



HANDBOOK

No. 06-18

May 06

Tactical Combat



Casualty Care

Tactics, Techniques, and Procedures

Center for Army Lessons Learned (CALL)
Fort Leavenworth, KS 66027-1350

FOR OFFICIAL USE ONLY



Foreword

The original guidelines for Tactical Combat Casualty Care (TCCC) were published in 1996. The Committee on Tactical Combat Casualty Care (CoTCCC) has updated these guidelines several times and the most recent revisions will be published later this year. The application of TCCC principles during combat has proven highly effective and is a major reason combat deaths in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) are lower than in any other conflict in the history of the United States. It is imperative, then, that all military medical personnel become familiar with the concepts and practices of TCCC.

This handbook is a one-stop, hip-pocket reference for all medical personnel, from the combat medic to the provider, on the tactics, techniques, and procedures (TTP) of TCCC. While this handbook's contents are derived from the recommendations of the CoTCCC and lessons learned in OIF/OEF, it should not be seen as a substitute for the professional training and judgment of medical personnel. Rather, this handbook is meant to serve as a quick reminder of the TTP of TCCC for medical Soldiers in the field.

The primary mission of all military medical personnel in the field is to treat the combat wounded and save lives. This task can be incredibly difficult due to the complex medical needs of wounded Soldiers and the tactical situations in which these injuries occur. The purpose of this handbook is to support medical Soldiers as they strive to meet their most noble goal: to save lives and “conserve the fighting strength.”

A handwritten signature in black ink, appearing to read 'S. Mains', is positioned above the name and title of the signatory.

Steven Mains
Colonel, Armor
Center for Army Lessons Learned

Tactical Combat Casualty Care Handbook	
Table of Contents	
Foreword	
Chapter 1: Tactical Combat Casualty Care	1
Chapter 2: Tactical Combat Casualty Care Procedures	25
Appendix A: Triage Categories	51
Appendix B: Evacuation Categories	53
Appendix C: 9-Line Medical Evacuation	55
Appendix D: Combat Pill Pack	57
Appendix E: Improved First Aid Kit	59
Appendix F: Warrior Aid and Litter Combat Casualty Kit	61
Appendix G: Aid Bag Considerations	63
Appendix H: National Stock Numbers	65
Appendix I: References/Resources	67

Center for Army Lessons Learned	
Director	Colonel Steven Mains
Managing Editor	Dr. Lon Seglie
CALL Analyst	Major Andrew Doyle
Contributing Author	Donald L. Parsons, PA-C, MPAS
Editor	John Pennington
Graphic Artist	Mark Osterholm

CENTER FOR ARMY LESSONS LEARNED

The Secretary of the Army has determined that the publication of this periodical is necessary in the transaction of the public business as required by law of the Department. Use of funds for printing this publication has been approved by Commander, U.S. Army Training and Doctrine Command, 1985, IAW AR 25-30.

Unless otherwise stated, whenever the masculine or feminine gender is used, both are intended.

Note: Any publications referenced in this newsletter (other than the CALL newsletters), such as ARs, FMs, and TMs, must be obtained through your pinpoint distribution system.

This information was deemed of immediate value to forces engaged in the Global War on Terrorism and should not be necessarily construed as approved Army policy or doctrine.

This information is furnished with the understanding that it is to be used for defense purposes only, that it is to be afforded essentially the same degree of security protection as such information is afforded by the United States, and that it is not to be revealed to another country or international organization without the written consent of the Center for Army Lessons Learned.

Chapter 1

Tactical Combat Casualty Care

Section I: Introduction

Tactical Combat Casualty Care (TCCC) is the prehospital care rendered to a casualty in a tactical, combat environment. The principles of TCCC are fundamentally different from those of traditional civilian trauma care, where most medical providers and medics train. These differences are based on both the unique patterns and types of wounds that are suffered in combat and the tactical conditions medical personnel face in combat. Unique combat wounds and tactical conditions make it difficult to determine which intervention to perform at what time. Besides addressing a casualty's medical condition, responding medical personnel must also address the tactical problems faced while providing casualty care in combat. A medically correct intervention at the wrong time may lead to further casualties. Put another way, "good medicine may be bad tactics," which can get the rescuer and casualty killed. To successfully navigate these issues, medical providers must have skills and training oriented to combat trauma care, as opposed to civilian trauma care. Unfortunately, many military medical providers and medics lack this experience.

Casualties and wounds

On the battlefield, the prehospital period is the most important time to care for any combat casualty. Up to 90 percent of combat deaths occur before a casualty reaches a medical treatment facility. This highlights the primary importance of treating battlefield casualties at the point of injury, prior to casualty evacuation (CASEVAC) and arrival at a treatment facility.

Specifically, combat deaths result from:

- 31 percent: Penetrating head trauma.
- 25 percent: Surgically uncorrectable torso trauma.
- 10 percent: Potentially correctable surgical trauma.
- **9 percent: Exsanguination.**
- 7 percent: Mutilating blast trauma.
- **5 percent: Tension pneumothorax (PTX).**
- **1 percent: Airway obstruction/injury.**
- 12 percent: Died of wounds (mainly infection and shock).

A significant percentage of these deaths (highlighted above in bold type) are potentially avoidable with proper, timely intervention. Of these avoidable deaths, the vast majority are due to exsanguination and airway or breathing difficulties, conditions that can and should be addressed at the point of injury. It has been estimated that of all preventable deaths, 90 percent of them can be avoided with the simple application of a tourniquet for extremity hemorrhage, the rapid treatment of a PTX, and the establishment of a stable airway.

On the battlefield, casualties will fall into three general categories:

- Casualties who will die, regardless of receiving any medical aid.
- Casualties who will live, regardless of receiving any medical aid.
- Casualties who will die if they do not receive timely and appropriate medical aid.

TCCC addresses the third category of casualties, those who require the most attention of the medical provider during combat.

TCCC versus advanced trauma life support (ATLS)

Trauma care training for military medical personnel traditionally has been based on the principles of the civilian Emergency Medical Technicians Basic Course and basic and advanced trauma life support. These principles, especially ATLS, provide a standardized and very successful approach to the management of civilian trauma patients in a hospital setting. However, some of these principles may not apply in the civilian prehospital setting, let alone in a tactical, combat environment.

The prehospital phase of casualty care is the most critical phase of care for combat casualties, accounting for up to 90 percent of combat deaths. Furthermore, combat casualties can suffer from potentially devastating injuries not usually seen in the civilian setting. Most casualties during combat are the result of penetrating injuries, rather than the blunt trauma seen in the civilian setting. Combat casualties may also suffer massive, complex trauma, such as traumatic limb amputation. In addition to the medical differences between civilian and combat trauma, several other factors affect casualty care in combat, including the following:

- Hostile fire may be present, preventing the treatment of the casualty.
- Medical equipment is limited to that carried by mission personnel.
- Tactical considerations may dictate that mission completion take precedence over casualty care.
- Time until CASEVAC is highly variable (from minutes to hours or days).
- CASEVAC may not be possible, based on the tactical situation.

TCCC goals

TCCC presents a system to manage combat casualties that considers the issues discussed above. An important guiding principle of TCCC is performing the correct intervention at the correct time in the continuum of field care. To this end, TCCC is structured to meet three important goals:

- Treat the casualty.
- Prevent additional casualties.
- Complete the mission.

Stages of care

In thinking about the management of combat casualties, it is helpful to divide care into three distinct phases, each with its own characteristics and limitations:

- **Care under fire** is the care rendered at the point of injury while both the medic and the casualty are under effective hostile fire. The risk of additional injuries from hostile fire at any moment is extremely high for both the casualty and medic. Available medical equipment is limited to that carried by the medic and the casualty.
- **Tactical field care** is the care rendered by the medic once he and the casualty are no longer under effective hostile fire. It also applies to situations in which an injury has occurred on a mission, but there has been no hostile fire. Available medical equipment is still limited to that carried into the field by mission personnel. Time to evacuation may vary from minutes to hours.
- **Combat CASEVAC care** is the care rendered once the casualty has been picked up by an aircraft, vehicle, or boat. Additional medical personnel and equipment that has been prestaged in these assets should be available during this phase of casualty management.

The following chapters and sections of this handbook will present a discussion of each stage of TCCC, as well as instructions for the procedures TCCC requires.

Section II: Care under fire

Care under fire is the care rendered by the rescuer at the point of injury while he and the casualty are still under effective hostile fire. The risk of additional injuries at any moment is extremely high for both the casualty and the rescuer. The major considerations during this phase of care are:

- Suppression of hostile fire.
- Moving the casualty to a safe position.
- Treatment of immediate life-threatening hemorrhage.

Casualty care during the care under fire phase is complicated by several tactical factors. First, the medical equipment available for care is limited to that which is carried by the individual Soldiers and the rescuers. Second, the unit's personnel will be engaged with hostile forces, and, especially in small-unit engagements, will not be available to assist with casualty treatment and evacuation. Third, the tactical situation prevents the medic or medical provider from performing a detailed examination or definitive treatment of casualties. Furthermore, these situations often occur during night operations, resulting in severe visual limitations while treating the casualty.

Defensive actions

The best medicine on the battlefield is fire superiority. The rapid success of the combat mission is the immediate priority and the best way to prevent the risk of injury to other personnel or additional injuries to casualties. Medical personnel carry small arms to defend themselves and casualties in the field. The additional firepower from the medical personnel may be essential to obtaining fire superiority. Initially, medical personnel may need to assist in returning fire before stopping to care for the casualty. Additionally, casualties who have sustained non-life-threatening injuries and are still able to participate in the fight must continue to return fire as they are able.

As soon as the rescuer is directed or able, his first major objective is to keep the casualty from sustaining additional injuries. Wounded Soldiers who are unable to participate further in the engagement should lay flat and still if no ground cover is available, or move as quickly as possible if nearby cover is available. If there is no cover and the casualty is unable to move himself to find cover, he should remain motionless on the ground so as not to draw additional fire. The medic may be able to direct the injured Soldier to provide self-aid.

Airway management

Do not perform any immediate management of the airway during the care under fire phase. Airway injuries typically play a minimal role in combat casualties,

comprising only 1 to 5 percent of casualties and are primarily from maxillofacial injuries. The primary concern is to move the casualty to cover as quickly as possible. The time, equipment, and positioning required to manage an impaired airway expose the casualty and rescuer to increased risk. Rescuers should defer airway management until the tactical field care phase, when the casualty and rescuer are safe from hostile fire.

Hemorrhage control

The number one cause of preventable battlefield deaths is exsanguination from extremity wounds. Therefore, the primary medical interventions during the care under fire phase are directed toward stopping any **life-threatening** bleeding as quickly as possible. Injuries to an artery or other major vessel can rapidly result in hemorrhagic shock and exsanguination. A casualty may exsanguinate before medical help arrives, so definitive control of **life-threatening** hemorrhage on the battlefield cannot be overemphasized. In Vietnam, exsanguination from an extremity wound was the cause of death in more than 2,500 casualties who had sustained no other injury.

Extremity wounds: The rapid, temporary use of a tourniquet is the recommended management for all life-threatening extremity hemorrhage. Standard field dressings and direct pressure may not work reliably to control extremity hemorrhage exsanguination. While traditional ATLS training discourages the use of tourniquets, they are appropriate in the tactical combat setting. The benefits of tourniquet use over other methods of hemorrhage control include:

- Direct pressure and compression are difficult to perform and maintain in combat settings and result in delays in getting the rescuer and casualty to cover.
- Tourniquets can be applied by the casualty to himself, thus limiting the rescuer exposure to hostile fire.
- There are few complications from tourniquet use. Ischemic damage is rare if the tourniquet is in place for less than two hours.

During the care under fire phase, the casualty and rescuer remain in grave danger from hostile fire while the tourniquet is being applied. Ignore non-life-threatening hemorrhage until the tactical field care phase. The rescuer must make the decision regarding the relative risk of further injury from applying the tourniquet versus the possibility of exsanguination.

Non-extremity wounds: As with extremity wounds, address only life-threatening, non-extremity hemorrhage during the care under fire phase. If the wound site is accessible, bleeding should be controlled with direct pressure and/or a hemostatic device. One currently recommended hemostatic device is the HemCon dressing, a proprietary bandage impregnated with the hemostatic agent poly-N-acetyl glucosamine.

Another hemostatic device available is QuikClot, a proprietary hemostatic powder by Z-Medica. QuikClot can be effective in controlling bleeding, but should only be used for external bleeding, not in internal cavities (abdominal, thoracic, or cranial). Complications of its use include an exothermic reaction that can cause pain and collateral tissue damage. In addition, the powder format of this product can be very difficult to administer properly on the battlefield, especially at night. Therefore, because of its safety and ease of use, the Committee on TCCC recommends using a hemostatic dressing, such as HemCon, as the first option for the control of hemorrhage from sites not amenable to the use of a tourniquet. QuikClot may be considered after a hemostatic dressing is used.

Casualty transportation

Transportation of the casualty is often the most problematic aspect of TCCC. In the care under fire phase, transportation is complicated by the limited equipment and personnel available and the risk of further injury due to hostile fire. Removing the casualty from the field of fire as quickly as possible is the transportation priority during this phase of care. Do not attempt to save a casualty's rucksack unless it contains items that are critical to the mission. However, if at all possible, take the casualty's weapons and ammunition. The enemy may use them against you.

Cervical spine immobilization: Although the civilian standard of care is to immobilize the cervical spinal column prior to moving a patient with injuries that might have resulted in damage to the spine, this practice is generally not appropriate in the combat setting. In Vietnam, studies examining the value of cervical spinal immobilization in penetrating neck injuries found that only 1.4 percent of casualties with penetrating neck injuries would have possibly benefited from immobilization of the cervical spine. The time required to accomplish cervical spine immobilization was found to be 5.5 minutes, even when using experienced rescuers. In addition, the equipment needed for this procedure (long spine board) is generally not available at point of wounding. Therefore, the potential hazards of hostile fire to both the casualty and rescuer outweigh the potential benefit of cervical spine immobilization.

However, for casualties with significant blunt trauma, cervical spine immobilization is appropriate during the care under fire phase. Parachuting injuries, fast-roping injuries, falls greater than 15 feet, and other types of trauma resulting in neck pain or unconsciousness should be treated with spinal immobilization, unless the danger of hostile fire constitutes a greater risk in the judgment of the medic.

Transportation methods: Standard litters for patient evacuation may not be available for movement of casualties in the care under fire phase. Consider using alternate methods of evacuation, such as Sked or Talon II litters, or dragging the casualty out of the field of fire by his web gear, poncho, or even a length of rope with a snap link. Additionally, consider the use of obscurants, such as smoke or CS (irritating agent), to assist in casualty recovery. Vehicles can also be used as a screen during recovery attempts. In Iraq, there have been several instances of tanks being used as screens to facilitate CASEVAC.

Section III: Tactical field care

Tactical field care is the care rendered to the casualty once the casualty and rescuer are 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. This phase of care is characterized by the following:

- The risk from hostile fire has been reduced, but still exists.
- The medical equipment available is still limited by what has been brought into the field by mission personnel.
- The time available for treatment is highly variable. Time prior to evacuation, or reengagement with hostile forces, can range from a few minutes to many hours.

Medical care during this phase of care is directed toward more in-depth evaluation and treatment of the casualty, focusing on those conditions not addressed during the care under fire phase of treatment. While the casualty and rescuer are now in a somewhat less hazardous situation, this is still not the setting for a true ATLS evaluation and treatment. Evaluation and treatment is still dictated by the tactical situation.

In some cases, tactical field care will consist of rapid treatment of wounds with the expectation of a reengagement with hostile forces at any moment. The need to avoid undertaking nonessential evaluation and treatment is critical in such cases. Conversely, care may be rendered once the mission has reached an anticipated evacuation point without pursuit and is awaiting CASEVAC. In these circumstances, there may be ample time to render whatever care is feasible in the field. However, as time to evacuation may vary greatly, medical providers and medics must take care to partition supplies and equipment in the event of prolonged evacuation wait times.

Cardiopulmonary resuscitation (CPR)

In casualties of blast or penetrating injury found to be without pulse, respiration, or other signs of life, CPR on the battlefield will generally not be successful and should not be attempted. Attempts to resuscitate trauma patients in arrest have been found to be futile even in urban settings, where victims are in close proximity to trauma centers. On the battlefield, the cost of performing CPR on casualties with what are inevitably fatal injuries will result in additional lives lost as care is withheld from casualties with less severe injuries. Also, these attempts expose rescuers to additional hazards from hostile fire. Prior to the combat CASEVAC phase, rescuers should consider CPR only in the cases of nontraumatic disorders such as hypothermia, near drowning, or electrocution.

Altered mental status

Immediately disarm any casualty with an altered mental status, including secondary weapons and explosive devices. An armed combatant with an altered mental status is a significant risk to himself and those in his unit. The four main reasons for an altered mental status are traumatic brain injury (TBI), pain, shock, and analgesic medication (for example, morphine).

Airway management

In the tactical field care phase, direct initial management to the evaluation and treatment of the casualty's airway. Intervention should proceed from the least invasive procedure to the most invasive. Do not attempt any airway intervention if the casualty is conscious and breathing well on his own. Allow the casualty to assume the most comfortable position that best protects his airway, to include sitting upright.

Unconscious casualty without airway obstruction: If the casualty is unconscious, the most likely cause is either hemorrhagic shock or head trauma. In either case, an adequate airway must be maintained. If the unconscious casualty does not exhibit signs of airway obstruction, the airway should first be opened with a chin-lift or jaw-thrust maneuver. As in the care under fire phase, cervical spine immobilization is generally not required, except in the instance of significant blunt trauma.

If spontaneous respirations are present without respiratory distress, an adequate airway in the unconscious casualty is best maintained with a nasopharyngeal airway (NPA). An NPA is preferred over an oropharyngeal airway because it is better tolerated if the casualty regains consciousness and is less likely to be dislodged during casualty transport. After inserting the NPA, place the casualty in the recovery position (see Figure 1-1) to maintain the open airway and prevent aspiration of blood, mucus, or vomitus.

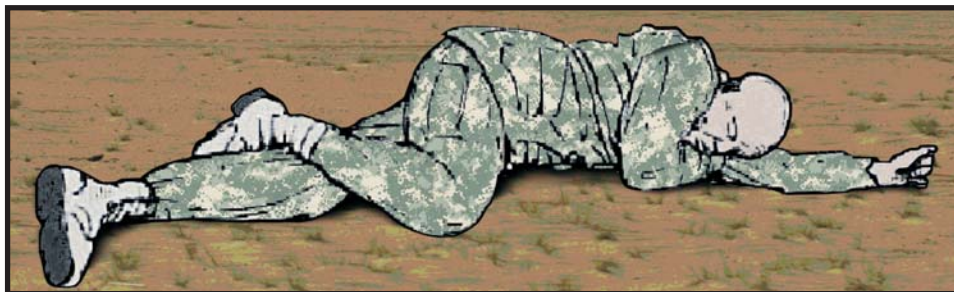


Figure 1-1. Recovery position

Current or impending airway obstruction: For casualties with a current or impending airway obstruction, the initial intervention is again to open the airway with either a chin-lift or jaw-thrust maneuver. This maneuver is followed by the insertion of an NPA. However, if an airway obstruction develops or persists despite the use of an NPA, a more definitive airway is required. In some casualties a more definitive airway may consist of a supraglottic device, such as a Combitube or King LT. These devices are easily inserted and able to maintain an open airway better than a simple NPA. However, often a surgical cricothyroidotomy may be indicated.

- **Cricothyroidotomy:** Significant airway obstruction in the combat setting is likely the result of penetrating wounds of the face or neck, where blood or disrupted anatomy precludes good visualization of the vocal cords. This setting makes endotracheal intubation highly difficult, if not impossible. In these cases, surgical cricothyroidotomy is preferable over endotracheal intubation. This procedure has been reported safe and effective in trauma victims, and in the hands of a rescuer who does not intubate on a regular basis, it should be the next step when other airway devices are not effective. Furthermore, cricothyroidotomy can be performed under local anesthesia with lidocaine in a casualty who is awake.
- **Intubation:** Endotracheal intubation is the preferred airway technique in civilian trauma settings, but this procedure may be prohibitively difficult in the tactical environment. Many medics have never intubated a live person; their experience is only with mannequins in a controlled environment and is infrequent at best. Standard endotracheal intubation technique requires the use of tactically compromising white light. Also, esophageal intubations are more likely with the inexperienced intubator and much more difficult to detect in the tactical environment. Finally, most airway obstructions on the battlefield are the result of penetrating wounds of the head and neck, where cricothyroidotomy is the procedure of choice.

Breathing

The next aspect of casualty care in the tactical field care phase is the treatment of any breathing problems, specifically the development of either an open PTX or a tension PTX.

Penetrating chest wounds: Traumatic defects in the casualty's chest wall may result in an open PTX. All open chest wounds should be treated as such. Cover the wound during expiration with an occlusive dressing, such as petroleum gauze and a battle dressing or tape. The dressing may be three-sided, but this is not necessary if the rescuer has the ability to perform needle chest decompression. The casualty should then be placed in a sitting position and monitored for the development of a tension PTX, which should be treated as described below.

Tension PTX: Assume any progressive, severe respiratory distress on the battlefield resulting from unilateral penetrating chest trauma represents a

tension PTX. Do not rely on such typical signs as breath sounds, tracheal shift, and hyperresonance on percussion for diagnosis in this setting, because these signs may not always be present. Even if these signs are present, they may be difficult to detect on the battlefield.

Treat tension PTXs in the tactical field care phase via decompression with a 14-gauge needle catheter. A casualty with penetrating chest trauma will generally have some degree of hemothorax or PTX as a result of his primary wound. The additional trauma caused by a needle thoracostomy will not worsen his condition should he not have a tension PTX. Decompress the casualty with a needle and catheter so that the catheter, with the needle removed, can be taped in place to prevent recurrence of the tension PTX. The medic must monitor this casualty after the procedure to ensure the catheter has not clotted or dislodged and that respiratory symptoms have not returned. If respiratory symptoms have returned or the catheter is clotted or dislodged, flush the catheter or perform a second needle thoracostomy adjacent to the first. Chest tubes are not recommended during this phase of care as they are not needed for initial treatment of a tension PTX, are more technically difficult, time-consuming to perform, and more likely to result in additional tissue damage and subsequent infection.

Hemorrhage control

In the tactical field care phase, hemorrhage control includes addressing any significant bleeding sites not previously controlled and possibly removing any earlier-placed tourniquets. When evaluating the casualty for bleeding sites, only remove the absolute minimum of clothing needed to expose and treat injuries. Stop significant extremity bleeding as quickly as possible, using a tourniquet without hesitation if necessary. Otherwise, direct pressure, pressure dressings, or hemostatic dressings (HemCon, QuikClot) should be used to control bleeding.

Tourniquets should remain in place until the casualty has been transported to the evacuation point. Once the patient has been transported to the site where CASEVAC is anticipated, reassess any tourniquets previously applied. If possible, loosen the tourniquet and control bleeding with direct pressure or hemostatic dressings. However, complete any required fluid resuscitation **prior** to tourniquet discontinuation. It is not necessary to remove the tourniquet, only to loosen it. This allows the tourniquet to be re-applied if the hemorrhage cannot be controlled by other methods.

Vascular access

Obtain intravenous (IV) access at this point during the tactical field care phase. While ATLS training teaches starting two large-bore (14- or 16-gauge) IV catheters, the use of a single 18-gauge catheter is preferred in the tactical setting. The 18-gauge catheter is adequate for rapid delivery of resuscitation fluids and medication, is easier to insert, and conserves the supplies in a medic aid bag. Medics should not start an IV on an extremity that may have a significant wound proximal to the IV insertion site. Although larger catheters are necessary for the

delivery of blood products, these products will not routinely be administered until the casualty has reached a treatment facility, at which point new IV access will be obtained.

If the casualty requires fluid resuscitation and IV access cannot be obtained, sternal intraosseous (IO) access is recommended. One possible IO fluid delivery system is the First Access for Shock and Trauma (FAST1) System. Cutdowns are not recommended in the tactical setting as they are time-consuming, technically difficult, and require instruments that in all likelihood will not be available. Medics will most likely not be trained, equipped, or authorized to perform cutdowns.

Fluid resuscitation

Fluid resuscitation during the tactical field care phase is significantly different than in the civilian prehospital setting. During this phase of care, fluid resuscitation is guided by several assumptions:

- The tactical situation may not allow time for thorough fluid resuscitation. Care may only consist of immediate CASEVAC while *in extremis*.
- Lack of hemorrhage control is the leading cause of preventable death on the battlefield. Therefore, hemorrhage control is paramount and takes priority over fluid resuscitation, especially in a situation with limited time and resources.
- Stethoscopes, blood pressure cuffs, and other equipment used in the hospital setting to monitor fluid status and shock are rarely available or useful in a noisy and chaotic battlefield setting. In the tactical setting, assessing a casualty's mental status and peripheral pulses is adequate for determining the need for fluid resuscitation.
- The fluids available for casualty resuscitation are limited to those carried by the combat medic. At most, a medic can be expected to carry six 1,000-milliliter (ml) fluid bags or twelve 500-ml bags.

In light of these considerations, during the tactical field care phase only fluid resuscitate those casualties exhibiting signs of shock or TBI. If the casualty has only superficial wounds, IV fluid resuscitation is not necessary, but oral fluids should be encouraged. In those casualties with significant wounds who are coherent and without any obvious blood loss or signs of shock, blood loss likely has been stopped. In these casualties, obtain IV access, hold IV fluids, and reevaluate the casualty as frequently as possible.

Shock: Shock encountered in the combat setting will most likely be hemorrhagic shock. Assume the casualty is in shock if he has an altered mental status in the absence of head injury and/or has weak or absent peripheral pulses. Begin fluid resuscitation in these cases.

During the tactical field care phase, 6 percent Hetastarch (Hextend) is the recommended fluid for resuscitation. Hextend is preferred over crystalloid fluids because one 500-ml bag of Hextend is physiologically equivalent to three 1,000-ml bags of lactated Ringers (LR), weighs 5.5 pounds less, and expands intravascular fluid volume for at least eight hours.

- Initiate fluid resuscitation with a 500-ml Hextend IV bolus.
- Monitor the casualty, and, if after 30 minutes the casualty still has no peripheral pulse or still has altered mentation, administer a second 500-ml Hextend bolus.
- Do not administer more than 1,000 ml of Hextend. This is equivalent to six liters of LR.

If the casualty is still in shock after 1,000 ml of Hextend, the casualty is probably still bleeding. Fluid resuscitation is unlikely to be effective until the hemorrhage is controlled. The casualty needs to be evacuated to surgical care as soon as possible. If rapid evacuation is not feasible, the medic may need to consider triaging medical supplies and focusing attention on more salvageable casualties.

TBI: Head injuries are special situations. Hypotension and hypoxia exacerbate secondary brain injury and are difficult to control in the initial phases of combat casualty care. If the casualty with TBI is unconscious and has no peripheral pulse, he should be resuscitated to restore a palpable radial pulse and evacuated as soon as possible.

Hypothermia prevention

Combat casualties are at a high risk for hypothermia, which is defined as a whole body temperature below 95°F (35°C). Hypothermia can occur regardless of the ambient temperature. The blood loss typically associated with combat trauma results in peripheral vasoconstriction, which contributes to the development of hypothermia. In addition, the longer a casualty is exposed to the environment during treatment and evacuation, especially in wet conditions, the more likely the development of hypothermia. This is even more the case during rotary-wing evacuation.

Hypothermia, acidosis, and coagulopathy constitute the “bloody vicious cycle” in trauma patients. The association of hypothermic coagulopathy with high mortality has been well described. Hypothermia causes the inhibition of coagulation proteins, thus exacerbating the bleeding problem. The need to prevent hypothermia is highlighted by the fact that up to 10 percent of combat casualties arrive at the Level III treatment facility exhibiting some degree of hypothermia.

During the tactical field care phase, the rescuer must first minimize the casualty’s exposure to the elements. If possible, keep all protective gear on the patient. However, if at all possible, replace any wet clothing. Use any methods available to keep the casualty warm, such as dry blankets, poncho liners, sleeping bags, etc.

Hypothermia Prevention and Management Kit (HPMK): One product now available is the HPMK, which should be carried by all medics. HPMK consists of a Ready-Heat blanket, which actively warms to 110-118°F when opened, a Blizzard Rescue Blanket, and a Thermolite Hypothermia Prevention System cap. When the casualty is ready for transport, place the Ready-Heat blanket around his torso, the heat reflective cap on his head, and wrap him in the Blizzard Rescue Blanket.

Monitoring/further evaluation

During the tactical field care phase, monitor the casualty clinically and frequently reassess him until evacuation. Pulse oximetry, at a minimum, should be included in the medic aid bag and used as an adjunct to clinical monitoring. Keep in mind, though, that pulse oximetry readings may be misleading in the settings of shock and hypothermia.

Carefully check the casualty for additional wounds. High-velocity projectiles from assault rifles may tumble and take erratic courses in tissue, leading to exit sites removed from the entry wound. Inspect and dress all wounds.

Pain control

All casualties in pain should be given analgesia. The type and route of medication is dependent upon whether the casualty is conscious, still able to fight, and if IV access has been obtained.

- **Able to fight:** If the casualty is conscious and still able to fight, give him oral pain medications that will not alter his level of consciousness. The recommended medications are meloxicam (Mobic) 15 milligrams (mg) once daily, along with two 650 mg bi-layered Tylenol caplets. These medications, along with an oral antibiotic, will make up the Combat Pill Pack, which all combatants should be instructed to take when they sustain a penetrating wound on the battlefield.
- **Unable to fight:** If the casualty is seriously injured, in pain, and otherwise unable to fight, he should be given narcotic medications. **Medics must be trained in the use of naloxone (Narcan) and have it readily available before administering any narcotics.** Closely monitor the casualty for any respiratory depression. Clearly and visibly document the use of any narcotics to avoid overdose and respiratory compromise.
 - **Without IV/IO access:** Administer a 400-microgram transmucosal fentanyl citrate lozenge. This is placed in the casualty's mouth and is absorbed through the oral mucosal. It is recommended to tape the lozenge to the casualty's finger to prevent overdose. Reassess the casualty in 15 minutes and repeat once if necessary.
 - **IV/IO access present:** Administer an initial dose of 5 mg morphine sulfate. This can be repeated every 10 minutes as needed to control severe pain. Accompany morphine use with 25 mg of promethazine IV/IO/intramuscular (IM) every four hours, for synergistic analgesia and nausea control.

Fractures

Splint all fractures as circumstances allow, ensuring that peripheral pulse, sensory, and motor checks are performed both before and after splinting.

Infection control

Infection is an important cause of morbidity and mortality in battlefield wounds. Assume all open wounds on the battlefield are infected and treat them with antibiotics. Choose antibiotics that cover a broad spectrum of organisms, with the specific medications based on available delivery route and any medication allergies the casualty may have.

- **Able to take oral medication:** If the casualty can take oral medications, 400 mg of gatifloxacin, taken once daily, is recommended. This medication should be part of the Combat Pill Pack and the casualty should take this as soon as he is injured and all life-threatening injuries have been addressed.
- **Unable to take oral medication:** If the casualty is unable to take oral medications because of shock, unconsciousness, or other reasons, IV or IM antibiotics should be given. Recommended antibiotics in this case include cefotetan 2 grams (g) IV (over 3-5 minutes) or IM every 12 hours; or ertapenem 1 g IV (over 30 minutes) or IM every 24 hours.

Communication

Combat is a frightening experience. Being wounded, especially seriously, can generate tremendous anxiety and fear. Engaging a casualty with reassurance is therapeutically beneficial. Communication is just as important in casualty care on the battlefield as it is in the treatment facility. Ensure the care plan is explained to the casualty.

Documentation

Document clinical assessments, treatment rendered, and changes in the casualty's status. Forward that information with the casualty to the next level of care. Utilize DD Form 1380, *Field Medical Card*, for this. If this form is not available, use three-inch white tape on the casualty's chest and an indelible pen to document care.

Section IV: Combat CASEVAC care

Combat CASEVAC care is the care rendered once the casualty has been picked up by an aircraft, vehicle, or boat for transportation to a higher echelon of care. CASEVAC is the evacuation of combat casualties from the battlefield. In general, combat CASEVAC care is a continuation of care rendered during the tactical field care phase, with minor additions based on the following conditions:

- Additional medical personnel may accompany the evacuation asset.
- Additional medical equipment may be brought with the evacuation asset.

The arrival of additional medical personnel is important for several reasons:

- The medic may be one of the casualties or be dehydrated, hypothermic, or otherwise debilitated.
- There may be multiple casualties that exceed the medic's capability to care for simultaneously.
- The evacuation asset's equipment will need to be prepared prior to CASEVAC.
- Additional medical personnel, such as physicians and other specialists, provide greater expertise.

The additional medical equipment brought by the evacuation asset serves several purposes. Medical resupply may be accomplished during this phase of care. More advanced medical equipment, such as blood products and other fluids, electronic monitoring devices, and oxygen, may now be used to care for the casualty. This equipment, and the possibly improved care environment of the evacuation asset, allows more advanced casualty care with more skilled providers during the CASEVAC phase.

Airway management

Airway management during the CASEVAC phase follows the same principles as during the tactical field care phase, with the use of positioning and a NPA as the initial management options. However, the management of an impaired airway is exceedingly difficult during CASEVAC. It is now appropriate, if the equipment and provider expertise is available, to obtain a definitive airway if required by the casualty's condition. Possible airway management options include:

- **Cricothyroidotomy:** As in the tactical field care phase, cricothyroidotomy is still an appropriate option when an NPA is not effective. This is still the procedure of choice for penetrating wounds of the face or neck, where blood or disrupted anatomy precludes good visualization of the vocal cords.

- **Intubation:** The conditions of the CASEVAC phase now make intubation a viable option. If the equipment is available and the care provider has the appropriate expertise, several intubation methods are possible. Blind intubation devices, such as the laryngeal mask airway, intubating laryngeal mask airway (ILMA), King LT, or the Combitube, are recommended options. These devices provide adequate ventilation without the need for illuminated laryngoscopy; have been used effectively in the prehospital setting; and, in the case of the ILMA and Combitube, protect the airway from aspiration. Additionally, if personnel have adequate training, endotracheal intubation is now an option.

Breathing

During the CASEVAC phase, management of the casualty's breathing is a continuation of the interventions made during the tactical field care phase. Continue to treat penetrating chest wounds with petroleum dressing and monitor for the development of a tension PTX. Treat PTXs with needle decompression. At this phase of care, though, it may now be possible to consider additional interventions.

- **Chest tubes:** For casualties with a tension PTX who show no improvement with needle decompression, the provider should consider inserting a chest tube. A chest tube should also be considered for casualties with PTX when a long evacuation time is anticipated, even if the initial needle decompression was successful.
- **Oxygen:** Oxygen may be brought by the evacuation asset and now be available. Most combat casualties do not require oxygen, but it should be used in seriously injured casualties, especially in the following circumstances:
 - Low oxygen saturation by pulse oximetry.
 - Injuries associated with impaired oxygenation.
 - Unconscious casualties.
 - Casualties with traumatic brain injuries.
 - Casualties in shock.
 - Casualties at altitude.

Fluid resuscitation

Several improvements in fluid resuscitation are possible in the CASEVAC phase. Monitoring equipment brought by the evacuation asset may yield a better understanding of a casualty's fluid status and can direct resuscitation efforts. Continue resuscitation in casualties with TBI to maintain a systolic blood pressure of at least 90 millimeters (mm) mercury (Hg). If indicated and available, packed red blood cells should be given to casualties suffering from blood loss. These blood cells will restore oxygen-carrying capacity. Resuscitation for casualties in shock

can be continued with the use of Hextend (but not to exceed 1,000 ml per casualty) or LR. Finally, LR can now be used to treat dehydration.

Hypothermia prevention

Hypothermia prevention becomes paramount during the CASEVAC phase, especially if the casualty is evacuated in a helicopter. Continue to follow the hypothermia prevention principles of the tactical field care phase: minimize the casualty's exposure to the elements, replace wet clothing, and use equipment such as the HPMK. If the doors of the evacuation asset must be kept open, protect the casualty from the wind. Also, if portable fluid-warming devices, such as the Thermal Angel, are available, they should be used on all IV fluid sites.

Monitoring

The evacuation asset may contain additional patient-monitoring devices. Electronic systems capable of monitoring blood pressure, heart rate, pulse oximetry, and end-tidal carbon dioxide (CO₂) may be available and should be used. This is especially true in helicopter evacuation, which impairs or prevents the ability to monitor the casualty clinically.

Pneumatic anti-shock garment (PASG)

PASG may be available during the CASEVAC phase and may be useful for stabilizing pelvic fractures and helping to control pelvic and abdominal bleeding. However, its application and extended use must be carefully monitored. This device is contraindicated and should not be used in casualties with thoracic and brain injuries.

Additional measures

All other aspects of care during the CASEVAC phase are identical to those during the tactical field care phase. Hemorrhage must be controlled, using tourniquets as necessary. However, tourniquets should be discontinued, if possible, once bleeding is controlled by other means and the casualty has been resuscitated for hemorrhagic shock. Maintain vascular access with at least one 18-gauge IV or an IO device, if necessary. Provide analgesia and antibiotics as previously indicated during the tactical field care phase. Continue to document all care and forward this information with the casualty to the next level of care.

Section V: Management guidelines

Care under fire procedures

1. Take cover. Return fire as directed or required.
2. Direct and expect the casualty to continue to return fire if able.
3. Direct the casualty to move to cover/apply self-aid if able.
4. Try to keep the casualty from sustaining additional wounds.
5. Airway management is generally best deferred until the tactical field care phase.
6. Stop **life-threatening** external hemorrhage:
 - Direct the casualty to control hemorrhage by self-aid if he is able.
 - Use a tourniquet for hemorrhage that is anatomically amenable to tourniquet application.
 - For hemorrhage that cannot be controlled with a tourniquet, apply a HemCon dressing.

Tactical field care procedures

1. Immediately disarm any casualty with an altered mental status.
2. Airway management:
 - Unconscious casualty without airway obstruction:
 - Chin-lift or jaw-thrust maneuver.
 - NPA.
 - Place casualty in recovery position.
 - Consider Combitube or King LT.
 - Casualty with or impending airway obstruction:
 - Chin-lift or jaw-thrust maneuver.
 - NPA:
 - * Allow conscious casualty to assume any position that best protects the airway, including sitting up.
 - * Place unconscious casualty in recovery position.
 - Surgical cricothyroidotomy if above measures fail.

3. Breathing:

- Treat penetrating chest wounds with a three-sided dressing.
- Consider tension PTX and perform needle decompression.

4. Bleeding:

- Assess for unrecognized hemorrhage and control bleeding.
- Assess for discontinuation of any tourniquets.

5. Access:

- Start an 18-gauge IV.
- If fluid resuscitation is needed and IV access is not obtainable, use sternal IO access.

6. Fluid resuscitation:

- **Resuscitate only if in shock:**
 - Weak or absent peripheral pulses.
 - Altered mental status.
- Hextend 500-ml IV bolus.
- Repeat once after 30 minutes if casualty is still in shock.
- No more than 1,000 ml of Hextend.

7. Prevent hypothermia:

- Minimize exposure.
- Replace wet clothing, if able.
- Apply Ready-Heat blanket to torso.
- Wrap in Blizzard Rescue Blanket.
- Put Thermolite Hypothermia Prevention System cap on casualty's head, under helmet.
- Use any other method to retain heat if above gear is not available.

8. Monitor:

- Continue to monitor clinically.
- Initiate pulse oximetry monitoring.

9. Analgesia:

- Able to fight:
 - Mobic 15 mg orally (PO), daily (qd).
 - Tylenol 650 mg bi-layer caplet, 2 PO.
- Unable to fight:
 - **Naloxone should be available before administering opiates.**
 - Non-IV/IO access: Oral transmucosal fentanyl citrate 400-microgram lozenge.
 - IV/IO access:
 - * Morphine sulfate 5 mg IV/IO repeat every (q) 10 minutes as needed (PRN).
 - * Promethazine 25 mg IV/IO/IM.

10. Splint fractures.

11. Antibiotics (**Recommended for all open wounds**):

- PO: Gatifloxacin 400 mg PO qd.
- IV:
 - Cefotetan 2 gm IV.
 - Ertapenem 1 gm IV.

12. Communicate: Encourage, reassure, explain.

13. Document: Initiate documentation and forward with casualty.

Combat CASEVAC care

1. Airway management:

- Unconscious casualty without airway obstruction:
 - Chin-lift or jaw-thrust maneuver.
 - NPA.
 - Place casualty in recovery position.
- Casualty with airway obstruction or impending airway obstruction:
 - Chin-lift or jaw-thrust maneuver.
 - NPA:
 - * Allow conscious casualty to assume any position that best protects the airway, to include sitting up.
 - * Place unconscious casualty in recovery position.
- If measures above are unsuccessful,
 - Surgical cricothyroidotomy *or*
 - Combitube, King LT *or*
 - Endotracheal intubation.

2. Breathing:

- Treat penetrating chest wounds with a three-sided dressing.
- Consider tension PTX and perform needle decompression.
- Consider chest tube insertion if no improvement and/or long transport anticipated.
- Administer oxygen if:
 - Low oxygen saturation by pulse oximetry.
 - Injuries associated with impaired oxygenation.
 - Unconscious patient.
 - TBI patients (maintain oxygen saturation >90).
 - Casualties in shock.
 - Casualties at altitude.

3. Bleeding:

- Assess for unrecognized hemorrhage and control all sources of bleeding.
- Assess for discontinuation of tourniquets once bleeding is controlled by other means. Before releasing any tourniquet on a patient who has been resuscitated for hemorrhagic shock, assure a positive response to resuscitation efforts (i.e., a peripheral pulse normal in character and normal mentation if there is no TBI).

4. Access:

- Reassess need for IV access:
 - If indicated, start an 18-gauge IV or saline lock.
 - If resuscitation is required and IV access is not obtainable, use sternal intraosseous route.

5. Fluid resuscitation:

- Reassess for hemorrhagic shock: altered mental status (in the absence of brain injury) and/or abnormal vital signs.
- If not in shock:
 - No IV fluids necessary.
 - PO fluids permissible if conscious.
- If in shock:
 - Hextend 500-ml IV bolus.
 - Repeat Hextend 500-ml IV once after 30 minutes if still in shock.
 - No more than 1,000 ml of Hextend.
- Continue resuscitation with packed red blood cells, Hextend, or LR as indicated.
- If a casualty with TBI is unconscious and has a weak or absent peripheral pulse, resuscitate as necessary to maintain a systolic blood pressure of 90 mm Hg or above.

6. Prevention of hypothermia:

- Minimize casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.
- Continue Ready-Heat blanket, Blizzard Rescue Blanket and Thermolite cap.

- Apply additional interventions as needed.
- Utilize the Thermal Angel or other portable fluid warmer on all IV sites, if possible.
- Protect the casualty from wind if doors must be kept open.

7. Monitoring:

- Institute electronic monitoring of pulse oximetry and vital signs if indicated.

8. Inspect and dress known wounds if not already done.

9. Check for additional wounds.

10. Analgesia as necessary.

- Able to fight:
 - Mobic 15 mg PO qd.
 - Tylenol, 650 mg bi-layer caplet, 2 PO q 8 hours.
- Unable to fight:
 - **Have naloxone readily available whenever administering opiates.**
 - Does not otherwise require IV/IO access:
 - * Oral transmucosal fentanyl citrate 400-microgram lozenge.
 - IV or IO access obtained:
 - * Morphine sulfate 5 mg IV/IO repeat q 10 min PRN.
 - * Promethazine 25 mg IV/IO/IM q 4 hours, for synergistic analgesic effect and as a counter to potential nausea.

11. Reassess fractures and recheck pulses.

12. Antibiotics: recommended for all open combat wounds.

- If able to take PO:
 - Gatifloxacin 400 mg PO qd.
- If unable to take PO (shock, unconscious, or penetrating torso injuries):
 - Cefotetan 2 g IV *or*
 - Ertapenem 1 gm IV.

CENTER FOR ARMY LESSONS LEARNED

13. PASG may be useful for stabilizing pelvic fractures and controlling pelvic and abdominal bleeding. Its application and extended use must be carefully monitored. It is contraindicated for casualties with thoracic and brain injuries.

14. Document clinical assessments, treatments rendered, and changes in casualty's status. Forward this info with the casualty to the next level of care.

Chapter 2

Tactical Combat Casualty Care Procedures

Section I: Airway management

Nasopharyngeal airway (NPA) insertion

(Necessary equipment: NPA, gloves, water-based lubricant.)

1. Place the casualty supine with the head in a neutral position.

Caution: Do not use the NPA if there is clear fluid (cerebrospinal fluid) coming from the ears or nose. This may indicate a skull fracture.

2. Select the appropriately sized airway using one of the following methods:

- Measure the airway from the casualty's nostril to the earlobe.
- Measure the airway from the casualty's nostril to the angle of the jaw.

Note: Choosing the proper length ensures appropriate diameter. Standard adult sizes are 34, 32, 30, and 28 French (Fr).

3. Lubricate the tube with a water-based lubricant.

Caution: Do not use a petroleum-based or non-water-based lubricant. These substances can cause damage to the tissues lining the nasal cavity and pharynx, thus increasing the risk for infection.

4. Insert the NPA.

- Push the tip of the nose upward gently.
- Position the tube so that the bevel of the airway faces toward the septum.
- Insert the airway into the nostril and advance it until the flange rests against the nostril.

Caution: Never force the NPA into the casualty's nostril. If resistance is met, pull the tube out and attempt to insert it in the other nostril. Most attempts to insert the NPA should be in the right nostril. If unable to insert into the right nostril, try the left. If inserting in the left nostril the bevel will not be against the septum.

Surgical cricothyroidotomy

(Necessary equipment: Cutting instrument [for example, Scalpel # 10 or 15]; forceps or tracheal hook; povidone-iodine; endotracheal tube [ETT] 6-millimeter [mm]; gloves; 4 x 4 gauze; tape; local anesthetic; and materials to inject.)

1. Hyperextend the casualty's neck.
 - Place the casualty in the supine position.
 - Place a blanket or poncho rolled up under the casualty's neck or between the shoulder blades so the airway is straight.

Warning: Do not hyperextend the casualty's neck if a cervical injury is suspected.

2. Put on gloves, if available.
3. Locate the cricothyroid membrane.
 - Place a finger of the nondominant hand on the thyroid cartilage (Adam's apple) and slide the finger down to the cricoid cartilage.
 - Palpate for the "V" notch of the thyroid cartilage.
 - Slide the index finger down into the depression between the thyroid and cricoid cartilage.

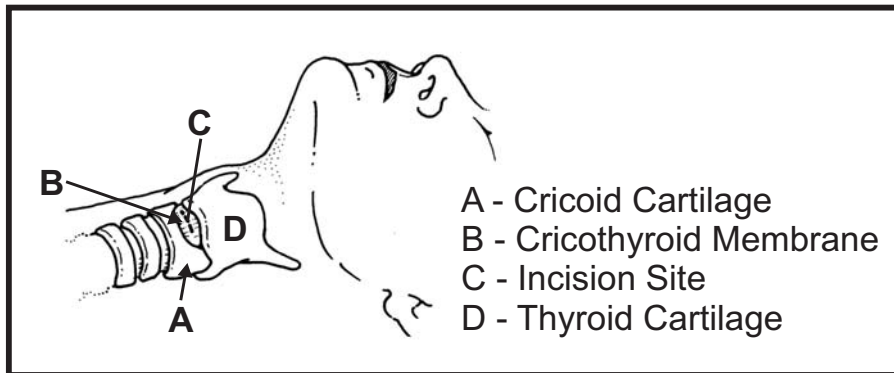


Figure 2-1: Cricothyroid membrane anatomy

4. Prepare the incision site.

- Administer local anesthesia to the incision site if the casualty is conscious.
- Prep the skin over the membrane with povidone-iodine.

5. With a cutting instrument in the dominant hand, make a 1.5-inch **vertical** incision through the skin over the cricothyroid membrane.

Caution: Do not cut the cricothyroid membrane with this incision.

6. Relocate the cricothyroid membrane by touch and sight.

7. Stabilize the larynx with one hand and make a 1/2-inch **horizontal** incision through the elastic tissue of the cricothyroid membrane.

Note: A rush of air may be felt through the opening.

8. Dilate the opening with a hemostat, scalpel handle, or a hooked 18-gauge needle that can grasp the cricoid cartilage and stabilize it.

9. Insert the ETT through the opening and toward the lungs. Only advance the ETT 2-3 inches into the trachea to prevent right mainstem bronchus intubation. Inflate the cuff to stabilize the ETT.

10. Check for air exchange and tube placement.

- Air exchange: Listen and feel for air passage through the tube; look for bilateral chest rise and fall.
- Tube placement: Bilateral chest sounds/rise and fall of the chest confirms proper tube placement.
 - Unilateral breath sounds/rise and fall of chest indicate a right main stem bronchus intubation: Withdraw the ETT 1-2 inches and reconfirm placement.
 - Air from the casualty's mouth indicates the tube is directed toward the mouth. Remove the tube, reinsert, and recheck for air exchange and placement.
 - Any other problem indicates the tube is not placed correctly. Remove the tube, reinsert, and recheck for air exchange.

11. Once the tube is correctly placed, begin rescue breathing, if necessary and tactically appropriate.

- Connect the tube to a bag-valve-mask (BVM), and ventilate the casualty at the rate of 20 breaths/minute (min).
- If BVM is not available, begin mouth-to-tube resuscitation at 20 breaths/min.

12. Apply a sterile dressing. Use either of the following methods:

- Make a V-shaped fold in a 4 x 4 gauze pad and place it under the edge of the ETT to prevent irritation to the casualty. Tape securely.
- Cut two 4 x 4 gauze pads halfway through and place on opposite sides of the tube. Tape securely.

Note: Cricothyroidotomy sets should be prepared prior to the mission. All essential pieces of equipment should be prepared before deployment and packed into a plastic zip-lock bag. Cut the ETT tube to just above the cuff inflation tube so that the ETT is not protruding six inches out of the casualty's neck.

Combitube insertion

(Necessary equipment: Combitube, 140-cubic centimeter [cc] syringe, 20-cc syringe; gloves, stethoscope, BVM.)

1. Oxygenate the casualty, if available.

- Instruct an assistant to oxygenate the casualty using the BVM.
- Instruct the assistant to count aloud for 20 seconds while intubation is performed.
- At the end of 20 seconds, the assistant should immediately resume resuscitation if intubation is unsuccessful.

2. Prepare the Combitube.

- Inspect the tube for breaks or cracks.
- Attach the large syringe to the pharyngeal (proximal) cuff and inflate it with 100 cc of air. Check for leaks and then deflate completely.
- Attach the small syringe to the tracheal (distal) cuff and inflate it with 15 cc of air. Check for leaks and then deflate completely.

Note: These volumes are only true if using the 41 Fr size tube. If using the 37 Fr tube, the inflation amounts are 85 cc and 12 cc, respectively.

Note: If a leak is present, replace the tube.

3. Put on gloves.
4. Kneel just above the casualty's head, facing the casualty's feet.

Note: If the casualty's neck has been hyperextended to open the airway, return it to a neutral position.

5. Insert the tube.
 - Have the assistant give the casualty two breaths and start counting for 20 seconds.
 - Lift the jaw and tongue straight upward without hyperextending the neck.
 - Pass the tube blindly, following the pharyngeal curvature until the teeth are between the two black lines on the tube.

Caution: Do not force the tube at any time.

- Use the large syringe to inflate the pharyngeal cuff with 100 cc of air. The device will seat itself in the posterior pharynx, behind the hard palate.
 - Use the small syringe to inflate the distal cuff with 10 to 15 cc of air.
6. Ventilate the casualty and check tube placement.
 - Attach the BVM device to the esophageal connector.
 - Attempt to ventilate and listen for the presence of breath sounds in the lungs and absence of sounds from the epigastrium.
 - If there is an absence of breath sounds and presence of sounds in the epigastrium, the tube is in the trachea.
 - Attach the BVM to the tracheal connector and ventilate the casualty.
 - Listen for the presence of breath sounds.
 - Continue to ventilate the casualty every 3-5 seconds.
 7. Remove the Combitube if the casualty regains consciousness or a gag reflex.
 - Oxygenate the casualty with two slow breaths.
 - Turn the casualty to one side.
 - Deflate both cuffs.
 - Withdraw the tube in one quick motion, following the curve of the pharynx.
 - Immediately clear the casualty's airway of any vomitus.

King LT insertion

(Necessary equipment: King LT, water-based lubricant, syringe.)

1. Prepare the casualty.

- Place the casualty's head in the "sniffing" position.
- Preoxygenate the casualty, if equipment is available.

2. Prepare the King LT.

- Choose the appropriately sized tube.
- Test cuff inflation by injecting the proper volume of air into the cuff. Deflate the cuff prior to inserting the tube.
- Lubricate the tube with a water-based lubricant.

Caution: Do not use a petroleum-based or non-water-based lubricant. These substances can cause damage to the tissues lining the nasal cavity and pharynx, thus increasing the risk for infection.

3. Insert the King LT.

- Hold the tube in the dominant hand. With the nondominant hand, open the casualty's mouth and apply a chin lift.
- With the King LT rotated laterally 45 to 90 degrees, place the tip into the mouth and advance the tube behind the base of the tongue.

Note: A lateral approach with the chin lift facilitates proper insertion. The tip must remain midline as it enters the posterior pharynx.

- Rotate the tube to midline as the tip reaches the posterior pharynx.
- Advance the tube until the base of the connector is aligned with the teeth or gums.
- Using either an attached pressure gauge or syringe, inflate the cuff to the minimum volume necessary to seal the airway.

4. Confirm proper placement of tube.

- Reference marks for the tube are at the proximal end of the tube and should be aligned with the upper teeth.
- Confirm proper placement by listening for equal breath sounds during ventilation.

- While gently ventilating the casualty, gently withdraw the tube until ventilation is easy and free flowing, with minimal airway pressure needed.

Note: Initially placing the tube deeper than required and then withdrawing slightly increases the chance of proper insertion, helps ensure a patent airway, and decreases the risk of airway obstruction if the casualty spontaneously ventilates.

5. Secure the tube with tape.

Size:	3	4	5
Connector Color:	Yellow	Red	Purple
Casualty Size:	4 to 5 ft	5 to 6 ft	> 6 ft
Cuff Volume:	45 to 60 ml	60 to 80 ml	70 to 90 ml

Section II: Breathing management

Penetrating chest wounds

(Necessary equipment: Field dressings or any airtight material [Asherman Chest Seal, plastic wrap, tape].)

1. Expose the wound(s).

- Cut or unfasten the clothing that covers the wound.
- Disrupt the wound as little as possible.

Note: Do not remove clothing stuck to the wound.

2. Check for an exit wound.

- Feel and/or look at the casualty's chest and back.
- Remove the casualty's clothing, if necessary.

3. Seal the wound(s), usually covering the first wound encountered first.

Note: All penetrating chest wounds should be treated as if they are sucking chest wounds.

Note: In an emergency, any airtight material can be used. It must be large enough so it is not sucked into the chest cavity.

- Cut the dressing wrapper on one long and two short sides and remove the dressing.
- Apply the inner surface of the wrapper to the wound when the casualty exhales.
- Ensure that the covering extends at least 2 inches beyond the edges of the wound.
- Seal by applying overlapping strips of tape to three sides of the plastic covering to provide a flutter-type valve.
- Cover the exit wound in the same way, if applicable, but tape the wound on all four sides.

Note: Assess the effectiveness of the flutter valve when the casualty breathes. When the casualty inhales, the plastic should be sucked against the wound, preventing the entry of air. When the casualty exhales, trapped air should be able to escape from the wound and out the open side of the dressing.

4. Dress the wound.

- Place the field first aid dressing over the seal and tie the ends directly over the wound. This may negate the flutter-valve effect, so reevaluate and adjust the dressing to maintain the flutter-valve effect.
- Use padding material or another dressing for pressure and stability.
- Dress the exit wound in the same way, if applicable.

Caution: Ensure that the dressings are not tied so tightly that they interfere with the breathing process or the flutter-type valve.

5. Place the casualty on the injured side, sitting up.

6. Monitor the casualty.

- Monitor breathing and the wound seal.
- Assess the effectiveness of the flutter valve.
- Check vital signs.
- Observe for signs of shock.

Needle chest decompression

(Necessary equipment: Large-bore needle [10 to 14 gauge], at least 2.5 inches in length, and tape.)

1. Locate the insertion site. Locate the second intercostal space (between the second and third ribs) at the midclavicular line (approximately in line with the nipple) on the affected side of the casualty's chest.

2. Insert a large-bore (10- to 14-gauge) needle/catheter unit.

- Place the needle tip, bevel up, on the insertion site (second intercostal space, midclavicular line).
- Lower the proximal end of the needle to permit the tip to enter the skin just above the third rib margin.
- Firmly insert the needle into the skin over the third rib, until the pleura has been penetrated, as evidenced by feeling a "pop" as the needle enters the pleural space, and a hiss of air escaping from the chest.

Warning: Proper positioning of the needle is essential to avoid puncturing blood vessels and/or nerves.

Note: If you are using a catheter-over-needle, hold the needle still and push the catheter into the plural space until resistance is felt. Withdraw the needle along the angle of insertion while holding the catheter still.

3. Secure the catheter to the chest with tape, and monitor the casualty.

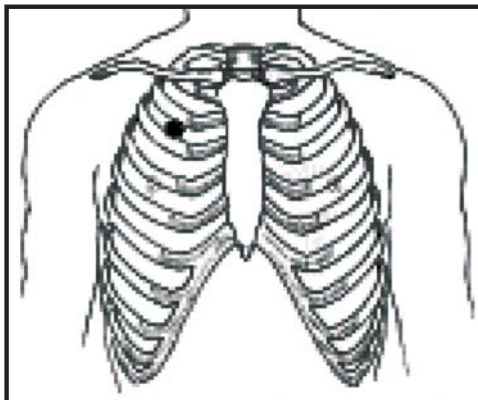


Figure 2-2: Needle chest compression, needle insertion site

Chest tube insertion

(Necessary equipment: Chest tube [16-35 Fr], gloves, one-way valve, scalpel handle and blades [#10 and #15], Kelly forceps, large hemostat, povidone-iodine, suture material, lidocaine with 1-percent epinephrine for injection, needle, and syringe.)

1. Assess the casualty.

- If necessary, open the airway.
- Ensure adequate respiration and assist as necessary.
- Provide supplemental oxygen, if available.
- Connect the casualty to a pulse oximeter, if available.
- Initiate an intravenous (IV) line.

2. Prepare the casualty.

- Place the casualty in the supine position.
- Raise the arm on the affected side above the casualty's head.
- Select the insertion site at the anterior axillary line over the fourth or fifth intercostal space.
- Clean the site with povidone-iodine solution.
- Put on sterile gloves.
- Drape the area.
- Liberally infiltrate the area with the 1-percent lidocaine solution.

3. Insert the tube.

- Make a 2- to 3-centimeter (cm) transverse incision over the selected site and extend it down to the intercostal muscles.

Note: The skin incision should be 1 to 2 cm below the intercostal space through which the tube will be placed.

- Insert the Kelly forceps through the intercostal muscles in the next intercostal space above the skin incision.
- Puncture the parietal pleura with the tip of the forceps and slightly enlarge the hole by opening the clamp 1.5 to 2 cm.

Caution: Avoid puncturing the lung. Always use the superior margin of the rib to avoid the intercostal nerves and vessels.

- Immediately insert a gloved finger in the incision to clear any adhesions, clots, etc.
- Grasp the tip of the chest tube with Kelly forceps. Insert the tip of the tube into the incision as you withdraw your finger.
- Advance the tube until the last side hole is 2.5 to 5 cm inside the chest wall.
- Connect the end of the tube to a one-way drainage valve (e.g., Heimlich valve).
- Secure the tube using the suture materials.
- Apply an occlusive dressing to the site.
- Radiograph the chest to confirm placement, if available.

4. Reassess the casualty.

- Check for bilateral breath sounds.
- Monitor and record vital signs every 15 minutes.

5. Document the procedure.

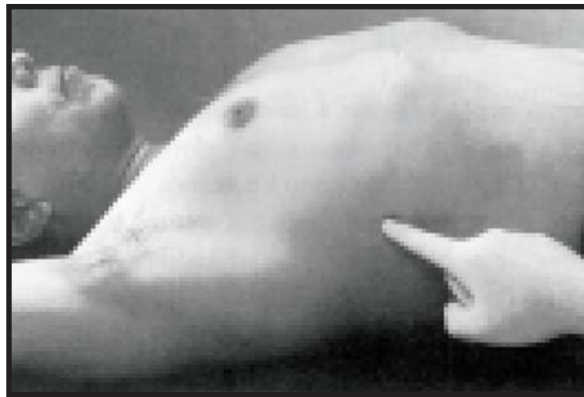


Figure 2-3: Chest tube insertion site

Section III: Hemorrhage control

Combat application tourniquet (CAT)

(Necessary equipment: CAT.)

1. Place the wounded extremity through the loop of the band.



Figure 2-4

2. Place the tourniquet about 2 inches above the injury site. Pull the self-adhering band tight and securely fasten it back on itself.



Figure 2-5(a)

3. Adhere it completely around the band until it reaches the clip.



Figure 2-5(b)

4. Twist the windlass rod until the bleeding stops.



Figure 2-6

5. Lock the windlass rod in place with the windlass clip.



Figure 2-7

6. Grasp the windlass strap, pull tight, and adhere it to the windlass clip.



Figure 2-8

Note: When applying the CAT to a lower extremity wound, the self-adhering band must be routed through the friction-adapter buckle.

HemCon dressing

(Necessary equipment: HemCon dressing; bandage.)

Warning: HemCon should only be used for external wounds. Do not use in internal cavities (abdominal, thoracic, cranial) or apply to the eyes. Bandage should be presoftened when first issued.

1. Apply dressing with pressure to the wound for 1 to 2 minutes or until the dressing adheres to the wound and bleeding stops.
2. Apply outer bandage to secure the dressing to the wound.
3. Remove the dressing within 48 hours.

QuikClot

(Necessary equipment: QuikClot.)

Warning: QuikClot should only be used for external wounds. Do not use in internal cavities (abdominal, thoracic, cranial).

1. Blot away excess blood, water, and dirt from the wound.
2. Tear open the package, holding it away from your face and the casualty's face.

Note: Avoid breathing the dust from QuikClot; it may irritate or burn the eyes, nose, throat, or skin.

3. Apply contents of the bag directly to the wound. Only use enough QuikClot to stop bleeding. Discard any unused product.
4. Apply direct, firm pressure to the wound for several minutes.
5. Wrap and tie the bandage to the wound to maintain pressure.
6. Evacuate the casualty as soon as possible. Send the empty package with the casualty.

Note: When using hemostatic agents on extremity wounds it is best to use them in conjunction with a tourniquet. Stop bleeding initially with tourniquet, clean and dry the wound, and then apply the hemostatic agent. Allow the agent to set up for a period of time and then attempt to remove tourniquet.

Section IV: Vascular access

Peripheral IV access

(Necessary equipment: IV tubing, IV fluids, 18-gauge IV needle/catheter, constricting band, antiseptic wipes, gloves, tape, 2 x 2 gauze sponges.)

1. Select an appropriate access site on an extremity.
 - Use the most distal, accessible vein possible.
 - Avoid sites over joints.
 - Avoid injured extremities.
 - Avoid extremities with significant wounds proximal to IV insertion site.
2. Prepare the site.
 - Apply the constriction band around the limb, about 2 inches above the site of the puncture site.
 - Clean the site with antiseptic solution.
3. Put on gloves.
4. Puncture the vein.
 - Stabilize skin at the puncture site, pulling the skin downward until taut.
 - Position the needle point, bevel up, parallel to the vein, 1/2 inch below the venipuncture site.
 - Hold the needle at a 20- to 30-degree angle and insert it through the skin.
 - Move the needle forward about 1/2 inch into the vein.
 - Confirm the puncture by observing blood in the flash chamber.

Note: A faint give may be felt as the needle enters the vein.

5. Advance the catheter.
 - Grasp the hub and advance the needle into the vein up to the hub.

Note: This prevents backflow of blood from the hub.

- While holding the hub, press lightly on the skin with the fingers of the other hand.
- Remove the needle from the catheter.

6. Connect the catheter to the IV infusion tubing and begin the infusion.

- If the casualty does not require IV fluids, attach a saline lock.
- Observe the site for infiltration of fluids into the tissues.

7. Secure the catheter and tubing to the skin and dress the site.

Intraosseous (IO) placement: First Access for Shock and Trauma (FAST1) system

(Necessary equipment: FAST1 device, infusion fluids.)

1. Prepare the site.

- Expose the sternum.
- Identify the sternal notch.

2. Place the target patch.

- Remove the top half of the backing (“Remove 1”) from the patch.
- Place index finger on the sternal notch, perpendicular to the skin.
- Align the locating notch in the target patch with the sternal notch.



Figure 2-9: FAST1 target patch

- Verify that the target zone (circular hole) of the patch is directly over the casualty’s midline, and press firmly on the patch to engage the adhesive and secure the patch.
- Remove the remaining backing (“Remove 2”) and secure the patch to casualty.

3. Insert the introducer.

- Remove the cap from the introducer.
- Place the bone probe cluster needles in the target zone of the target patch.
- Hold the introducer perpendicular to the skin of the casualty.
- Pressing straight along the introducer axis, with hand and elbow in line, push with a firm, constant force until a release is heard and felt.



Figure 2-10: FAST1 introducer insertion

Warning: Avoid extreme force or twisting and jabbing motions.

- Expose the infusion tube by gently withdrawing the introducer. The stylet supports will fall away.
- Locate the orange sharps plug. Place it on a flat surface with the foam facing up, and, keeping both hands behind the needles, push the bone probe cluster into the foam. Reattach the sharps cap.

4. Connect the infusion tube.

- Connect the infusion tube to the right-angle female connector.
- Flush catheter with 1 milliliter (ml) of sterile IV solution.
- Attach the straight female connector to the source of fluids or drugs.



Figure 2-11: Connection of infusion tube

5. Secure the protector dome. Place the protector dome directly over the target patch and press firmly to engage the Velcro fastening.



Figure 2-12: Completed FAST1 device with protector dome in place

6. Attach the remover package to the casualty for transport.

Warning: The remover package must be transported with the casualty in order to remove the FAST1 device later.

IO device removal (FAST1)

(Necessary equipment: FAST1 remover package.)

1. Remove the dome.

Note: Hold the patch with one hand so it does not come away from the casualty when the dome is removed.

2. Disconnect the tube.
3. Remove the infusion tube.

Warning: Do not pull on the infusion tube to remove it.

- Open the remover package.
- Remove the tubing protecting the remover tip.
- Insert the remover into the infusion tube while holding the tube perpendicular to the casualty.



Figure 2-13: FAST1 remover

- Advance the remover and turn it clockwise until it stops.
 - Press lightly on the target patch and pull the remover straight out to dislodge the infusion tube. Hold the remover by the T-shaped knob. If the remover disengages from the tube without removing it, repeat the attempt.
4. Remove the target patch.
 5. Dress the infusion site.

Section V: Hypothermia prevention

Care under fire phase

1. Get the casualty to safety.
2. Treat life-threatening hemorrhage.
3. Keep the casualty as clothed as possible.

Tactical field care phase

1. Stop bleeding and resuscitate appropriately. If warm fluids are available, use them. **They likely will not be available.**
2. Remove any wet clothing and replace them with dry clothes, if possible.
3. Use the Hypothermia Prevention and Management Kit (HPMK):
 - Place the Thermolite Hypothermia Prevention System cap on the casualty's head, underneath his helmet.
 - Place the casualty on the Blizzard Rescue Blanket.
 - Place the Ready-Heat blanket on the casualty's torso and back. Once the ingredients are exposed to the air, they instantly start to heat up to a maximum temperature of 104°F (40°C) for 8 hours.
 - Wrap the rescue blanket around the casualty.

Note: If you do not have an HPMK or a survival blanket of any kind, then find dry blankets, poncho liners, space blankets, sleeping bags, body bags, or anything that will retain heat and keep the casualty dry.



Figure 2-14: HPMK

Combat casualty evacuation care phase

1. The casualty should remain wrapped in the Ready-Heat blanket, Blizzard Rescue Blanket, and hypothermia cap.
2. If these items were not available in the other phases of care, check with the evacuation personnel to see if they have them or any other items that can be used to prevent heat loss.
3. Wrap the casualty in dry blankets and, during helicopter transport, try to keep wind from open doors from blowing over or under the casualty.
4. Use the Thermal Angel or other portable fluid warmer on all IV sites, if available.

Section VI: Medication guidelines

Analgesia

Note: Pain medication should be given to any casualty in pain.

Oral analgesia

1. Give to any casualty still able to fight.

Note: These medications are included in the Combat Pill Pack: Meloxicam (Mobic) 15 milligrams (mg) and acetaminophen (Tylenol) 650 mg bi-layer caplet, x 2.

2. Oral transmucosal fentanyl citrate 400-microgram lozenge.

- Tape lozenge-on-a-stick to the casualty's finger and place in the casualty's cheek.
- Reassess the casualty in 15 minutes.
- Add a second lozenge in the other cheek as necessary to control severe pain.
- Monitor for respiratory depression.

3. Morphine sulfate

- Give morphine sulfate 5 mg IV or IO.
- Reassess in 10 minutes.
- Repeat dose every 10 minutes as necessary to control severe pain.
- Monitor for respiratory depression.
- Give promethazine 25 mg IV/IO/IM every 4 hours for synergistic analgesic effect and as a counter to morphine-induced nausea.

4. Naloxone (Narcan)

- **Have naloxone (Narcan) available before administering fentanyl or morphine.**
- Use immediately if casualty exhibits signs of respiratory depression.

Antibiotics

Note: Treat all casualties with open combat wounds with antibiotics. Broad-spectrum antibiotics (for example, fluoroquinolones or cephalosporins) should be used, depending on the casualty's condition and allergies.

1. Oral antibiotics

Note: This medication is included in the Combat Pill Pack: Gatifloxacin 400 mg once a day.

2. Non-oral antibiotics

- Cefotetan 2 grams (g) IV/IO (given with a slow push over 3-5 minutes) or IM every 12 hours.
- Ertapenem 1 g IV or IM every 24 hours.

Appendix A

Triage Categories

Triage Category	Category Description	Examples
Immediate	This group includes those Soldiers requiring lifesaving surgery. The surgical procedures in this category should not be time-consuming and should concern only those patients with high chances of survival.	Upper airway obstruction Severe respiratory distress Life-threatening bleeding Tension pneumothorax Hemothorax Flail chest Extensive 2nd- or 3rd-degree burns Untreated poisoning (chemical agent) and severe symptoms Heat stroke Decompensated shock Rapidly deteriorating level of consciousness Any other life-threatening condition that is rapidly deteriorating
Delayed	This group includes those wounded who are badly in need of time-consuming surgery, but whose general condition permits delay in surgical treatment without unduly endangering life. Sustaining treatment will be required (e.g., stabilizing intravenous fluids, splinting, administration of antibiotics, catheterization, gastric decompression, and relief of pain).	Compensated shock Fracture, dislocation, or injury causing circulatory compromise Severe bleeding, controlled by a tourniquet or other means Suspected compartment syndrome Penetrating head, neck, chest, back, or abdominal injuries without airway or breathing compromise or decompensated shock Uncomplicated immobilized cervical spine injuries Large, dirty, or crushed soft-tissue injuries Severe combat stress symptoms or psychosis

CENTER FOR ARMY LESSONS LEARNED

<p>Minimal</p>	<p>These casualties have relatively minor injuries and can effectively care for themselves or can be helped by non-medical personnel.</p>	<p>Uncomplicated closed fractures and dislocations</p> <p>Uncomplicated or minor lacerations (including those involving tendons, muscles, and nerves)</p> <p>Frostbite</p> <p>Strains and sprains</p> <p>Minor head injury (loss of consciousness of less than five minutes with normal mental status and equal pupils)</p>
<p>Expectant</p>	<p>Casualties in this category have wounds that are so extensive that even if they were the sole casualty and had the benefit of optimal medical resource application, their survival would be unlikely. The expectant casualty should not be abandoned, but should be separated from the view of other casualties. Using a minimal but competent staff, provide comfort measures for these casualties.</p>	<p>Traumatic cardiac arrest</p> <p>Massive brain injury</p> <p>2nd- or 3rd-degree burns over 70 percent of the body surface area</p> <p>Gunshot wound to the head with a Glasgow Coma Scale of 3</p>

Appendix B

Evacuation Categories

Evacuation Category	Army	Navy	Marines	Air Force
Urgent (To save life, limb, or eyesight.)	Within 2 hours	Within 2 hours	Within 2 hours	As soon as possible
Priority (Medical condition could deteriorate.)	Within 4 hours	Within 4 hours	Within 4 hours	Within 24 hours
Routine (Condition is not expected to deteriorate significantly while awaiting flight.)	Within 24 hours	Within 24 hours	Within 24 hours	Within 72 hours

Note: The categories of evacuation precedence are urgent, priority, and routine. The evacuation time periods are flexible, mission-dependent, and vary greatly among the services based upon the different types of evacuation assets that each uses. The Army uses an “Urgent Surgical” subcategory to identify casualties that may need immediate surgical intervention. The Army also uses a “Convenience” category for personnel requiring medical evacuation for conditions that are not expected to significantly change for an extended period of time (greater than 72 hours).

Appendix C

9-Line Medical Evacuation

Line 1. Location of the pickup site.

Line 2. Radio frequency, call sign, and suffix.

Line 3. Number of patients by precedence:

A - Urgent

B - Urgent Surgical

C - Priority

D - Routine

E - Convenience

Line 4. Special equipment required:

A - None

B - Hoist

C - Extraction equipment

D - Ventilator

Line 5. Number of patients:

A - Litter

B - Ambulatory

Line 6. Security at pickup site:

N - No enemy troops in area

P - Possible enemy troops in area (approach with caution)

E - Enemy troops in area (approach with caution)

X - Enemy troops in area (armed escort required)

*** In peacetime: Number and types of wounds, injuries, and illnesses (but also desired in wartime for planning purposes).**

CENTER FOR ARMY LESSONS LEARNED

Line 7. Method of marking pickup site:

- A - Panels
- B - Pyrotechnic signal
- C - Smoke signal
- D - None
- E - Other

Line 8. Patient nationality and status:

- A – U.S. military
- B – U.S. civilian
- C - Non-U.S. military
- D - Non-U.S. civilian
- E – Enemy prisoner of war

Line 9. Nuclear, Biological, and Chemical (NBC) contamination:

- N - Nuclear
- B - Biological
- C - Chemical

*** In peacetime: Terrain description of pickup site (but also desired in wartime as NBC contamination is rarely an issue).**

Appendix D

Combat Pill Pack

Contents:

1. Meloxicam (Mobic) 15 milligrams (mg) x 1.
2. Acetaminophen (Tylenol) 500 mg x 2.
3. Gatifloxacin 400 mg x 1.

Instructions:

In the event of an open combat wound, swallow **all four pills** with water.

Note: Soldiers should be instructed in the use of the Combat Pill Pack and should be issued the pack prior to combat.

Warning: Do not issue the pill pack to those Soldiers with known drug allergies to any of the components. In these cases it will be necessary to replace the contents with appropriate substitutes.



Figure D-1: Combat Pill Pack

Appendix E

Improved First Aid Kit (IFAK)

Contents:

1. Nasopharyngeal airway
2. Exam gloves (4)
3. 2-inch tape
4. Trauma dressing
5. Kerlix
6. Combat application tourniquet
7. Modular lightweight load-carrying equipment pouch with retaining lanyard

Note: The IFAK is a rapid-fielding initiative item and is issued to deploying units by the unit's central issue facility.



Figure E-1: IFAK

Appendix F

Warrior Aid and Litter Combat Casualty Kit (WALK)

Contents:

1. 1 x bag (WALK)
2. 10 x gloves (Trauma, Nitrile, Black Talon [5 pair])
3. 2 x nasopharyngeal airway (28 Fr with lubricant)
4. 2 x gauze (Petrolatum 3" x 18")
5. 2 x needle/catheter (14 gauge x 3.25")
6. 2 x combat application tourniquet
7. 6 x trauma dressing
8. 4 x gauze (compressed, vacuum-sealed)
9. 1 x emergency trauma abdominal dressing
10. 2 x SAM II splint
11. 1 x shears (Trauma, 7.25")
12. 2 x tape (surgical, adhesive 2")
13. 1 x card (reference, combat casualty)
14. 2 x card (individual, combat casualty)
15. 1 x panel (recognition, orange)
16. 1 x litter (evacuation platform, Talon 90C)
17. 1 x Hypothermia Management and Prevention Kit
18. 4 x strap (tie down, universal litter)

Note: There should be a WALK on at least one vehicle per convoy.



Figure F-1: Warrior Aid and Litter Combat Casualty Kit

Appendix G

Aid Bag Considerations

There is no standard packing list for an aid bag. The contents of a medic's or provider's aid bag are dependent upon:

- The skill level of the medic or provider.
- The type of mission.
- The length of mission.

In preparing an aid bag, the following categories and suggestions should be considered:

- Airway supplies:
 - Nasopharyngeal airways
 - Combitube kits
 - King LT kits
 - Surgical cricothyroidotomy kit (if trained)
- Breathing supplies:
 - Occlusive dressing
 - Asherman Chest Seal
 - 10- to 14-gauge, 2.5- to 3-inch needle catheter unit (chest decompression)
 - Chest tube supplies (if trained)
- Hemorrhage control:
 - Emergency trauma dressings
 - Kerlix
 - Tourniquets
 - Hemostatic devices (HemCon or QuikClot)
 - Cravats
- Access devices:
 - Intravenous (IV) infusion sets/kits
 - IV fluids (Hextend)
 - FAST1 sternal intraosseous device

- Fractures:
 - SAM II splints
 - Ace wraps
- Hypothermia prevention:
 - Hypothermia Prevention and Management Kit
- Antibiotics:
 - Gatifloxacin tablets, 400 milligrams
 - Cefotetan, 2-gram injections
- Pain medication:
 - Acetaminophen
 - Mobic
 - Morphine
 - Transmucosal fentanyl citrate
 - Promethazine
 - Narcan
- Miscellaneous supplies:
 - Large abdominal pads
 - Tape, various sizes
 - Gauze pads, various sizes
 - Eye pads
 - Cotton-tipped applicators
 - Stethoscope
 - Burn packs
 - Water-based lubricant (for example, Surgilube)
 - Exam gloves
 - C-collar
 - Needles and syringes, various sizes
 - Chem lights
 - Band-Aids
 - Tongue depressors

Appendix H

National Stock Numbers

Equipment	National Stock Number (NSN)
Airway Supplies	
Nasopharyngeal airway	6515-00-300-2900
“Combitube, adult”	6515-01-307-7479
King LT:	
Size 3	6515-01-515-0146
Size 4	6515-01-515-0151
Size 5	6515-01-515-0161
Breathing Supplies	
Asherman Chest Seal	6510-01-408-1920
Hemorrhage Supplies	
Combat application tourniquet	6515-01-521-7976
HemCon dressing	6510-01-502-6938
QuikClot	6510-01-499-9285
Vascular Access/Fluids	
FAST1 Device	6515-01-453-0960
Hetastarch (Hextend)	6505-01-498-8636
Hypothermia Prevention	
Hypothermia Management Prevention Kit:	
Ready-Heat blanket	6515-01-532-8056
Blizzard Rescue Blanket	6532-01-525-4063
Thermolite Cap	6532-01-524-6932
Thermal Angel	6515-01-242-6532

CENTER FOR ARMY LESSONS LEARNED

Miscellaneous Supplies	
Sked litter	6530-01-260-1222
Talon IIC	6530-01-452-1651
Warrior Aid and Litter Combat Casualty Kit (WALK)	6545-01-532-4962
Improved First Aid Kit (IFAK)	Kit is an issue item
Combat application tourniquet	6515-01-521-7976
Nasopharyngeal airway	6515-00-300-2900
Trauma dressing	6510-01-492-2275
4-inch Kerlix Roll	6510-00-105-5807

Appendix I

References/Resources

Books:

Alexander, R.H. and H.J. Proctor. Advanced Trauma Life Support 1993 Student Manual. American College of Surgeons, 2003.

Bond, Casey (ed). Combat Medic Field Reference. Jones and Bartlett, 2005.

Burris, David G., Paul J. Dougherty, et al. (eds). Emergency War Surgery, Third United States Revision. Department of Defense, 2004.

McSwain, N. (ed.). Prehospital Trauma Life Support Manual, 5th edition. Mosby, 2003.

Articles:

Butler, F. and K. O'Connor. "Antibiotics in Tactical Combat Casualty Care." *Military Medicine*. 2003; 168: 911-914.

Butler, F.K., J. Hagman, and E.G. Butler. "Tactical Combat Casualty Care in Special Operations." *Military Medicine*. 1996: 161 (Supp) 3-16.

Giebner, S. "Tactical Combat Casualty Care – 2003." *Journal of Special Operations Medicine*. 2003; 3(4): 47-55.

Training Manuals:

STP 8-91W15-SM-TG, *Soldier's Manual and Trainer's Guide, MOS 91W, Health Care Specialist*, 10 October 2001.

Center for Army Lessons Learned (CALL) Resources:

CALL Newsletter 04-18, *Medical Planning*.

CALL Special Edition 05-8, *Deploying Health Care Provider*.

Online Resources:

U.S. Army Medical Department (AMEDD) Center and School Portal, Deployment Relevant Training: <https://www.cs.amedd.army.mil/deployment2.aspx>.

AMEDD Lessons Learned: <http://lessonslearned.amedd.army.mil>.

Center for Army Lessons Learned: <http://call.army.mil/>.

CALL PUBLICATIONS INFORMATION PAGE

In an effort to make access to our information easier and faster, we have put all of our publications, along with numerous other useful products, on our World Wide Web site. The CALL Web site is restricted to Department of Defense personnel. The URL is <http://call2.army.mil>.

If you have any comments, suggestions, or requests for information, you may contact CALL by using the Web site "Request for Information or a CALL Product" or "Give Us Your Feedback" links at <http://call.army.mil>. We also encourage Soldiers and leaders to send in any tactics, techniques, and procedures (TTP) that have been effective for them or their units. The TTP may be sent to us in draft form or fully formatted and ready to print. Our publications receive wide distribution throughout the Army, and CALL would like to include your ideas. Your name will appear in the byline.

If your unit has identified lessons learned or tactics, techniques, and procedures, please contact CALL using the following information:

Telephone: DSN 552-9569/9533; Commercial 913-684-9569/9533

Fax: DSN 552-4387; Commercial 913-684-4387

NIPR Email address: call.rfimanager@leavenworth.army.mil

SIPR Email address: call.rfiagent@leavenworth.army.smil.mil

Message: CDRUSACAC FT LEAVENWORTH KS//ATZL-CTL/

Mailing Address: Center for Army Lessons Learned, ATTN: OCC, 10 Meade Ave., Bldg 50, Fort Leavenworth, KS 66027-1350.

If you would like copies of this manual or have a request for information (RFI), please submit your request at NIPR: <http://call.army.mil> or SIPR: <http://call.army.smil.mil>. Use the "Request Information or a CALL Product" link. Please fill in all the information to include unit name and official military address. Please include building number and street for military posts.

Additionally, we have developed a repository, the CALL Archives, that contains a collection of operational records (OPORDS and FRAGOS) from recent and past military operations. Much of the information in the CALL Archives is password-protected. You may obtain your own password by accessing our Web site and visiting the CALL Archives page. Click on "Restricted Access" and "CALL Archives Access Request." After you have filled in the information and submitted the request form, we will mail you a password. You may also request a password via STU III telephone or a SIPRNET e-mail account.

CENTER FOR ARMY LESSONS LEARNED

CALL's products are produced at Fort Leavenworth, KS, and are not distributed through publication channels. Due to limited resources, CALL selectively provides its products for distribution to units, organizations, agencies, and individuals and relies on them to disseminate initial distribution of each publication to their subordinates. Contact your appropriate higher element if your unit or office is not receiving initial distribution of CALL publications.

Installation Distribution Centers
Corps, divisions, and brigades
Special forces groups and battalions
Ranger battalions
Staff adjutant generals

TRADOC Schools
ROTC headquarters
Combat training centers
Regional support commands

CALL PRODUCTS "ON-LINE"

Access information from CALL via the World Wide Web (www). CALL also offers Web-based access to the CALL Archives. The CALL Home Page address is:

<http://call.army.mil>

CALL produces the following publications:

BCTP Bulletins, CTC Bulletins, Newsletters, and Trends Products: These products are periodic publications that provide current lessons learned/TTP and information from the training centers.

Special Editions: Special Editions are newsletters related to a specific operation or exercise. Special Editions are normally available prior to a deployment and targeted for only those units deploying to a particular theater or preparing to deploy to the theater.

News From the Front: This product contains information and lessons on exercises, real-world events, and subjects that inform and educate Soldiers and leaders. It provides an opportunity for units and Soldiers to learn from each other by sharing information and lessons. *News From the Front* can be accessed from the CALL Web site.

Training Techniques: Accessed from the CALL products page, this online publication focuses on articles that primarily provide tactics, techniques, and procedures (TTP) at the brigade and below level of warfare.

Handbooks: Handbooks are "how to" manuals on specific subjects such as rehearsals, inactivation, and convoy operations.

Initial Impressions Reports: Initial Impressions Reports are developed during and immediately after a real-world operation and disseminated in the shortest time possible for the follow-on units to use in educating personnel and supporting training prior to deployment to a theater. Products that focus on training activities may also be provided to support the follow-on unit.

Support CALL in the exchange of information by telling us about your successes so they may be shared and become Army successes.

Center for Army Lessons Learned



10 Meade Avenue, Building 50
Fort Leavenworth, KS 66027-1350

FOR OFFICIAL USE ONLY