has about 350 soldiers assigned to it. About one-third of those soldiers are aviators who need to see a flight surgeon for all of their primary medical care. At Fort Bragg, I trained with the unit and helped get its soldiers ready for the medical challenges they would face in Afghanistan.

We left Fort Bragg the day before Thanksgiving and arrived in Afghanistan two days later. Our unit took over from its sister battalion and assumed control of an aviation task force at Bagram Air Base. The job of the attack battalion's Apaches is primarily to fly armed escort and protect the other helicopters in the task force. The Apaches also perform on-order attack missions as part of a quick-reaction force. I was amazed to find that the very Apache that used to have my name on the pilot's door is still in the battalion's fleet. The other aircraft in the task force are UH-60 Blackhawk and CH-47 Chinook transport helicopters.

My job as the task force surgeon is to provide primary and emergency care to all of the soldiers in the task force. I am also the task force commander's advisor for all medical issues, including preventive and occupational medicine. As the flight surgeon, my duties include making regular flights in military aircraft (as a medical officer—not as a pilot).

The facilities here at Bagram are austere in comparison to the Pentagon, but regal in comparison to what I had during the Gulf War. My aid tent has a wooden floor and is equipped with a military phone line and a computer with Internet access. The rest of my "staff" consists of one enlisted medic, but two more will arrive from the States shortly. I have a Humvee to transport patients when needed, and the Combat Support Hospital (CSH) is just a few minutes away. The CSH offers full surgical capabilities, as well as radiology and limited laboratory and pharmacy services. Many of the doctors and nurses there were deployed from Walter Reed, so some of the faces are familiar to me. I have had to transport four patients to the hospital under urgent conditions. All of them received great care and are doing well.

I am serving with a wonderful group of soldiers here. I am continually amazed by the quality of the young men and women that our military manages to attract. It is difficult to endure another extended separation from my family (this past holiday season was my fourth spent overseas with the Army), but I feel that I am serving soldiers who are giving their all for an important and worthwhile cause. The job at the Pentagon certainly hasn't been the cushy, rear-area one that I expected. But it has turned out to be a great GMO assignment after all.

– Maj. George vonHilsheimer, USA

Jeff Elting: Holding on to a Tiger's Tail

When Col. Jeff Elting was a student at West Point, he knew he wanted to be a doctor, but was discouraged from doing so by his advisers. Instead, he joined the Army Corps of Engineers, and from there entered medical school at USU, graduating in 1985 and going on to be a family physician. After working as a White House physician during President Clinton's administration, he returned to USU with an executive medicine fellowship, earning an M.P.H. From there, it was on to the Industrial College of the Armed Forces, where he entered their executive health program. During the Gulf War, he also served as a biomedical expert, working to detect dangerous biological agents.

As a senior medical officer in the Army surgeon general's office, Elting was responsible for advising the SG as well as overseeing 50 physicians and other staff. During his tenure, the terrorist events of September 11th took place, and he was put in the position of coordinating bioterrorism-related activities. By his own admission, he was in the right job at the right time. He quickly observed that military health care professionals lead the way in being prepared for and responding to such events, and that the military is often not given sufficient credit or recognition for its expertise and responsiveness.

After 25 years of service, he retired as a colonel and immediately began work on Aug. 1, 2002, as medical director for bioterrorism response coordination of the D.C. Hospital Association. Elting's job is to connect the health departments of 18 local jurisdictions and form a cohesive, regional bioterrorism defense plan that he hopes will serve as a national model. With $8 million in funding to distribute among agencies, he must ensure that there is no duplication of efforts and that funds are properly applied. Responses to a survey designed to analyze hospital capabilities have helped elicit top priorities.

Elting will continue to develop several key initiatives: protection and detection (e.g., immunizations, equipment); event response (e.g. decontamination, pharmaceutical stockpiles, hospital surge and quarantine capability); and medical logistics (e.g., patient tracking, coordinated public information efforts).

When he lectures in USU's Human Context course, Elting tells students to appreciate the range of activities to which they are exposed in the military. "You get to do so many things your counterparts never get to do in their lives," Elting tells students. "Twenty-five years go by quickly. It's like holding on to a tiger's tail and being dragged through life."

To which he adds, "I wish I could do it all over again."

– Helaine Ahern

From the Battlefield to Baghdad . . . and Beyond

Cmdr. Ralph C. Jones ('87) is among those treating the sick and wounded on board the USNS Comfort, in support of Operation Iraqi Freedom.

Jones is one of a number of USU graduates on the hospital ship that is currently in the Persian Gulf lending regular medical support to coalition forces as well as Iraqi prisoners of war and civilians.

A 1,000-bed converted supertanker, the Comfort was designed to stabilize injured coalition fighters for transport to hospitals in Europe and the United States.

Since the ship's Jan. 6 deployment to the Gulf, medical personnel on board have treated numerous coalition forces and more than 180 Iraqi patients.

Capt. Charles Blankenship, commanding officer of the Comfort's medical facility, said at a recent press briefing that the ship's busiest day (as of April 12) was April 10 as Iraqi President Saddam Hussein's government continued to collapse, with 50 admissions in a six-hour period.

Jones said the longest procedure performed so far was an 11-hour surgery to rebuild and stabilize the spine of a U.S. soldier so he could be transported back to the United States.

Alumnus Part of Navy First in Iraq

USU graduate Capt. Hans Brings ('85) is a vascular surgeon attached to the Navy's Fleet Hospital Three (FH-3), the first expeditionary medical facility assigned to a war zone. Brings, who is stationed at the National Naval Medical Center, is among a team of 300 health care providers and construction battalion personnel deployed to Iraq with the Pensacola, Fla.-based fleet hospital.

FH-3 is the latest effort to increase the lifesaving capabilities of Navy medicine. With an eye on delivering care faster, the 9-acre, 116-bed facility is designed to provide treatment in the field to those who risk their lives on the battlefield. FH-3 went to Iraq with 166 trucking containers filled with more than $12 million in medical equipment and supplies.

Graduates Jump into the Fray

While U.S. soldiers and Marines began their push toward Baghdad from southern Iraq, over 1,000 troops from the Army's 173rd Airborne Brigade parachuted from a C-17 aircraft into the northern Kurdish region of the country. Among those jumping were USU alumni Lt. Col. Harry Stinger ('85) and Maj. John DeVine ('95), both members of the 250th Forward Surgical Team based in Fort Lewis, Wash., as well as Maj. Richard Malish ('96), the 173rd Airborne Brigade surgeon, Capt. Bob Holland ('97) and Lt. Col. John Scott ('90), both serving as parachute battalion surgeons. It was the first forward surgical team to parachute into combat since World War II, and Stinger, a trauma surgeon, is its commander.

As they hit the ground, Stinger, Malish, Holland, Scott and DeVine – who is an orthopaedic surgeon — and the other medical team members began treating paratroopers injured on the jump, as well as taking care of those brought to them by special forces troops. With equipment and a tent delivered in advance, they were able to assemble a working operating room that was ready for surgery the following morning. Joining them several days later were USU graduates Lt. Col. Rob Rush ('90), a general surgeon, and Capt. Gregg Hann (GSN '01), a nurse anesthetist, as well as USU assistant professor of surgery Maj. Benjamin Starnes, a vascular surgeon. Eventually, a full trauma center was erected near Bashur Air Base.

Stinger later met with the Kurdish Democratic Party's health minister to ensure treatment and evacuation for wounded Kurdish fighters and to discuss providing medical care for civilians in northern Iraq. For Stinger, the deployment is one of the highlights of his career.

"If something were to happen to me on this mission I would have no regrets at all," he said. "I believe this is stopping a second World Trade Center attack."

Brigade Surgeon Keeps Soldiers in Stitches

When it's time to do his rounds, Doc Meadows doesn't hop in his "Beemer" and commute to his private practice in the 'burbs. He steps out of the Humvee that serves as his office, bedroom and clinic, smiles and walks among the 2nd Brigade Combat Team soldiers in the middle of war in Iraq.

He reacts to medical emergencies, makes sure soldiers are drinking enough water, changes field dressings, and dishes out equal doses of doxycycline and humor.

"It's the only job where you can stab people and they say, 'thank you,'" 2nd BCT surgeon Capt. Robert Meadows ('99), explained with a grin. "I had Cox in stitches, even though I didn't put any stitches in him," Meadows said of his cot-side manner with Sgt. Brian Cox, a soldier who suffered mortar wounds near the Iraqi village of An Najaf.

"There's a time to be serious and there's a time not to be. A lot of people are way too serious. If you can't laugh at yourself, who can you laugh at," he said of his way with patients.

Meadows has been in the Army 18 years, his first 10 spent as an infantryman, but he said he knew since junior high school that he was going to be a doctor. "I always volunteered in hospitals – it just took me longer to get there than I thought it would."

In addition to treating soldiers' physical injuries, Meadows also acts as a field psychologist, dishing out coping strategies such as his three rules for surviving the Army: wherever you are (stinks), wherever you're going is better, and wherever you've been was great. "So you might as well enjoy where you are now" because eventually you will look back on it as having been great.

When the casualties come in, it's time for him to get serious. He wears a medical load-bearing vest, filled with everything he needs to combat any injuries he might find. "What am I going to need? What am I going to see when I get there?" are the thoughts Meadows said run through his mind when he prepares to treat a casualty. "I just make sure I grab the stuff I'm going to need."

Meadows said one of the hardest decisions he makes on the battlefield is whether or not to call in a medical evacuation helicopter. "You don't want to hold on to a soldier above your level (of medical assistance), or who could deteriorate. You have to weigh the advantages of getting a patient to a better qualified doctor with risking a helicopter crew (flying into a dangerous area) or taking them from a more seriously wounded casualty."

He explained an Army doctor's job. "It's scary, people can die. It gets the adrenaline pumping – like being mortared. You've got to stay calm and remember your training, just like any job in the Army."

Meadows said he's glad to be in Iraq. "If you're an Army doc, there's no place you'd rather be than right here. We're changing the face of a region. We're going into a foreign country and establishing a new government – a government that helps people."

His own coping strategy is, "I just roll with the situation, try to see the best or humorous side of the situation. Things are rarely totally bad. Someone can be tired or scared – sometimes you have to remind him that it could be worse."

He said he's terrible at making jokes, but "they say laughter is the best medicine. I'm not sure that's true, but it can distract (wounded soldiers) for a while."

Spc. Mason T. Lowery, 50th Public Affairs Detachment, Army News Service

Team Provides Airborne Intensive Care

Moving critically injured and sick troops from the front line to larger and better-equipped military medical facilities is the job of the Air Force Critical Care Air Transport Team (CCAT) based at Kandahar Airfield, Afghanistan. The team works with Air Force aeromedical evacuation specialists to provide specialized care during medical evacuation flights.

"Basically, what we are doing is putting an (intensive care unit) in the sky," said Maj. (Dr.) Daniel T. Smith from the 438th Expeditionary Air Medical Evacuation Squadron at Kandahar. "We can put a chest tube in. We can put a central line in ... anything we could do in the (emergency room) or the ICU."

The CCAT team is made up of a physician, a critical care nurse and a cardio-pulmonary technician. The physician, who usually has a background in emergency medicine or general surgery, is the team leader, but everyone on the team plays a vital role in saving lives.

"We all have to know the equipment, but mostly that is my job," said Capt. Kristen McCabe, a critical care nurse. "I have to react to what our monitors tell us, administer medications and document everything we do. We're limited to the number of patients we can treat, but we offer a higher level of care."

All team members attend a CCAT team training course at Brooks City-Base, Texas.

"Everybody who is on a CCAT team has to go through that training," Smith said. "All the equipment we use we trained with (at Brooks). They have air frames for us to train in, moving patients in and out and preparing them for flight. We saw it all before we came here."

Since arriving in Afghanistan, the team has helped transport a U.S. soldier with a head wound and another soldier with a pulmonary embolism, or blood clot, in his lung. It is also tasked with the care and transport of local-national patients in need of high-level care. Local patients have included victims of landmines, unexploded ordnance and gunshot wounds, and some critically injured stabbing victims.

One such patient was "Patient 53," transported Jan. 12, 2003. Patient 53 was involved in a fight with a neighbor when he was stabbed several times. He had wounds to his head, neck and chest.

"The chest wound (was) a potentially life-threatening injury," said Smith, who is a 1995 graduate of USU. "He received a chest tube in the field which relieved the pressure on his lung and allowed him to breathe with that lung again."

Smith said Patient 53's head injury required a trip to Bagram Air Base's hospital for a CT scan to check for bleeding inside the skull or damage to his brain.

Because of his critical injuries, the CCAT team went along in case anything went wrong during the flight. Patient 53 remained stable throughout the flight.

Providing medical care for the Afghans is an important part of the coalition mission here, said Smith.

"It helps us build a relationship with the people of the country and lets them know that the United States is here for them," he said. "At the hospital in Bagram, I didn't see a single American in ICU."

Medical evacuation airmen care for all noncritical patients and ensure the aircraft is properly set up and equipped for their own patients and the team. The airmen are experts on the interaction of patients, medical teams and aircrew members.

"We'll have everything already all set up on the aircraft for the CCAT team when they arrive from the hospital with their patient," said Senior Master Sgt. Brian Kearney, an air medical evacuation specialist assigned to the 438th Expeditionary Air Medical Evacuation Squadron at Kandahar. "They can just focus on their one patient while we take care of the rest."

A three-person CCAT team is only capable of caring for three critical patients at a time.

The CCAT and air medevac teams help relieve the burden placed on forward-deployed medics allowing them to concentrate on incoming casualties.

— Army Cpl. Keith A. Kluwe, 109th Mobile Public Affairs Detachment

'80

Col. Cass Conaway recently retired from the Army, leaving his position as deputy commander for clinical services at Evans Army Community Hospital, Fort Carson, Colo. He remains in the area.

'82

Christoph Kaufmann, M.D., who retired from the Army last year, has been named as the chairman of the ATLS subcommittee of the Committee on Trauma of the American College of Surgeons. As such, he oversees Advanced Trauma Life Support content and teaching.

Col. David Burris, who is now serving as the interim chair of the USU Department of Surgery, has been named Military Region XIII Chief for the ATLS subcommittee of the Committee on Trauma of the American College of Surgeons, responsible for all ATLS programs within the Department of Defense.

Patricia Assan, M.D., is a board-certified child psychiatrist for Sheppard Pratt Hospital/Health System in Baltimore. She is married to Abel Sousa, an engineer for AT&T government markets. Assan is active in the Naval Reserve with the National Naval Medical Center Naval Reserve Bethesda headquarters unit, as administrative officer and medical corps advisor. She is also assigned to Fleet Hospital Fort Dix as a department head.

Brig. Gen. (select) Bill Germann has been selected to command the 89th Medical Group (Malcolm Grow USAF Medical Center), Andrews Air Force Base, Md. Germann is currently serving as the Air Education and Training Command surgeon at Randolph Air Force Base, Texas.

'83

Michael M. Dickerson, M.D., is now the emergency medicine director for the Cape Fear Valley Health System in Fayetteville, N.C.

'84

Col. Kimberly Slawinski is the director of the Surgeon General's Tactical Action Team at Bolling Air Force Base, Washington, D.C. In June, she will become commander of the 8th Medical Group at Kunsan AB, Korea.

'85

Col. Sean Murphy is a student at the National Defense University, Fort McNair, Washington, D.C. Upon completion, Murphy will assume command of the 325th Medical Group, Tyndall Air Force Base, Fla.

'92

Maj. Jamie (Kendrick) Waselenko is assigned to the hematology/ oncology service at Walter Reed Army Medical Center, Washington, D.C.

'96

Lt. Cmdr. Mark Michaud is the senior medical officer aboard the USS Emory S. Land, a submarine tender based in Lamaddalena, Sardinia, Italy.

Maj. Samual Sauer is assigned to the aerospace and occupational medicine division at the Walter Reed Army Institute of Research in Silver Spring, Md.

'98

Lt. Cmdr. David Lesser serves as a flight surgeon with Navy Helicopter squadron HSL-41 in San Diego, Calif.

Lt. Cmdr. Robert Johnson has been selected for an ophthalmology residency at the Naval Medical Center in San Diego, beginning in June. Johnson is currently a flight surgeon assigned to VAQ-133 and the Naval Hospital, Oak Harbor, Wash.

Maj. Kelley Moore, a graduate of the nurse anesthesia program, is the anesthesia element chief at McGuire Air Force Base, N.J., and returned recently from a deployment to Ganci Air Base, Kyrgyzstan in support of Operation Enduring Freedom. "I was the only anesthesia provider for about 900 people in the camp. We took care of all nations' military. We had Australians, French, Spanish, Dutch, Koreans and many more. It was a wonderful experience to see the other cultures and get to know them." She is preparing to deploy again to Southwest Asia.

'99

Lt. Kimberly Fagen is assigned to Commander, Carrier Air Wing 9, as a flight surgeon. When not deployed, Fagen is based at the Naval Branch Medical Clinic, Naval Air Station North Island, in San Diego, Calif.

Maj. Brian Todd, who graduated from the nurse anesthesia program, was deployed in 2002 to Southwest Asia, including a stay in Oman. An expert in field equipment, he was one of the first Air Force nurse anesthetists to use specialized anesthesia equipment in an austere environment. Due to his expertise, he has been named to the prestigious Tri-service Joint Readiness Clinical Advisory Board at Fort Detrick, Md. The board establishes equipment policy for the services. Todd is a staff nurse anesthetist at the U.S. Air Force Academy in Colorado Springs, Colo.

Nurse anesthesia program alumna Capt. Wendy Aronson was deployed in 2002 to Southwest Asia from Elemendorf Air Force Base, Alaska.

Setting up operations at a bare base location, Aronson pioneered the modification of EMEDS supplies resulting in significant savings of compressed oxygen, a rare commodity in an austere location. Her efforts led to Air Force-wide recognition and appointment to the Tri-service Joint Readiness Clinical Advisory Board at Fort Detrick, Md.

'00

Lt. John Ringquist is stationed in Lamaddalena, Sardinia, Italy, where he is serving as the undersea medical officer on board the USS Emory S. Land.

'01

Capt. Jason Bothwell is assigned to Madigan Army Medical Center, Tacoma, Wash., where he is completing his residency program.

Several USU graduates pose for a photo on board the USNS Comfort, deployed in support of Operation Enduring Freedom.

From left to right they are: Lisa Mulligan ('93), Craig Bonnema ('93), Elizabeth McGuigan ('90), Ted Schafer ('93), David Beardsley ('84), Todd Peterson ('92), Terry Stambaugh ('92), Kevin McKenney ('94), Pat Sipe ('97), Steve Morrow ('85), Brad Hartgerink (GSN '98), Ralph Jones ('87), Mike Mazzilli ('90), Robert Woodbury ('92), Roy Rice ('93), John Gilstad ('93), Pat McKay ('93), John Capacchione ('93).

In Memoriam

Dr. Anne C. Gawne died Sunday, Dec. 15, 2002.

Gawne was a specialist in physical medicine and rehabilitation, with a subspecialty in electro-diagnostic medicine. She treated post-polio patients for more than 10 years, at the National Rehabilitation Hospital in Washington, D.C., and the Roosevelt Warm Springs Institute for Rehabilitation in Warm Springs, Ga., and was the co-author of many articles and book chapters on Post-polio Syndrome.

Gawne earned her bachelor's degree in physical therapy from the University of California, Santa Barbara, in 1980, and her Doctor of Medicine from USU in 1984. In 1986, Gawne completed an internship in family practice at the University of Maryland School of Medicine in Baltimore, while working as the physician director for the Ambulatory Rehabilitation Center at the Wyman Park Hospital in Baltimore. She completed her residency in physical medicine and rehabilitation at the National Rehabilitation Hospital in 1990 and served for a year as a staff physician at the National Institutes of Health before returning to the rehabilitation hospital as a staff physiatrist and associate director for their Post-polio program. Gawne later served as the Post-polio Clinic director at the NRH. In December 1996, she moved to Birmingham, Ala., where she was an assistant professor at the University of Alabama's Spain Rehabilitation Center.

During that time, Gawne became the medical director for the Post-polio Clinic and Brain Injury Program at the Roosevelt Warm Springs Institute for Rehabilitation.

Gawne was a nationally recognized specialist in physical medicine and rehabilitation and lectured extensively throughout the nation. She was a member of numerous medical societies, including the American Congress of Rehabilitation Medicine and the American Association of Electro-Diagnostic Medicine. Her achievements earned Gawne a number of awards, including being chosen as an honored member of the Americas Registry of Outstanding Professionals for 2002-2003.

She is survived by her husband Timothy Gawne, Ph.D., a 1985 graduate of USU's physiology program, and her two children, Andrew and Beth.

Enriching the Lives of Surgical Residents: A Family Continues to Give

More than 35 years ago in Vietnam, John and Jean Baldwin had the privilege to serve our nation at a time of great need and apply their medical and nursing expertise to the many wounded during that conflict. Thanks to a training program of the U.S. Army, Jean Mitchell Baldwin attended nursing school and was commissioned as a second lieutenant in the Army Nurse Corps. After completing medical school and general vascular as well as cardiothoracic surgery residencies, John Baldwin spent his second year of duty as chief of thoracic surgery at the 24th Evacuation Hospital, Republic of Vietnam.

Based on their experience caring for the many soldiers who demonstrated bravery and integrity, the Baldwins committed to doing the same in their daily lives. While building a successful and enjoyable surgical practice on the Monterey Peninsula, they gave many hours of service to community groups over the next 35 years. At the same time, they became acquainted with a young university, USU, and as their respect grew for the training provided here, decided to "give back" to this institution.

The Baldwins believe that giving is best done while one is still alive and well and can see the benefits to others. As a result, they have initiated the Dr. John and Jean Baldwin RN Surgical and Education Scholarship at USU. Their donations now and over time, as well as through their estate plans, will provide funding to USU's surgical residents for educational opportunities, surgical training seminars and attendance at major surgical gatherings. With the goal of a permanent endowment, they are assuring perpetual support for activities that would not otherwise be possible. They believe that there are few worthier places to make an investment than in the men and women who are surgical residents at USU and in the promise they have made to our nation and its soldiers.

For more information on how you can help enrich the education of USU's students and residents, please contact Helaine Ahern, Assistant V.P. for Development at 301-295-3094 or at hahern@usuhs.mil.

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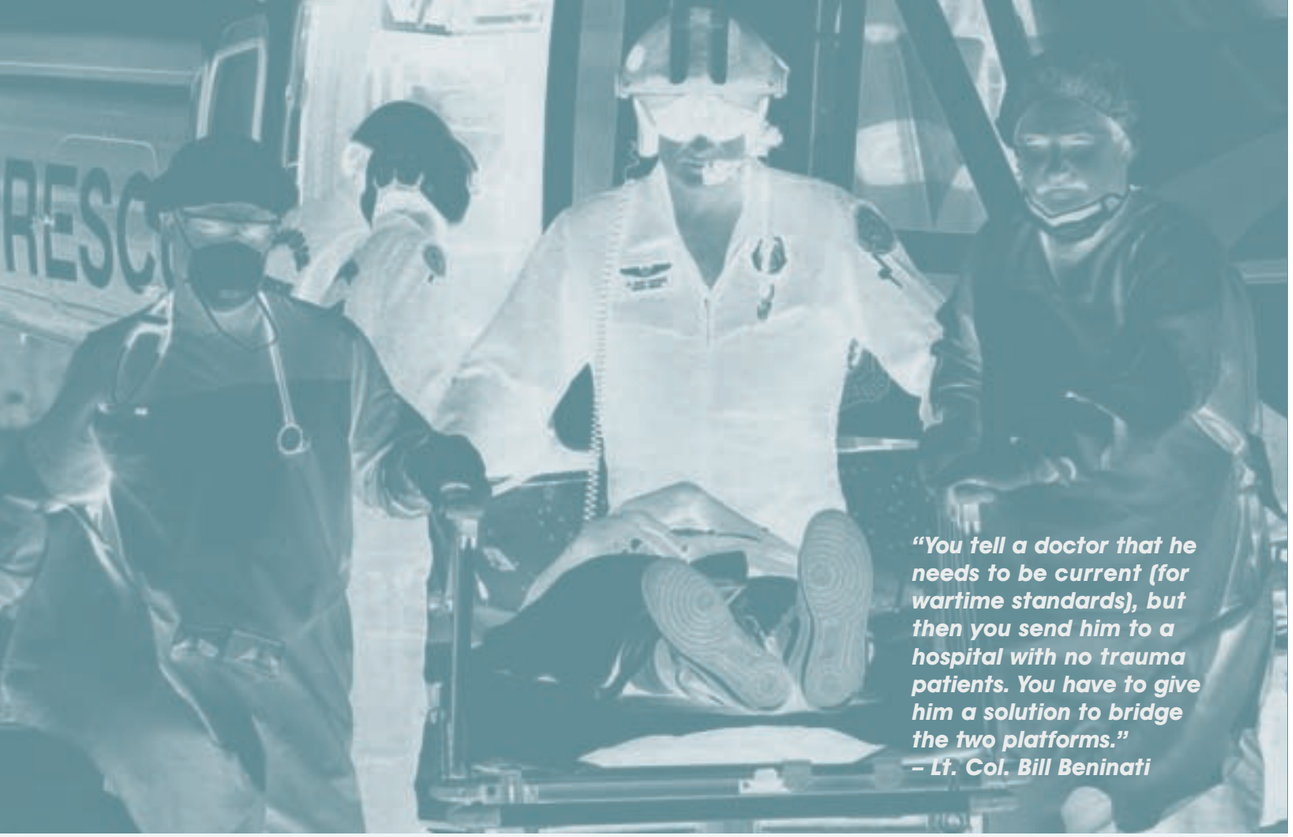

"You tell a doctor that he needs to be current (for wartime standards), but then you send him to a hospital with no trauma patients. You have to give him a solution to bridge the two platforms."
– Lt. Col. Bill Beninati

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