
UNITED STATES MARINE CORPS
THE BASIC SCHOOL
MARINE CORPS TRAINING COMMAND
CAMP BARRETT, VIRGINIA 22134-5019

COMBAT LIFESAVING
B140127XQ
STUDENT HANDOUT

Combat Lifesaving

Introduction

This handout and the accompanying lecture will prepare you to render effective first aid for combat-related injuries and to teach your Marines the same skills.

Importance

The difference between life and death can be measured in minutes after a Marine suffers a severe injury. Being trained in first aid, to the point where recognizing a life-threatening wound becomes second nature, is a critical skill for Marines of all ranks.

In This Lesson

This lesson covers the following topics:

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Learning Objectives

Terminal Learning Objectives:

TBS-MED-1016 Given a scenario with suspected Traumatic Brain Injuries (TBI) in any environment, identify signs and symptoms of TBI to ensure potential TBI patients are referred to competent medical personnel for follow-on evaluation in accordance with Attachment 2 of Directive-Type Memorandum (DTM) 09-033.

TBS-MED-1012 Given a simulated casualty, determine how to treat a burn to prevent further injury or death.

TBS-MED-1006 Given a simulated casualty with no life-threatening bleeding, an Individual First Aid Kit (IFAK), and a secure position out of effective enemy fire, perform Tactical Field Care (TFC) to prevent further bleeding or death.

TBS-MED-1005 Given a simulated casualty, an Individual First Aid Kit (IFAK), and field expedient materials, apply a tourniquet to prevent further bleeding or death.

TBS-MED-1002 Given an Individual First Aid Kit (IFAK) and references, inventory an IFAK to ensure it is complete and serviceable.

Enabling Learning Objectives

TBS-MED-1002a Given an Individual First Aid Kit (IFAK) and references, identify components of IFAK to ensure it is complete and serviceable.

TBS-MED-1002b Given an Individual First Aid Kit (IFAK), organize the IFAK based on casualty care to provide rapid care to casualties.

TBS-MED-1005a Given a list of materials, identify suitable materials for a field expedient tourniquet without omission.

TBS-MED-1005b Given a simulated casualty, an Individual First Aid Kit (IFAK), and field expedient materials, apply a field expedient tourniquet to prevent further bleeding or death.

TBS-MED-1005c Given a simulated casualty, an Individual First Aid Kit (IFAK), and field expedient materials, mark the the casualty with date and time of care for follow-on treatment without omission.

TBS-MED-1006a Given a simulated casualty, an Individual First Aid Kit (IFAK), field expedient materials, treat a casualty for bleeding to prevent further injury or death.

TBS-MED-1006b Given a simulated casualty with no life threatening bleeding, an Individual First Aid Kit (IFAK), and a secure position out of effective enemy fire, evaluate a casualty's airway to prevent further injury or death.

Learning Objectives (Continued)

TBS-MED-1006c Given a simulated casualty with a sucking chest wound and an Individual First Aid Kit (IFAK), treat a sucking chest wound to prevent further injury or death.

TBS-MED-1006d Given a simulated casualty with no life-threatening bleeding, an Individual First Aid Kit (IFAK), and a secure position out of effective enemy fire, evaluate a casualty for additional wounds to prevent further injury or death.

TBS-MED-1006e Given a simulated casualty that has been treated for life-threatening bleeding, an Individual First Aid Kit (IFAK), and a secure position out of effective enemy fire, treat a casualty for shock to prevent further injury or death.

TBS-MED-1006f Given a simulated casualty and an Individual First Aid Kit (IFAK) or Training IFAK, apply a splint to a casualty to prevent further injury or death.

TBS-MED-1006h Given a simulated casualty with restored breathing, place a casualty in the proper recovery position without error.

TBS-MED-1012a Given a simulated burn casualty and an Individual First Aid Kit (IFAK), identify classifications of burns in accordance with MCRP 3-02G (First Aid).

TBS-MED-1012b Given a simulated burn casualty and an Individual First Aid Kit (IFAK), evaluate a burn casualty in accordance with MCRP 3-02G (First Aid).

TBS-MED-1012c Given a simulated burn casualty and an Individual First Aid Kit (IFAK), identify sources of burns in accordance with MCRP 3-02G (First Aid).

TBS-MED-1012d Given a simulated casualty and an Individual First Aid Kit (IFAK) or Training IFAK, treat a burn casualty to prevent further injury or death.

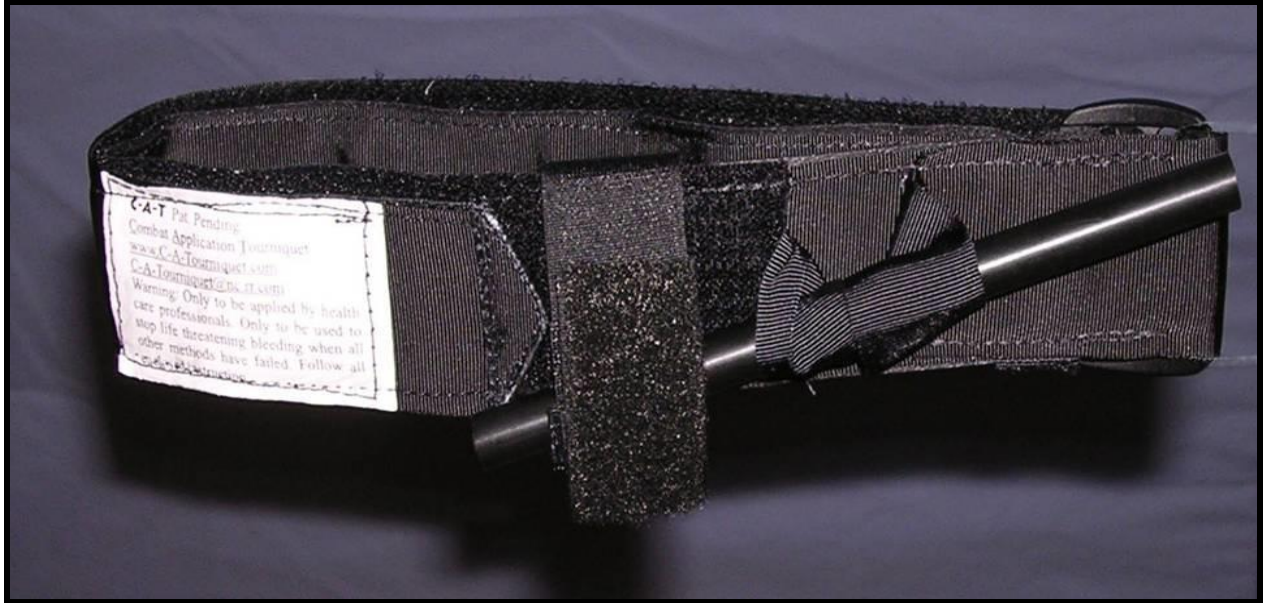
TBSMED-1016a Given a scenario with suspected traumatic brain injuries (TBIs), identify elements of the HEADS checklist in accordance with Attachment 2 of Directive-Type Memorandum (DTM) 09-033.

TBS-MED-1016b Given a scenario, a casualty, and a completed HEADS checklist, identify ways to supervise the care for Marines in accordance with Attachment 2 of Directive-Type Memorandum (DTM) 09-033.

IFAK Inventory

The following items are contained within your Individual First Aid Kit (IFAK):

Combat Application Tourniquet (CAT)



Quick Clot Combat Gauze



IFAK Inventory (Continued)

“H” Compression Bandage

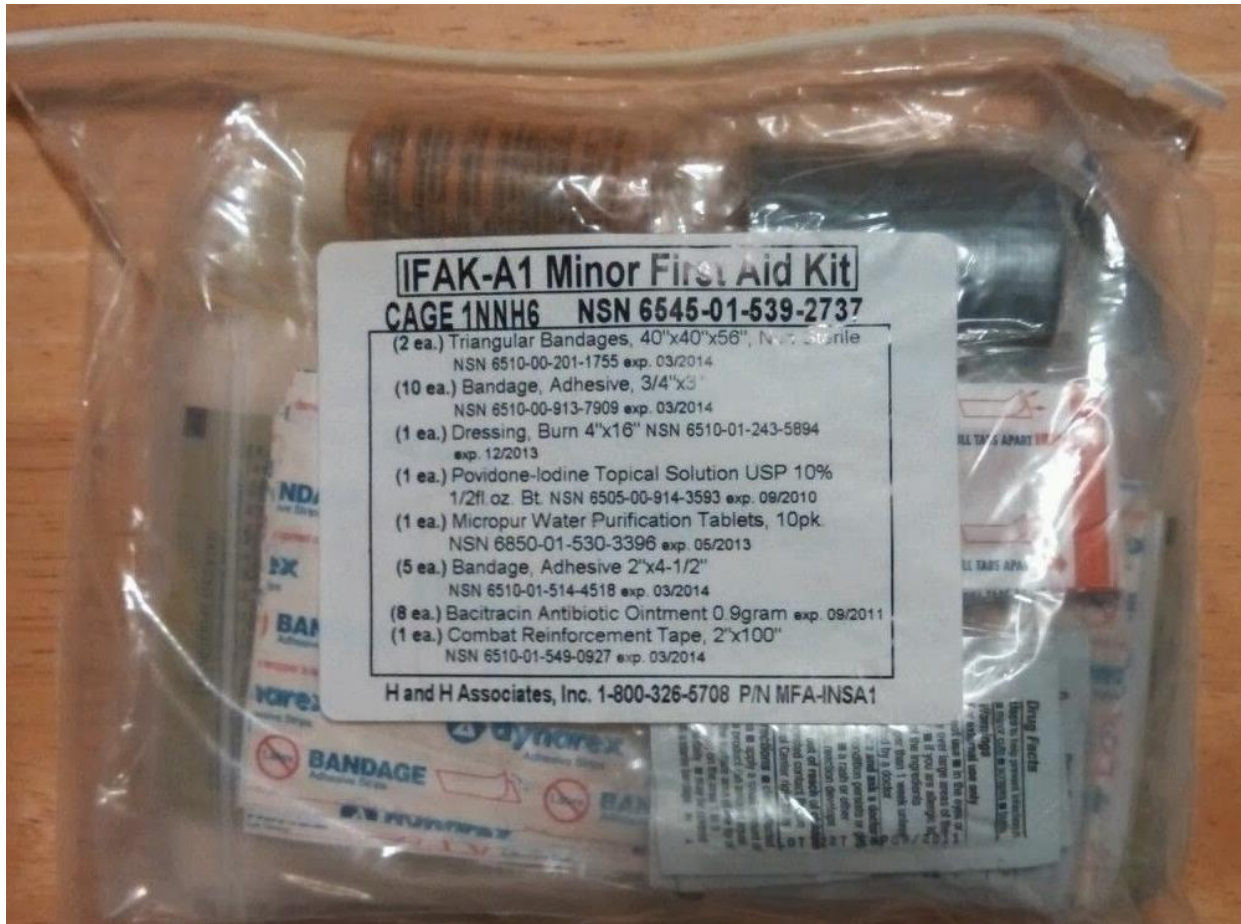


Compressed Gauze



IFAK Inventory (Continued)

A1 Minor First Aid Kit



Types of Bleeding

Three Types of Bleeding

There are three types of bleeding that will be covered; arterial, venous, and capillary.

Arterial Bleeding

Arterial bleeding is characterized by the flow of bright red blood (due to the oxygen content) that pumps out in distinct spurts. The flow can be alarmingly profuse. Arterial bleeding is not likely to clot unless the flow of blood is minimal or the artery is very small. If an artery is completely severed, it has the tendency to constrict and seal itself off. **Severe arterial bleeding could cause a victim to bleed to death in one to two minutes or less depending on the location of the wound. Immediate application of a tourniquet or specialized dressings is imperative in order to stop life-threatening hemorrhage.**

Venous Bleeding

Venous bleeding is characterized by a steady flow of dark red or maroon-colored blood. Although veinal bleeding may be profuse, it is much easier to control than arterial bleeding. Because blood in the larger veins is being drawn to the heart by the sucking action that develops as the heart contracts and relaxes, air may be drawn through the opening into the vein. If the air bubble is large enough, the ability of the heart to pump properly is hindered, and the heart may fail completely.

Capillary Bleeding

Capillary bleeding is characterized by the slow oozing of blood, usually from minor wounds. Because of the large amount of surface area that may be involved, the threat of contamination may be more serious than blood loss.

Controlling External Bleeding

Mild Bleeding may be controlled by both elevating the wound and by the application of direct pressure. Apply pressure to the wound using a sterile dressing. Do not attempt to replace a dressing once it is held in place even though it may become blood-soaked. Replacing a dressing releases pressure on the cut blood vessels, interferes with normal coagulation, and increases the probability of contamination. Rather than replacing the dressing, place another one on top of the soaked dressing and hold them all in place.

Types of Bleeding (Continued)

Serious Bleeding

Use a combination of one or more of the following treatments:

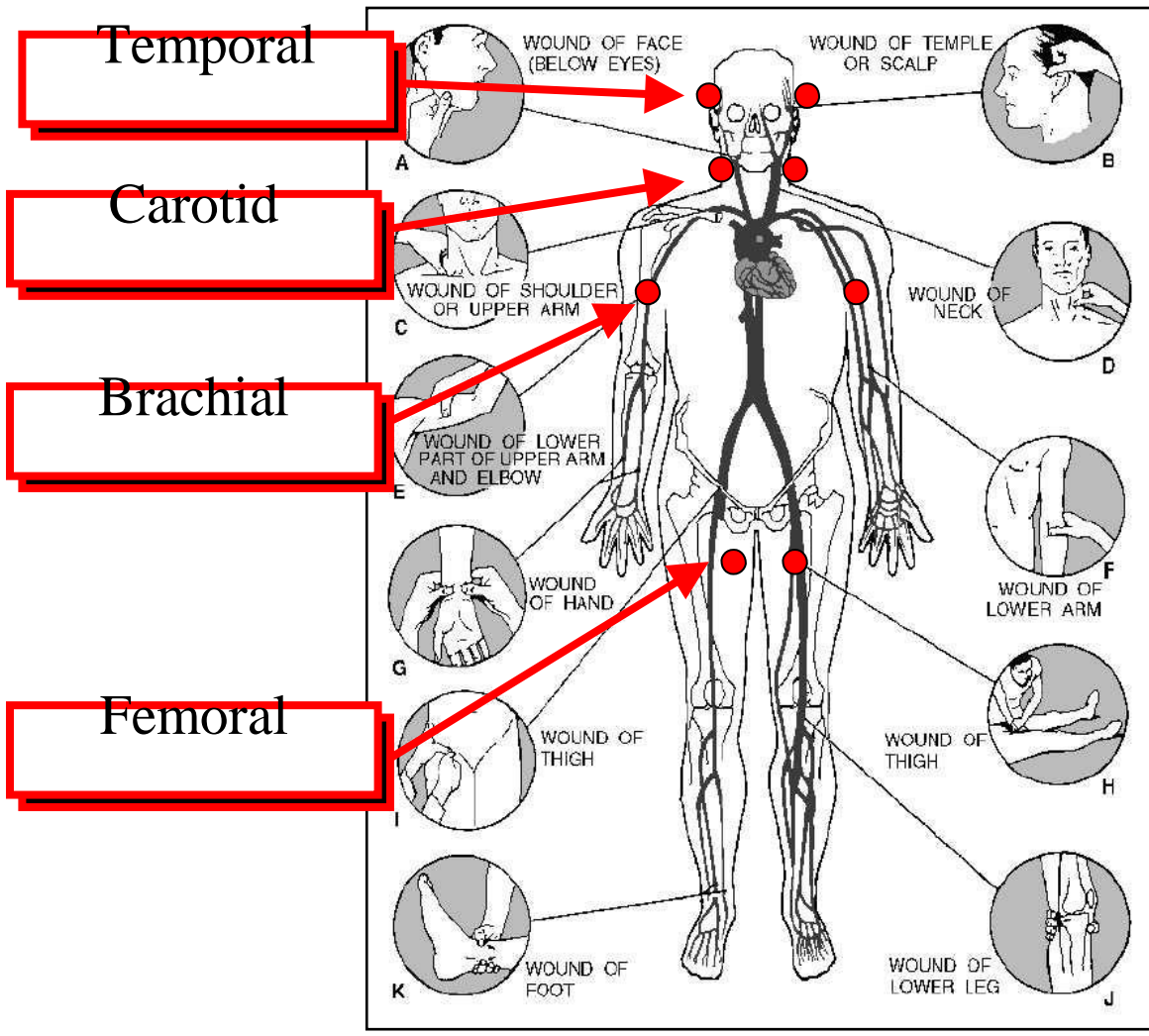
Direct pressure on the wound: This is the single most effective method for stopping serious bleeding. If a bandage is not immediately available, the hand or fingers can be used (inside the wound if necessary) to bring direct pressure to bear. The importance of quick action of this type outweighs the possibility of infection later.

Pressure points: A pressure point is a location where the main artery to the injury site lies near the surface of the skin and directly over a bone. There are twenty-two pressure points throughout the body. The three most effective pressure points are over the brachial (arm), femoral (upper thigh), and carotid (neck) arteries. If direct pressure is failing to stop bleeding, the application of pressure at a pressure point can be used effectively. Place the heel of your hand over the pressure point and exert pressure downwards toward the bone until it is obvious that the bleeding has been controlled. If the casualty is very muscular or obese, you may have to exert considerable pressure to compress the artery.

Tourniquet: Control of hemorrhage is important since injury to a major vessel can result in hemorrhagic shock and exsanguination in a short time frame. It is very important to stop major bleeding as quickly as possible. Over 2500 deaths occurred in Viet Nam secondary to hemorrhage from extremity wounds. These are preventable deaths. **If casualty is suffering from life-threatening hemorrhaging, do not hesitate to apply tourniquet!** Use of tourniquets to stop the bleeding is essential in these types of casualties. Although civilian medicine discourages the use of tourniquets, they are appropriate in a tactical environment because direct pressure is hard to maintain under fire and the threat of exsanguination is greater. Permanent damage to the casualty is rare if the tourniquet is left in place for less than 1 hour, and tourniquets are often left in place for several hours during surgical procedures. It is better to accept the small risk of permanent damage to the limb than to lose a casualty to exsanguination.

Note: Both the medic and casualty are in grave danger while a tourniquet is being applied, and non-life-threatening bleeding should be ignored until security is established and the enemy threat is reduced. The Marine or Corpsman rendering care must make the decision regarding the relative risk of further injury, versus that of exsanguination.

Types of Bleeding (Continued)



Types of Bleeding (Continued)

Hemostatic Agents: In addition to tourniquets, hemostatic agents can be a very effective method of stopping life-threatening hemorrhaging if used correctly. The following specialized bandages create a tenacious clot with source of bleed—open artery—almost immediately halting blood loss. These specialized bandages are currently being issued with the IFAK.

- **QuickClot:** Speeds coagulation of blood. QuikClot works by causing a chemical reaction that rapidly absorbs liquid from the blood by creating hydrogen bonds that quickly generate intense heat. That chemical reaction will occur with any liquid or tissue it comes in contact with. By absorbing the liquid from blood, Quikclot concentrates the clotting factors and encourages rapid clotting to stop the bleeding. The SIDE EFFECT is that it burns whatever tissue it comes in contact with. Use only on extremities so that it doesn't come in contact with the face or vital organs. Do not use on the groin area. Works best when treating arterial wounds on extremities where a tourniquet cannot be applied; i.e. upper femoral arterial as the artery meets the hip, or a shoulder wound that severs the brachial artery. Whenever possible, the best choice is a tourniquet.
- **HemCon:** The HemCon bandage is a firm 4X4 inch dressing that is sterile and individually packaged. HemCon like QuickClot uses a chemical reaction to induce blood clotting, but HemCon does not extract hydration through extraction. HemCon contains positively charged molecules of chitosan (kit-o-san) to attract negatively charged red blood cells. That attraction triggers a clot that halts the bleeding. The downside is that this process is not instantaneous like QuikClot. The HemCon bandage has to come into direct contact with the bleeding tissue and have time to react. The most effective usage of the HemCon bandage for heavy bleeding is to apply the tourniquet and then once the bleeding diminished then apply the HemCon bandage. The chitosan for the HemCon is made from shells of crustaceans (lobster/crab/shrimp). Anyone with shellfish allergies will not have an adverse reaction to this – the “allergens” or properties that cause allergic reactions have been removed by a process of sterilization.
- **Combat Gauze:** Made by the same manufactures as QuickClot, Combat Gauze is an advanced hemostatic agent combined with the simplicity of gauze. Combat Gauze is easy to use and is easy to remove once the casualty reaches a surgical unit. It generates zero heat which allows it to be applied anywhere on the body and is easy to pack into the wound due to its gauze-like characteristics. This specialized bandage can also be applied directly to an exposed artery in a pooled wound with terrific results. It can also be applied anywhere on the body where there is a life-threatening bleed—will not effect organs, face, eyes, or groin area.

Types of Bleeding (Continued)

Tourniquet Application Steps

- Select a place between the wound and the heart, approximate 2-4 inches from the wound.
- Place a pad, made from a dressing or other suitable material, over the main artery supplying blood to the limb.
- Apply a constricting band over the pad, knot it and insert a device to tighten the tourniquet. Ropes, pieces of wire or other thin materials should not be used because they could cut into the tissues of the limb.
- Tighten the tourniquet enough to control the bleeding. If it is unnecessarily tight, it will cause excessive damage to the limb.
- Mark the casualty's forehead with "T" and the time and date the tourniquet was applied FOR EACH TOURNIQUET APPLIED!

Tourniquet Application Considerations

- Only the absolute minimum of clothing should be removed.
- If the casualty needs to be moved, a tourniquet that is self-applied by the casualty is the most reasonable initial choice to stop major bleeding.
- Never place tourniquet on a joint.
- Do not cover tourniquet under any conditions. Leave it exposed for open viewing.
- All Marines engaged in combat missions should have a suitable tourniquet readily available at a standard location on their battle gear and be trained in its use.

Common Tourniquet Mistakes

- Not using one when you should.
- Using one when not appropriate.
- Putting it too close to wound.
- Not applied tightly enough.

Soft Tissue Injuries

Types of Soft Tissue Injuries

There are two types of soft tissue injuries that will be covered, closed wounds (in which the skin is not broken) and open wounds (in which the skin is broken.)

Closed Wounds

Closed wounds are commonly caused by blunt objects striking the body with sufficient force to crush the tissues beneath the skin. A contusion or bruise will commonly develop beneath the surface of the skin, which characteristically remains unbroken.

Contusions are characterized by swelling and pain, caused by the blood leaking into the wound. This "leaking blood" will cause the characteristic black and blue marks. When serious amounts of tissue are damaged (to include the underlying blood vessels), a lump may develop rapidly. This is known as a *hematoma* or, literally, a blood tumor.

Open Wounds

An open wound is any wound in which the surface of the skin has been broken. Open wounds may be classified as **abrasions**, **lacerations**, **incisions**, or **puncture wounds**.

An **abrasion** is a loss of a portion of the epidermis and part of the dermas from its being rubbed or scraped across a hard surface. It is extremely painful, and blood may ooze from injured capillary vessels at the surface. It does not penetrate completely through the skin.

A **laceration** is a cut produced by glass, metal, or any other object that may leave a jagged wound on the skin surface and cut through the subcutaneous tissue, the underlying muscles, associated nerves, and blood vessels.

An **incision** is similar to a laceration, except that the wound will be somewhat "cleaner," having no jagged edges.

Puncture wounds may result from a stab with a knife, nail, ice pick, splinter, or any other pointed object. They may also result from gunshot injuries. External bleeding is usually not severe from a puncture wound because the wound is so small. However, these instruments may injure major vessels within body cavities and cause rapid, fatal bleeding within the chest or abdomen. There is no way to assess the amount of damage sustained from a puncture wound. Ordinarily such assessment requires an exploratory operation in the chest, the abdomen, or the extremity involved. Extensive damage should always be suspected. Some puncture wounds, especially those in extremities, may traverse the entire limb to exit the opposite side. These are perforating ("through and through") wounds. The Marine should always seek and note an exit wound, especially in the case of a gunshot wound. A special case in the puncture wound category is the impaled object. An excellent example of the impaled object is a bayonet in the abdominal area in which the bayonet has not been extracted. In the case of impaled objects, it is important to remember not to extract the object and to immobilize the object so that it will not cause further damage.

Soft Tissue Injuries (Continued)

Treatment of Open Wounds

- Control the bleeding by direct pressure, pressure points, and then a pressure dressing or tourniquet.
- Prevent contamination with a sterile dressing.
- Aside from serious blood loss, the danger of infection from an open wound should be your principal concern. The field dressing carried by every Marine in the field consists of two parts: a sterile dressing and a bandage to hold the dressing snugly in place.

In emergencies, it is not necessary to apply bandages in accordance with pictures found in textbooks. However, it is imperative to apply all bandages using the following principles:

- When direct pressure is not required, do not apply the bandage too tightly, as the blood supply to the lower extremities may be restricted.
- Do not apply the bandage too loosely (the most common error), because it will not hold the dressing in place. The bandage must be applied snugly, as it will stretch over time.
- When bandaging extremities, leave fingers and toes exposed so that color changes may be noted. Pain, pale skin, numbness and tingling all indicate poor circulation, potentially due to constricting bandages.
- Immobilize and elevate the injured part in the event of serious bleeding, providing it will not aggravate other injuries. (Procedures on immobilization will be covered in follow-on instruction).

Special Wounds In this category are avulsions, crushing wounds, and amputations.

An **avulsion** is an injury in which a whole piece of skin with varying portions of tissue or muscle is either torn loose completely or left hanging as a flap. Occasionally, avulsed tissue will be torn completely free from the limb and will be lying apart from the injured individual. This tissue, if it is readily available, should be retrieved and transported along with the casualty to the hospital. It should be wrapped in sterile gauze and placed in a plastic bag, which should then be placed in a cooled container. The tissue should not be allowed to freeze.

Crushing wounds are contusions that are more severe, as the underlying skeletal support is also damaged. Crushing wounds may or may not be characterized by open skin.

Traumatic **amputations** may be caused by explosions, sharp objects, or by separations. An amputation is characterized by the separation of either digits (fingers, toes, etc.) or limbs from the victim's body. In most cases, a tourniquet will be required to stop the bleeding in the major artery that formerly supplied blood to the extremity. If possible, the extremity should be prepared (if completely separated) and transported with the victim to the medical facility. Should it still be partially attached, splint it as with fractures.

Sucking Chest Wounds

Symptoms

The primary symptom of a "sucking" chest wound is a hole in the chest wall. Another major symptom in extreme cases is the coughing up of bright red, frothy blood. Other symptoms include:

- Pain at the site of the injury.
- Pain that is aggravated by or occurs with breathing, localized around the site of an injury in the chest.
- Dyspnea (difficulty or pain with breathing).
- Failure of one or both sides of the chest to expand normally when inhaling.
- A rapid, weak pulse and low blood pressure.
- Cyanosis (discoloration) of the lips, fingertips, or fingernails.

This will probably cause the lung on the injured side to collapse. Be sure to examine the casualty carefully so that you do not miss a second hole or an exit wound. If necessary, cut or remove the casualty's clothing to expose the entire area of wound.

Treatment

- Use a field dressing plastic wrapper.
- Tear open one end of the plastic wrapper covering the field dressing. Be careful not to destroy the wrapper.
- Remove the inner packet (field dressing).
- Tear open the empty plastic wrapper and create a flat surface, using as much of the wrapper as possible.
- Place wrapper over wound. Place the inside surface of the plastic wrapper directly over the open chest wound as the casualty exhales and hold in place.
- Apply dressing to the wound.
- Using the free hand, shake open the field dressing and place the white side of the dressing directly over the plastic wrapper covering the open wound, holding it securely in place to create an airtight dressing.
- Place casualty on injured side. Position the casualty on his injured side or in a sitting position, whichever makes breathing easier.
- Make the victim warm and evacuate as soon as possible.

Tension Pneumothorax

Once a casualty is treated for an open chest wound, a condition known as **tension pneumothorax** may develop. Air pressure within the chest cavity builds up to such a degree that the collapsed lung is pressed firmly against the uninjured lung and heart, interfering both with the ventilation of the good lung and with heart action. **Tension pneumothorax is the 2nd leading cause of preventable death on the battlefield.** If you see the casualty's condition worsen for no apparent reason, unplug the seal immediately. If tension pneumothorax exists, there will be an escape of air, and the casualty's condition will improve almost immediately as pressure is released from the uninjured lung and heart. The wound should then be resealed.

Abdominal Wounds

Abdominal Cavity

A smooth, glistening, thin tissue called the *peritoneum* lines the abdominal cavity. This tissue is in turn surrounded by a layer of muscles on all sides. The organs inside are classified as either solid organs or hollow organs.

The construction of the abdominal organs greatly influences their vulnerability to injury. Injuries to solid organs may result in their bleeding into the abdominal cavity. Hollow organs may discharge harmful bacteria and chemicals.

Abdominal Wound Symptoms

Injuries to the abdomen are often difficult to diagnose. Other than the obvious signs of a wound or an impaled object, the symptoms are:

- Nausea and vomiting are good indications of abdominal injury, especially if the vomitus contains blood.
- Pain, although usually minimal in the abdomen.
- Tenderness exists in affected areas.
- Muscle spasms or a stiffening of the abdominal muscles suggests the irritation of the lining of the abdominal cavity.
- Shock.
- Bruises and Abrasions.

Treatment for Abdominal Wounds

- Position the casualty on his or her back with the knees flexed up to relieve pressure on the muscles of the abdomen.
- Expose the wound. Remove loose clothing from the wound, leaving clothing that is stuck in place.
- With a clean, moist dressing, gently pick up any organs that may be on the ground. Place the organs on top of the casualty's abdomen. **DO NOT** attempt to replace any protruding organs.
- Apply moist field dressing.

NOTE: If the dressing wrapper is large enough to extend well beyond the protruding bowel, the sterile side of the dressing wrapper can be placed directly over the wound with the field dressing on top.

- Grasp tails of dressing with two hands.
- Hold dressing directly over wound with white side down. Pull dressing open and place directly over wound.
- With one hand, hold dressing in place and use the other hand to wrap one of the tails around the body.
- Wrap the other tail in the opposite direction until the dressing is completely covered.
- Tie the tails with the knot at the patient's side.
- Treat for shock and evacuate as soon as possible.

NOTE: Casualties with abdominal wounds should not be given anything by mouth.

Internal Bleeding

Internal Bleeding

Don't assume that internal bleeding occurs only in abdominal and chest cavity injuries. A casualty can lose one to three pints of blood, internally, from a broken femur (thighbone) or pelvis. A casualty can actually bleed to death without externally losing a drop of blood.

Symptoms

Due to the loss of blood, blood pressure will drop. To compensate for this pressure drop, the heart will beat faster in an attempt to raise the pressure. The force of the heartbeat is reduced since there is less blood to pump. Internal bleeding can be suspected when the situation surrounding the injury indicates internal damage and the signs of shock are present without an obvious injury.

Symptoms Include

- Rapid and weak pulse.
- Pale, moist and cold skin.
- Shallow and rapid respiration.
- Thirst.
- Dilated pupils.
- Coughing up or vomiting dark red blood the color of coffee grounds.
- Stiff abdominal muscles.

Treatment

- Treat for shock.
- Give nothing by mouth.
- Evacuate as soon as possible.

Burns

Burns

The skin serves to isolate the body from its environment, to protect the body from bacterial invasion, to control the temperature of the body, to retain the fluids of the body, and to furnish information about the external environment to the brain through its nerve endings. Any damage of this surface covering allows a break in these mechanisms. Burn injuries are generally rated in terms of damage to the skin. Specifically, they are classified by percentage of surface damaged and depth of damage through the various layers of the skin.

Classification

Burns are classified in degrees, i.e. **First**, **Second** and **Third**.

First-degree burns are limited to the most superficial layer of the epidermis and result only in reddening of the skin.

Second-degree or partial-thickness burns cause damage into but not through the dermas and characteristically result in blisters forming on the skin.

Third-degree or full-thickness burns destroy the skin down to the subcutaneous fat. In this type of burn, the skin may appear pale, dry, and white or it may be brown or charred. Clotted blood vessels may be seen through the skin and occasionally the bone structure is exposed. With third degree burns, the nerve endings in the skin are usually destroyed, and the victim will feel no pain. Such a casualty must be evacuated as soon as possible. **THIRD DEGREE BURNS ARE LIFE THREATENING EMERGENCIES.**

When determining the seriousness of burn injuries it is not so much the TYPE of burn but the LOCATION and AMOUNT of skin surface that is burned. An individual with second degree burns covering 40% of his body, located on the face and neck, is in far worse shape than someone who has sustained a third degree burn covering 15% of his leg.

Sources of Burns

There are many sources of burns. Before administering the proper first aid, you must be able to recognize the type of burn to be treated.

Three Types of Burns

Thermal burns are caused by contact with fire, hot objects, hot liquids, gases, or nuclear blast or fireball. This is the most frequent type of burn in a combat environment.

Electrical burns are caused by contact with electrical wires, current, or lightning.

Chemical burns are caused by contact with wet or dry chemicals or white phosphorus (from marking rounds and grenades). Chemical burns require special treatment in that the chemical must be removed for the burning to stop.

Burns (Continued)

Laser burns. (Eye [ocular] injury).

Treatment

- Remove the casualty from the source of the burn.
- Remove and cover the thermal burn casualty with a field jacket or any large non-synthetic material and roll him or her on the ground to smother (put out) the flames.
- Remove electrical burn casualties from the electrical source by using any nonconductive material, such as rope, clothing, or dry wood. **DO NOT** touch the casualty with your bare hands.
- Remove chemical burn casualties from the chemicals.
- Remove liquid chemicals by flushing with as much water as possible.
- Remove dry chemicals by brushing off loose particles and then flushing with large amounts of water, if available.
- Remove white phosphorus (WP) from the skin by brushing with a damp cloth or scraping with a knife.

For FIRST and SECOND degree burns with closed blisters ONLY:

- Immerse the burned part in cold water for two to five minutes if the patient is seen within fifteen minutes of the time of injury and the burn involves less than 20% of the total body surface.
- Cover the burn with a moist, sterile dressing.
- Do not puncture the blisters on second-degree burns.
- **DO NOT APPLY CREAMS OR OINTMENTS!**
- Transport the patient promptly to a medical facility.

For THIRD degree burns or SECOND-degree burns with open blisters:

- Examine for and relieve any respiratory distress. Always anticipate respiratory difficulty when there are burns about the face and neck or when the patient has been exposed to hot gases or smoke. Stand by to administer CPR.
- Cover the burned area with a dry sterile dressing or a clean sheet.
- Treat the patient for shock if it is present, and make him as comfortable as possible.
- **DO NOT APPLY CREAMS OR OINTMENTS!**
- Transport the patient promptly to the nearest medical facility.

Fractures

Fractures

Fractures are the sudden breaking of a bone or a break in a bone. Bones may be fractured by direct violence, indirect violence or through the continual over stressing of the bone. Through direct violence the bone is broken directly at the spot where the force was applied. Through indirect violence then bone is fractured by a force at a distance from the site of the fracture and transmitted to the fractured bone, such as a fracture of the clavicle by falling on an outstretched hand. A stress fracture is a fine hairline break in the bone that occurs from repetitive microtraumas, as with running, hiking or marching; with improper footwear or with heavy loads on hard surfaces; or with inadequate healing time after stress.

Types of Fractures

There are two types of fractures that will be covered, closed fractures (in which the skin is not broken) and open fractures (in which the skin is broken.)

Symptoms of Fractures

Symptoms include loss of movement, pain with acute tenderness over the site of the fracture, swelling and bruising, deformity or possible shortening, unnatural mobility, or crepitus or grating that is heard when the ends of the bone rub together.

Treatment

- Stop the bleeding if required.
- Remove all binding objects.
- “Splint them where they lie.”
- Immobilize the joint above and below the break.
- Use padding.
- Tie/secure the splint.
- Use a sling if applicable.
- Check for circulation.

Spinal Injuries

Spinal Injury

The spinal cord is a column of nerve tissue averaging about 44 cm in length. Most of the nerves to the trunk and limbs emerge from the spinal cord and transmit the impulses to and from the brain. The spinal column is the vertebral column that encloses the spinal cord. A traumatic injury or damage to the spinal cord constitutes a spinal injury.

Symptoms of Spinal Injuries

- Pain in the neck or back.
- Numbness or tingling in the extremities.
- Deformity.
- Paralysis.

Treatment

- Stop the bleeding if required.
- Insure that the airway is secure and that circulation is stable.
- Immobilize the casualty. Use a back board if available.
- Treat for shock.

Head Injuries

Symptoms of Head Injuries

- Pain in the neck or back.
- Numbness or tingling in the extremities.
- Deformity.
- Paralysis.

Treatment for Head Injuries

- Stop the bleeding if required.
- Insure that the airway is secure and that circulation is stable.
- Immobilize the casualty. Use a back board if available.
- Treat for shock.

Traumatic Brain Injury (TBI)

Traumatic Brain Injury (TBI) is a specific type of head injury where the function of the brain is disrupted. TBI can occur as a result of injuries sustained in garrison or in combat.

Marines in the following categories are required to be evaluated for TBI:

- Any Marine in a vehicle rollover, collision, or blast.
- Any Marine that is within 50m of a blast.
- Any Marine who sustains a direct blow to the head or a loss of consciousness.
- Any Marine directed by the command as the result of multiple exposures to blast events.

Marines are evaluated for TBI using the HEADS Checklist:

- H- Headaches or Vomiting (Yes/No)
- E- Ears Ringing (Yes/No)
- A- Amnesia and/or Altered or Loss of Consciousness (Yes/No)
- D- Double Vision and/or Dizziness (Yes/No)
- S- Something Feels Wrong (Yes/No)

Shock

Shock

Shock may be caused by severe or minor trauma causing pain to the body. It can be the result of a significant blood loss, heart failure, severe and painful blows to the body, burns, severe wounds that become infected, a severe allergic reaction to drugs or certain foods, certain insect bites, snakebites, or dehydration. Shock stuns and weakens the body. When the normal blood flow in the body is upset, death can result. Early identification and proper treatment may save the injured Marine's life. The objective is to administer first aid measures that prevent shock from developing or worsening.

Signs and Symptoms of Shock

Examine the casualty for any of the following signs or symptoms:

- Sweaty but cool skin.
- Pale skin.
- Restlessness, nervousness.
- Thirst.
- Loss of blood (caused by internal or external bleeding).
- Confusion or loss of awareness.
- Faster than normal breathing rate.
- Blotchy or bluish skin (especially around the mouth and lips).
- Nausea and vomiting.

Hemorrhagic Shock

The average adult contains approximately 5 liters of blood and upon the loss of even 20%; the body will begin to go into hemorrhagic shock. The onset of this shock will happen quickly, as the body can bleed out in 60 – 120 seconds. The causes of hemorrhagic shock are external loss of whole blood, an internal hemorrhage or an extreme loss of plasma due to severe burns. Shock (Continued)

Treatment and Prevention of Shock:

In the field, the procedures followed to treat for shock are identical to procedures that would be performed to prevent shock. When treating a Marine, assume that shock is present or will occur shortly.

- Move the casualty to cover if the situation requires and permits.
- Position the casualty on his or her back. Do not move the casualty or his or her limbs if suspected fractures have not been splinted.

NOTE: Some casualties who may be in shock after suffering a heart attack, chest wound or breathing distress may breathe easier in a sitting position. If this is the case, allow them to sit upright, but monitor their condition carefully.

- Elevate the casualty's feet higher than the level of the heart. Use a stable object (a box, field pack, or rolled up clothing) so that the feet will not slip off. Remember to splint suspected fractures before elevating the feet.

Shock (Continued)

- Loosen clothing at the neck, waist or wherever it may be binding.
- Prevent chilling or overheating. Place a blanket or like item over and under the victim to prevent chilling.
- Calm the casualty.
- During the treatment or prevention of shock, do not give the casualty any food or drink. If the casualty is unconscious, turn his or her head to the side so that, in case he or she vomits, the victim will not choke on the vomit.

Summary

The difference between life and death can be measured in minutes after a Marine suffers a severe injury. Only a trained individual who understands the combat life saving techniques to the point where recognizing and treating a life-threatening wound is second nature will he or she be able to save a fellow Marine's life. This handout and the accompanying lecture will prepare you to render effective first aid for combat-related injuries and to teach your Marines the same skills.

