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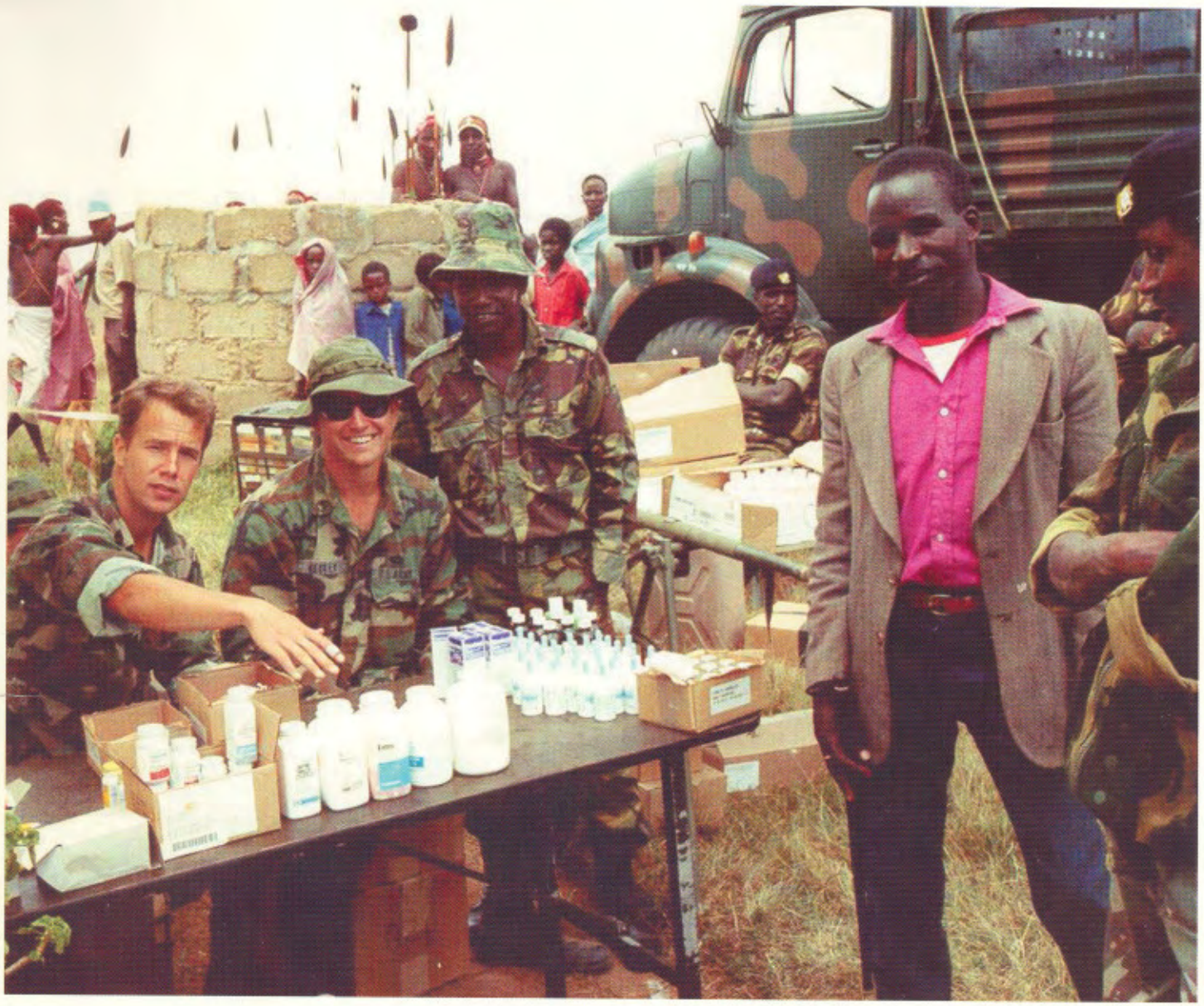
A Journal for Special Operations Forces Medical Professionals



Dedicated to SOF medics who give their all - past, present and future

From the Surgeon

United States Special Operations Command
"Unconventional Warfare, Unconventional Medicine"
Col Steve Yevich, MC, USA

NEVER BEFORE.....

Three decades ago, NO ONE in a Special Operations unit ever thought: that Special Operations would be considered "legitimate"; that one could spend more than one assignment in SOF without committing career suicide; that we could actually (and legally) own our trucks; that we could develop our own special weapons and equipment without having to make them ourselves (or steal them).

Fifteen years ago, NONE of us could have imagined that there would be a formal, tri-service, entity known as a Special Operations Combat Medic – who trained with fellow services' medics at a single Special Operations medical schoolhouse.

A decade ago, NONE of us could have imagined that all SOF medics would hold the civilian EMT-Paramedic certification or there would be a mandatory SOF-EMT-P sustainment training course.

NEVER BEFORE...

NEVER BEFORE... have we seen such great things as those which have happened to Special Operations in less than a decade.

NEVER BEFORE... has there been such an empowered CINC Surgeon's office to ensure medical readiness, medical support to the field, adequate initial and sustainment medical training, proper medical doctrine, and research and development of SOF-peculiar medical items – an office capable of reaching directly to the Joint Chiefs of Staff as well as the Services' Surgeons General.

In EDUCATION and TRAINING, *NEVER BEFORE...*

NEVER BEFORE... have we seen such advancements in SOF medical training and education: a single SOF Medical schoolhouse (JSOMTC) where all SOF medics train together, overseen by a Board of Regents with equal representation by all 4 components, and an Enlisted Advisory Council (1999) which ensures input from the components' senior enlisted SOF medics.

NEVER BEFORE... have we had a SOF Commander-in-Chief's requirement that all SOF medics obtain the highest non-degreed civilian medical credential available – *EMT-Paramedic* – through our own course curriculum which is acclaimed by the National Registry of EMTs as the premier EMT-P course in the nation.

NEVER BEFORE... have we had a SOF Commander-in-Chief's requirement that all SOF medics *sustain* the EMT-Paramedic credential, and that the sustainment be provided by a single "one-stop shop" SOF EMT-P sustainment course, held at one location, with mandatory attendance every two years by all SOF medics. ...And this EMT-P sustainment course also has been acclaimed by the NREMT as "the Standard" toward which EMT-P sustainment programs should aspire.

In Medical RESEARCH, *NEVER BEFORE...*

NEVER BEFORE... was there a SOF-specific, medical, Research and Development fund to address SOF-specific med requirements – an R&D fund which is controlled by a Biomedical Initiatives Steering Committee (BISC) made up of special operations medical personnel who take the input from the SOF components and convert their needs into solutions.

NEVER BEFORE... has there been such an empowered CINC Surgeon's office to leverage other Department of Defense medical R&D commands through: a seat on the powerful Needs Integration Subcommittee of the OSD-Health Affairs Armed Services Biomedical Research and Evaluation Management

(ASBREM) committee, which determines the direction of all DOD medical research; through USSOCOM's BISC connection with the DOD Defense Directorate of Research & Evaluation, allowing weighty consideration of SOF's input to the Defense Technology Objectives (DTOs) which determine the direction of DOD research; through the strong consideration which the US Army Medical Research and Materiel Command gives SOF for its input to their Science and Technology objectives (STOs) which determine the direction of their research; through the strong ties with the Office of Naval Research; the blood ties to Uniformed Services University of Health Sciences (USUHS) Combat Casualty Research Center.

In SOF MEDICAL PERSONNEL, *NEVER BEFORE...*

NEVER BEFORE... has the SOCOM Surgeon along with ALL the component Command Surgeons had prior SOF experience (in fact, some offices have more SOF experience than most other directorates!) – all bringing their hearts on their sleeves, burning to move Medicine in SOF.

NEVER BEFORE... have there been so many prior enlisted SOF personnel becoming PAs and doctors and returning to SOF, bringing their past experience, insight and passion for SOF, but now coupled with new knowledge,ideas and power.

And a few other things, *NEVER BEFORE...*

NEVER BEFORE... has there been a USSOCOM Directive which mandates that there must be an active Health Surveillance program for all deployed SOF personnel so that ANY illness or possible detrimental health exposure is entered into the permanent health record — and that these records can be accessed in the future should health alerts similar to Agent Orange or Persian Gulf War syndrome arise. No longer will the health of SOF personnel be "overlooked" due to security classification of a mission, or because SOF personnel were in an isolated location where a doctor or fixed medical treatment facility was not available to officially record a bad health event.

NEVER BEFORE... has there been a system which reaches out to the entire SOF medical community to solicit direct and continuous feedback from the field (Project *MedTruth!*) – from all SOF components, junior and senior medics, medical officers, and commanders – concerning improvements to initial medical training, sustainment needs, medical mission deficiencies, equipment deficiencies. No longer can decisions about medical issues be confined to the opinions of a few high-level headquarters staff. No longer are the loudest voices the only ones heard.

NEVER BEFORE... was there a Special Operations Medical Association (SOMA) which is so far-reaching that it not only brings together special operations medical assets from the international military community, but also pulls in our civilian special operations brethren who live and breathe the same medical problems – in a neutral forum where common problems and solutions can be discussed.

In the flurry of all this attention, in the mad scramble to spend the sudden gush of money, with the desires and burning passion to develop and improve SOF, we MUST NEVER FORGET why we exist. We exist for two basic Truths: 1) SOF Medicine IS the SOF medic - we exist to support the SOF medic; and 2) protecting the health of SOF is the ONLY reason SOF Medicine exists.

In support of these Truths, *NEVER BEFORE...*

NEVER BEFORE... has there been a formal, professional medical journal written specifically for the SOF medic, operating alone, in the austere, geographically isolated environment — unsupported. ...No TV cameras, no medals or ribbons, no recognition, no glory, no witnesses. THAT is the real SOF medic who I recognize — on the quintessential mission. This is a salute to you.

So, welcome to the Journal of Special Operations Medicine – YOUR journal.

"Unconventional Warfare, Unconventional Medicine"

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Cover

SFC Don Shipman and SSG Pete Becker (18Ds) dispense medications at their make shift pharmacy while conducting a MEDRETE for Masai tribesmen in the Samburu Province of Kenya. October1987

The Journal of Special Operations Medicine **is an authorized , official quarterly of the United States Special Operations Command, MacDill Air Force Base, Florida. Its mission is to promote the professional development of special operations medical personnel by providing a forum for the examination of the latest advancements in medicine.**

The views contained herein are those of the authors and do not necessarily reflect official Department of Defense position. This publication does not supercede any information presented in other Department of Defense publications.

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SITREP

INAUGURAL ISSUE

This issue of the *Journal of Special Operations Medicine* (JSOM) is inaugural, which means that it's still a work in progress. Think of it as a sample of what we would like to do.

This journal is intended to stimulate discussion among any groups involved in special operations medicine: medics, physicians, veterinarians, dentists, operations personnel, environmental science officers, and anyone else concerned with issues revolving around caring for the special operations community. These issues span the full spectrum, from austere environment care of medical illness to denied-area (and deniable operations) combat casualty care; from critical incident stress debriefing to aviation and undersea medicine.

This journal is interservice. Not only are we interested in articles from the Navy, Army, and Air Force, but we invite participation from Marine Recon, Coast Guard, and law enforcement special operations communities. For example, the guys who are getting spun up for MOUT (military operations in urbanized terrain) can learn from police special weapons and tactics teams. Likewise, the guys who may do clandestine ship takedowns can learn from Coast Guard counter-drug operations personnel.

In addition to the "how-to-do-it" topics, we are looking for medical science which challenges current doctrine, such as Frank Butler's article on wound infection prophylaxis with oral antibiotics, or Scott Barnes' article on refractive surgery. These articles are meant to stimulate discussion and even to highlight disagreement – reasonable men may disagree reasonably – and consensus develops from the process. The ultimate goal is always the well-being of the special operations soldier, sailor, or airman, and the accomplishment of the mission.

You do not have to be a literary giant to submit your thoughts. Rather, you must have a firm grasp of your subject matter and, preferably, an experiential background which will make your writing relevant. We will rework your item for grammar and spelling. But we want input from the medics and providers in the field, so experiences can be shared around the campfire, so to speak. Take your sea stories and war stories and beef them up with a little science and common sense, and send them to us to share in the community.

A couple of features are missing from this issue. *First*, we have no book review. We realize that the special operations community is composed of avid readers, and we want to help with some suggestions about new stuff to read. *Second*, we would like some of your operational stories that point out lessons learned. I don't think we can actually use the traditional invocational phrase, "Now this is no shit, there I was..." but we will make every attempt to pass on your lesson(s) for the benefit of your brethren.

Finally, we have no letters section. That deficiency should naturally correct itself if our readership will simply share (on paper or e-mail) the criticism, agreement, and other discussion these topics are bound to generate.

Above all, this is your journal. We need special operations feedback, input and participation. The community is you.

D.G.S.

THE UNIT SURGEON'S ROLE IN SPECIAL OPERATIONS

Brian S. Campbell, DO, MPH

ABSTRACT

Physicians assigned to operational roles in the military are poorly prepared to function optimally in this capacity. This article provides guidelines for physicians practicing operational medicine, with emphasis on special operations.

Understanding the role of the physician as a special staff officer is key to the successful practice of operational medicine. The physician must support his unit's mission by performing two duties. First, he must maintain the health of unit members and protect them from injury. Second, he must medically intervene when necessary in a manner that produces optimal outcomes for the patient's health and his ability to accomplish his mission.

There are five priorities to performing these duties. First, advise the unit commander on the medical aspects and implications of all unit activities. Second, educate patients and commanders concerning safety and preventive health matters. Third, train unit non-physician health care providers to a level that will allow them to substitute for the physician. Fourth, provide clinical health care to the soldiers in garrison, in the field, and at war. And fifth, provide clinical health care to the soldiers' dependent family members.

The art of command can perhaps best be thought of as orchestrating talent. The commander is not intended to be an expert in every aspect of military operations; he has a staff of officers with talent in each of these areas upon whom he can call as subject matter experts. The commander then makes decisions based upon this staff input. Any given commander will be individually talented in one or more areas, and usually will have a broad knowledge of all of the primary staff jobs, but no single person can be an expert in everything. Nowhere is the concept of orchestration more important than when it comes to the *special staff functions*. Medical expertise, for example, requires skills that take many years to develop and an enormous amount of time and effort to maintain. Tactical commanders simply do not have the luxury of becoming experts in field medicine.

Many commanders, lacking a medical perspective, do not know how to best employ the talents of their unit surgeon. This situation is complicated by the fact that general medical officer and flight surgeon assignments are traditionally given to military physicians who are coming directly from internship or who have at most a year or two of experience as a physician. Often these officers have no prior military experience and thus do not themselves know how to employ their talents to best support the unit.

The purpose of this article is to provide a checklist for the optimal employment of the unit surgeon. It defines two duties for the surgeon and outlines five steps that must be taken to accomplish those duties. It is intended as a commentary on the skills and attitudes that are necessary for the successful practice of operational medicine within the special operations community. A more formal discussion of the role of the medical officer can be found in Joint Publication 4-02, AR 385-95, FM 101-5, the new SOF-specific FM 8-43 and HSC Pamphlet 40-7-25.

Operational medicine is not taught in medical school. Making the transition from doing hospital based clinical health care to being an officer in any operational military unit is difficult. This transition can be insurmountable when the unit in question is a special operations unit. The most important aspect in making a successful transition from the hospital to the line is for the surgeon to understand his role as a special staff officer.

Doctors are trained to make decisions and to take charge. A lot of difficulty can be avoid-

ed by providing the neophyte surgeon with the simple guidance that the commander commands while the staff officer advises. The surgeon can not, for example, order the troops to get their flu shots. He can, however, advise the commander of the necessity and benefits of having them vaccinated, and the commander can order the troops to comply.

Just as the unit surgeon cannot command, the unit commander can not practice medicine. The commander is vested with command authority under the Uniform Code of Military Justice, but the physician is the one licensed to practice medicine. This is a unique distinction of the special staff officer verses the primary staff officer. The commander can not, for example, order the surgeon to prescribe certain medications or provide certain treatments as this constitutes practicing medicine without a license and is a violation of federal law.

Another simple realization that is sometimes overlooked is the fact that the staff officer's job is not just telling the commander what he wants to hear. If the commander is given bad staff input, he will make bad decisions. Commanders must know the truth, and sometimes the truth may be that the commander's desired course of action is inadvisable. The surgeon must understand that part of his job is to diplomatically discuss his concerns with the commander whenever the need arises. The commander, likewise, must expect and encourage this. It is a matter of integrity; and soldiers respect soldiers who have integrity, even when they disagree.

Soldiers also respect a "can do" attitude, and place great emphasis on having one. This is how we win wars and accomplish that which others can not. Both the commander and the surgeon must, however, be able to differentiate between being motivated to succeed and just being stupid. The physician who tries to "make do" unnecessarily is, in fact, endangering the lives he is sworn to protect. Sometimes the surgeon must have a "can't do" attitude and have the intestinal fortitude to say he can not adequately support a given mission with the resources available. The commander must understand this. A tactical situation may require that the mission be executed without adequate support, but even in such a case the commander must know the plan's limitations. Thus counseled by the commander or executive officer, the surgeon should understand his role as staff officer, but the central question remains, *how can the surgeon best support the unit's mission?*

He does so by performing his duties. There are only two.

First and foremost, he must maintain the health of and protect from injury the soldiers assigned or attached to his unit. Operational medicine differs from clinical medicine in that the patients are predominantly young, strong, and healthy. It is the surgeon's duty to keep them that way.

Failing that, his second duty is to medically intervene in a manner which produces the optimal outcome for the patient both in terms of his health and his ability to accomplish his mission. Thus, a prime consideration in the unit surgeon's approach to patients must be their occupational potential both at present and in the future. The commander must know the medical readiness status of his unit at all times. It is the surgeon's duty to optimize that status. While it is possible to be a good clinician and not be good at operational medicine, one can not be good at operational medicine without being a good clinician. This is important to remember because maintaining good clinical skills is difficult when all your patients are young, strong, and healthy, and you are also burdened with the demands of being a good staff officer.

There are five steps to successfully performing these duties. Each follows in order of priority.

First, the surgeon serves as the subject matter expert, advising the commander on the medical aspects and implications of all unit operations whether in war, in training, or in garrison. The commander should realize the importance of unit health matters and seek out this input, but the surgeon must make this his top priority whether solicited or not. He should work closely with the S3 (operations officer) and get involved in operational planning at an early stage to facilitate this action.

Second, the surgeon must educate his patients and the commander concerning safety and preventive health measures. Health education is the cornerstone of preventive medicine, and preventive medicine is the foundation of operational medicine. Preventing disease and injury conserves the fighting strength of the unit. Nothing less can make this claim.

Third, the surgeon must train his medics to a standard that allows them to operate as an acceptable substitute in his absence. The Army trains medics to work in hospitals or at aid stations under the supervision of a higher level health care provider. The cold, hard facts of life in the field are that higher level providers are not always available to supervise medics. This is particularly true in special operations. Since the surgeon can not be everywhere at once, his duty to his patients requires that he provide for them through the medics. Additionally, the surgeon himself may become a casualty, cared for by those he has trained (or perhaps not trained!).

Fourth, the surgeon must provide clinical health care for the unit's soldiers in garrison, in the field, and at war. This part comes naturally to most physicians, but there is an additional component for the operational physician. In order to provide care in the field and at war, he must go to the field and to war with the unit. The operational physician's place is not in the rear. It is with the troops. He can not do his duty if he is back home at the hospital while the unit is doing a field training exercise. He must go where the troops go and do what they do. This fourth step, *forward presence*, is crucial in making the surgeon an active part of the team. He will gain credibility and rapport with the troops only once he proves that he understands, cares about, and is capable of participating in the unit's operations. For special operations units, this requires that he be trained as a special operations soldier, but he must not be a "door kicker." He can not do his duty if he is killed leading the charge against the enemy. Occasionally, the commander may be called upon to remind the surgeon of this fact. Careful balance here will make the surgeon a valued advisor to the commander and a successful health educator to the unit.

Fifth, the surgeon should positively impact the readiness, focus, and psychological well being of the unit by providing medical care to its dependents. It is a well-established principle of aviation medicine that the health of a pilot's family directly impacts his performance of duty. This is true of all soldiers who have difficult and stressful jobs. Treating family members also provides valuable insight into a soldier's home life and therefore his emotional and psychological health. This is of obvious concern to the commander.

Most unit physicians, however, are not required to provide dependent care. Dependents are usually cared for through the local family practice program or by civilian TRICARE providers. Still, it is inevitable that the surgeon will be called upon to care for family health problems, and as he gains in credibility and increases rapport with the soldiers this will become more and more frequent. A fine line must be walked in this regard. Note that this has the lowest priority of the five steps in performing the surgeon's duties. It is very easy for the surgeon to become overwhelmed by requests to care for family members at the expense of his primary responsibilities. He can not do his job if he is busy doing somebody else's.

These five prioritized steps will give the unit surgeon the guidance he needs to become a successful operational physician in any military unit. The practice of operational medicine in a special operations unit will require just a bit more. The commander should make certain that the incoming surgeon understands the following unique aspects.

Special operations differs from the conventional military in several ways, perhaps the most striking of which is the relationship between officers and enlisted personnel. There exists a familiarity among special operations soldiers that is not found elsewhere. Respect is earned by the quality and caliber of one's work and is not merely a function of rank or position. Special operations missions require soldiers to follow a team approach to their work which values the contribution of each team member beyond his rank. A special operations physician must accept his share of manual labor and suffer his share of privations. This environment will be totally foreign to most physicians.

Special operations physicians often find themselves working under the most austere conditions. There are no consultations with specialists, there is usually no laboratory or radiology service support, and often there is not even a clinic in which to work. The availability of medical supplies is sometimes limited to what the surgeon can literally carry on his back, and he must often limit his medical practice to what he can do with his own eyes, ears, hands, and mind. Not every physician who volunteers for a tactical unit assignment is prepared for or capable of such practice.

The Geneva Convention protects physicians as noncombatants. Unfortunately, opposition

forces do not always honor this convention. The size of deployed special operations units is often quite small, leading to the possibility of the surgeon deploying with as little as one or two other men. While it is true that the surgeon will not be asked to take an offensive role, he may find himself in a situation where he must protect himself or his patients against hostile intent. Some physicians possess moral or religious convictions that would preclude them from carrying a weapon and/or taking action in such a case. These persons should not be assigned where they could find themselves in such a situation, and thus are poor candidates for special operations assignment.

Finally, physical training, haircuts, uniforms, and military bearing are just as important for the operational physician as they are for combatant personnel, and they are vital considerations in the special operations community. Physicians do not, frankly, always view them as matters of import. A good rule of thumb would be, if the surgeon views himself as a doctor who happens to be in the military, rather than an officer who happens to have a medical specialty, he is a poor candidate for special operations duty.

In conclusion, unit surgeons are frequently not utilized to their maximum potential, due to a lack of understanding by both the surgeon and the commander of the surgeon's role within the unit. The surgeon's role in special operations planning, training, and execution is based upon sound ethics and doctrine. The effective special operations surgeon plays a complex and vital role in operations, but it is not an intuitive one. The surgeon, as a special staff officer, can use a prioritized, five-step approach to accomplishing his duties. Special operations commanders can direct and evaluate the performance of the unit surgeon using this checklist as a guide, thereby ensuring optimal utilization of the surgeon's special talents.

Lieutenant Colonel Brian S. Campbell, DO, MPH, U.S. Army
Lieutenant Colonel Brian S. Campbell is the Chief of Operational Medicine & Clinical Services at the U.S. Special Operations Command.

He received a Bachelor of Science degree in Biology from Edinboro University of Pennsylvania, a Doctor of Osteopathy degree from Philadelphia College of Osteopathic Medicine, and a Masters degree in Public Health from the University of Tennessee. His military education includes the Army Medical Department Officer Basic and Advanced Courses, and the Command and General Staff Officers Course.

Lieutenant Colonel Campbell completed his residency training at the U.S. Air Force School of Aerospace Medicine, Brooks Air Force Base, Texas. He is certified by the American Board of Preventive Medicine and the American Osteopathic Board of Preventive Medicine as a Preventive Medicine specialist in the fields of Aerospace Medicine and Occupational/Environmental Medicine. He holds a faculty position as an Assistant Adjunct Professor of Preventive Medicine and Biometrics at the Uniformed Services University of Health Sciences.

During his career, Lieutenant Colonel Campbell has served as the Preventive Medicine Officer, U.S. Central Command, MacDill Air Force Base, Florida; as Regimental Flight Surgeon, 160th Special Operations Aviation Regiment (Airborne), Fort Campbell, Kentucky; as 2nd Battalion Surgeon and Medical Platoon Leader, 5th Special Forces Group (Airborne), Fort Campbell, Kentucky; as the Group Surgeon and General Medical Officer for the 5th Special Forces Group (Airborne), Fort Bragg, North Carolina; and as General Medical Officer for the 382nd Mobile Army Surgical Hospital, Erie, Pennsylvania.

Lieutenant Colonel Campbell served in combat with D Company, Task Force 160, during Operation Prime Chance (Earnest Will) in the Persian Gulf. He also served with the 2nd Battalion, 5th Special Forces Group (Airborne), during Operation Desert Storm in the Kuwaiti Theater of Operations.

History, Missions, and Organization of the Joint Special Operations Medical Training Center

Clifford C. Cloonan, MD
Michael Wilkinson, PhD
Steve Ellison, MD

ABSTRACT

The Joint Special Operations Medical Training Center (JSOMTC) at Fort Bragg North Carolina trains all enlisted medical personnel within the United States Special Operations Command. The JSOMTC is the result of over a decade-long effort to establish a single medical training facility for all Special Operations Forces (SOF) enlisted medical personnel. In May of 1996 the JSOMTC opened its doors at Fort Bragg, North Carolina for centralized training of Special Forces medics (the Special Forces Medical Sergeants Course) and a new training program for all non-SF SOF medics, called the Special Operations Combat Medic Course, was begun. With all SOF enlisted medical personnel now training at a single site, and with and all becoming certified EMT-Paramedics, the level of medical training and of medical interoperability within SOF has been significantly enhanced.

The Joint Special Operations Medical Training Center (JSOMTC) at Fort Bragg, North Carolina, is the new home of medical training for Special Operations personnel from all branches of the military. This Department of Defense (DoD) training center was established in 1996 to consolidate and standardize medical training among all DoD Special Operations Forces (SOF) while continuing a mission to provide first class medical training to U.S. Army Special Forces (SF) medics (18D). This new training center uses the latest training techniques and technological advances to impart medical skills and knowledge to SOF medical personnel. The JSOMTC is destined to be the home of Special Operations medicine for well into this century.

Beginning in 1986, the United States Army Special Warfare Center and School (SWCS) and the U.S. Army Medical Department Center and School (AMEDDC&S), in an effort to consolidate enlisted medical training for all DoD special operations forces, began preliminary discussions on the feasibility of integrating special operations medical training in a single facility. at Fort Bragg, North Carolina. The training of Special Forces medics had formerly been divided between programs at Fort Sam Houston and Fort Bragg and there existed no specialized advanced medical training for other non-SF special operations medics, i.e. Rangers, SEALS, and USAF Pararescue.

Efforts to establish such a facility began in earnest in December 1987 with a recommendation from the SWCS Joint Working Group to the Joint Special Operations school integration committee that a school be established. The expected benefits were improved training for non-SF SOF medical personnel (who were formerly trained only to the conventional force standard), reduced training costs, and standardization of all SOF medical training leading to enhanced interoperability. Early in the process of designing the joint SOF medic training program that was to be taught at this new facility it was decided that training and certification as a paramedic to National Registry EMT-Paramedic standards would be an integral and requisite part of the course.

In 1991 the Commander of United States Special Operations Command (USSOCOM) requested funding from the U.S. Congress for the creation of a United States Army Institute for Special Operations Medical Training (USAISOMT) at Fort Bragg. In 1993 $17.5 million dollars were allocated by Congress for the construction of a new SOF Medical Training complex and trainee barracks at Fort Bragg[1]. In February 1993, the United States Army John F. Kennedy Special Warfare Center and School (USAJFKSWCS) was designated the executive agent for the new facility and was tasked with staffing the new center and with developing an integrated curriculum for all services. Since congressional funding was made contingent upon the consolidation of all SOF medical training and since the train-

ing was to be joint, the name was changed from the US Army Institute for Special Operations Medical Training to the Joint Special Operations Medical Training Center. Three years later, in May of 1996, the Joint Special Operations Medical Training Center (JSOMTC) was completed at a final cost of $27.1 million for facilities and equipment.

The JSOMTC is designed to support the training of several classes simultaneously. Located on 9.6 acres of land, the 74,000 square foot main building houses the offices, classrooms, and ancillary facilities necessary to support training. There are 17 large and small classrooms available for lecture and small group sessions. The largest of these can comfortably seat 200 students. Additionally, there are over two acres of enclosed woodlands on the grounds of the JSOMTC to support training in simulated field environments.

A barracks facility constructed near the JSOMTC houses 140 single and unaccompanied students and an identical barracks is currently under construction and nearing completion immediately adjacent to the existing barracks. Upon completion of the second barracks all single and unaccompanied students will reside within immediate proximity of the JSOMTC.

A host of other facilities dedicated to instruction in medical subjects are located within the JSOMTC. Ten operative procedure rooms modeled after modern hospital operating rooms are equipped for instruction in surgical techniques. Two, 800 square foot laboratory classrooms are available for student instruction and can accommodate up to 48 students each. These laboratories rival contemporary university facilities, each having a five-headed microscope with mounted digital camera. A modern well-equipped anatomy and physiology teaching laboratory enables quality basic science instruction. Between five and eight cadaver specimens are available for each class through arrangement with a local university. A dedicated X-ray suite allows teaching radiological techniques with field x-ray equipment. Finally, these specialized areas are supported by a large medical logistics division complete with instrument sterilization equipment and supply storage areas.

In 1998, USSOCOM provided $200,000 for the creation, within the JSOMTC, of a SOF-focused medical library and a student computer lab. The JSOMTC currently has holdings of over 700 titles covering a wide range of topics of relevance to SOF medicine. In addition to books, the library subscribes to a variety of medical journals of SOF relevance, and has videotapes that can be viewed in the library. The 1300 square foot library allows for approximately forty patrons to sit and study. Students can facilitate their learning on interactive CDs and via the Internet at forty-four, state-of-the-art, IBM computer workstations located in the library and in a separate computer lab. Access to MEDLINE and other full-text databases allow patrons to read the latest journals in the field and search for relevant articles of interest.

Within the JSOMTC compound there is also a 9000 square foot veterinary facility that supports veterinary and medical skills training. Complete with automated feeding equipment and air exchange mechanisms, this facility incorporates the newest animal care provisions and emulates the finest facilities of this type in the country.

The design of the JSOMTC incorporates the latest in computer, electronic and fiber optic technology. In an effort to provide a more dynamic style of instruction, each classroom and laboratory is equipped with a BARCO projector and screen with video monitors and speaker systems. These are linked into a central computerized audio-visual control center. Instructors in each classroom can conduct computer-based presentations, supplemented with video and audio enhancement from multiple sources. These are orchestrated by infrared remote control from the classroom.

Instruction at the JSOMTC is provided by a talented, dedicated, and experienced group of permanently assigned officer and enlisted

personnel from all branches of the military. Dean of the JSOMTC is an Army colonel physician with a special operations background. The Navy and the Air Force each provide an Assistant Dean with medical, educational, and special operations training and experience. Day-to-day operation of the facility is the responsibility of the Special Operations Medical Training Battalion which is commanded by a lieutenant colonel Special Forces branch officer. Included in the staff are officers selected for their professional expertise and special operations experience from the Medical, Dental, Veterinary, Nursing, and Physician Assistant branches. Enlisted instructors are assigned from SOF in the Army, Navy and Air Force. Enlisted technicians specializing in pharmacy, radiology, laboratory diagnostics, surgery, animal care, and logistics and personnel management provide additional support. A group of dedicated civilian employees with backgrounds in education, personnel management, information management, and pre-hospital emergency medical care complete the staff of the JSOMTC.

Currently, the JSOMTC is tasked with the execution of two complete courses of instruction, the Special Operations Combat Medic Course (SOCM) and the Special Forces Medical Sergeants Course (SFMS). JSOMTC also provides instruction for two modular courses, the USAF EMT-Intermediate (EMT-I) course for Air Force Pararescue (PJs) not assigned to a special operations unit and the USN Advanced Special Operations Combat Medic course (ADSOCM) for senior SEAL corpsmen. In addition, portions of two other Special Warfare Center and School Courses, the 18D Special Forces Medic Advanced Non-Commissioned Officer Course and the Special Forces officer orientation course, are also taught at the JSOMTC.

The 24 week Special Operations Combat Medic (SOCM) course is taught to enlisted Army personnel from the Ranger Regiment, Special Operations Aviation Regiment (SOAR) and Special Operations Support Battalion (SOSB). USN SEALs and USN personnel supporting USMC Recon units as well as Air Force Special Operations Command (AFSOC) Pararescue personnel make up a large portion of each SOCM class. Although 19 of the 24 weeks of SOCM training are focused on anatomy and physiology and paramedic training, the remaining five weeks cover such military unique subjects as medical management of NBC casualties, sickcall medicine, sports medicine, and environmental medicine (heat, cold, and dysbaric injuries). A four-day field training exercise in a simulated combat environment culminates the SOCM course. During the SOCM course students receive American Heart Association certification in Basic and Advanced Cardiac Life Support (ACLS) as well as certification by the National Registry of Emergency Medical Technicians at the EMT-Basic and Paramedic levels. Upon graduation a SOCM is capable of providing basic primary care for his Special Operations team for up to seven days and is capable of sustaining a combat casualty for up to 72 hours after injury as required.

Special Operations Combat Medic students receive clinical training in both emergency pre-hospital and hospital settings. This training is conducted during a four-week deployment to one of two major metropolitan areas on the East Coast of the United States. During Fiscal Year 1997, the initial four classes of SOCM students documented care for over 19,500 patients in various pre-hospital and hospital settings.

Beginning in January 1999 non-AFSOC USAF Pararescue (PJ) personnel began training at the JSOMTC to the EMT-I standard. These students had formerly been trained at Kirtland Air Force Base, New Mexico, in a program that has now closed. Air Force students in the EMT-I program attend the first seven weeks of the SOCM curriculum, specifically arranged to meet this requirement. After meeting the didactic requirements for EMT-I these students leave the SOCM course to perform ten days of clinical rotations at Womack Army Medical Center, Fort Bragg, or at a local civilian hospital to get experience on civilian ambulances in the Fayetteville, North Carolina area. Students in the course then take the NREMT-I test and receive an additional ten days of Air Force, military specific, medical instruction prior to departing the JSOMTC to complete their pararescue training at Kirtland Air Force Base.

U.S. Army Special Forces students attend the 46 week Special Forces Medical Sergeants (SFMS) course, which is Phase II of a three phase, 58 week long, Special Forces Qualification Course conducted at Fort Bragg. Students in this course must successfully complete the 24-week SOCM curriculum before continuing on for an additional 22 weeks of specialized training in medical, surgical, dental, veterinary and preventive medicine subjects. Upon completion of this

course students are qualified to function as independent health care providers. Navy personnel qualified for this advanced training attend a similar course of instruction at the JSOMTC known as the Advanced Special Operations Combat Medic course (ADSOCM) which is also 22 weeks in length. Upon completion of this course the Navy awards these students the title of Independent Duty Corpsman (IDC).

In addition to the four weeks of clinical training provided during the SOCM portion of their training, U.S. Army SFMS and USN ADSOCM students receive another four weeks of clinical experience (called Special Operations Clinical Training or SOCT) at selected military health care facilities throughout the Eastern and Central United States. The focus of this training is on honing student skills as independent, general practice, health care providers.

The JSOMTC participates in the continuing medical education or medical sustainment training of SOF medical personnel in a number of ways. Qualified Special Forces Medical Sergeants receive two weeks of medical instruction at the JSOMTC as part of their Advanced Non-Commissioned Officers Course (ANCOC). Advanced Cardiac Life Support (ACLS) Instructor certification is available to qualified personnel through JSOMTC-taught instruction. Qualified SOF medical personnel may also attend Advanced Trauma Life Support (ATLS) courses that are conducted preiodically by the Defense Medical Readiness Training Institute (DMRTI) utilizing JSOMTC facilities. In addition, a number of initiatives are being pursued which will provide JSOMTC instuction via distance learning to SOF medical personnel worldwide. In the near future, SOF personnel will be able to continue their medical education or receive support in the field by logging on to a JSOMTC World Wide Web home page via the Internet.

The Joint Special Operations Medical Training Center became operational with the intiation of training in July 1996. This inagural class marked the next step in a tradition of training Special Operations personnel in advanced medical skills. This tradition spans over 30 years and it is JSOMTC's mission to carry on this tradition of excellence well into the 21st Century.

COL Clifford C. Cloonan, MC, U.S. Army
Vice Chair, Dept. of Military and Emergency Medicine,
Uniformed Services Unitversity of the Health Sciences
Bethesda, MD 20814
CDR (Ret) Michael Wilkinson, MSC, U.S. Navy
Joint Special Operations Medical Training Center,
Naval School of Health Sciences, Portsmouth
USN Component, Fort Bragg, North Carolina 28307-5200

CPT (P) Steve Ellison, MC, U.S. Army
Joint Special Operations Medical Training Center,
JFK Special Warfare Center and School
Fort Bragg, North Carolina 28307-5200

Thor's Hammer: Lightning Injury

Robert C. Allen, DO

INTRODUCTION

Lightning is a constant occurrence. There are upwards of 2,000 thunderstorms active throughout the world at any particular time. Worldwide, it is estimated that that there are 100 cloud-to-ground lightning strikes every second. Virtually every culture on earth has legends concerning lighting and thunder, from the Nordic Hammer of Thor, to the thunderbolts of Zeus, to the Southwestern Native American Thunderbird. In ancient Rome, people killed by lightning were denied burial rituals as it was presumed that they had been struck down by the Gods. There are still many myths concerning lightning strikes, including: "Lightning never strikes twice in the same place;". "If you can't hear the thunder, you're safe from lightning," "People struck by lightning are electrically charged and can shock you if you touch them;" People struck by lightning are in 'Suspended Animation' and can be successfully resuscitated after hours of CPR." As we shall see, all of these myths are incorrect.

EPIDEMIOLOGY

Lightning injuries are most common in areas of frequent thunderstorm activity. In Florida there are 70-90 thunderstorm-days per year. The area of highest thunderstorm frequency in the United States is a band across the middle of the state from Tampa, through Orlando, to Cocoa Beach. In northeast New Mexico there are approximately 70 thunderstorm-days per year. Even desert regions such as Arizona can have frequent thunderstorms. Southern Arizona averages 60 thunderstorm-days per year.

The exact incidence of lightning injury is not known. There is no accurate reporting of thunderstorm deaths or injuries. NOAA reported 2566 deaths and 6270 injuries from 1969-1986. However, the incidence of lightning related injury and death is almost certainly under-reported. It is estimated that there are between 50 and 300 lightning related deaths in the United States every year. A study from Colorado covering lightning injuries and deaths from 1950-1991 reported that 9% of fatalities were single fatality mishaps, 10% were two fatalities per incident, and 1% were three or more fatalities per incident. This may reflect the availability of bystanders to provide emergency care.

PHYSICS

Lightning is a complex phenomenon caused by electrical charge stratification within cumulonimbus clouds. This requires an unstable air mass (usually where hot and cold fronts meet), with rapid vertical movement of water droplets and/or ice crystals. Multiple layers of charges may exist within the cloud mass. When the charge differential between two cloud layers, or between the cloud and the ground exceeds the insulating capacity of the air, ionized pathways form, creating a bolt of lightning.

For a cloud-to-ground lightning strike to occur, a complex sequence must take place. First, a *stepped leader* forms from the cloud, reaching towards the ground. At the same time, a *pilot streamer* from the ground forms, reaching up towards the cloud. There can be several stepped leaders and pilot streamers. Eventually, a stepped leader and pilot streamer meet, forming a *pilot stroke*. This creates a low resistance ionized pathway between charged layers (cloud/ground). Within milliseconds, the charges between the cloud and ground equalize via a *return stroke*. There may be many return strokes. The average is four to five per bolt, however, as many as 30 have been recorded.

The lighting bolt itself is 6-8 cm in diameter, carrying between 10 and 100 million volts and 20,000-50,000 amperes of direct current. The duration of the bolt is very short, between 0.01-1.0 milliseconds. Bolts of two billion volts and 50 to 500,000 amps have been measured.

Lightning bolts can strike up to 10 km in front of or behind a thunderstorm cell. The 'bolt from the blue' is a real entity, and is responsible for many strikes causing property damage, injury and death.

Thunder occurs as a result of the expansion of air within the superheated bolt. The thunder sound wave travels at the speed of sound, while the lightning flash travels at the speed of light. The speed of sound at sea level is approximately 5 seconds per mile, so to determine your distance from the lightning bolt, count the seconds from the flash, and divide by 5 (Distance=Seconds/5). Distant thunder 'rumbles' because of refraction of the sound waves, while close thunder is a sharp clap.

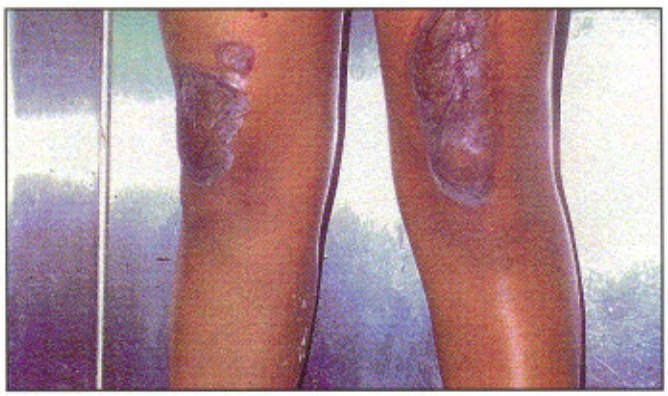
There are multiple types of lightning, most named because of their appearance. Streak lightning is the most common, and has the classic jagged blot shape usually associated with lightning. Ribbon lightning resembles a relatively wide flat sheet, and is usually seen in cloud to cloud lightning. Ball lightning is the strangest of the lightning types. It is a complex, poorly understood phenomenon, manifested by glowing balls of charge that may change direction apparently at random. Many theories have attempted to explain and predict its erratic appearance and sometimes-bizarre behavior, but it has never been adequately explained or modeled.

The interaction of a lightning bolt against the human body is a complex collision of physics and physiology. Electrical current will always take the path of least electrical resistance. If the path of least resistance happens to include a person, then you have a lightning strike injury.

Skin is quite resistant to electrical conduction, especially with very short duration current such as a lightning bolt. As a consequence, the lightning charge does not usually enter the body, but 'flashes over' the exterior. If the charge actually passes through a body rather than flashing over, the victim is almost invariably killed. In a 'flash over' situation, some charge may 'leak' into the body via eyes, ears and mouth, causing further injury. Burns from lightning are usually superficial, unless caused by heating of objects close to the skin (belt buckles, dog tags, bracelets, etc.). Wet clothing may be blasted from the body as a result of the bolt flashing water on the skin or clothing into steam. The most important point to remember about a lightning victim is that the charge flashes over and is gone within milliseconds. There is no residual charge in the body after a lightning strike. The victim may be handled without fear of being shocked (unless another lighting bolt hits).

There are multiple types of lightning strikes. A direct strike occurs when a stepped leader connects directly with a human or other animal. A splash strike is a side flash from a struck object to the victim (bolt hits a tree, goes over the victim and then to the ground). A contact strike occurs when an object that is in direct contact with a person is hit and the electrical charge passes from the object through (or over) the person to the ground. Step voltage (also known as ground current or stride voltage) occurs when current passing through the ground finds a less-resistant pathway by passing up through a person then back down to the ground. This type of lightning strike is commonly blamed for killing livestock. Lightning can also cause blunt and blast trauma, due to the concussive effect from the bolt, or blast injury from an object that explod when struck: trees will frequently explode when struck, as the water and sap in the wood flashes to steam

INJURIES ASSOCIATED WITH LIGHTNING STRIKE



There are multiple types of injuries that can occur with lightning strike. Minor injuries include dysesthesias, confusion, temporary blindness or deafness, amnesia (typically anterograde), paresthesias, and rupture of the tympanic membrane. Victims with minor injuries usually recover without serious physical sequelae, although psychological effects (storm phobias, depression, personality changes and such) can be quite serious.

Moderate lightning injury can result in a combative, disoriented victim. A unique form of motor paralysis (known as *keraunoparalysis*) can occur. Autonomic dysfunction can occur, with including vascular spasm and blood pressure fluctuation. Loss of consciousness and coma are common. Victims usually recover, however significant sequelae such as cataracts, paresthesias and autonomic instability may result.

Severe lightning injury includes cardiopulmonary arrest (usually cardiac asystole or ventricular fibrillation), direct damage to the brain, and blunt trauma to the brain or inter-

nal organs. Prognosis in these cases is usually poor.

Cardiopulmonary arrest after lightning strike can be a primary event (think of it as the "defibrillator from hell"), with spontaneous cardiac re-start within a few seconds. However, animal evidence indicates that the respiratory paralysis lasts longer, which can lead to secondary hypoxic cardiac arrest. EKG changes indicative of myocardial damage can evolve if the event is survived, classically showing QT prolongation. Although ST changes with CK-MB enzyme elevation have been known to occur.

At one time it was felt that the unique nature of cardiac arrest associated with lightning strike made successful resuscitation more likely, even after a prolonged cardiac arrest. Recent data show that this hypothesis (sometimes referred to as the 'cessation of metabolism' theory) is not correct. Primary cardiac and respiratory arrest associated with lightning strike may in fact do very well if early CPR is administered. However, secondary cardiac arrest from prolonged respiratory arrest has no better prognosis than any other hypoxic cardiac arrest. Furthermore, cardiac arrest as a result of damage to the brainstem is almost invariably fatal.

Neurological injuries can be varied, ranging from direct electrical injury to the brain stem (almost invariably fatal), to keraunoparalysis. Anterograde amnesia is common, sometimes associated with difficulty in short-term to long term memory transfer. Sympathetic instability, associated with cold, mottled, insensate, pulseless extremities is sometimes seen. Blood pressure instability is common, and may last for several days.

Burns associated with lightning injury are usually superficial (deep burns are an indication of electrical passage through the body and carry a grave prognosis). Burns can also occur from metal objects close to the skin (belt buckles, dog tags, etc). A pathognomonic sign of lightning strike is *feathering burns* of the skin. These are not really burns at all, but the result of an intense shower of electrons across the skin.

Many other injuries can be associated with lightning injury. Cataracts can develop rapidly, within days to weeks, or can show up years later. Fixed, dilated pupils occur frequently in lightning victims and are an unreliable sign of death. Tympanic membrane rupture, hemotympanum, and oto-rhinorrhea may be noted. Neuropsychological changes have been documented in lighting injury victims, but are hard to quantify. Followup neuropsychological testing is recommended for all lightning injury victims.

TREATMENT OF THE LIGHTNING STRIKE VICTIM

Single victim

Scene safety: Lighting does strike twice in the same place.

ABC's: Rapid CPR may prevent further damage. Start ACLS ASAP.

Occult cervical spine injury is a possibility; protect the neck

Transport ASAP to ED. Recognize occult lightning strike: victim down in field, clothes in disarray - is it assault or blown out of their clothes by a lightning strike?

Prolonged CPR in lightning strike victim is no more effective than it is with any other form of cardiac arrest. In a wilderness environment, know when to quit.

Multiple victims

REVERSE TRIAGE.

Victims that are able to talk, move or otherwise show significant signs of life will likely survive. Victims that are down in cardiopulmonary arrest need help first (reverse of normal mass-casualty triage schemes).

CPR on all victims in arrest.

Patients in arrest get transported first.

Remember autonomic dysfunction and keraunoparalysis: people who are awake, but complain of paralyzed extremities (especially lower extremities) will likely do well. However, *do* use appropriate spinal precautions.

Hospital Evaluation

Continue resuscitation as needed, and ICU care, invasive monitoring as needed.

EKG, CBC, UA (check for myoglobin), cardiac enzymes.

Complete neurological exam.

Complete ophthalmologic exam, including slit lamp.

Neuropsychological testing?

DUCKING THOR: HOW NOT TO GET HIT

Don't be the tallest object in the area.

Don't be next to the tallest object in the area.

Stay out of open fields, off mountain tops and below the tree line in thunderstorm conditions.

That thunderstorm cell "10 klicks over thataway" can reach out and touch you, unpleas-

antly.

If in the mountains, shelter in a grove of trees.

If in a group, spread out so a single hit won't affect everyone (hand-grenade rules!).

Sheltering in a metal vehicle is relatively safe.

Bolts can be conducted through telephone lines, water pipes, electrical wires, cable TV lines, steel reinforcing rods in concrete, or kite strings (Ben Franklin was lucky). Stay away from such things during an electrical storm.

If caught in the open, lying flat isn't a good idea. Crouching down with feet together seems a good a posture as any.

Stay off the water in thunderstorm conditions.

Robert C. Allen, DO, FACEP

Lt Col Rob Allen is currently assigned as the Group Surgeon, 720th Special Tactics Group (AFSOC), at Hurlburt Field, FL. He is the head physician for USAF Combat Control, Combat Weather, and Special Operations Pararescue personnel. He has been assigned to Special Tactics for 7 years, first as the Squadron Surgeon, 24th Special Tactics Squadron, Pope AFB, NC, and now as the Group Surgeon, 720th Special Tactics Group.

Dr. Allen is originally from Claremont, California, and did his undergraduate work at the University of California, Irvine, where he completed degrees in biological sciences and chemistry. He attended medical school at the College of Osteopathic Medicine of the Pacific, receiving his DO degree in 1983. After completing his Internship in Pontiac, MI, he came on active duty with the Air Force in 1984.

Dr. Allen did his residency in Emergency Medicine at Wilford Hall USAF Medical Center/Brook Army Medical Center, is Board-Certified in Emergency Medicine, and is a Fellow of the American College of Emergency Physicians. Dr Allen has extensive experience in clinical toxicology, operational medicine and wilderness medicine. He is on the Board of Directors of the Wilderness Medical Society.

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Oral Fluoroquinolones: A New Tool for SOF Combat Medics?

Frank Butler, MD

Knowing that wound infections constitute one of the major causes of late morbidity and mortality from combat trauma, why are we not more aggressive in starting antibiotic therapy as soon as possible for SOF operators wounded in battle?

The USSOCOM-sponsored workshop on Tactical Management of Urban Warfare Casualties held in Tampa in December 1998 focused on the Battle of Mogadishu in 1993 and identified a number of potential improvements in the battlefield care of combat casualties. One of these was the need for antibiotics to be administered as soon as possible after wounding. This was not done in Mogadishu and there was a high incidence of wound infections that followed the prolonged evacuation time for the casualties in this engagement. The antibiotics discussed by the panel for this purpose were cefoxitin and ceftriaxone. Both of these antibiotics, however, require mixing and IV or IM administration by the combat medic in the field. Although this is easily accomplished in the confines of a medical treatment facility, having to mix and administer an IV antibiotic is an unwanted logistic burden for a corpsman, medic, or PJ engaged in a combat action.

Participants in the Mogadishu workshop noted that a possible alternative to cefoxitin or ceftriaxone is the fluoroquinolone class of antibiotics. Since blood levels of the fluoroquinolones achieved with oral dosing are similar to those achieved with IV dosing, SOF combat medics could easily carry an adequate supply of antibiotics for the entire unit. Administering the antibiotics to wounded teammates would require no more than swallowing a gulp of water from a canteen. The fluoroquinolones also have an excellent spectrum of antibacterial action. Trovafloxacin is effective against gram-positive, gram-negative, and anaerobic organisms. Ciprofloxacin has less activity against anaerobes but offers excellent coverage against *Pseudomonas* species. Levofloxacin has more action against gram-positive organisms than ciprofloxacin, but is less effective against *Pseudomonas* and equally ineffective against anaerobes.

In addition to the advantage of oral administration, the fluoroquinolones require less frequent dosing. Both trovafloxacin and levofloxacin are given as a single daily dose. Imagine a SEAL platoon with 3 seriously wounded individuals that cannot be extracted for 48 hours. To maintain antibiotic coverage with cefoxitin for all 3 casualties would require 24 doses – a quantity that SEAL corpsmen are not likely to carry. In contrast, a single bottle of trovafloxacin or levofloxacin tablets would suffice for a much longer period if required.

The fluoroquinolones have an excellent safety profile. A review in the October 1999 *Mayo Clinic Proceedings* states that the they are tolerated as well or better than any other class of antibacterial agents. The best-known toxic effect of the fluoroquinolones has been the severe hepatotoxicity seen with trovafloxacin use, but this was seen in only one hundred-forty patients out of 2.5 million prescriptions, and was seen after long-term (more than twenty-eight days) use of the medication. Gastrointestinal upset is seen in about five percent of patients treated with fluoroquinolones and mild allergic reactions (rash, urticaria, and photosensitivity) are seen in one to two percent of patients. Mild CNS symptoms (headache and dizziness) are also encountered with the fluoroquinolones in five to ten percent of patients.

Do we need double-blind, randomized, placebo-controlled studies to study this potential treatment option? This type of study is not likely to be done in humans, and, even if it were to be attempted, it would be difficult to replicate combat-appropriate conditions in civilian trauma centers. USSOCOM Biomedical R+D Task 7-2000 attempted to undertake an animal study to answer this question. The response from laboratories that might potentially have undertaken this study was minimal, however, largely because of the difficulty of maintaining injured and infected animals in a humane manner.

Another way to approach this question would be to conduct a workshop to explore the possibility of using oral fluoroquinolones to prevent wound infections in combat trauma. A preliminary litera-

ture search should be accomplished and the results disseminated to workshop participants. Experts in critical care, infectious disease, and trauma surgery should join with representatives from the SOF medical community to address questions such as:

1) Which medication should be used?
2) Should it be used before combat or after wounding?
3) Which types of wounds should it be used for?
4) Should several different fluoro quinolones be used, with the choice of medication dependant on the type of wound?
5) Are there types of wounds (e.g., penetrating abdominal trauma) that would benefit from combination therapy?
6) Are there wounds for which only IV antibiotics should be used? What if no IV antibiotics are available for these wounds?
7) What side effects should be expected from the agent(s) chosen?
8) Best second choice oral antibiotic?

The results of this workshop will hopefully provide SOF medical leaders with the information they need to make an informed decision. There may be no single best answer to the question of how SOF first responders can best help to prevent wound infections in their wounded teammates, but the use of oral fluoroquinolones holds a great deal of promise as a combat-appropriate approach to this problem. While we would all like to have definitive clinical studies in this area prior to making a decision, the SOF medical community can't use that as an excuse to ignore the issue. Every single combat operation that SOF undertakes requires that our mission commanders be prepared to make critical decisions with information that is incomplete. They are expected to rely on their training and judgement to come up with the best possible answer given the circumstances they encounter. They expect the same of those of us in SOF medicine.

We *know* that we will have wounded SOF operators in future battles: we know that many of them will have prolonged delays to definitive medical care; and we know that many of them will develop wound infections if they are not treated with appropriate antibiotics as soon as possible. Oral fluoroquinolones are a much better answer than what has been done in the past to prevent wound infections in SOF combat casualties. That all too often has been – nothing.

Do we want to add a wound infection to this casualty's problems?

(Photo courtesy SFC Bob Miller 3/75 Rangers)

CAPT Frank Butler
Captain Frank Butler is the Chief of Ophthalmology at Pensacola Naval Hospital. He is one of the few Navy physicians who are SEAL-qualified. He is the Biomedical Research Director for Naval Special Warfare Command.

Keratorefractive Surgery

Scott Barnes, MD

Keratorefractive surgery is a new procedure that gets rid of the need for glasses, right? Well, it is neither new nor does it get rid of the need for glasses (in everybody).

The first surgical procedure to reduce the dependency on glasses is generally believed to be by the Japanese doctors Sato and Akiyama in the 1930s. Cuts were made on the inner and outer surfaces of the cornea of willing patients. Most patients had a dramatic improvement in their uncorrected visual acuity...until some years later when all patients required corneal transplants to see through their now opaque corneas. Thanks to Dr. Sato's unfortunate experiment, we now know that one cannot make cuts on the inner surface of the cornea without disastrous results.

This misadventure temporarily set back refractive surgery, until the Soviet Union decided that it was time to test a procedure called radial keratotomy (RK). In the 1970s, Drs. Fyodorov and Durnev were able to enlist volunteers to test a procedure in which radial cuts were made on the outer surface of the cornea. Again, many of the patients achieved dramatic improvements. However, unless the incisions were carried through at least 90-95% of the thickness of the cornea (without going through 100%), there was not a significant improvement. Of more concern is the cornea's lack of healing; corneal keratocytes are specialized cells which heal differently than typical tissue fibroblasts. Otherwise, an opaque scar would result. This modified healing response allows for a weakened cornea along the incision lines. The opthalmic literature contains a number of reports of ocular trauma resulting in globe (eye) ruptures along the previous "healed" RK incisions.

While many civilian ophthalmologists and patients were quite happy with RK, the potential for traumatic ruptures, the ensuing regression effects (changing refraction and prescription over time), and the significant visual acuity changes that occur at altitude (discovered by Army ophthalmologists) caused the military community to avoid such procedures.

The next refractive procedure to gain favor was photorefractive keratectomy (PRK). While this sounds similar to RK, it has no similarity other than improved visual acuity. This procedure was pioneered by ophthalmologists in Louisiana in 1987, using an excimer laser developed by Dr. Toboda of Brooks Air Force Base. The excimer laser allows very precise cuts without appreciable collateral damage. The photochemical ablation avoids the peripheral melting associated with typical photothermal lasers (YAG, CO2, etc). The basic process involves reshaping the corneal surface to better focus images upon the retina.

PRK has the advantage of not weakening the cornea, not being affected by altitude or pressure changes, and not being associated with significant regression. The main disadvantages come in the three to five days of discomfort associated with epithelial healing, the usual one to two week period of visual recovery, and the problem of corneal haze which appears to be associated more with higher degrees of myopia, (greater than –6 to –20 diopters). Bandage contact lenses and preservative-free anesthetic drops have greatly reduced the initial discomfort and the newer generation lasers have markedly reduced the incidence of corneal haze and the time necessary to achieve one's best visual acuity. However, the search to improve the patient's experience with refractive surgery resulted in yet another refractive procedure.

Laser assisted in-situ keratomileusis (or LASIK), is the most recent player in the refractive market. It is actually a combination of a 1950's technology (updated to 1990s standards) with the same laser procedure described for PRK. Jose Barraquer of Colombia described a technique where he used a manual keratome to shave off a thin slice of the cornea. He froze this portion and reshaped it using

a small lathe-type device. He then sutured the reshaped section onto the cornea. While Barraquer had success with this procedure, worldwide results were not as impressive.

LASIK employs the keratome that originated with Barraquer but it is now automated once the surgeon manually positions the device. Instead of totally removing the small corneal flap, an uncut portion acts as a hinge. This flap is folded back and the excimer laser reshapes the underlying cornea in the same manner as with PRK. The corneal flap is placed back over the treated stroma and allowed to heal back in place.

The main advantages of this combination procedure are remarkably quick recovery of visual acuity and essentially no post-operative pain beyond mild discomfort during the day of surgery. There is less follow up involved with LASIK compared to PRK as well as less post-operative medication. There appears to be less incidence of corneal haze than with the original PRK but modern PRK shows similar rates.

The main disadvantages involve flap dislocation associated with trauma; literature and anecdotal episodes have occurred with dog's paws, tennis balls, pet birds, eye rubbing, and a child's finger to a parent's eye. While most of these patients did well after receiving immediate ophthalmologic care, the special operations arena involves personnel deployed in remote, isolated areas which often have little access to such specialized care should a flap dislocation occur. An unproven but theoretical risk related to infection was recently raised among refractive surgeons. The normal cornea has collagen fibers arranged in a fashion somewhat like winding country roads, so that peripheral infections cannot easily travel across the entire cornea. However, the attendees at the recent American Academy of Ophthalmology meeting in Dallas raised the possibility that creating a LASIK flap might be like creating a superhighway, allowing a more direct access to infectious organisms. Late complications of dry eyes also seem more common with LASIK as compared to PRK; this is thought to be related to the slow regeneration of the corneal nerves cut with the LASIK flap.

Reports vary widely but as a whole the results of PRK and LASIK are identical to the patient. There is no significant advantage for either procedure regarding uncorrected visual acuity, incidence of glare, halos, or night vision difficulties. Numerous studies have also indicated that there is no difference in PRK or LASIK in post-operative loss of visual acuity (about 0.5-2.0% of patients will lose at least two lines of visual acuity).

However, the significant advantage of a rapid, painless visual recovery with less intense follow up care warrants further investigation of the safety and efficacy of LASIK in the special operations soldiers. A study of Ranger school candidates after LASIK was initiated in the late 1999. To date, 13 subjects have made it through Ranger school without any incident of flap trauma or eye-related difficulties. Numerous subjects reported walking into branches. One soldier's corneal abrasion was so deep that he sought medical care; while the linear abrasion was directly across the entire LASIK flap, there was no evidence of flap displacement. Recent IRB approval was granted for a study involving Special Forces Qualification Course (SFQC) and Basic Underwater Demolition/SEAL (BUD/S) candidates who have had previous LASIK.

Current Army regulations prohibit soldiers from entering the service or from participating in all combat arms schools after having any type of keratorefractive surgery (RK, PRK, or LASIK). However, there is a process for waiver consideration. Prior to entrance, military recruiters can help an applicant secure a waiver for PRK or LASIK provided the preoperative refractive error was less than eight diopters. The surgery must have been done 12 months prior to application (this may be changing), with no complications or side effects impacting daily performance (cannot be using eye medications), and resulting visual acuity must currently meet entrance requirements.

Applicants for courses administered through the John F. Kennedy Special Warfare Center and School will be considered for waivers only if they have had PRK. Other than the SFQC/BUD/S study, no waivers will currently be considered for LASIK or RK. However, the policy regarding LASIK may be amended based upon the results of the above study. The prerequisites for the waiver are the same as mentioned for new recruits with the exception that the wait time after PRK has been shortened to three months.

There are no regulations which prohibit those already on active duty, who do not intend going to any of the combat arms schools, from receiving either PRK or LASIK. The only current exceptions to this

are those in the flight community (flight surgeon, flight crew, aviators) who would *lose their fitness for flying duty* if they undergo any type of refractive surgery. Fort Rucker is seeking approval for a study of aviation candidates who have had previous PRK or LASIK, the status of which is undetermined at this time.

The Army has begun a rather significant refractive surgery program for the warfighter. Five laser centers are planned for implementation, with the first center at Fort Bragg operational as of May 2000. The sites are initially funded to operate on 1000 patients/year. As the demand for refractive surgery will far outweigh 1000 patients/year, the operational units will be asked to develop an order of merit list similar to those used for the Military Freefall or Combat Dive Qualification Course. The idea is to bring the surgery to those soldiers most likely to receive the greatest benefit from a reduced dependency on glasses rather than treating the first 1000 patients to request the surgery.

While the surgery is quite successful, the excessive advertising associated with such a high priced procedure gives the impression that this is a perfect procedure guaranteed to eliminate glasses or contact lenses. The 1 and 3 month results from the refractive surgery clinic at Womack Army Medical Center (900 PRK procedures, 450 LASIK procedures) show uncorrected visual acuity of 20/15 in 52% and 20/40 in 98% of patients undergoing PRK; 42% at 20/15 and 97% at 20/40 for patients undergoing LASIK. These results are better than the FDA trials and as good or better than most refractive centers that publish their data. While many have excellent uncorrected visual acuity, some will require corrective lenses to achieve their best vision. That is why the procedure should be advertised as aiming to reduce the dependency on glasses rather than promising to eliminate everyone's need for corrective lenses.

What does the future hold for refractive surgery?

Implantable silicone rings that change the shape of the cornea, intrastromal laser without cutting a flap, intraocular lenses, and wavefront analysis with customized laser ablation are all possibilities. Wavefront analysis uses technology found in many astronomical telescopes to measure the fine differences in with the corneal surface. Computers link this information to a variable spot laser which can more specifically custom design a detailed resurfacing unique to each individual. The early results from New Orleans actually seem to point to slightly better results with PRK than with LASIK. The present lasers aim to give one the same visual acuity that one is capable of with glasses or contacts; customized wavefront ablation might have the potential to give the patient better vision than is currently possible with glasses or contacts.

As for military refractive surgeons' being on the leading edge of keratorefractive work, the Navy's refractive center in San Diego is going to be one of the main research centers for customized wavefront ablation. The clinic at Fort Bragg is currently in negotiations to be involved with this exciting research. So while Rangers may lead the way,---ophthalmologists are making that way more clear!

MAJ Scott Barnes, MD
MAJ Scott Barnes, USASOC Deputy Surgeon, had PRK while serving as the Group Surgeon, 1st SFG(A) in 1993. This led to a residency in ophthalmology in order to bring refractive surgery to the special operations community.

Laser Eye Injuries For the Special Operations Medic

John McAtee, PA-C

The rapid growth of laser technologies has resulted in increased military use of lasers by DoD, unfriendly forces and U.S. Allies. Rapid proliferation has proportionally increased the risks that military personnel may be exposed and injured. Applications of lasers include target designators, range finders, secure communications and antipersonnel weapons. A single, microsecond or shorter flash from a laser can cause damage to the eye if the energy reaching the cornea or retina is above the damage threshold. Susceptibility of the human eye to injury and the importance of vision for mission execution and success requires, a general understanding of the principals of laser energy, rapid identification of injury and treatment and immediate command notification.

Laser is an acronym which stands for *Light Amplification by Stimulated Emission of Radiation.* The energy is in the optical portion of the electromagnetic spectrum that is amplified to an extremely high intensity. The term "radiation" refers to energy transfer and is often misinterpreted because the same term is also used to describe radioactive materials or ionizing radiation. Energy is transferred by conduction, convection and radiation.

In the present use, radiation is merely one of the three ways energy can be transferred; the other two being convection and conduction.

The color of the laser light is expressed in terms of its wavelength, and the most common unit of Laser wavelength measurement is the nanometer (nm).

Laser light is non-ionizing and ranges from the ultra-violet (100-400nm), through visible (400-700), and into infrared (700-1micrometer).

Lasers are classified into one of four general categories based on their potential for injury. The following are the four categories and a brief description of each.

Class 1
This class is considered safe and includes lasers that cannot radiate energy above exposure limits for eyes under any condition that is inherent in the design.

Class 2
Lasers in this class must emit a visible beam. Because of its brightness and dazzling, these lasers would evoke an aversion response that would force the viewer to look away. These lasers, under normal conditions, would not produce an injury to the eye if viewed directly for less than 1000 seconds. Intentional extended viewing is considered hazardous.

Class 3
Class 3 lasers can emit at any wavelength, however, it cannot produce a diffuse reflection hazard unless focused or viewed for extended period at close range.

Class 4
These lasers present an eye hazard from direct and diffuse reflections

Listed below are current lasers deployed by DoD, with comments on their characteristics:

488/515nm	Argon ion lasers used in the Falklands but limited to shipboard application or other platforms with at least 10 kW of power available because the laser is only 0.01% efficient. 1 to 5 W cw.
532 nm	Doubled output of Nd:YAG. Nanosecond pulses of high energy.
647 nm	Diode laser pointers and designators. Low power, currently now of limited or no threat, but may be more powerful in the future. Low power available commercially now.
694 nm	Giant pulse ruby in old Soviet rangefinders. Nanosecond pulses of high energy.

X-rays	Ultraviolet	Visible	Near Infrared	Mid Infrared	Far Infrared
0.1	10 100	200 300	400 500 600 700 800 900 1000	3um	30um - 1mm

750-1000nm	Tunable Cr- ion in solid-state hosts (Alexandrite or LiSrAlf) or Ti:Al203. Future counter -measures lasers, either short pulse or long pulse at high energy. Cr:LiSAF is most probable candidate.
850-890nm	GaAs semiconductor diode lasers, low power individually for pointing but high average power in giant arrays. Expensive, but very power-efficient. Available now, IR pointers used by Special Tactics personnel to mark targets.
1.06 micron	Fundamental output of Nd:YAG. Available in high energy, short pulses and in high-average-power, either high PFF pulses or cw. Work-horse laser on battlefield: range-finder, designator, illuminator, etc. Special Tactics is using the AN/PEQ-1A laser target designator (LTD) for close air support missions. This is a class IV laser system. Also, the AC-130 H/U has an airborne version of a LTD at 1.06 micron.
1.3 micron	Very high energy single pulse potential laser weapon: iodine atom, at present in the laboratory.
1.54micron	Erbium ion in solid-state host or wavelength shifted Nd. Eye-safe wavelength for range-finding or designating. Usually low energy and power.
2.1 micron	Holmium ion, solid state laser. Eye-safe applications and countermeasures. Medium energy and power.
2.7 & 3.8 micron	High-average power HF or DF chemical laser. Potential weapon. Micron wavelengths.
9-11micron	CO2 laser. High average power at high efficiency. Versatile laser that can be used for almost all applications under consideration. Can be weaponized and may have many non-lethal applications, including medical.

A laser produces an intense, highly directional beam of light. If directed, reflected, or focused on an object, the light will be partially absorbed, thus raising the temperature of the surface and potentially causing an alteration or deformation of the material. In addition, there can be photochemical effects when the wavelength is sufficiently short (ultraviolet or blue region of the spectrum). The eye is particularly sensitive to laser energy by its very nature of absorption and concentration of light and thus it is exquisitely vulnerable to injury. The potential for injury depends upon which structure absorbs the energy. Injuries can occur to the cornea, lens or retina depending on the wavelengths, intensity of the radiation and the characteristics of the various eye tissues.

In the far ultraviolet and far infrared wavelengths, the cornea absorbs the laser energy and may be damaged. The absorption produces a photokeratitis (welder's burn) by a photochemical reaction resulting in a denaturation of proteins within the cornea. This is a temporary condition. However, the injury can be extremely painful and can cause an immediate loss in visual acuity. As the wavelength lengthens (315-400nm), the cornea, lens and aqueous humor allow UV radiation penetration with the principal absorber being the lens. The photochemical process within the lens results in the denaturation of its proteins causing the development of a cataract.

Of greatest concern is the laser exposure in the visible and near infrared region of the optical spectrum (400nm-1400nm). Near infrared lasers are invisible to the unaided eye, but many can be seen with night vision goggles. The cornea, lens and vitreous fluid are transparent to the radiation of these wavelengths. Damage to the retina occurs by absorption of loight and its conversion to heat by the melanin in the pigmented epithelium, or by photochemical action to the photoreceptor.

The focusing effects of the cornea and lens can increase the irradiance on the retina up to 100,000 times. For visible light, the aversion reflex (the automatic turning away from an extreme light source, approximately 0.25 seconds) may reduce exposure, however, this will not occur if the intensity is great enough to produce damage more rapidly. Extent of in jury will be increased if the pupil is dilated at the time of the incident (as in night operations), if the beam is directed and not reflected, if binoculars are in use, and relative to the duration and strength of the light source. Little healing occurs after damage to the retina occurs, and no treatment is currently available. The severity of vision loss depends on which area of the retina is damaged. Damage to the *fovea centralis*, can result in significant and permanent losses of visual acuity as well as color vision. Repeated injuries are cumulative and can lead to total blindness.
If a laser exposure is suspected, the health care provider must obtain a detailed operational and medical history. Determine the nature and characteristics of the exposure, including details of

intensity, color, constant or flickering light source, duration of exposure, location, range, tracking characteristics, airborne or ground environment, any immediate or delayed symptoms, and glare, pain or photophobia. Keep in mind that injuries from lasers invisible to the naked eye may present with sudden visual symptoms without a history of visible light exposure. It is important to note what types of personal protection equipment or optics were being used at the time of the incident.

The medic should test eyes independently, assessing vision with the Aidman Vision Screener and visual fields with the Amsler Grid, and record the results. Each eye should be tested separately while the opposite eye is covered. It is critical to follow and document any changes, so reexamine the victim as clinically indicated and at a minimum, every 24 hrs. If possible, test distant visual acuity using the Snellen Visual Acuity chart. If distant visual acuity is worse than 20/30 and the patient uses corrective eyewear which is not available, use a pin hole acuity test to access distant visual acuity.

It is extremely important to perform a complete physical examination of the eyes including an external examination of eye and adenexa looking for evidence of burns.

Examine the pupils for anisocoria (unequal pupils), fixed pupil, or other external abnormalities. Be sure to measure and record both pupil sizes in dim and bright light.

Perform a funduscopic examination. Inability of the examiner to focus on the retina can be a sign of vitreal debris or hemorrhage. After completion of the funduscopic exam, perform a fluorescein examination with a cobalt blue or Wood's lamp. Describe and diagram any lesions that you may identify.

If there is a corneal injury, treat it as an ultraviolet keratitis. If the eye is painful, apply topical anesthetic drops, a short acting cycloplegic medication, topical ophthalmic antibiotic and patch. Victims with vitreoretinal injuries should be maintained at bedrest if possible, with their head elevated to facilitate blood settling down and away from the macula. Immediate evacuation is recommended.

The use of steroids to reduce intraocular inflammation is controversial. It is strongly recommended that the medic contact medical control if at all possible prior to initiation of treatment. If guidance is not available, the medic must take in consideration the length of time for evacuation, the victim's condition, concurrent injuries or illness and past medical history. Non-steroidal antiinflammatories may be considered in lieu of steroids.

As in all special operations missions, the medic must consider impact upon the mission. Elimination of the threat is the first priority. Once eliminated, move to a less threatening environment. Notify command and intelligence personnel as soon as possible of all documented or perceived laser incidents. Ensure evacuation of the victim to higher levels of medical care as soon as feasible and assure team members take adequate precautions to avoid additional injuries.

Lasers present a formidable threat to the special operator in the air and on the ground. Though few lasers Lasers have been weaponized by other countries, it is clear that normal operational lasers, designators, illuminators, weapon sights, and so on can cause substantial injury resulting in failure to execute the mission. It is imperative that each medic become familiar with laser Laser equipment, the identification of their injuries and the rapid treatment and disposition of the injured. Thorough threat analysis, mission preparedness, and force protection measures are absolutely necessary to mitigate the threat.

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Lt Col John McAtee, USAF, BSC

Chief of Education and Training

United States Special Operations Command

Visual Acuity

20/60 or worse in both eyes

20/50 or better in both eyes

Foveal Grid Result

Normal	***Minor Defect***	***Major Defect***
Evacuate	Evacuate	Evacuate
Return to duty	Reevalaute in 15 minutes	Evacuate

The Expedient Medic

The Difficult I.V. Start

If you've never missed an I.V. start, then you haven't started many intravenous lines. Common causes of a difficult I.V. start include hypovolemia (such as from hemorrhage, heat injury, or diarrhea with vomiting). It seems like the hardest starts are always the patients who need it most.

Some applications of basic clinical science can make starting an intravenous line easier for you and the patient. A little time spent up-front in positioning the patient and yourself can save a lot of time and anguish in the long run. Obviously, considerations such as fire and maneuver dictate the circumstances but (let's face it) most I.V.'s started by medics at the present time are not under fire.

Intravenous lines are typically started with the medic standing or kneeling at the patient's side, depending upon whether the patient is on a stretcher or the ground. These positions do not establish a good, stable foundation.

Whenever possible, the medic should be as comfortable and stable as possible, such as sitting down, and not over-extended. This principle of a stable base is familiar from marksmanship.

To fill the patient's arm veins with more blood, thus distending them, raise the patient's legs into the old "shock" position, or drop the stretcher head-down.

If the patient's legs cannot be raised, such as in an immobilized patient, or the head of the bed cannot be dropped, as in a head injury or pulmonary edema, the arm can almost always be lowered off the side of the stretcher, which works about as well as position changes to distend the veins. Let gravity do your work. Water runs downhill.

When the patient is hypotensive or has fragile veins, use a blood pressure cuff for a tourniquet. Inflate it to just above the diastolic pressure, but less than the systolic. This way, blood can enter the venous side of the circulation from the arteries, but not escape toward the heart. The veins will invariably distend from the back-pressure (providing your patient has a systolic pressure).

Starting an I.V. in a child or infant can be a challenge. Before trying an intraosseous line, at least consider starting the line in the external jugular, which technically is a peripheral stick. A slight head-down position will almost always distend the veins in a very gratifying way. However, remember that the neck can be a difficult site to secure an I.V., and the I.V. should be changed to an extremity as soon as practical.

Finally, keep in mind that warmth dilates veins. Wrapping the extremity with a warm wet towel prior to starting the line can make the start much easier.

W.J.A.

Pharmaceutical Return Program

7th Special Forces Group (Airborne)

Victor Suarez, MS

The 7th Special Forces Group (Airborne) Medical Supply Office implemented a new and exciting program during the past year that directly reimburses team medics and battalion medical sections who turn in their expired pharmaceuticals for credit.

The Army program is called *Easy Returns*. Many medical units do not participate, typically because they do not have a system in place to pass credit down to the elements returning the expired medications. This provides no incentive for the unit/medic to spend time doing the paperwork for turn-in. Unfortunately, these expired meds sometimes get flushed down the toilet or thrown in the trash. To capitalize on this existing program, the 7th SFG(A) has established a financial tracking system that enables the group medical supply officer (GTMSO) to account for return credit down to the team level.

So far, during the program's first three quarters (Jan-Oct 00), twenty-two teams and all battalion medical sections have participated and earned a total of $15,795.93 in return credit. This money is reimbursed to the 7th SFG(A) account at the hospital (Womack Army Medical Center) and teams or medical sections can then re-order any type of Class VIII they wish. They are not held to buying only pharmaceuticals, but can use these funds to buy local purchase medical items they may need for their unit.

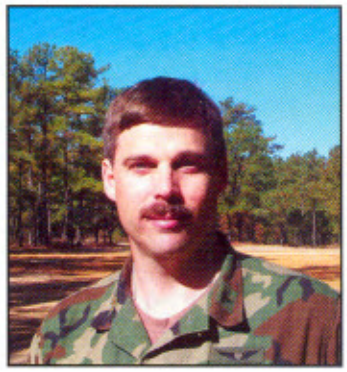
In addition to the return credit incentive for medics, the GMSO has also created additional monetary incentives to promote and motivate medics to clean out their team rooms of expired pharmaceuticals. These bonuses come from the return credit the GMSO receives from their turn-ins. The premise of the program is simple: medics routinely inventory and return expired pharmaceuticals to the GMSO, who then returns them to the supporting Installation Medical Supply Activity (IMSA) for credit. The IMSA at Fort Bragg currently awards customers 50% of the cost of credit-eligible items.

Since some items are not credit-eligible and have to be destroyed, the IMSA picks up the destruction costs and keeps a portion of the credit earned with Easy Returns, Inc., a pharmaceutical re-distribution company. Credit-eligible pharmaceuticals are generally those which are 90 days from expiration to 1 year past expiration. However, some drug companies like Abbott Labs do not award credit for expired meds.

The main objective of this program is to maximize the return of all expired pharmaceuticals in order to eliminate waste and maximize the Class VIII purchasing power of the 7th SFG(A). The key to the program's success is promoting awareness to the medics and encouraging them to reap the benefits of the program by participating. It is not unusual for ODA medics to earn over $500 in return credit for a quarter. Some have earned more. This program certainly helps medical personnel leverage and recycle their resources to help save lives on the battlefield.

CPT Victor Suarez
DSN 239-3796
suarezv@soc.mil

Preventing Lyme Disease in the Army



Mitch Meyers, MD

BACKGROUND

Lyme disease is multi-system illness caused by an infection by the spirochete *Borellia burgdoferi*, which is transmitted by *Ixodes scapularis* and *I. pacificus* ticks. It accounts for 95% of all reported tickborne illnesses. It is the most commonly diagnosed arthropod borne illness in the US, with approximately 90,000 cases reported to the CDC between 1992-1998. These cases usually occur in the summer when humans are most likely to spend working or leisure time in their yards and around grassy or wooded areas where ticks feed. It is also a time of the year when people are least likely to wear adequate protective clothing such as long pants, shirts, and boots. For most people the greatest exposure occurs in the area around their houses, and it is believed that peri-residential exposure is the origin of most cases.

Infected nymph stage ticks can be quite small and difficult to see with the unaided eye. If they stay attached for more than 24 hours they may transmit the spirochete to their new host.

Many cases are asymptomatic, but for others symptoms present after a three to thirty-two day incubation period. Usually the symptoms are non-specific, such as malaise, fever, headache, myalgias, or arthritis. In about 60-80% of the cases a bulls-eye rash called *erythema migrans* may appear at the bite site(s), alerting knowledgeable patients and their providers of the possibility of Lyme disease. This provides an excellent opportunity to diagnose and treat the illness early with antibiotics such as doxycycline or amoxicillin. Left untreated, the illness could progress and result in chronic arthritis, cardiovascular and neurological sequelae that may become increasingly resistant to treatment.

Because we have only been aware of and studying Lyme disease for about 20 years now, much remains to be learned about the natural history of this disease and its long-term severity and sequelae.

RISK FACTORS

The biggest risk factor for Lyme disease can be summed up in only three words: location, location, location! Although infected ticks can be found in almost every state in the United States, ninety percent of cases occur in counties of a few northeastern and north-central states that have dense populations of the white-footed mice and white tail deer that *Ixodes* ticks preferentially feed on.

High geographic risk occurs primarily in those states with the highest rates of infection which by descending order are: Connecticut, Rhode Island, New York, New Jersey, Delaware, Pennsylvania, Wisconsin and Maryland. Because of its large population, however, the state with the highest total number of cases is New York ,reporting thirty-three percent of all cases occurring in the US.

Current and detailed information about tick and Lyme disease distribution may be obtained from state and county public health departments. Entomologists at various military bases should be quite knowledgeable about their areas. Another source is *"Lyme Disease Risk Assessments Done by U.S. Army, 1983-1996,"* which can be found on the internet at:
http://www.utech.net/users/10766/lyme.htm

Lyme disease can be acquired outside of the U.S. in places like Canada, Europe and Asia , although true risk levels in these areas may be difficult to effectively quantify. According to data entered into the Defense Medical Surveillance System (DMSS) between 1995-99, twenty-seven percent of all cases in service members were diagnosed in Germany.

Behavioral factors can also increase or decrease a person's risk for acquiring tickborne diseases. These factors are related to type, frequency, and duration of a person's activities in a tick-infested environment that can increase their risk of person to tick contact. Examples are gardening, deer hunting, failure to wear protective clothing or use repellents and insecticides.

SOF soldiers may have increased risk due to occupational factors such as veterinary duties, deployments or prolonged FTX's in areas where the deer and the antelope play. However, it is of interest to note that despite increased occupational exposure, service members appear to get infected at a rate less than half of that of their civilian neighbors. The incidence in the general US population is 4.4 cases per 100,000 people per year, but for service members is only 1.1 case per 100,000 SM per year. The rate is higher in the Army: at 2.4 cases per 100,000 soldiers per year.

This is probably a result of military education and better use of PPM (personal protective measures) such as always wearing trousers and having them tucked into the boots.

PREVENTIVE MEASURES

Individual protective measures (IPM) and PPM are highly effective and are the first line of defense against tick and other arthropod borne illnesses. Education also plays an important role in prevention. Soldiers must be knowledgeable about their risk for exposure to tick bites, tick habitats, and how to avoid them. They need to know when to seek medical attention after finding attached ticks or developing the bulls-eye rashes that are a hallmark sign of this disease. In medical briefings they should be advised to:

(1) Wear uniforms with pants bloused into boots and sleeves down.
(2) Apply repellent (DEET) to exposed skin.
(3) Treat uniforms with repellents such as permethrin, where available, or DEET.
(4) Perform tick checks frequently (every three to four hours) and use the buddy system.
(5) Remove ticks immediately with fine-tipped tweezers by grasping the tick as close to the skin as possible and gently pulling straight out since squeezing the tick's body may inject fluid into the host.

Recently, another preventive tool was added to our armamentarium. LYMErix ® was developed by SmithKline Beecham Pharmaceuticals and approved by the FDA in December 1998 for vaccination of people between 15-70 years of age. It is a series vaccine that should be administered intramuscularly at a dosing schedule of 0, 1, & 12 months.

Research indicates that LYMErix® is safe, generally well tolerated, and up to 85% effective at preventing Lyme disease. At first glance, this sounds like an excellent vaccine for universal or routine administration for all soldiers. However, there are currently at least three other disadvantages to using this vaccine.

First, in the absence of infection, vaccination may adversely affect serological testing for Lyme disease by inducing false-positive or equivocal Elisa tests for *B. burgdoferi*. This could lead to overdiagnosis and inappropriate treatment. Second, the duration of immunity following a complete three-dose immunization schedule has not yet been established. Therefore we simply do not know how often booster shots will need to be given. Many researchers believe yearly boosters will be necessary to maintain a high level of immunity.

Third, at $35 for each single-dose vial or pre-filled syringe, this vaccine is not cheap. As mentioned earlier, the incidence of Lyme disease in the army is about 1.1 cases per year per 100,000 soldiers. For the Army this amounts to only 15 diagnosed cases per year.

If the vaccine were actually 85% effective in the real world, it could reduce those 15 cases a year down to only two or three cases. Assuming the need for a yearly booster, the $35 price tag of the vaccine would probably go up to an average of about $50 per person a year after figuring in shipping, storage, administrative and costs related to side effects and adverse reactions.

Under these assumptions, administering this vaccine to 480,000 soldiers would then cost the Army about 24 million dollars a year, or two million dollars for each case of Lyme disease that was prevented!

For years, the Army has promoted PPM that, when properly and consistently applied, are highly effective. Insecticides, repellents, clothing and netting, and other measures are already in our system and provide protection not only against ticks but other insect borne diseases at the same time. Considering that if detected early, Lyme disease can be easily and effectively treated with inexpensive antibiotics, the DoD is currently recommending against the routine or universal vaccination of soldiers with LYMErix®. This is in accordance with many other advisory organizations such as the CDC's Advisory Committee on Immunization Practices, the Armed Forces Epidemiological Board, the American Academy of Pediatricians, and the American Academy of Family Physicians, who have also considered future roles for LYMErix®.

What they do recommend is that LYMErix® be considered for use primarily in persons who may be at higher risk for infection due to geographical and behavioral or occupational risk factors. These are persons who:

1. Reside, work, or recreate in areas of high risk during times of high transmission (usually April through September in the US), *and*

2. Who engage in activities (e.g., recreational, property maintenance, occupational, or leisure) that result in frequent or prolonged exposure to tick-infested habitats.

In general, travelers to areas of high risk are expected to be at lower risk for Lyme disease than those who permanently reside in endemic areas. Vaccination should be considered for travelers to areas of high risk if frequent or prolonged exposure to tick habitat is anticipated.

Also, vaccination should be considered for persons with a history of previous uncomplicated Lyme disease who are at continued high risk.

CONCLUSION

Lyme disease is a great imitator that can present as one of many common ailments and therefore can be difficult to diagnose without a solid understanding of the illness and a high index of suspicion. Diagnosed early, it is usually easy to cure. Left undetected, it can cause a variety of chronic health problems that may be resistant to treatment. Therefore, prevention, early recognition and treatment are essential in reducing morbidity.

Education, avoidance, and the use of PPM remains the cornerstone of prevention, however, the use of the recently licensed vaccine LYMErix® may eventually play a significant role as an adjunct. Until more is known about the safety profile and long-term effectiveness of LYMErix ® the decision to administer this vaccine series should be determined on an individual rather than group basis. Consideration for vaccine administration should be given to soldiers believed to be at high risk due to a combination of geographical, behavioral and occupational risk factors.

As SOF medics, our continuing infectious disease challenge is taking the initiative to anticipate, identify, counsel and treat high risk individuals before they become "disease and non-battle injuries".

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MAJ Mitch Meyers, MD, MPH.
Chief of Preventive Medicine, USASOC
Meyersm@soc.mil
DSN 239-4261

MEDICAL AND PM HUMANITARIAN CIVIC ACTION PROJECTS: TRAINING VALUE AND HOST NATION BENEFIT

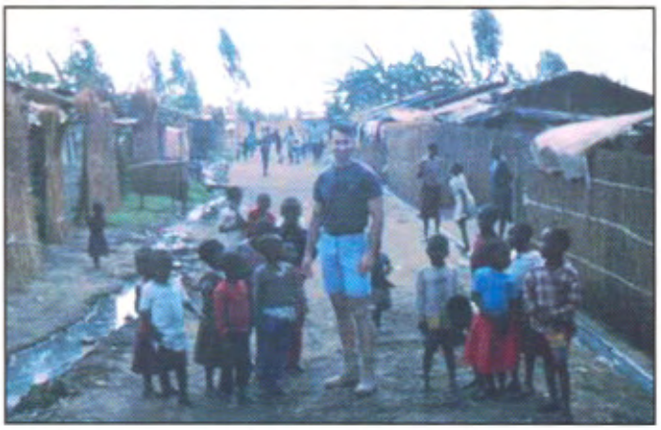
Darrell Singer, MD

10 USC 401 provides the US Army legal authority to conduct training in foreign countries. It allows spending funds for US military forces to provide medical, dental and veterinary treatment to civilian host nation individuals, provided the US military exacts some sort of training value from the exercise.

In addition to these activities, rudimentary roads, building and water systems may also be constructed. Other than maybe a US military specific medical or engineer unit, it sounds like this mission was tailored precisely for SOF units. You could say, maybe, a unit that has organic medical and engineering personnel and whose mission is to work in foreign countries? Sounds like SF to me.

Special Forces has been completing humanitarian assistance (HA) missions worldwide since Viet Nam. Teams there built housing, schools, and sanitation facilities not only to "win the hearts and minds", but also to provide a healthier population base of *Montagnards* and other guerrillas.

COL Craig Llewellyn began some of the first HA missions to Central and South America. The authority was formalized in the early 80's, with 10 USC 401 and 2551. They are quite commonplace now, and the CINC's annual HA budgets exceed many millions of dollars.



Why should we do humanitarian assistance? For several reasons; some obvious, some less so. First, it provides a mission with extra funding. Of course, this is a double-edged sword, as it forces a unit to provide for an "add-on" mission. Secondly, when planning a JCET or other combined training mission, a country is more likely to approve training if they get something else out of it. What better way to show the rural villagers that the host nation (HN) government is caring for them, than by bringing in the United States Armed Forces to cure their sickness? Third, many developing countries have great needs, and we might be able to truly help these people. Finally, the most important reason we should be doing them is to improve medical military occupational specialty (MOS) and mission-essential (METL – *mission-essential task list*) skills of our personnel so that they may save lives during war.

SF medics have an MOS task list containing over 400 items, ranging from trauma to laboratory, physical examination to preventive medicine tasks. The legendary METL task is to keep their gravely injured, dying buddy alive for 72 hours. Other METL tasks include such things as *set up a guerrilla hospital* or *improve water and sanitation in a village*.

SF medics undergo a year-long broadly-based medical training program, followed by language training, and then are assigned to a team to exercise their new skills. As with any complex skill set, this medical knowledge is perishable. And translating the "tissue" lab to human applications without much "hands-on-humans" time, from my perspective, is inadequate.

Preventive medicine (PM) missions, such as constructing latrines, clinics or irrigation systems are practical, positive end-product types of missions. When you provide something needed to those who have none, you can not only "make their day", but maybe some entire generation's day. These types of missions are appreciated by USAID and the U.S. embassies because of their tangibility. This can buy you great influence when you require embassy assistance in one matter or another. This holds true of any mission for which you get "good press" in a country - the US Embassy can take credit for providing the service. But a permanent product

also translates to a permanent reminder and something to build upon.

Medical missions, when planned appropriately, may provide the exposure a medical person needs to save the life of another in the future. During my tenure as the battalion surgeon for 3/3 SFG(A), I ran PM, dental, medical and surgical missions. I tended to stay away from the immunization or "treatment tent" idea because of poor past experiences. The MOS task list trained was quite extensive, and those medics participating received exposures to problems they are not soon to forget. However, providing this very small amount of care to any population of size is not even measurable. Non-government organizations (NGO's) and HN facilities provide the longevity and depth to make much more difference.
Examples of missions run by Third Battalion, Third Special Forces Group include a PM mission in Zimbabwe, where we constructed a clinic, potable water system, latrines and a drainage system. This exercised several 18C and 18D PM skills. Another PM mission in Zimbabwe constructed an irrigation system at a school for the disabled - these systems are still in use today. A medical mission in Malawi was operated from a small government clinic, where we used the existing triage system and malaria program to examine those with episodic fevers, doing physical examinations, blood smears and cell counts to practice our "fever of unknown origin" differential diagnostic skills.

A dental mission in Zambia trained medics to extract teeth, make temporary restorations, and drill and fill caries. Another mission in Malawi had medics intubating and monitoring patients during surgery, providing intravenous, inhalation, regional and local anesthesia under the direction of HN anesthetists and a US Army nurse anesthetist. Under the supervision of a U.S. Army orthopedic surgeon and HN surgeons, our medics reduced and plastered fractures and dislocations, assisted in surgery doing X-fixes and open reductions, performed amputations, and more lacerations than any care to remember. We even had the team technician and 18C's in the OR, assisting a fingertip amputation.

Other than reducing the load for the local providers over a several week period, the medical missions may have impacted several hundred people, while the one PM mission in Zimbabwe had a measurable effect on well over 5000. The PM mission certainly provided the team with a tangible accomplishment in the form of concrete. The medical missions provided valuable MOS and METL training, and a job well done.

Depending upon your perspective, one mission provided better wartime training than the other. This training filled the gaps left by the schoolhouse and sustainment training. It provided an opportunity to work on real tissue, on real patients. For wartime MOS training, the medical-surgical training is more valuable. For lasting impact on HN populations, it is the PM mission, hands down.

Which is better? For me, I am glad I did them all.

CPT Darrell Singer, MD
Captain Singer is presently a Preventive Medicine Resident undergoing his MPH training at Johns Hopkins University. He was the former Third Battalion Surgeon for 3rd SFG(A).

EDITORIALS

THE PECULIAR ROLE OF THE SOF TEAM MEDIC

The special operations medic lives in a strange and curious world. He must have the capacity for both unbounded compassion and unlimited savagery. He must have academic intelligence, native cunning, and the adaptability to solve unsolveable problems.

The medic plays a central role on his team, whether it's an ODA, a SEAL squad, a Marine Recon or Ranger platoon, or a PJ team. He is responsible for the physical and mental well-being of his team, while performing the same stressful and physically taxing tasks and missions as his mates.

The team medic must have the ability to listen and to carry secrets, to be the neutral guy on the team who can suspend judgement and deal with problems. But he must also be outspoken when necessary, advocating for his team members' physical and mental health.

The SOF medical community has lately given much attention to the medic's role as trauma specialist, but he plays other roles that are equally important. His role *exactly* parallels that of the staff medical officer addressed in LTC Campbell's article in this *JSOM* issue. The medic must attend to maintaining the health of his team (immunizations, physical examinations and preventive advice). He also intervenes in dangerous situations that may be remediable (training in heat, cold, or sleep-deprived states). He must be honest with his commander, yet diplomatic, in establishing the medical parameters of a mission.

The medic trains his teammates in first aid and intravenous lines, splinting and stabilization. He also trains, perhaps in a more subtle manner, his command and control element on realistic expectations of medical support. The medic, maybe more so than the staff medical officer, knows it may be his teammates who will have to care for him if he is injured in battle or training – or becomes incapacitated by illness in an austere environment.

The team medic performs medical mission planning. He identifies health threats, and then employs preventive and pre-emptive measures to counteract them; he must always know his own resources and those of his allies, host nation, and indigenous neighbors.

The medic must be able to mentally "adjust fire" from steel on target to deciding in an instant whether his wounded and apneic teammate should be intubated on the spot or dragged to cover. Or whether he – the medic – has to ignore the casualty and just keep on shooting.

A strong theoretical background, with laboratory exercises and ambulance runs, goes a long way toward preparing the medic to take his place on a team. But, as Campbell points out in regard to the medical staff officer, the guy just out of school is ill-prepared for the day to day decisions and challenges that await him on the team. We must develop a way to mentally inoculate him with a strong dose of uncommon sense, appropriateness and tact.

W.J.A.

SPECIAL OPERATIONS COMBAT WOUND CARE

In this issue of JSOM Captain Frank Butler again raises provocative questions regarding our current standards of combat casualty care: should we provide oral prophylaxis (instead of intravenous) for prevention of infection?

Is a war wound, whether an open fracture or a gunshot, to be treated as a pre-operative surgical procedure or as an established infection? The data on treating an established infection are sound and widely- published – depending upon the severity, a typical regimen would involve antibiotic treatment initiated intravenously. Then, when the patient defervesces or the other objective signs of infection recede, the patient is switched to an oral analog of the intravenous antibiotic for completion of treatment.

Pre-operative prophylaxis is less well-established, yet good data support a dose or two of parenteral (intravenous or intramuscular) antibiotics just before, during, and sometimes just after the procedure. The exact regimen depends upon the cleanliness of the wound, or degree of contamination. For example, an orthopedic procedure with no known contamination, or a tubal ligation, will likely receive a single pre-operative dose of a cephalosporin. Studies show that the type or generation of cephalosporin make little difference in the outcome.

A contaminated wound, such as abdominal surgery with spillage of bowel contents, will be treated with saline irrigation and liberal doses of antibiotics, often in combination to take advantage of individual spectrums of antibacterial activities.

The combat-sustained injury may not fit conveniently into either of the two above categories. It is a fresh wound, but by definition is contaminated. What should be the protocol for such wound care, especially in an austere or denied environment? Can the provision of lightweight, simple-to-administer antibiotics by mouth substitute for parenteral administration? If so, what class should be used?

First, and I believe foremost, the medic should remember that irrigation of the wound is arguably more important than the administration of the latest "gorillacillin" or "cephakillall". Several studies have shown that irrigation with tap water is as effective as with saline, and irrigation with a canteenful (1 liter) of water with two iodine tablets dissolved, as for drinking, certainly passes the "common sense" (face validity) test. The victim should have his own water, so it does not represent any particular added burden in the medic's ruck.

The issue of foreign body contamination is more problematic. Can debris such as clothing bits carried into the wound along with the projectile be removed? Probably not. Probing a wound in the field is time-consuming and fraught with danger. Although any obvious foreign material should be removed as time permits moreadequate exposure, probing the wound is the medical equivalent of incoming "friendly fire".

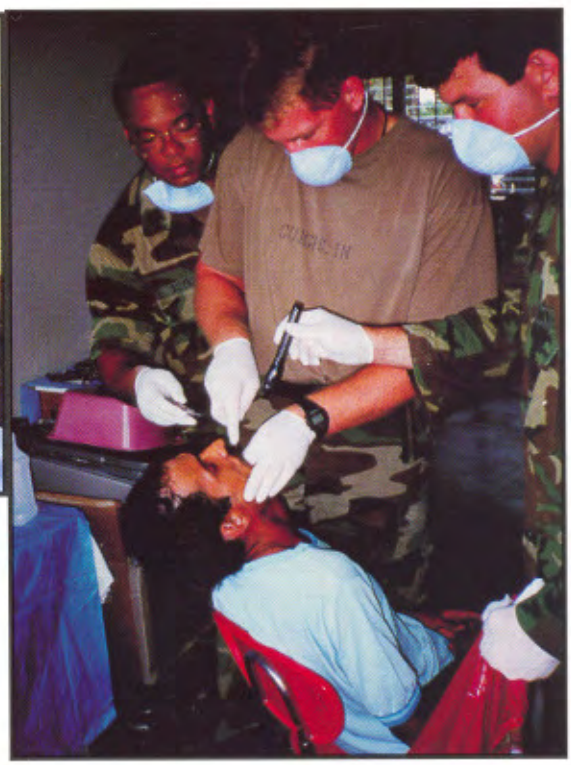
An antibiotic prophylaxis regime should only be considered after the basic steps of wound care are underway. Again, reverting to face validity, intravenous administration of antibiotics is virtually an article of faith for serious infections in North America, while in Europe oral antibiotics are much more likely to be used. Probably the primary empiric criteria for oral versus parenteral are: one, can the patient safely swallow; and two, can the drug be absorbed when it reaches the gut – assuming it is safe to administer a drink of water with the tablet or capsule.

The quinolones may not be the best class of antibiotic to administer orally, although ciprofloxacin (Cipro®) has certainly served as a archetype of a drug which is orally and intravenously equi-efficacious. Other antibiotics to consider in this role include oral cephalexin, clindamycin, or chloramphenicol. Perhaps the best combination would be ciprofloxacin to cover the gram positive and negative aerobes, with added metronidazole to cover the anaerobes. Both drugs offer a long half-life and relative safety, although minor side effects can be common. Since quinolones are not approved for prophylaxis, studies and FDA approval may be necessary.

Yet, much of the inconvenience of an intravenous administration can be circumvented by using the tried and true parenteral antibiotics just as we do atropine – a syringe with twenty-two gauge needle through the trousers and into the thigh intramuscularly. No bags, no lines, no air, nor IV catheter to rip out. Just a good, old-fashioned shot in the butt.

W.J.A.

SOF MEDICS IN ACTION



Component Surgeons

USASOC

Sergeant "Doc" Rocky Farr
in Cambodia in 1969

Special Forces Medicine Then....And Special Operations Medicine Now.

Colonel Warner D. Farr, USASOC Surgeon

Some things have remained relatively constant over the years of special operations medical training. They include the toughness of the courses, the relative shortage of the graduates, the combat focus, and the dedication of special operations medical personnel to their patients and the mission.

Many things are different. The enlisted course name shifted from Special Forces Medical Aideman to Special Forces Medical Sergeant. The military occupation specialty changed from 91B4S to 18D, the locations of training shifted, the faces changed, and the medical skills changed, as did the armamentarium of drugs. We established an entirely new course, the Special Operations Combat Medic (ASI W1). Medical officers went from SFQC to no SFQC to sharing their billets with physician assistants.

When I started in the fall of 1967, there was no Special Forces Assessment and Selection Course. Special Forces selected soldiers from the big, Viet Nam-sized Army based on a written examination and an interview with the Special Forces recruiter and sent them PCS to Fort Bragg, with Airborne school en route. There in Company C, Special Forces Training Group, about where the SWC NCO Academy now stands, I started my training. We wore a non-subdued Special Forces shoulder patch on our green fatigues and airborne wings with bright teal blue and gold wing backgrounds on our hats.

First was Phase 1, Tactics and Techniques ("T&T"), which started with MOI (Methods of Instruction), and went on to land navigation and small unit tactics. The training assumed you already had most of it down. Thank God, I was already an 11B1P! It culminated in an airborne field problem at Camp MacKall. This FTX, with a lengthy survival phase, was extended a week due to a snowstorm.

Upon return to Fort Bragg, there was a "don beret" ceremony in the street in front of the John F. Kennedy Memorial Chapel. One wore a Special Forces crest with no flash on the beret from that moment through the rest of training. All successful Phase 1 candidates were then seated in the U.S. Army John F. Kennedy Center for Special Warfare auditorium to be briefed on possible Phase 2 MOS training choices. There were about one hundred of the original T&T's two hundred and fifty, if I remember correctly. Each briefer, a training committee NCOIC, dwelt in detail on the FTX portion of their prospective training, except for the Operations and Intelligence Committee NCOIC (11F). He, a bald headed master sergeant stated that they did not have one and "Didn't believe in practicing being miserable!"

There were then individual interviews by Special Forces officers with each candidate to determine the correct Phase 2 track. I had been an infantryman in my prior life but was told by the officer that I should go medic as it was the hardest and longest. I said "Yes Sir!"

SF Medic Phase 2 started with ten weeks of 91A training at Fort Bragg. 91A was at that time the Army's front line medic course. The Medical Field Service School, predecessor to the AMEDD Center and School, had given Special Forces Training Group permission to run their own 91A training course. As SF types ran it, they stuffed the 91A required training into as short a time as possible each morning and used the rest of the day to push medicine in preparation for the Fort Sam Houston phase. There was a Nurse Corps officer nominally in charge, but the real powerhouse was a SF medic SFC who was also a 91C practical nurse. Most of the SF medic instructors were soldiers, who had been shot up in Viet Nam and were living, some barely, proof of SF medics and what they had done to save soldiers.

Following ten weeks of 91A training we all went on Christmas leave and then came back to Fort Bragg for outprocessing and reported to Fort Sam Houston in mid January 1968. The 300F-1 course was taught by two draftee physician captains who realized that this duty beat going to Viet Nam. They, however, knew nothing about teaching Army enlisted students. They did, however, know how they had been treated as medical students. As they were general medical officers, medical school and internship was only a year behind them and their memory was fresh! They taught the course at a medical school level, orals, three page essay questions on tests, case discussions, journal reviews, etc. The nurses and 91Cs made sure we got all the hands on nursing procedures, particularly nasogastric tubes on each other on a Monday morning after a long weekend. There was no CPR, no ATLS, no Lifepacks, and no established national standard for how to treat trauma. Airway was stressed, although there were fewer ways to control it, and fluids like albumen, dextran and saline.

This phase ended in April 1968 with the top three or four students receiving a promotion for being distinguished honor graduates (I made Spec 4). We all were sent off to Army hospitals in the southeastern U.S. for the OJT phase in twos and threes. My "on the job training" was at Fort Polk, Louisiana, a sea of draftees training for Viet Nam and a sea of draftee physicians trying to take care of "McNamara's hundred thousand," the mass of substandard (4F) soldiers the draft had brought in. We worked all day on various rotations: surgery, recovery room, dental, psychiatry, veterinary, pediatrics, and then went to the emergency room at night. Many nights I would walk in the ER & the captain Doc would say "It's yours, wake me if you need something." He would also sign a pad of blank prescription forms and would sign my SF600s in the morning when I awakened him.

OJT helped put it all into perspective and made it clear that enthusiasm would carry one where knowledge was scarce! A great way to cement all the medical theory we had learned at Fort Sam Houston.

May 1968 saw the remaining 23 of an initial one hundred return to Fort Bragg for Advanced Medical Lab. This summer's training started out with dental blocks and procedures, then shifted to laboratory procedures, and then surgical laboratory in the old Womack World War II cantonment hospital. The former Womack Operating Suite (a World War II wooden building) had five operating rooms. We all went through a series of procedures on our patient from physical examination, clinical laboratory work, to gun shot wounds with débridement, to delayed primary closure, to amputation, all over six weeks and on our one patient.

Twenty-one went forward to Phase 3, the unconventional warfare phase, which has changed the least over the years. Isolation facilities, rucksacks, a chance to practice medicine on your team mates, whom you'd never seen before, and a night jump into Pineland. After Med Lab cementing our medical skills, Phase 3 cemented our SF Skills.

Graduation from "Training Group" was in August 1968 and I moved out smartly to Co E (there were no Battalions then), Seventh Special Forces Group (Airborne), 1st Special Forces, one of three groups on post. The others were the Third and the Sixth. A scant one year later, after spending most of that 7th SFG(A) year in the motor pool, I would go to Fifth Special Forces Group (Airborne) in Viet Nam to MACV-SOG and the ultimate practice of my medical skills. No sustainment training or medical proficiency training on an annual basis, at all. The only sustainment training I had was they graduated me from deuce and a half to crackerbox ambulance driver six months into my motor pool year. The following year I was running a Cambodian Army hospital by myself. Talk about OJT!

My next assignment was in Detachment "A," Berlin Brigade where we actually did MPT in the hospital, not required, just had a smart commander who understood.

Now, returning as the command surgeon, some thirty-three years later, I see standardized trauma care, one- station training here at Fort Bragg, modern facilities, new drugs and procedures, the same great product, and the same dedication to patient and mission. Please read the articles on the Special Operations Forces Medical Skills Sustainment Training Program (SOFMSSP) and Medical Proficiency Training (MPT) to see how far we have come.

What issues are at the top in the Surgeon's Office? They include: refractive eye surgery, medical sustainment training, medical support to our National Guard (*Hooah! Editor*) and reserve soldiers, medic retention, and medical research to bring us new equipment, tactics, and techniques.

On the officer side, we are slowly transitioning to a board certified force of medical corps officers and transitioning to *aeromedical* physician assistants. The Rangers have their physical therapy officers on board. Getting enough diving medical officers remains a problem. I am working to get some alternate pathways and an officer ASI for DMO. There are other initiatives in early stages to get appropriate SOF training for medical officers.

Anything else we are working on? Yes - anything someone from the field calls or emails (farrwa@soc.mil) in and asks us to fix!

NAVSPECWARCOM:

CAPT Larry Garsha, MD

Hoo Yah! *The SOF Medicine Journal* is a great idea to communicate with our widespread medical forces in Navy Special Warfare.

First things first. Bravo Zulu to CAPT Steve Giebner, an icon in the history of the Naval Special Warfare medical department. CAPT Giebner's footprint is large on the development and progression of medical education and readiness planning. He elected to pursue resurrecting the hyperbaric chamber at the Naval Aviation Medical Institute. He will be sorely missed by the NSW community and will be long-remembered for his major dedication and support of medical special operations.

I have the awesome opportunity to pick up the baton and continue the run. So where are we going?

Rear Admiral Eric Olson has approved of a Strategic Plan for the Medical Department. The "Strategic Plan" is a part of our military's "top business practices" to enhance performance. A Strategic Plan is a blue print for success by defining the mission, vision, goals to accomplish the mission, and measures to identify whether the mission goals are succeeding. A plan that covers specifics of the mission and has the means to check whether or not the target is going to be hit.

The Strategic Plan for Naval Special Warfare Medical Departments is defined as follows:

Mission: Ensure that Naval Special Warfare Forces are medically ready to go to war.

Vision: Achieve 100% situational awareness in medical readiness in all NSW forces.

Goals:

1. General Medical / sick-call services will be provided at high priority for all members of subordinate Commands.

2. Rehabilitation of training injuries will be available on a high priority basis.

3. Compliance with SOCOM Directives on required certification andsustainment training for SOF Combat medics and corps men.

4. Proactive protection of fighting forces by maintenance of immunizations,physical exams, and surveillance programs.

5. Communicate situational reports on non-battle disease and injury within 24 hours to tactical and strategic commanders.

6. Manage Naval Special Warfare medical equipment and Authorized Medical Allowance List.

Measures:

1. Assess subordinate command response to medical and rehab services by quarterly review of patient/commander surveys.

2. Review quarterly compliance with maintenance of EMT/P sustainment program.

3. Review quarterly percentage compliance with SOCOM Directives.

4. Log all injuries and illness at tenant Commands with physician diagnosis.

5. Review quarterly fill percentages of sub ordinate AMALs.

These goals and strategies have been briefed and well- received by the NSW Commanders. Medical

Departments should align their activities to meet the goals and measures.

Why have a strategic plan? Why have a plan? The reason is to accomplish a commonly defined mission that works for both East and West Coast and will give confidence to our Commanders that our medical forces are not sub-par for their duty at geographic diverse assignments are equal to all SOF medics in training and expertise.

These are exciting times for NSW. We are changing our organizational structure and we will learn more how this will affect our readiness. Our departments in NSW commands will continue to have the same requirements in ensuring Force health. We will learn more at the SOMA conference in December.

Two projects at the WARCOM medical office are keeping me occupied. First, I am writing a pilot study designed to determine if adding Physician Assistants to NSW forces will enhance delivery of care. Before health professionals can be assigned to an activity, they must be able to fill a billet. Commands' have responsibility to utilize and support the members in its billet structure. In order to increase their force numbers of billets, they must be able to afford the position and this requires money that must be provided by the Navy to pay for the individual in the billet. We are seeking to get two PA's assigned to each of our Special Boat Squadrons to assist in the high volume readiness requirements presently borne by our fellow general medical officers. In order to go to the Navy for additional money to cover the new billets we need a strong argument. This is what the pilot study should support. The numbers of undersea medical officers are limited by billets available and we already our gapping available jobs. I just spoke with our detailer and the likelihood of obtaining any more UMO and/or GMO billets is highly unlikely.

Our second WARCOM initiative is to add to the existing Group Rehab facilities, two new rehab facilities again for our Special Boat Squadron Commands. The incidence of injury in boats that go into harm's way at a high rate of speed is about 20%. One fifth of the force requires intense medical treatment to maintain readiness and the need for the rehab units is obvious. Master Chief Cavolt and I are working on this project including the hiring of athletic trainers and appropriate rehab equipment.

I am pleased to report to Rear Admiral Olson that our NSW corpsmen are leading the services in percentage of EMT/P certified. We are at about 70%. We need to continue to encourage those who need initial certification training as well as those who must recertify. SOCOM has directed that a 10-week high- speed course for those who have lapsed in certification will be iterated three times in 2001.

Next quarter we will bring everyone up to speed on some of the medical research that Dr. Warren Lockett has done. He is a civilian physician researcher who has academic credentials and is a full time associate professor at the University of Michigan Medical School. He is on sabbatical and a special assistant to RADM Olson for medical research.

I look forward to meeting many of you at our upcoming SOMA meeting in December.

R/

CAPT Larry Garsha
Force Medical Officer
Naval Special Warfare Command, Coronado, CA

AFSOC:

Col James Dougherty

AFSOF Medics,

What a great time to be a part of AFSOC; so many things are going on that every day is different. I've visited with a number of you already, and I plan to travel to the overseas locations in the near future. I hope to see the great things you're doing, and hear about the challenges you face.

Col. Ediger has made the transition from AFSOC Surgeon to Group Commander. He did a great job here, with a string of accomplishments. Now he's immersed in the clinical side of things at the MAJCOM's only fixed medical facility. The good news is he's still close by and I get to pick his brain when necessary.

Other transitions: Col. Bob Zerull, the first AFSOC medical flight commander will be retiring. At the helm of the 16th OSM, Dr. Zerull was in the forefront of implementing the Special Ops medical support concept, shepherding the operational support medics through eight years of successful effort. This is no small legacy for a career of service to this command and the nation. Best of luck in the future. Lt. Col. (S) Gordon Peters, who returns to AFSOC from the Aerospace Medicine Residency, succeeds Col. Zerull. AFSOC returnees such as Dr. Peters, affectionately known as 'retreads', have been previously SOF-tested for quality. I'm sure he'll be able to leverage his prior experience in his new assignment.
Congratulations to Lt Col (S) Tim Robinette on meeting the squadron commander selection board this year. He has an assignment next summer to Fairchild AFB as the 92 ADOS/CC. It's going to be tough to find a replacement. He has a reputation for tenacity and outspoken support to the operators and support personnel in the 353d. Please give him your best wishes for success—there's no other job quite like command.

We've sent a second group of medics, docs, and PJ's to the St. Louis Trauma Training Center. The feedback I've gotten is that there's a good opportunity for hands-on care in this 2-week block. If you've got the time and want to do casualty care for real, see MSgt Daren Robinson about upcoming classes.

Here's something really special. A1C William H. Pitsenbarger, a Pararescueman killed by enemy fire during a battle with Viet Cong forces in 1966 will become only the second enlisted airman of the Vietnam era to be awarded the Medal of Honor. A1C Pitsenbarger volunteered to descend by hoist into the center of the battle to treat the wounded and arrange for their evacuation. As he crawled from position to position defending the injured and instituting life saving treatment, he was himself wounded several times before succumbing. With this tradition of selfless sacrifice, it's no wonder that we hold the PJ in such high regard.

As we get rolling with this Journal I hope to share a lot more with you about exciting stuff going on at Air Force level. Lt Gen Carlton has been the Air Force Surgeon General for only a short time, but it's clear that innovation in readiness is his special interest. He is also a great supporter of AFSOC.

That's all for now... 'til next time.

Col James Dougherty
Command Surgeon
Hurlburt AFB, FL

Aeromedical Evacuation for SOF

Shiela Millette, Col, USAF, NC, CFN
Jim Lorraine, Maj, USAF, NC, CFN

USSOCOM has an unequalled capability to care for casualties with injuries and diseases that cover the spectrum of medicine. However, one of the capabilities that currently does not exist is the provision of long-range patient movement of sick and injured from remote locations, throughout the world, without degrading the unit/teams medical coverage.

USTRANSCOM is the executive agent for global patient movement; Air Force aeromedical evacuation (AE) is a subset of that mission. Their air component, Air Mobility Command (AMC) is responsible for executing the worldwide AE mission. The Air Force aeromedical evacuation system provides fixed-wing movement with qualified AE crewmembers. Historically, AMC, in conjunction with supported theaters, has had the ability to respond to SOF requests for patient evacuation when the injury or disease exceeds the capability or equipment of the SOF medic. However, in many cases, AE response to SOF forces around the globe has been in terms of days rather than hours.

Base reductions, globally, have resulted in greater distances between military medical facilities and our forward-deployed forces. The lack of forward basing, aeromedical evacuation capable aircraft, and adequate military medical facilities throughout the world has complicated the Air Force's ability to respond. Maintaining a small footprint on foreign internal defense, humanitarian, or other missions reduces the ability for AE to pre-position forces in support of the SOF mission. It is not that the Air Force AE system does not respond. However, under the current configuration, it is difficult for the USTRANSCOM patient movement and Air Force AE systems to be able to respond to any location at any given time with short notice and potentially rapid turnaround requirements.

Air Force AE response standards are seventy-two hours for a routine patient, twenty-four hours for priority, and as-soon-as-possible for an urgent patient. This response is based largely upon their ability to pre-plan, prepare, and forward base AE personnel on a threat/risk-based response. Most of USSOCOM's deployments involve small numbers of forces, in low to medium risk deployments, to locations not conducive to pre-positioning a large footprint of AE support personnel. For our forces in Africa, South America, or any other austere location, the quickest AE response can be more than twenty-four to forty-eight hours away.

In an effort to provide medical transportation to the Third Special Forces Group (Airborne) a contract was established with a civilian air ambulance company. This company claimed the ability to evacuate patients from any location in the world, *which is free from hostile fire*, within hours of the initial request for movement. This company has assets permanently based throughout the world,

thus eliminating the need for co-location with SOF forces. The contract covers personnel deployed to Africa at a cost of approximately $40,000 per year. Coverage includes evacuation from point of injury to destination in CONUS. The contract for support in Africa has been active for 3 years, but has only been used once on a patient who did not need medical intervention en route. In this case, the company merely contracted for a seat on a commercial carrier and flew the soldier to CONUS for lab tests and treatment of a human bite. Despite this single success there were issues that required refinement in coordination. For USSOCOM to pursue a capability of this type, standards, clear lines of communications, and capabilities must be thoroughly resolved.

USSOCOM recognizes the need to provide global evacuation to deployed SOF forces. Work is

underway to provide this capability, not only to those deployed in Africa, but worldwide, *regardless of hostile fire.*

USSOCOM will, as we have in South East Asia, Grenada, Panama, Haiti, South West Asia, the Balkans and nearly every contingency, continue to rely on the Air Force AE system to support SOF operations, placing aircraft and crew in harm's way. The Air Force and AMC have made great strides in the last year to refine their AE doctrine and capability. Included in this new operational concept are smaller, incremental, more medically capable AE crews augmented with specialists, when required, and the essential equipment for transportation of patients, on almost every mobility platform in the Air Force. Along with the new AE doctrine, USAF airframe capabilities and priorities must be addressed. With our liaison at the AMC Surgeons Office, we anticipate a solid plan to test and field an AE capability prepared to respond to USSOCOM force requirements.

SPECIAL FORCES MEDICAL PROFICIENCY TRAINING

Major Joe Williamson
Master Sergeant John Barrett

Periodic completion of Medical Proficiency Training (MPT) is required of all Special Forces Medics (18D). The title *"Medical Proficiency Training* (MPT)" states both the the mission and the purpose of the requirement.

MPT is conducted at "First World" medical facilities, both civilian and military, to keep Special Forces (SF) medics on the cutting edge. All must be graduates of the SOCOM, ADSOCM and SFMS courses (prior/300-F1). All must have attended SOFMSSP (SOF Medical Skills Sustainment Program) within 2 years, according to USASOC/USASFC Regulation 350-1. The USASOC Surgeon's Office via the group surgeon's office will manage the MPT application packet in its entirety and verify and approve it. This packet is available at battalion level and should be turned-in and approved 45 days prior to desired MPT rotation.

The SF medic will attend an MPT rotation every 2 years, in accordance with USASOC/USASFC Regulation 350-1 (a bloc of four weeks will count for 4 years). This means that commanders will lose their medics once each year, alternating MPT and SOFMSSP attendance. Official two- week MPT programs will have to be established at on-base hospitals by the prospective group surgeon's office. These programs may be primarily clinical or trauma. This will be achieved in accordance with USASOC Surgeon's Memorandum: MPT, 01 Aug 2000. Currently, all established official four-week sites are at civilian trauma/ or medical centers listed here, with prospective SF group:

Harborview Medical Center; Seattle, WA – 1st SFG(A), Ft. Lewis, WA

Denver Medical Center; Denver, CO – 10th SFG(A), Ft. Carson , CO

Vanderbilt Trauma Center; Nashville, TN – 5th SFG(A), Ft. Campbell, KY (as of Jan 2001)

UNC Trauma Center; Chapel Hill, NC – 3rd SFG(A), Ft. Bragg, NC (as of Jan 2001)

Ryder Trauma Center; Miami, FL – 7th SFG(A), Ft. Bragg, NC (2001)

ECU/Pitt County Trauma Center; Greenville, NC – 96 CA/SWTG, Ft. Bragg, NC (2001)

R. Adams Shock Trauma Center (MEIMS); Baltimore, MD – Available to all

Shiprock Indian Hospital; Shiprock, NM – Available to all

The last and least desirable means of achieving MPT standards and credit will be conducted in accordance with USASOC Surgeon's Memorandum: MPT Criteria for Accreditation (in other than Official MPT Sites), 01 Sep 2000. This allows the SF medic deployed (OCONUS), who is conducting MPT-like operations or training, to receive MPT credit. All specified documentation must be submitted to the USASOC Command Surgeon's Office for review and accreditation, by the Command Surgeon.

Special Operations Forces Medical Skills Sustainment Program

Major Kevin Riley
Sergeant First Class Richard Crandall

The Special Operations Medical Skills Sustainment Program (SOFMSSP) which began on 17 October 1999, has completed a most successful first year with over 504 SOF medics trained.

SOFMSSP was developed to refresh Special Operations Medics throughout USSOCOM in the perishable combat medical skills required to save life on the battlefield. The course is predominantly military oriented with an emphasis on trauma and tactical combat casualty care.

This course satisfies the 48-hour refresher training required by the National Registry of Emergency Medical Technicians (NREMT) for recertification forof the paramedics every level required by the National Registry of Emergency Medical Technicians (NREMT) for recertification required every two years. The program consists of 88 hours of instruction, which includes 48 hours of paramedic refresher training and 40 hours of military medicine and trauma management . Some of the specific topics include emergency surgical procedures such as chest tubes, venous cut-down and surgical airways. In addition to the advanced trauma life support curriculum, classes in war wound management, diseases of military importance, emergency dentistry, environmental emergencies, and NBC are also conducted. Students also receive recertification in CPR, ACLS, BLS, PALS, and ABTLS.

Attendance in the SOFMSSP can be coordinated through your unit training managers and your com ponent surgeons' office. Priority should be given to those medics whose EMT-P credentials will expire on 31 March. The program and is opened to the following specialties: SEAL corpsmen, Special Amphibious Reconnaissance Corpsman (SARC), Special Forces medics (18D), Ranger medics, 160th SOAR medics, 528th SOSB medics, and Air Force Pararescuemen (PJs) and independent duty medical technicians (IDMTs) assigned to AFSOC operational support squadrons.

The course will beis two weeks in length and will consists of eleven days of training, including one Saturday. The average training day iswill be from 0800-1800.

For more information about the program contact: SFC Richard Crandall (Course Director/NCOIC) at (910) 396-8202 email crandall@soc.mil or SFC Richard Toth (Assistant NCOIC) at (910) 396-8216 email tothr@soc.mil.

Editor's note: the term Advanced Trauma Life Support was used in this piece, but modified due to its copyright by the American College of Surgeons. The ACS guards this term carefully, and has brought legal action against its unsanctioned (unpaid) use. In this journal, we will make an effort to refer to the commercial, sanctioned program as Advanced Trauma Life Support® or ATLS®, and other non-ACS curriculum as" trauma life support*". Apologies to Maj. Riley, SFC Crandall, and others.*

New EMT-Paramedic Re-certification Guidelines for SOF medics.

HMCM Dennis Harkness, Senior Enlisted Medical Advisor for USSOCOM Surgeon and the Enlisted Advisory Council released the following information regarding re-certification procedures for EMT-Paramedics.

Each component retains the responsibility of determining what additional training and certifications their medics are required to maintain. Although there are some medical skills that are universal to all, this program is tailored to meet the skills and education requirements for National Registry Emergency Medical Technician Paramedic certification.

Medics who have a **current** National Registry EMT-P certification can re-certify by:

Submitting the Medical Director Verification form (Joint Special Operations Medical Training Center-JSOMTC document), signed by the respective command surgeon or his/her delegate (coordinated by the NREMT Area Coordinator at the JSOMTC).

- Re-certifying in CPR, ACLS, BLS, PALS, ABTLS by attending SOFMSSP (Special Operation Forces Medical Skills and Sustainment Program)

SOF Medics whose certification has **recently lapsed** can re-certify by:

- Submitting the Medical Director Verification form (JSOMTC document), signed by the respective command surgeon or his/her delegate (coordinated by the NREMT Area Coordinator at the JSOMTC)
- Recertify in CPR, ACLS, BLS, PALS, ABTLS by attending SOFMSSP
- Successfully pass the National Registry EMT-P written and practical exams coordinated and conducted at the JSOMTC

SOF Medics whose certification has **lapsed by 4 years or more years** can re-certify under the Re-entry program by:

- Submitting the Medical Director Verification form (JSOMTC document), signed by the respective command surgeon or his/her delegate (coordinated by the NREMT Area Coordinator at the JSOMTC)
- Re-certify in CPR, ACLS, BLS, PALS, and ABTLS by attending SOFMSSP
- Successfully pass the National Registry EMT-P written and practical exams coordinated and conducted at the JSOMTC.
- Additional documents will be required and are compiled by the NREMT Coordinator at the JSOMTC

Coordinate with the SOFMSSP Course Director prior to requesting a SOFMSSP billet to ensure that National Registry testing will be available after all requirements have been met.
All required documents for the re-certification package will be compiled and forwarded by the NREMT Coordinator upon successful completion of SOFMSSP.

USSOCOM SOF PARAMEDIC RECERTIFICATION GUIDE

13 July 2000

SOF PARAMEDIC SUSTAINMENT/RECERTIFICATION PROGRAM

1) The USSOCOM Board of Directors off-site conducted on November 5th, 1998, established the requirement that all SOF medics assigned to USSOCOM, its components or operating agencies will be EMT-Paramedic certified and will maintain currency. Additionally, all SOF medics will be required to sustain their certification and attend the Special Operations Medical Skills Sustainment Program (SOFMSSP) located at Ft Bragg, NC, on a biennial basis.

2) Each component retains the responsibility of determining what additional training and certifications their medics are required to maintain. Although there are some medical skills that are universal to all, this program is tailored to meet the skills and education requirements for National Registry Emergency Medical Technician Paramedic certification.

3) Medics who have a **current** National Registry EMT-P certification can recertify by:

   a) Submitting the Medical Director Verification form (encl. 1), signed by the respective com mand surgeon or his/her delegate (coordinated by the NREMT Area Coordinator at the JSOMTC)

   b) Recertifying in CPR, ACLS, BLS, PALS, ABTLS by attending SOFMSSP

4) SOF Medics whose certification has lapsed can recertify by:

   a) Submitting the Medical Director Verification form (Encl. 1), signed by the respective com mand surgeon or his/her delegate (coordinated by the NREMT Area Coordinator at the JSOMTC)
   b) Recertify in CPR, ACLS, BLS, PALS, ABTLS by attending SOFMSSP
   c) Successfully pass the National Registry EMT-P written and practical exams coordinated and conducted at the JSOMTC

5) SOF Medics whose certification has lapsed by **4 years or more** can recertify under the Re-entry program by:

   a) Submitting the Medical Director Verification form (Encl. 1), signed by the respective com mand surgeon or his/her delegate (coordinated by the NREMT Area Coordinator at the JSOMTC)
   b) Recertify in CPR, ACLS, BLS, PALS, and ABTLS by attending SOFMSSP
   c) Successfully pass the National Registry EMT-P written and practical exams coordinated and conducted at the JSOMTC.
   d) Additional documents will be required and are compiled by the NREMT Coordinator at the JSOMTC

Coordinate with the SOFMSSP Course Director prior to requesting a SOFMSSP billet to ensure that National Registry testing will be available after all requirements have been met.
All required documents for the recertification package will be compiled and forwarded by the NREMT Coordinator upon successful completion of SOFMSSP.

INSTRUCTIONS AND RESPONSIBILITIES

For the individual SOF Paramedic: The SOF medic is responsible for the content, accuracy and update of his training record. He will:

a) Surrender the training record upon reporting to a new command
b) Ensure the training record is accurate and up to date prior to reassignment
c) Provide data for inclusion in a timely manner
d) Review the training record no less than biannually
e) Not assume that the Training NCO, medical staff or Command Surgeon has entered required data

For the Training NCO and Medical Supervisor: The Training NCO/Medical Supervisor is responsible for data entry and custody of the SOF Medic training record. The Training NCO and or Medical Supervisor will:

a) Maintain each SOF medic training record
b) Make appropriate data entries as required
c) Ensure the SOF medic reviews his training record at least biannually
d) Understand that the training record is auditable by the National Registry, Command Surgeon and the USSOCOM Senior Enlisted Advisor

For the verifying Medical Officer: The verifying Medical Officer is over-all responsible for:

a) Quality assurance of medical training conducted and data entry
b) Verification/validation of the training record annually and prior to the SOF medic attend ing SOFMSSP
c) Submission of required forms for recertification (signed and dated)
d) Assuring that all skills demonstrated are conducted properly and performed to the appro priate standard
e) Understanding that his signature affirms that all activities including training received by the individual conforms to the national standard for EMT-Paramedics periodic review of the SOF medic's training record

MEDICAL DIRECTOR VERIFICATION FORM

LAST NAME:	FIRST NAME:	MI:	SS#:
PARAMEDIC #:	EMT-P EXP DATE:	SOFMSSP DATE:	INITIAL EMT-P CLASS:
EMT-BASIC #:	EMT-BASIC EXP DATE:		
ACLS EXP DATE:	PALS EXP DATE:	BLS EXP DATE:	ABTLS EXP DATE:
UNIT TRAINING RECORDS REVIEW SECTION:			
DATE OF REVIEW:	CLINICAL ROTATION DATE:	REVIEW OF SECTION III SKILLS:	
NAME OF MEDICAL OFFICER:	RANK:	UNIT:	PHONE #

I hereby affirm that the aforementioned candidate is an active medic in the U.S. Military and has conducted his medical duties in hospitals and clinics. I have verified his training record for accuracy and completeness and understand that it is an auditable document by the National Registry and higher command medical authorities. I further certify that he is competent to perform the skills and tasks to the level of EMT-Paramedic.

MEDICAL OFFICER SIGNATURE _____ DATE _____

Points of Contact

JFC Richard Crandall
Comm (910) 432-8202/8226 DSN 236-8202/8226
DSN 236-8202/8226
JSOMTC Fort Bragg NC

JSOMTC National Registry EMT-P Coordinator
Mrs. Evelyn Williams
Comm. (910) 396-0089 ext 169. DSN 236-0089 ext 169
JSOMTC Fort Bragg NC

Senior Enlisted Medical Advisor USSOCOM
HMCM Dennis Harkness
Comm. (813) 828-5049 DSN 968-5049
HQ USSOCOM SOCS-SG

Program Manager/BUMED
HMC Terra Flynn
SEAL/RECON HM's
Comm (202) 762-3446 DSN 762-3446

720th Special Tactics Group (AFSOC)
Ops Division NCOIC
SMSgt Mike Sandler
Comm (850) 884-6028 DSN 579-6028
AFSOC, HQ Hurlbert Field Fl

SFC Richard Toth
Comm (910) 432-8202/8226

JSOMTC Fort Bragg NC

Senior Medic USASOC
MSG Pete Pease
Comm (910) 432-2617 DSN 239-2617
USASOC HQ Ft Bragg NC

Naval Special Warfare Command
HMCM Brian Cavolt
Comm (619) 437-0783 DSN 577-0763
NAVAMPHIBASE Coronado Ca

AFSOC Medical Enlisted Functional Manager
CMsgt Stan McGill
Comm (850) 884-2269 DSN 579-2269

Joint SOF Medical Training

MSgt Robert "Bob" McCumsey
IDMT, EMT-P
Comm (813) 828-5043 DSN 299-5043
USSOCOM/SOCS-SG

***Do not contact the National Registry directly for issues regarding re-certification or the re-entry program. These are programs set up specifically for SOF medicine under the authority and coordination with USSOCOM SG.

USSOCOM Biomedical Initiatives Steering Committee (BISC)

The Biomedical Initiatives Steering Committee (BISC) was developed to bring cComponent medical issues in to focus and reduce redundant Component research efforts. The BISC functions with the first of the CINC's Special Operations Truths, "Humans are more important than hardware". It also permitts the component surgeons to compete for funds to support SOF medical objectives. Research into areas of ergonomics, performance enhancements, combat casualty care procedures and protocols, and other operationally significant areas of interest are now either funded by either MFP 11 or are being funded by outside research activities. The BISC has been successful in seeking matching funds or leveraging funds in supporting SOF needs.

Some of the past research projects are as follows:

1) *The Medical Multilanguage Translator, a* CD-ROM containing 40 languages, with 2000 medical phrases;

2) *The Special Operations Interactive Medical Training Program;*

3) *The Special Operations Computer Assisted Medical Reference System;*

4) Photo Reactive Keratotomy (PRK) research and approval for SOF.

Most recently, the BISC has endorsed the following areas of research:

1) High altitude parachute operations in conjunc tion with diving operations;
2) LASIK procedures and the impact on the SOF operational community;
3) Human patient simulators for SOF medical training;
4) Medical Skills Utilization Study;
5) Ergogenics (Creatine) study;
6) Casualty evacuation delays and outcomes;
7) Dive planner and decompression Computers/Algorithms;
8) Dry fibrin bandage/ dressing;.
9) The *SOF Medical Handbook;*
10) Motion sickness preventive measures in SOF mobility platforms;
11) Warm water diving issues.

Future research topics will include:

1) ASDS decompression protocols;
2) CV-22 pre-breathing requirements and enroute recompression procedures.;
3) Advanced combat casualty care protocols in the operational environment;
4) Rapid field diagnostics systems;
5) Detection and determination of laser injuries;
6) Circadian rhythm adjustments, operational considerations and alternatives;
7) Dysbaric disease treatment standards;
8) Expanded pulmonary 02 exposure limits;
9) Reversal of cold-related performance deficits;
10) Medical orientation for mission planners and/commanders;
11) Protective (barrier) creams to prevent jellyfish stings.

The BISC receives input through the component surgeons offices. The Special Operational Acquisition and Logistics Center (SOAL) manages the MEDTECH programs and announces research topics in the *Commerce Business Daily* with a Broad Agency Announcement. Research topics are published to canvass industry, academe and the DoD Laboratory System for proposals for consideration by the BISC.

The BISC ranks the proposals using several criteria. Unsolicited proposals are given equal consideration to solicited proposals, but the significant factor is the relevance to SOF missions and requirements.

The USSOCOM Surgeon's Office, in conjunction with the component surgeons, maintains a degree of technology oversight as well as operational awareness of the needs of the SOF medical community. As the saying goes, "Two heads are better than one"; the same applies to assessing the needs of the operational community. It is important that each medic, PA and physician in SOF assesses the unit's ability to perform its mission.

Deficiencies and recommended improvements must be addressed. The "solutions set" is not always a new and improved device to tackle the problem. The first issue to address is *training,* or improved training, and personnel skills. Another area to address is *doctrinal or organizational* issues, or how a unit accomplishes its mission. *Leadership* or informing the leaders of "medical issues and protocols" is another possible solution.

The above mentioned solutions are usually the

least costly. The *materiel* solution is usually the most costly, in both time and money. Before any device can be employed by a SOF medic or corpsman, the device must be FDA approved. With this in mind, we must try to find a device that has been approved for use in the civilian sector (*current, off-the-shelf technology,* or COTS). Another factor to consider is the necessary training on the device and its logistical considerations, maintenance, calibration, etc.

Each organization within SOF has a "force development" section, which is responsible for planning and equipping the force structure. As these ideas on how to improve your medical capabilities begin to "bubble", check with the force development points of contact. What you may perceive as a deficit at your level or organization may also be needed by other like organizations, so improvements can be structured to be more economically feasible (economy of scale).

Granted, the force development staff may not show much concern for a non-materiel or organizational issue. Their interest in ergogenics and stimulants, for example, probably stops at the coffeepot in the break rooms.

That is where the BISC can help. Contact your component surgeon. Each component has direct input to the USSOCOM Surgeon and the BISC. The BISC addresses issues with task statements, which usually are less than two pages in length. The BISC will recommend that the study addresses the issue and that a formal report be provided. Most studies, depending upon the complexity, are not much more than two years in length. Sometimes, due to budget constraints and the high cost of research, a study may run up to three years.

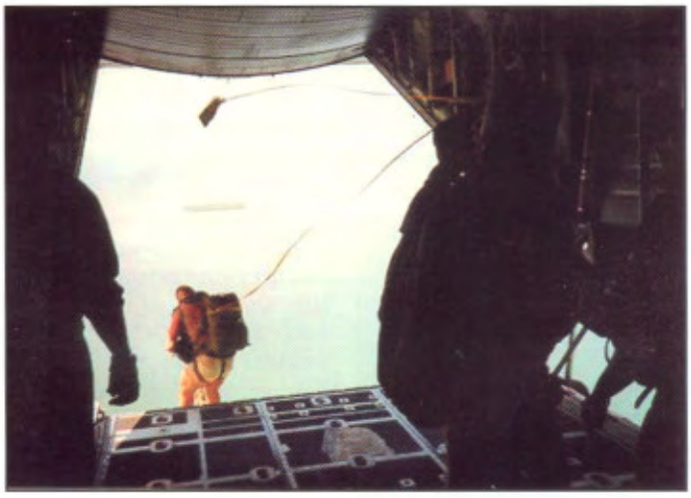
"Pie in the sky"?, - not really. Some operationally significant results have been addressed by the BISC, that were either to hard to do by the component services or not "important" enough to prioritize. The BISC addresses operational needs and/ concerns focused on the SOF mission.

Bob Clayton is the USSOCOM BISC coordinator. His previous position was the Director of Medical R&D at USASOC. He has worked in the SOF R&D community for over 20 years, and is a retired Special Forces officer.

The SOF Medical Photo Gallery

ODA-546, 3 March 1991,
Kuwait Theater of Operations.
The team's senior medic (*far left*) was killed two years to the day after this photo was taken when the HUMMV he was driving struck a mine in Somalia. Despite being fatally injured, he continued to give his teammates life saving instructions before exsanguination claimed his life. His sacrifice is not forgotten by those who knew him...

* Anonymity requested.



5th SFG (A) DMTs conduct water jump at Shark DZ, Key West, FL.
The jump was part of DMT recertification training being conducted by the 5th SFG(A) Surgeon's Office in May 1992. Members of 7th and 10th SFG(A), 75th Rangers, and School of the Americas also participated in the weeklong training event.

10th SFG(A) MEDCAP in Kosovo

November 2000

In November of this year, 10th SFG(A) conducted its first MEDCAP in the Balkans. MAJ Craig Durck, MD, (seated right) teaches 18Ds in physical exam, diagnosis, and treatment of Albanian patients. An article on the mission will follow in the March edition.

Field Veterinary Care: CPT Jim Giles, DVM, (left foreground) provides field surgical care to a village dairy cow as 18Ds and a Team Sergeant assist.

Dental Care:
Sgt Aaron Valevich extracts a caries ridden molar from an elderly Albanian woman.

Field Optometry:
CPT Denis Descarreaux, OD, and interpreter examines an elderly patient for the prescription and fitting of eyeglasses

Field Pharmacy:
Maj Kevin Riley, MSC, fills one of hundreds of the daily prescription from his makeshift pharmacy in an abandon schoolhouse.

Hearts and Minds:
A group of Albanian children are quick to gather for this representative photo of the hundreds of children cared for in the region.

History

Knee pain following trauma.

Radiographs of the Knee

AP

LAT

What is your diagnosis?

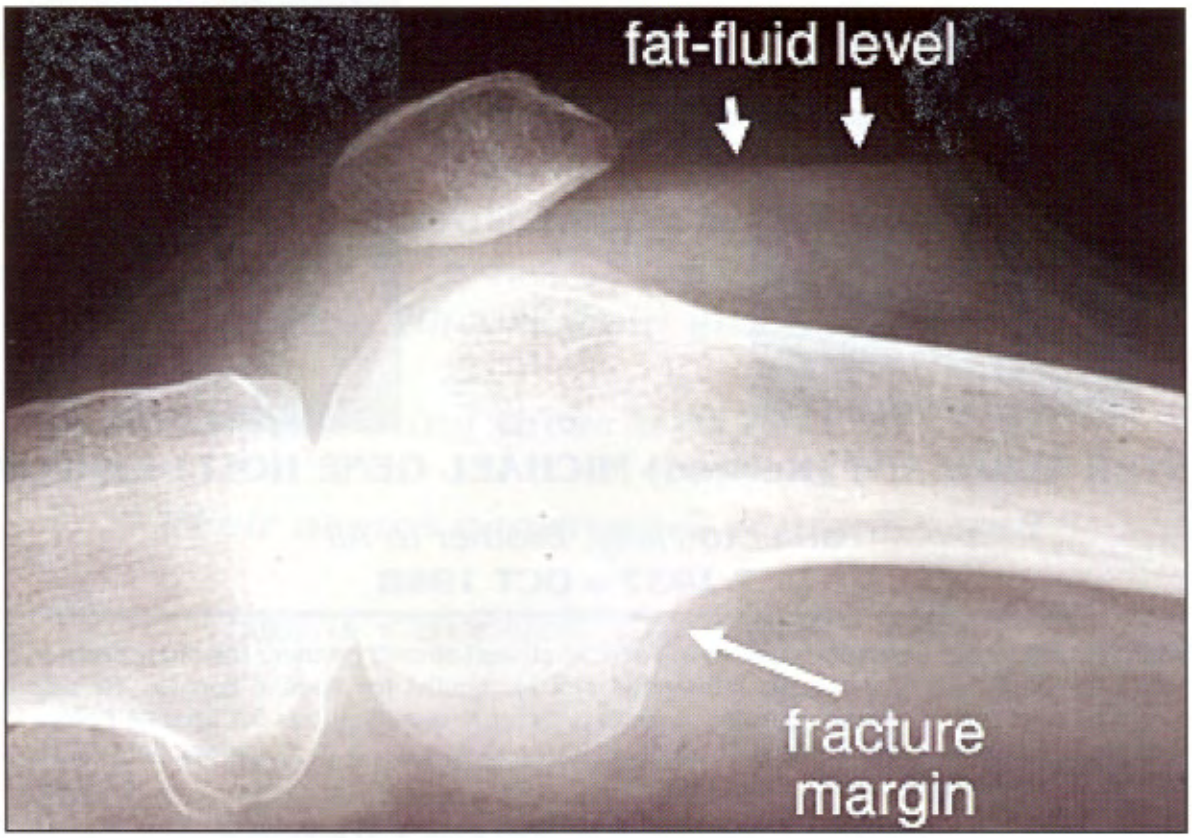
Radiographs of the Knee

AP

1. Unicondylar fracture of the femur
2. Lipohemarthrosis, knee joint.

A cortical discontinuity (arrow) is noted on the lateral side of the distal femoral metaphysis on the AP view. No other findings were visible on this film.

LAT



A cortical discontinuity is seen posteriorly representing the posterior-most extent of this unicondylar fracture. The cross table lateral film (arrows) shows a straight line in the area of the suprapatellar bursa. Straight lines are rarely present in nature, unless a fluid level of some kind is present. In this case, the fluid level is between blood and the fat floating on top of it in the knee joint. The presence of blood is relatively non-specific, but the presence of fat in the joint means that we are dealing with a fracture until proven otherwise.

Where did this free fat in the joint space come from? There are basically two choices: the subcutaneous fat or the marrow fat. Subcutaneous fat is not mobile (this is unfortunate, since it would be nice to mold unwanted body fat into some more appealing shape). In fact, it takes liposuction to really do much with it.

Marrow fat is much more mobile, and can easily enter the joint space from even a small fracture.

It is theoretically possible to see fat-fluid levels in any joint, but in practice, one only sees it in the knee. The main reason for this is that one needs to have the X-ray beam parallel to the fluid level. This is easy to do with the knee (cross-table lateral view), but not with most other joints. Of course, one can see a fluid-fluid level very easily with CT or MR, even in small joints.

Dedication...

MASTER SERGEANT (Retired) MICHAEL GENE HOLLINGSWORTH

Father to Many, Brother to All

OCT 1937 – OCT 1998

Mike Hollingsworth began his military career in 1957 as an anti-aircraft gunner. His older brother, a member of the original 77th Special Forces, influenced him to reenlist for Special Forces. He was initially trained as a Special Forces medic, but also earned additional qualifications for Special Forces demolitions, weapons, enngineer and communications. Mike was a witness to President John F. Kennedy's awarding the Green Beret to Special Forces in 1962.

Never shirking assignments, Mike was the ultimate Special Forces soldier, serving in the 77th, Seventh, Tenth, Third, Fifth, and Sixth Special Forces Groups, as well as the 46th Special Forces Company (Thailand) and Project "White Star" in Laos. He served three combat tours with Fifth Special Forces in Vietnam, including the highly classified "Studies and Observations Group" (MACSOG). Between tours in Vietnam, he was an instructor at the Special Forces medic course. While awaiting medical discharge from the Army due to accumulative disabilities, Mike was assigned as the acting Sergeant Major for Womack Army hospital at Fort Bragg, NC.

After discharge from the Army, Mike began a career of civil service, eventually returning to the US Army Institute for Military Assistance (Special Warfare Center), serving as an instructor at the Special Forces medic training course. He remained an instructor for Special Forces medics for 15 years, having a hand in the training of almost every Special Forces medic on active duty today as well as many Navy and Air Force special operations medics. Everyone remembers Mike for his paternal concern for his students, and his burning desire to give them as much training as possible before being sent out to face the war alone.

His concern for humanity extended beyond SOF, and Mike also was key in promoting and staffing the non-profit organization, Project Amazonas. Never seeking payment for services, Mike strategized, organized, and led many MEDCAP missions with American physicians, nurses and medics down the Amazon River in Peru, bringing medical, dental, and veterinary care to the isolated villages along that river. Like his SOF medics, the people in that region knew and loved Mike, as they sensed his genuineness of sentiment and character.

Mike is still missed by legions of teammates and SOF medics who he fought beside or trained.

Editor's Note: The last page of every edition will be marked with a dedication to a SOF medic who has died. In the next edition (March 2001), The SOF Medicine Journal will feature A1C William H. Pitsenbarger, a Pararescueman killed by enemy fire during a battle with Viet Cong forces in 1966. We appreciate any information on this hero.

GHOSTS

Watching on a Hallowed Day

Wearing Class A's and a Green Beret

Anticipation on his face

Fearing Ghosts from another place

Remembering those who gave their all

Their names engraved in a granite wall

Hands caressing warm black rock

Tells of all that we have lost

Warmth exudes, their presence felt

He traced their names in hopes to help

Erase those ghosts from years gone past

To us a name, but not to him

A lonesome memory for a long lost friend

SFC Stephen L. Young