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# **Tactical Medicine Training for SEAL Mission Commanders**

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The opinions and assertions expressed by the author are his alone and do not necessarily reflect the views of the Departments of the Navy or Defense.

## **Abstract**

The Tactical Combat Casualty Care (TCCC) project initiated by Naval Special Warfare and continued by the U.S. Special Operations Command has developed a new set of combat trauma care guidelines that seek to combine good medical care with good small-unit tactics. The principles of care recommended in TCCC have gained increasing acceptance throughout the Department of Defense in the four years since their publication and increasing numbers of combat medical personnel and military physicians have been trained in this concept. Since casualty scenarios in small-unit operations typically present tactical as well as medical problems, however, it has become apparent that a customized version of this course suitable for small-unit mission commanders is a necessary addition to the program. This paper describes the development of a course in Tactical Medicine for SEAL Mission Commanders and its transition into use in the Naval Special Warfare community.

**Key Words:** Tactical combat casualty care, battlefield trauma, prehospital trauma, trauma training

## **Introduction**

In the past, combat trauma training for Special Operations corpsmen, medics, and pararescuemen (PJs) was based on the principles taught in the Advanced Trauma Life Support (ATLS) Course. (1) ATLS is a standardized approach to trauma care that was developed by the Committee on Trauma of the American College of Surgeons. It is revised every 4 years and is widely accepted in the United States. ATLS is considered the standard of care for the Emergency Department management of trauma patients in both civilian and military hospitals. If one undertakes to use this course to train combat medical personnel, however, it quickly becomes apparent that ATLS was not designed to be used in the combat environment. ATLS was developed for physicians, not for combat medics. It assumes that hospital diagnostic and therapeutic equipment is available and, most importantly, does not recognize the existence of the tactical combat environment. There is no provision or allowance for such factors as incoming fire, darkness, environmental factors (the casualty may occur in a swamp, in the snow, or in the surf zone), casualty transportation problems, long delays to definitive care, and the need to balance the management of casualties with the conduct of an ongoing combat mission. Therapeutic measures that are taken for granted in the emergency department, such as CPR, c-spine immobilization, endotracheal intubation, starting two large-bore IVs, insertion of nasogastric tubes and foley catheters, supplemental oxygen therapy, and the complete undressing of the patient to complete a secondary survey would be inappropriate in the middle of an ongoing firefight. This is not a criticism of ATLS; it is a reflection of the fact that those of us in military medicine were trying to use ATLS in a setting for which it was not intended.

This realization, however, leaves us with a question. If an approach to battlefield trauma care other than ATLS is to be used, what should it be? Combat medical personnel are expected to make appropriate adjustments to civilian trauma guidelines on the battlefield, but why wait until they are in the middle of a firefight to begin thinking about what these adjustments should be? Corpsmen and medics must be aware of the fact that good medicine can sometimes be bad tactics and that bad tactics can get everyone killed or cause the mission to fail. Casualty scenarios in Special Operations usually entail both a medical problem and a tactical problem, and we want the best possible outcome for both the man and the mission. This realization forces us to redefine our outcome measures for the management of trauma in combat as shown in the TCCC Objectives in Figure 1.

In 1993, the Naval Special Warfare Command established a formal requirement to review the management of combat trauma in the tactical Special Warfare environment and make recommendations for changes as appropriate. The research approach used was to do a preliminary literature review and establish an initial set of recommendations. The recommendations were then reviewed over a six-month period in meetings with Special Operations corpsmen, medics, and physicians and consensus opinions were developed. Draft copies of the paper were then sent out to approximately 30 subject matter experts in the fields of emergency medicine, general and trauma surgery, critical care medicine, anesthesiology and cardiothoracic surgery. The paper was again revised to incorporate changes recommended by these reviewers and subsequently published as a Supplement to

Military Medicine. (2) The approach used was intended to ensure that the TCCC guidelines had as much input as possible from combat corpsmen and medics.

### **TCCC Transition**

Some of the recommendations made in the TCCC guidelines were controversial when initially published. The Naval Special Warfare community and the U.S. Special Operations Command, which had by this time assumed administrative control of the research program, were faced with the problem of how to transition the TCCC concepts into use. This aspect of the project was critically important. Without a successful transition effort, the research would have been of no help to SOF combat units.

Preliminary concept approval was first obtained from the Commander of the Naval Special Warfare Command. The next step in the process was to take it to the Bureau of Medicine and Surgery (BUMED). Initial BUMED contact was with CAPT Bob Hufstader, then Deputy Chief of the Medical Corps, who proposed that the best way to approach BUMED evaluation was to determine specifically which courses TCCC should be taught in and to seek out the individuals responsible for teaching that course. This was accomplished and, in March 1996, TCCC training was incorporated into the Undersea Medical Officer (UMO) training course in Groton, Connecticut, which is responsible for training the UMOs who support SEAL units. After this action had been taken, final approval of this concept was approved from the Commander of the Naval Special Warfare Command. In his letter of 9 April 1997, (3) RADM Tom Richards directed that the TCCC guidelines as outlined in reference (2) be used as the standard of care for the tactical management of combat trauma in Naval Special Warfare.

A six-hour TCCC course for SEAL corpsmen was developed, approved by BUMED, and taught to all SEAL corpsmen beginning in April of 1997. This course was designed to supplement the extensive trauma training received by SEAL corpsmen at the Joint Special Operations Medical Training Center (JSOMTC). The JSOMTC has now added the TCCC course to its curriculum. The principles of TCCC as taught in this course have also been adopted at least in part by the USAF (4), the US Army (personal communication, COL Richard Shipley, Commander of the US Army Academy of Health Sciences), the Israeli Defense Force (5), the US Army Special Forces (6), and the US Marine Corps. The TCCC course was taught at the Field Medical Service School at Camp Pendleton for the first time in February 2000.

One of the most important milestones in the transition process was the inclusion of the TCCC guidelines in the Prehospital Trauma Life Support Manual. (7) The fourth edition of this manual, published in 1999, contains, for the first time a chapter on military medicine. Preparation of this chapter was coordinated by CAPT Greg Adkisson and COL Steve Yevich of the Defense Medical Readiness Training Institute in San Antonio, Texas. The recommendations contained in the PHTLS Manual carry the endorsement of the American College of Surgeons Committee on Trauma and the National Association of EMTs. ***The TCCC guidelines are the only set of battlefield trauma guidelines ever to have received this dual endorsement***

Although the TCCC protocol is gaining increasing acceptance throughout the U.S. Department of Defense and allied military forces, this protocol by itself is not adequate training

for the management of combat trauma in the tactical environment. Since casualty scenarios in small-unit operations entail tactical problems as well as medical ones, the appropriate management plan for a particular casualty must be developed with an appreciation for the entire tactical situation at hand. (2) This approach has been developed through a series of workshops carried out by SOF medical personnel in association with appropriate medical specialty groups such as the Undersea and Hyperbaric Medical Society, the Wilderness Medical Society, and the Special Operations Medical Association. (8-10) The most recent workshop, which addressed the Tactical Management of Urban Warfare Casualties in Special Operations, noted that several of the casualty scenarios studied from the Mogadishu action in 1993 (11) had very important tactical implications for the mission commanders. (10) The unconscious fast-rope fall victim in the first scenario resulted in a decision by the mission commander to split the forces in his ground convoy, detaching 3 of the 12 vehicles to take the casualty back to base immediately, leaving the remaining 9 to extract the rest of the troops. The helicopter crash described in Scenario 2 resulted in the pilot's body being trapped in the wreck. As several discrete elements from the target building moved towards the crash site to assist, as described in Scenarios 5 and 6, they suffered multiple casualties. The casualties eventually outnumbered those who were able to maneuver, forcing the elements to remain stationary and preventing them from consolidating their forces. When a rescue convoy finally reached the embattled troops at the crash site, there was a delay of approximately 3 hours while the force worked feverishly to free the trapped body. Several hundred troops and over 25 vehicles were vulnerable to counterattack during this period. These scenarios made it obvious to members of the workshop panel that training only combat medics in tactical medicine is not enough. If tactical medicine involves complex decisions about both tactics and medicine, then we must train the tactical decision-makers – the mission commanders - as well as combat medical personnel in this area. (10) This paper is a description of how that has been accomplished in the Naval Special Warfare community.

### **The Tactical Medicine for SEAL Mission Commanders Course**

The concept of medical training for Special Operations combat operators is not new, but in the past, this training has usually focused on skills rather than strategies. The operators were trained to start IVs, apply field dressings, and so forth. This training is important, but needs to be supplemented by a strategies approach to combat medicine. A Tactical Medicine for SEAL Mission Commanders Course was developed to meet this need. The course is currently comprised of 5 main sections:

- a) a background of the Tactical Combat Casualty Care initiative
- b) an explanation of the need to train mission commanders in this area
- c) a description of how people die in ground combat
- d) the TCCC guidelines for Care Under Fire and Tactical Field Care
- e) an introduction to scenario-based training and planning

The background of the TCCC concept is presented as described above. The remaining aspects of the course are outlined below.

### **Why Train Mission Commanders in Tactical Medicine?**

The Tactical Medicine course as taught in Naval Special Warfare provides a rationale for why mission commanders need training in this area. While it is true that corpsman usually takes

care of the casualty, the mission commander runs the mission and *what is best for the casualty and what is best for the mission may be in direct conflict*. The question is often not just whether or not the mission can be completed successfully without the wounded individual(s); the issue may well be that continuing the mission may adversely affect their outcome for the casualty. If the mission is to be successfully accomplished, the mission commander may have to make some very difficult decisions about the care and movement of casualties. RADM Eric Olson, in his comments at the Urban Warfare workshop, points out that one of the primary responsibilities of the individual providing medical care is not to hinder the mission commander in the overall execution of the mission. (10) Additional reasons to train SEAL mission commanders in tactical medicine include: 1) the importance of having the commander know that the care provided in TCCC may be substantially different than the care provided for the same injury in a non-combat setting; 2) the unit may be employed in such a way that there is no corpsman, medic, or PJ immediately available to the injured individual; and 3) the corpsman, medic or PJ may be the first team member shot.

### **How People Die in Ground Combat**

This portion of the course was adopted from a presentation given by COL Ron Bellamy to the Joint Health Services Support Vision 2010 working group. (12) It is critically important that mission commanders be aware that the individuals with the most severe wounds are not necessarily the ones who should be treated first. The definitions of KIA (Killed in Action) versus DOW (Died of Wounds) are explained. The mission commanders are then presented with the percentages shown in Figure 2. These numbers are accompanied by a series of photographs illustrating the various types of fatal injuries. The point is made that for a through-and-through head wound with massive brain damage, even if the most skilled neurosurgeon in the world were present with the unit on the battlefield, there would be little that he or she could do to successfully intervene. By describing how casualties die, the course attendees gain a basic understanding of what might be done to prevent death and a more realistic set of expectations for the care which will be rendered by his combat medical personnel. An understanding which deaths are avoidable is enhanced by emphasizing COL Bellamy's important concept of focusing on the causes of **preventable** death on the battlefield. These are summarized in Figure 3. Air warfare, combat swimmer missions, shipboard warfare, and other types of combat would, of course, be expected to have different injury patterns.

### **Basic Combat Trauma Management Plan**

The three phases of care proposed in the TCCC paper (2) are shown in Figure 4. "Care under Fire" is defined as the care rendered by the medic or corpsman at the scene of the injury, while he and the casualty are still under effective hostile fire. The available medical equipment is limited to that carried by the individual operator or by the corpsman, PJ, or medic in his medical pack. "Tactical Field Care" is the care rendered by the corpsman, PJ, or medic once the unit is no longer under effective hostile fire. This term also applies to situations in which an injury has occurred on a mission, but there has been no hostile fire. The available medical equipment is still limited to that carried into the field by mission personnel. Time prior to evacuation to an MTF is very variable. "Combat Casualty Evacuation Care" or "CASEVAC" care is the care rendered once the casualty (and usually the rest of the mission personnel) have

been picked up by a aircraft, vehicle, or boat. Personnel and medical equipment that may have been previously staged in these assets will now be available.

### **Care under Fire**

Once these terms have been reviewed, the protocol outlined for the Care under Fire phase as shown in Figure 5 is presented and discussed. The care in this phase is the same as outlined in reference (2) except for the important added recommendation that the casualty continue to return fire if able to do so effectively. This change from the original protocol was proposed by then-CDR Pat Toohey, Commanding Officer of SEAL Team Four. It is very much in keeping with the philosophy noted in the original paper that *the best medicine on the battlefield is fire superiority*. The fact that control of hemorrhage is the top priority is emphasized by pointing out that exsanguination from extremity wounds is the number one cause of preventable death on the battlefield. Hemorrhage from extremity wounds was the cause of death in more than 2500 casualties in Vietnam who had no other injuries. (13)

Although tourniquets are discouraged by ATLS, they are believed to be the most reasonable initial choice to stop potentially life-threatening bleeding in the Care under Fire Phase because of the need to stop the bleeding immediately and definitively. Direct pressure is hard to maintain during the casualty transportation that will hopefully follow this phase of care. The following points are emphasized about tourniquets: 1) damage to the extremity is rare if the tourniquet is left in place less than an hour; 2) tourniquets are often left in place for several hours during surgical procedures; 3) in the face of massive extremity hemorrhage, in any event, it is better to accept the small risk of ischemic damage to the limb than to lose a casualty to exsanguination; 4) both the casualty and the corpsman/medic are in grave danger while a tourniquet is being applied during the Care under Fire phase, so non-life threatening bleeding should be ignored until the Tactical Field Care phase; 5) the decision regarding the relative risk of further injury versus that of exsanguination must be made by the corpsman/medic rendering care; 6) if applied, the tourniquet should be applied as close to bleeding site as possible; 7) the time of application should be noted; and 8) they should be removed when feasible. The need for immediate access to a tourniquet in such situations makes it clear that *all SOF operators on combat missions should have a suitable tourniquet readily available at a standard location on their battle gear and be trained in its use*. (2,3) Mission commanders are reminded that since this is an equipment item for every man in the unit, it is the mission commander's responsibility to ensure that a tourniquet is part of the routine pre-mission equipment check. As a final point of emphasis, the story of the death of General Albert Sidney Johnston at Shiloh on 7 April 1862 is presented. (14) General Johnston was one of the senior commanders in General Robert E. Lee's army. His command surgeon, Dr. David Yandell, had directed that tourniquets be issued to the troops prior to the battle. During the battle, General Johnston sustained a fatal hemorrhage from a popliteal artery injury that presumably could have been controlled by a tourniquet. The General forgot that he had one available and bled to death with his tourniquet in his pocket.

Since some of the mission commanders may have had some basic medical training, a few other major points of departure from civilian care are emphasized. Does the cervical spine not need to be immobilized before moving a trauma patient with a head or neck injury? The findings of Arishita et al (15) answer this question convincingly. They reviewed the issue of cervical spine immobilization (CSI) in penetrating neck injuries in Vietnam and found that in only 1.4% of

patients with penetrating neck injuries would CSI have been of possible benefit. Time to accomplish CSI was found to be 5.5 minutes, even with experienced EMTs. Their conclusion was that potential hazards to both patient and provider in a combat environment outweighed the potential benefit of CSI for penetrating neck injuries. The distinction between penetrating trauma and blunt trauma is reviewed, since parachuting injuries, fast-roping injuries, falls, and other types of trauma resulting in neck pain or unconsciousness should be treated with CSI unless the danger of hostile fire constitutes a greater risk in the judgement of the treating corpsman, PJ, or medic.

The difficulties of casualty transportation in the Care under Fire phase are reviewed. Senior combat medical personnel point out that this is often the most problematic aspect of care. Standard litters for patient transport are not carried into the field on many direct action Special Operations missions because of weight and bulk. Transport of the patient is accomplished with a shoulder carry or improvised litter. This works reasonably well when the casualty weighs 150 pounds and the rescuer weighs 250 pounds, less well when the roles are reversed. The need to rotate personnel carrying a casualty during an extraction is pointed out.

### **Tactical Field Care**

The outline of Tactical Field Care as shown in Figure 6 is presented. The Mission Commanders course omits much of the medical literature discussion contained in the longer (6-hour) BUMED-approved course taught to SEAL corpsmen.

The second major change from the protocol presented in reference (2) deals with the fluid resuscitation of patients with penetrating trauma of the chest or abdomen who are losing consciousness. Several such casualties were discussed at the workshop on urban warfare casualties workshop.(10) There was a clear consensus in the expert panel that should a casualty with uncontrolled hemorrhage have mental status changes or become unconscious (blood pressure of 50 systolic or below), he should be given either an empiric bolus of 1000cc of Hespan or enough fluid to resuscitate him to an end point of improved mentation (systolic blood pressure of 70 or above.)

One of the comments made by a senior Naval Special Warfare medical officer who was asked to review this course was that mission commanders needed to have an idea of the relative urgency of the various elements of care that might be required in the Tactical Field Care phase. (personal communication, CDR Bobby Lowe) A Tactical Field Care battlefield triage plan was added and is shown in Figure 7.

### **CASEVAC Care**

The term "CASEVAC" is used to describe this phase instead of the commonly used term "MEDEVAC" because the evacuation may require that the aircraft or other evacuating asset enter an area where the danger of hostile fire is imminent. Some aircraft will do this and some won't. The need for the mission commander to be sure that the evacuating asset will enter a hostile fire zone is illustrated dramatically by Moore and Galloway in their book "We Were Soldiers Once and Young." (16) During the battle of the Ia Drang Valley, the first large U.S. ground action in Vietnam, the 11<sup>th</sup> Air Assault Division made contact and had taken numerous casualties. The request for helicopter evacuation was made to the designated MEDEVAC unit, but upon learning that there was



a firefight in progress, this unit declined to perform the evacuation. The casualties were not evacuated until the 229<sup>th</sup> Assault Helicopter Battalion, a combat air cavalry helicopter unit, was contacted, resulting in a significant delay to definitive care. The book contains a quote from Major Bruce Crandall, the commanding officer of “A” company of that unit: “The officer commanding the MEDEVACs looked me up to chew me out for having led his people into a hot landing zone, and warned me never to do it again.” Mission Commanders need to ensure that their evacuating assets are prepared to fly into contested areas.

The recommendation in the TCCC care paper to establish Combat Casualty Transport Teams and use them on CASEVAC assets is also reviewed, since this is a mission commander planning responsibility.

### **Future Studies and Possible Changes to TCCC**

There are many questions about TCCC that lack definitive answers. Some of these questions have been identified by the USSOCOM Biomedical Initiatives Steering Committee as research issues and are being investigated either with USSOCOM funding or in cooperation with the Army Medical Research and Materiel Command. These issues include: 1) the impact of CASEVAC delays on casualty outcome; 2) hypotensive fluid resuscitation strategies in uncontrolled hemorrhage; 3) comparative resuscitation fluid studies in casualties with controlled hemorrhage and long delays to surgery; 4) oral antibiotics (fluoroquinolones) as potential alternatives to IV antibiotics for prophylaxis in non-abdominal combat wounds; and 5) comparative airway studies in maxillofacial trauma casualties.

### **Introduction to Scenario-Based Planning**

Despite the large amount of Special Operations time and effort that has gone into developing a combat-appropriate trauma management plan, the bottom line remains that no single plan is optimal for all situations. If a proposed trauma care plan does not work for a specific tactical situation, then for SEAL corpsmen, it just doesn't work. This realization led to the concept of scenario-based management plans (2). Scenarios chosen for discussion with mission commanders are ones that are thought to have a relatively high probability of occurring, have already occurred, require a difficult tactical/medical decision, or that require a major departure from standard civilian practice. For those who might argue that this approach injects an aspect of defeatism or negativity into mission planning, it is noted that there are only two times that you can plan for what to do in a tactical casualty situation – before it happens and after it happens.

Some representative scenarios are presented in Figures 8-15. The medical and tactical issues to be addressed in most of these scenarios have been addressed previously (8-10). Figures 8 and 9 are from the The Battle of Mogadishu on 3 October 1993. This engagement resulted in the most US casualties in a single firefight since Vietnam (18 dead, 73 wounded). In addition, there was a delay of 15 hours before the first wounded were evacuated to a Combat Support Hospital. Starting with scenarios that have already occurred helps to raise the level of interest in the discussions that ensue. An excellent recommendation made by COL Cliff Cloonan, the Dean of the Joint Special Operations Medical Training Center, during the planning for the Urban Warfare casualties workshop (10) was to use a series of specific questions to focus the

discussion. Incorporating this technique into the training adds greatly to the quality of the discussion and enhances the power of the scenario-based technique. For example, the questions asked of the mission commanders in the first scenario (Figure 8) include:

- Should the treating medic shoot first and treat later or should he treat immediately?
- Should the casualty be moved to cover before treating?
- Should the medic wait for a long spine board before moving casualty to cover or should the casualty be moved to cover immediately?
- If the casualty should be moved immediately, what is the best technique for moving him to minimize the risk of spinal cord injury?
- Should this casualty have an IV started?
- Should the casualty receive immediate fluid resuscitation? If so, with what and how much?
- What will be the expected impact on the outcome for the casualty if he has to wait 30 minutes for evacuation instead of being evacuated immediately?
- Are there concealment or defensive techniques (smoke, diversions, etc) that could be used in this scenario?
- Are there area denial techniques that could be used effectively in this scenario?
- Helicopter CASEVAC was very difficult because of crowds and RPGs.

Vehicle CASEVAC was a problem because of crowds, roadblocks, RPGs, and ambushes. What changes need to be made in CASEVAC plans for urban warfare in the future to address these problems?

- Providing adequate gunfire support in this scenario was problematic because of the presence of buildings that provided cover for hostile forces and the danger to helicopters from RPG fire. What changes could be made in the gunfire support plan to make gunfire support more effective?

Figures 10-12 deal with a parachute insertion and subsequent land warfare phase with injuries of several different magnitudes imposed on landing. The medical care of these casualties is relatively straightforward, but they require some difficult tactical decisions by the mission commander which are discussed.

Figures 13 -15 deal with casualty scenarios that occur during diving operations. This is a very important aspect of the training for SEAL mission commanders because the underwater environment has such a large impact on the management plan and because this area is virtually unaddressed in the civilian medical literature.

As the group discusses the various scenarios, it becomes apparent that the appropriate care for a casualty may vary based on: the criticality of the mission, the anticipated time to evacuation, and the environment in which the casualty occurs. Any management plan for a combat casualty discussed in the planning phase should be considered advisory rather than directive in nature, since only infrequently will an actual tactical situation unfold exactly as planned.

These scenarios illustrate that the importance of the role of the mission commander in dealing with casualties is often just as important as that of the corpsman, since the unit's emergency action must address both the medical and the tactical problems at the same time. It is

obviously not possible to plan for every casualty scenario that might be encountered, but review of several casualty scenarios most appropriate for an impending operation is a valuable addition to the planning process.

### **Transition**

The concept for the Tactical Medicine for Mission Commanders course was first presented to the line leadership at the Naval Special Warfare Center, which is responsible for teaching the SEAL Junior Officer Training Course to all officer graduates from Basic Underwater Demolition/SEAL training (BUD/S). The concept was approved, and with the help of the medical staff at the NSWC, the course has been taught to all officers graduating from BUD/S since April of 1998. It is being taught to SEAL operational units at present. Two recent innovations have been recommended by SEAL line officers and are in the process of being implemented. The Director of Training at the Naval Special Warfare Center stressed the need to provide course attendees with material at the course that they could use to help implement this training at the unit level (personnel communication – CDR Adam Curtis). A Tactical Medicine for Mission Commanders CD has been approved and is in production at the time that this article is being written. This CD contains the following items:

- Tactical Combat Casualty Care Powerpoint Presentations
  - Tactical Combat Casualty Care in Special Operations
  - Tactical Medicine for SEAL Mission Commanders
  - Mogadishu: The Tactical Medicine Lessons Learned
- SOF Combat Casualty Scenarios (275)
  - ASDS (9)
  - Biological Warfare (20)
  - Chemical Warfare (20)
  - Combat Swimmer Operations (18)
  - Dry Deck Shelter (16)
  - Foreign Internal Defense (10)
  - Hydrographic Reconnaissance (3)
  - In-Flight Aviation Casualties (22)
  - Mogadishu (9)
  - Parachute Insertion (10)
  - Radiation Casualties (24)
  - Rope Insertions (3)
  - Small Boat Operations (25)
  - SEAL Delivery Vehicles (5)
  - Submarine Lockouts (4)
  - Small Unit Land Warfare (32)
  - Urban Warfare (20)
  - Winter and Mountain Warfare (25)
- Tactical Combat Casualty Care Workshops and Papers
  - Tactical Combat Casualty Care in Special Operations
  - Tactical Management of Diving Casualties in Special Operations
  - Tactical Management of Wilderness Casualties in Special Operations

Tactical Management of Radiation Casualties in Special Operations  
 Tactical Management of Biological Warfare Casualties in Special Operations  
 Tactical Management of Chemical Warfare Casualties in Special Operations  
 Tactical Management of Urban Warfare Casualties in Special Operations

It is now anticipated that training in Tactical Medicine for Mission Commanders will be added to the SEAL Tactical Training Course taught to all new SEALs after graduation from Basic Underwater Demolition/SEAL training.

Although this course has been developed within the SEAL community, it has great applicability to the other components of SOF (Rangers, Special Forces, and Air Force Combat Control Teams) as well as to the Marine Corps and to other conventional forces that conduct small unit operations. Efforts are ongoing to coordinate with other potential users of this course to demonstrate the course to them and make course materials available if desired.

### **The SEAL Tactical Simulator**

A parallel concept could be used to help develop responses to tactical problems of a non-medical nature in SEAL operations. The aviation community makes extensive use of flight simulators to sharpen pilots' responses to both aircraft emergencies and tactical problems. The SEAL community likewise makes extensive use of the SEAL Delivery Vehicle (SDV) simulator to train new SDV pilots and navigators. There is, however, no simulation tool currently available for non-SDV SEAL operations. The same scenarios used for casualty discussion can be modified to present tactical problems. Figure 16 describes a ship attack in which there is an underwater explosion, but the divers have apparently suffered only middle ear barotrauma and can both continue with the mission. A number of tactical options may be considered by the senior member of the swim pair: 1) ignore the possibility of additional charges and continue with the planned operation; 2) abort the operation and swim away; 3) swim away from the ship and observe for possible periodicity of the charges; 4) surface and shoot the individual dropping the charges; 5) descend to the bottom of the harbor in an attempt to avoid the effects of subsequent blasts; or 6) swim 180 degrees around to the other side of the target ship to try to gain shielding from the effects of subsequent blasts. Several of these options may be reasonable; others would be dramatically ill-advised.

Use of scenario-based casualty planning has led to a number of medical research projects designed to address unanswered questions or shortcomings in medical technology. The same thing might occur using tactical scenarios. For example, if the prisoner in Figure 17 is released, he might compromise the mission and endanger the lives of mission personnel. If he is restrained at the location of the contact, there would be no way to release him after the mission is complete without returning to that location before extraction. One reasonable option might be to develop a pair of time-release handcuffs that will allow the prisoner to be restrained and left at the contact site but released after a preset time.

Use of real-world events would add a valuable measure of realism to the training obtained with the STS. Figure 18 describes a real-world Special Operation – the rescue of the Air France 139 hostages at the Entebbe airport by Israeli commandos in 1976. (17) All of the details of the scenario are historically correct up to the final line, which describes the first door entered as being booby-trapped and asks how the leaders of the second and third elements should change

their tactics as a result. If they choose to enter through their doors as planned, there is a very reasonable expectation that these doors will be booby-trapped as well, more commandos will be killed, and all the hostages executed. Looking for roof entrances or other similar maneuvers would take too much time. The best choice might be for the second and third elements to enter the terminal through the first door since that booby trap has already been tripped. Another good choice might be a window entry if there are suitable windows present. The chilling account of the rescue attempt at the town of Ma'alot on 15 May 1974 emphasizes the importance of speed in hostage rescue. (17) Terrorists had taken a school and were holding the children and teachers hostage. When the assault commenced, the terrorists began killing the hostages. 22 children and teachers were killed and another 56 wounded. The point that will be made to the individual studying the scenario is that in this type of operation, the difference between a dramatic success and a disaster may be measured in just a few seconds.

As a research effort, the SEAL tactical Simulator (STS) would progress from collection of suitable scenarios to development of tactical responses to determining the relative merits of each option. Advanced development might consist of adding combat video footage and a suitable computer interface. As with medical casualty scenarios, plans developed in this type of an exercise would often need to be modified in the field as a tactical situation unfolds somewhat differently from the ones contained in the STS. Use of the STS to train for tactical problems that emerge during a SOF operation is, however, consistent with the guidance provided by General Peter Schoomaker, Commander-in-Chief of the U.S. Special Operations Command, in his vision statement: "We must also have the intellectual agility to conceptualize creative, useful solutions to ambiguous problems....This means training and educating people *how to think, not just what to think.*" This project has been proposed as a candidate for funding through the USSOCOM Small Business Initiative Research Program and is currently competing for funding in FY01.

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## Figure 1

### Tactical Combat Casualty Care Objectives

1. Treat the casualty
2. Prevent additional casualties
3. Complete the mission

## Figure 2

### How People Die in Ground Combat

KIA: 31% Penetrating Head Trauma  
KIA: 25% Surgically Uncorrectable Torso Trauma  
KIA: 10% Potentially Correctable Surgical Trauma  
KIA: 9% Exsanguination from Extremity Wounds  
KIA: 7% Mutilating Blast Trauma  
KIA: 5% Tension Pneumothorax  
KIA: 1% Airway Problems  
DOW: 12% (Mostly infections and complications of shock)

## Figure 3

### PREVENTABLE Causes of Death on the Battlefield

1. Bleeding to death from extremity wounds (60%)
2. Tension pneumothorax (33%)
3. Airway obstruction (maxillofacial trauma) (6%)



## **Figure 4**

### **Phases of Care**

**Care under Fire**

**Tactical Field Care**

**Combat Casualty Evacuation (CASEVAC) Care**

## **Figure 5**

### **Care under Fire**

1. Return fire as directed or appropriate
2. The casualty(s) should also continue to return fire if able.
3. Try to keep yourself from getting shot
4. Try to keep the casualty from sustaining additional wounds
5. Stop any life-threatening hemorrhage with a tourniquet
6. Take the casualty with you when you leave

## Figure 6

### Tactical Field Care

1. CPR should not be attempted on the battlefield for victims of blast or penetrating trauma who have no pulse, respirations, or other signs of life.
2. The nasopharyngeal (tube in the nose) airway is the airway of first choice for unconscious patients until the CASEVAC phase. Patients who are shot in the face may require a surgical airway.
3. Progressive, severe respiratory distress in the setting of unilateral blunt or penetrating chest trauma on the battlefield should result in a presumed diagnosis of tension pneumothorax and that side of the chest should be decompressed with a needle.
4. Casualties who have controlled bleeding without shock do not need emergent IV fluid resuscitation.
5. Casualties who have had bleeding that is now controlled but who are in shock should receive 1000cc of Hespan.
6. Casualties who have uncontrolled hemorrhage from penetrating wounds of the chest or abdomen should receive no IV fluid in the field.
7. An exception to rule number 6 above is that casualties who have uncontrolled hemorrhage from penetrating wounds of the chest or abdomen and develop decreased mental status should either receive 1000cc of Hespan or be fluid resuscitated to an end point of improved mentation.
8. Saline locks (plastic IV catheters without fluids attached) may be used instead of IVs if fluid resuscitation is not required (for IV antibiotics and morphine, if required).
9. Morphine is to be used IV (5 mg) instead of IM.
10. IV antibiotics should be used as soon as possible for patients with penetrating abdominal trauma, grossly contaminated wounds, massive soft tissue trauma, open fractures, or any patient in whom a long delay until definitive treatment is expected.
11. Casualties should not be completely undressed for a secondary survey in the field. Removal of clothing should be limited to that necessary to expose known or suspected wounds.

## Figure 7

### **Battlefield Triage**

1. Control life-threatening bleeding
2. Disarm casualties as required
3. Establish airways (unconscious or respiratory distress)
4. Treat tension pneumothorax
5. Treat shock
6. Pain control
7. IV antibiotics

## Figure 8

### **Urban Warfare Scenario 1 – Fast Rope Casualty**

- 16 man Ranger team – security element for building assault
- 70 foot fast rope insertion for building assault
- One man misses rope and falls
- Unconscious
- Bleeding from mouth and ears
- Taking fire from all directions from hostile crowds
- Anticipated extraction by ground convoy in 30 minutes.

## Figure 9

### **Urban Warfare Scenario 7 - Helo Hit by RPG Round**

- Hostile and well-armed (AK-47s, RPG) urban environment
- Building assault to capture members of a hostile clan
- In Blackhawk helicopter trying to cover helo crash site
- Flying at 300 foot altitude
- Left door gunner with 6 barrel M-134 minigun (4000 rpm)
- Hit in hand by ground fire
- Another crew member takes over mini-gun
- RPG round impacts under right door gunner
- Windshields all blown out
- Smoke filling aircraft
- Right minigun not functioning
- Left minigun without a gunner and firing uncontrolled
- Pilot
  - Transiently unconscious - now becoming alert
- Co-pilot
  - Unconscious - lying forward on helo's controls
- Crew Member
  - Leg blown off
  - Lying in puddle of his own blood
  - Femoral bleeding

## Figure 10

### **Tib/Fib Fracture on Parachute Insertion**

- Twelve man SF team
- Interdiction operation for weapons convoy
- Night parachute jump from a C-130
- 4-mile patrol over rocky terrain to the objective
- Planned helicopter extract near target
- One jumper sustains an open fracture of his left tibia and fibula on landing

## Figure 11

### **Multiple Trauma from Parachute Collapse**

- 16 man SEAL patrol
- Interdiction operation on a weapons convoy
- Night static line jump from C-130
- 4 mile patrol over rocky terrain to objective
- Planned helicopter extraction near target
- One jumper has canopy collapse 40 feet above the drop zone
- Open facial fractures with blood and teeth in the oropharynx
- Bilateral ankle fractures
- Open angulated fracture of the left femur

## Figure 12

### **Fatality from Parachute Malfunction**

- 16 man SEAL patrol
- Interdiction operation on a weapons convoy
- Night static line jump from C-130
- 4 mile patrol over rocky terrain to objective
- Planned helicopter extraction near target
- One jumper has streamer
- Obviously dead on DZ

### **Figure 13**

#### **Underwater Explosion on Ship Attack**

- Ship attack
- Launch from PC 12 miles out
- One hour transit in two Zodiacs
- Seven swim pairs
- Zodiacs get in to a mile from the harbor
- Turtleback half mile, then purge and go on bag
- Charge dropped in water at target ship
- Swim buddy unconscious

### **Figure 14**

#### **CNS Oxygen Toxicity during Ship Attack**

- Ship attack
- Launch from PC 12 miles out
- One hour transit in two Zodiacs
- Seven swim pairs
- Zodiacs get in to a mile from the harbor
- 78 degree water - wet suits
- Turtleback half-mile, then go on bag
- Very clear, still night - transit depth 25 feet
- Diver notes that buddy is disoriented and confused with arm twitching

### **Figure 15**

#### **Gunshot Wound prior to SEAL Delivery Vehicle Extraction**

- 2 SEAL Delivery Vehicle operation
- Insertion from Dry Deck Shelter with a two hour transit to beach
- Target is a heavily defended harbor in a bay
- 43 degree water - divers wearing dry suits
- Air temperature 35 degrees
- Boats bottomed for across-the-beach radio beacon placement
- One man shot in chest at the objective
- Hostile forces in pursuit

## **Figure 16**

### **Underwater Explosion on Ship Attack (2)**

- Ship attack
- Launch from PC 12 miles out
- One hour transit in two Zodiacs
- Seven swim pairs
- Zodiacs get in to a mile from the harbor
- Turtleback half mile, then purge and go on bag
- Swim pair approaching target ship
- Underwater explosion
- Both swimmers experience ear pain without other symptoms

## **Figure 17**

### **Chance Contact on Parachute Insertion**

- Twelve man SF team
- Interdiction operation for weapons convoy
- Night parachute jump from a C-130
- 4-mile patrol over rocky terrain to the objective
- Planned helicopter extract near target
- Chance contact with three hostiles at the drop zone
- Contact results in two KIA and one prisoner
- Prisoner is a 15 year-old boy who was not armed

## Figure 18

### **Entebbe Raid – Tactical Problem Scenario**

- 27 June 1976
- Air France Flight 139 hijacked by 4 terrorists
- Flown to Entebbe (Uganda)
- 106 hostages held in Old Terminal at airport
- 7 terrorists guarding hostages
- 100 Ugandan troops perimeter security
- Sayeret Matkal rescue 4 July 1986
- Exit from C-130 in Mercedes and 2 Land Rovers
- Assault team dressed as Ugandan soldiers
- Shot Ugandan sentry when challenged
- Planned assaulted terminal through 3 doors
- First door reached booby trapped – multiple casualties
- What should second and third element leaders do?