

SHOCK

Shock is a life-threatening condition in which blood flow to the tissues of the body is inadequate and cells are deprived of oxygen. Any serious injury or illness can produce shock. Examples are severe bleeding (either external or internal), thigh (femur) or pelvis fractures, major burns, dehydration, heart failure, severe allergic reactions, or spinal cord injuries with paralysis.

Signs and Symptoms

The skin may be pale, cool, or clammy. The pulse is weak and rapid or even undetectable (in shock produced by a spinal cord injury, the pulse will remain normal or slow). Breathing may be shallow, rapid, or irregular. Mental status may be altered (the victim may be confused, restless, or combative).

Treatment:

It is important to recognize shock and to transport the victim to a medical facility immediately.

- 1) Keep the victim lying down, covered and warm. Remember to insulate him from the ground as well.
- 2) Stop any obvious signs of bleeding.
- 3) Loosen any restrictive clothing.
- 4) Splint all broken bones. If the femur bone is fractured, apply and maintain traction (See page 76). If a pelvic fracture is suspected, apply a pelvic wrap (See page 70).
- 5) Elevate the legs so that gravity can help improve the blood supply to the heart and brain only if the victim has shock from external bleeding which has been controlled, or has fainted. If the victim has internal bleeding, avoid unnecessary movement and keep him lying flat. For heart failure shock, the victim may be more comfortable with his head and shoulders raised slightly.

ABDOMINAL (BELLY) INJURIES

Blunt Abdominal Injuries

A blow to the belly can result in internal organ injuries and bleeding, even though nothing penetrates the skin. Examine the abdomen by pressing on it gently with the tips of your fingers sequentially in all four quadrants. Push slowly and observe for pain, muscle spasms or rigidity. Normal abdomens are soft and not painful to touch.

Signs and Symptoms of Internal Abdominal Injures

1. Signs of shock (See above);
2. Pain that is at first mild and then becomes severe;
3. Distention (bloating) of the abdomen;
4. Pain, or rigidity (tightness or hardness) of the belly muscles when pressing in on the abdomen;
5. Pain referred to the left or right shoulder tip may indicate a ruptured spleen;
6. Nausea or repetitive vomiting;
7. Bloody urination;
8. Pain in the abdomen on movement;
9. Fever.

Treatment

1. Immediately evacuate the victim to a medical facility.
2. Anticipate and treat for shock.
3. Do not allow the victim to eat. If the victim is not vomiting, he may have small sips of water.

Gunshot Wounds

Injuries caused by guns differ in severity and type according to velocity of the bullet, power of the gun, whether fragmentation occurs, presence of powder burns, and type of tissue struck. A gunshot wound may cause severe internal damage and bleeding that is not readily visible or apparent. Although the entrance or exit wound may appear small, the damage inside the body may be great. Any victim who has suffered a gunshot wound should be brought to a medical facility immediately, no matter how minor the external appearance.

General Treatment

- 1) Follow the basic principles of resuscitation, including airway, breathing, circulation, control of bleeding, immobilization of any broken extremities, wound care, and stabilization of the victim for transport (See page 12).
- 2) Remove the weapon from the vicinity where you are giving medical care. It may be wise also to remove the ammunition and open the firing chamber.
- 3) Provide immediate relief of a tension pneumothorax with pleural decompression (See page 40).
- 4) Treat any sucking chest wound with petrolatum-impregnated gauze (See sucking chest wound, page 42).
- 5) Control external bleeding with direct pressure and compression wraps.
- 6) Treat for shock and hypothermia (See page 22).
- 7) Monitor the neurovascular status of an extremity wound; keep the extremity elevated to minimize swelling.
- 8) Be aware that the path of the bullet cannot be determined by connecting the entrance and exit wounds.
- 9) For powder burns, remove as much of the powder residue as possible with a scrub brush because the powder will tattoo the skin if left in place.
- 10) Expect internal bleeding.

Arrow Injury

Arrowheads are designed to inflict injury by cutting tissue and blood vessels, causing bleeding and shock.

General Treatment

- 1) Follow the same treatment recommendations as for a firearm injury.
- 2) Stabilize the victim for transport, leaving any embedded arrow in place during transport if possible. Cut the shaft of the arrow and leave about 10 cm (three or four inches) protruding from the wound to make transport easier (see below).
- 3) Fix the portion of the arrow that remains in the wound with a stack of gauze pads or with cloth and tape.
- 4) Transfer the victim as quickly as possible to a medical care facility for removal of the arrow under controlled conditions.

Do Not Remove Imbedded Foreign Objects

If a foreign object (such as a knife, tree limb or arrow) becomes deeply imbedded (impaled) in the body, do not attempt to remove it, because the internal portion may be up against or in a vital organ and acting as a plug, thus preventing further bleeding. Any attempt to remove the object may cause further bleeding and injury. This is particularly true with a hunting (broadhead) arrow. Instead, pad and bandage the wound around the object and secure it in place with tape. The portion of the object that is sticking out of the wound may be cut to a shorter length to facilitate splinting and transport of the victim.

Internal Bleeding

If bleeding is internal (inside the body), such as from an injured spleen or liver, bleeding ulcer, broken bone, or torn internal blood vessel, the victim may suffer from shock. The symptoms of internal bleeding are the same as those of external bleeding, except that you don't see the blood. They include rapid heart-beat, low blood pressure, shortness of breath, weakness, pale skin color, cool and clammy skin, and confusion. The belly may feel firm to your touch and look distended, and the victim may feel abdominal pain. There may be blood in the vomit, urine or stool. Because it is difficult to predict the rate and severity of internal bleeding, the victim should be brought to medical attention immediately.

FRACTURES

A fracture is any break or crack in a bone. An open, or compound fracture occurs when the overlying skin at the fracture site has been punctured or cut. This can happen when a sharp bone end protrudes through the skin or from a direct blow which breaks the skin as it fractures the bone. The bone may or may not be visible in the wound. A closed fracture is one in which there is no wound on the skin anywhere near the fracture site. A closed fracture can become an open fracture if it is not handled carefully.

Open fractures are more likely to produce significant blood loss than closed ones. The bone is also contaminated by being exposed to the environment and may become infected. An infected bone is very difficult to treat and may cause long-term problems.

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How to Tell If a Bone Is Fractured

It may be difficult to differentiate a fractured bone from a sprained ligament or bruised muscle. When in doubt, splint the extremity and assume it is fractured until you can obtain an X-ray.

Signs of a Possible Fracture:

- Deformity. The limb appears in an unnatural position. Compare the injured with the uninjured limb on the opposite side. Look for differences in length, angle or rotation.
- Pain and tenderness over a specific point (point tenderness).
- Inability to use the extremity. For example, someone who twists an ankle and is unable to bear weight should be suspected of having a broken ankle rather than a sprained ankle.
- Rapid swelling and bruising (black and blue discoloration).
- Crepitus (grating). A grinding sensation can sometimes be felt and heard when touching or moving a fractured limb.
- Inappropriate motion. Motion at a point in a limb where no joint exists indicates a fracture.

Treatment: General Guidelines

- 1) Inspect the site of injury for any deformity, angulation, or damage to the skin. Instead of removing the victim's clothing, cut away the clothing at the fracture site with blunt-tipped scissors. This will prevent excess movement and better protect the victim from the environment.
- 2) Stop any bleeding with direct pressure.
- 3) Check the circulation below the fracture site by feeling for pulses and inspecting the skin for abnormal color changes. Pallor (paleness), bluish discoloration, or a colder hand or foot compared with the noninjured side may indicate a damaged blood vessel. Without circulation, a limb can survive for only about six to eight hours. Check sensation by using a safety pin to determine if the sharp sensation is felt equally on both extremities.
- 4) Because of the force necessary to break a bone, any person with a fracture should be examined carefully for other injuries.
- 5) Splint all fractures before the victim is moved, unless his life is in immediate danger. Splinting prevents movement of the broken bones, which avoids additional injury to bones, muscles, nerves, and blood vessels. It also reduces pain, prevents a closed fracture from becoming open, and makes evacuating the victim easier.

Treatment of Open Fractures

Irrigate the wound with large amounts of sterile saline or disinfected water to remove any obvious dirt and then cover it with a sterile dressing. Do not try to realign the bone or push the bone back under the skin unless it is necessary for splinting and evacuation, or if there are signs of diminished circulation, such as coldness, paleness, or blue discoloration of the extremity.

Realignment of an Open Fracture

- 1) After thorough irrigation of the wound, pull gently on the limb below the fracture site in a direction which straightens it, while someone else holds counter traction on the limb above the fracture.
- 2) While continuing to hold traction, immediately apply a splint to prevent further motion and damage.
- 3) Cover the wound with a sterile dressing and bandage.

Splinting

In general, a splint should be long enough to incorporate the joints above and below the fracture. The splint should be rigid and well-padded. The splint should immobilize the fractured part in a position of function. Functional position means that the leg is almost straight with a slight flexion at the knee (place a rolled up towel behind the knee), the ankle and elbow are bent at 90 degrees, the wrist is straight or slightly extended, and the fingers are flexed in a curve as if one were attempting to hold a can of soda or a baseball.

- Remove all jewelry, such as watches, bracelets, and rings, before applying the splint.
- Use plenty of padding, especially at the bony protrusions of the wrist, elbow, ankle, and knees.
- Secure the splint in place with strips of clothing, belts, pieces of rope, webbing, pack straps, elastic bandages, or duct tape.
- Fashion the splint on the uninjured body part first and then transfer it to the injured area to minimize discomfort.
- Elevate the injured body part as much as possible after splinting to minimize swelling.
- Always check the circulation after applying a splint or doing any manipulation. Check the pulse in the foot or wrist, skin color, and temperature often to make certain that swelling inside the splint has not cut off circulation.
- Administer any pain medicine that you have to the victim.

Realignment of a Closed Fracture

In general, straightening a fractured limb is not advised, unless circulation to the extremity is impaired or gross deformity prevents splinting and transportation. Realignment is easier if it is done early, before swelling and pain make it more difficult.

- 1) Pull gently on the limb below the fracture site in a direction which straightens it, while someone else holds counter-traction on the limb above the fracture. Discontinue the maneuver if the patient complains of a dramatic increase in pain.
- 2) After the limb has been straightened, immediately apply a splint before releasing traction. If alignment cannot be achieved, splint the extremity as it lies.
- 3) After any manipulation, recheck to see whether circulation has been restored or improved.

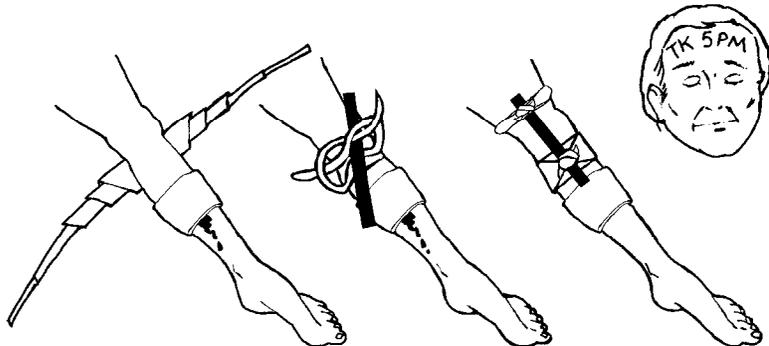
HEAD INJURY CHECKLIST

Seek immediate medical attention if any of the following symptoms occur after a blow to the head:

- Headache that progressively worsens;
- Consciousness gradually deteriorates from alertness to drowsiness or disorientation; Ask the victim if he knows his name, location, the date, and what happened. If he gets all four correct, he is oriented X 4.
- Persistent or projectile (shoots out under pressure) vomiting;
- One pupil becomes significantly larger than the other;
- Bleeding from an ear or nose without direct injury to those areas, or a clear watery fluid draining from the nose;
- Bruising behind the ears or around the eyes, when there is no direct injury to those areas;
- Seizures.

HOW TO APPLY A TOURNIQUET

1. Tourniquet material should be wide and flat, to prevent crushing tissue. Use a firm bandage, belt or strap that is three to four inches wide and that will not stretch. Never use wire, rope or any material that will cut the skin.
2. Wrap the bandage snugly around the extremity several times as close above the wound as possible, and tie an overhand knot.
3. Place a stick or similar object on the knot and tie another overhand knot over the stick.
4. Twist the stick until the bandage becomes tight enough to stop the bleeding. Tie or tape the stick in place to prevent it from unraveling.
5. Mark the victim with a TK, and note the time the tourniquet was applied.
6. If you are more than an hour from medical care, loosen the tourniquet very slowly at the end of one hour, while maintaining direct pressure on the wound. If bleeding is still heavy, retighten the tourniquet. If bleeding is now manageable with direct pressure alone, leave the tourniquet in place, but do not tighten it again unless severe bleeding starts.



Disclaimer: These instructions are provided for informational purposes only and are not meant to be a substitute for taking a comprehensive first-aid, EMT, or wilderness medicine course. The reader should use this pamphlet for guidance in difficult and remote situations only and should not attempt to perform any procedure that he or she is not comfortable with or trained to render, unless the victim will die without that intervention. Legally, a rescuer is always liable for his or her own actions and should never take unnecessary risks or perform any medical procedure unless it is absolutely necessary. **The author and publisher disclaim any liability for injuries, disability, or death that may result from the use of this information, correct or otherwise, or the products in any Adventure Medical Kit.**

CHEST INJURIES

Flail Chest

When three or more consecutive ribs on the same side of the chest are broken in two places, a free-floating segment called a “flail chest” can result. The flail segment will move opposite to the rest of the chest during breathing and make it hard for the victim to get enough air. The movement of broken ribs causes great pain, which further reduces the victim’s ability to breathe. The underlying lung is usually bruised with a flail chest.

Treatment

1. Immediately evacuate the victim to a medical facility. A flail chest can be tolerated only for the first 24 to 48 hours, before the victim will usually need to be put on a respirator to assist with his breathing.
2. Place a bulky pad of dressings, rolled up extra clothing or a small pillow gently over the site, or have the victim splint his arm against the injury to stabilize the flail segment and relieve some of the pain. Whatever is used should be soft and lightweight. Use large strips of tape to hold the pad in place. Do not tape entirely around the chest as this will restrict breathing efforts. The victim is unable to walk, he should be transported lying on his back or injured side.
3. If the victim is severely short of breath and cannot get enough air, you may need to assist his breathing with mouth-to-mouth rescue breathing. Time your breaths with his, and breathe gently to give him added air with each inspiration.

Collapsed Lung (Pneumothorax)

A collapsed lung (pneumothorax) occurs when air enters the chest cavity and compresses or collapses the lung. This can occur when a broken rib punctures the lung, an outside object such as a knife penetrates the chest, or even spontaneously, when a weak point develops in the lung and permits air to leak into the chest cavity.

Signs and Symptoms

1. Sharp chest pain, which may become worse with breathing;
2. Shortness of breath or difficulty breathing;
3. Reduced or absent breath sounds on the injured side.

Treatment

Evacuate the patient immediately and monitor closely for the development of a tension pneumothorax (see below).

Tension Pneumothorax

A pneumothorax can progress to a life-threatening condition called a tension pneumothorax if air continues to leak into the chest cavity. With each breath, air enters the space surrounding the lung, but it cannot escape with expiration. Pressure soon builds up, compressing the lung and heart, which can eventually lead to death.

Signs and Symptoms

1. Labored breathing;
2. Cyanosis (bluish skin discoloration);
3. Signs of shock (weak, rapid pulse, rapid breathing, fear, pale and moist skin, confusion);
4. Distended jugular (neck) veins;
5. Diminished or absent breath sounds on the injured side (place your ear on the chest wall of the victim);
6. Bubbles of air may be felt or heard (Rice Krispies sound) on touching the chest wall or neck.

TRAUMA AND ACCIDENT MANAGEMENT INSTRUCTIONS

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General Guidelines

- **Respond to accident in a systematic and organized fashion.** The following is a step-by-step approach that you can follow when providing first-aid to an injured patient.
- **Maintain self-control:** It is normal to feel anxious when confronted with an injured victim; however, this should not be transmitted to the patient or other members of the party. Try to act with confidence. Reassure any victims. Think before you act.
- **Control the scene:** Before approaching the victim, ensure the safety of yourself and the non-injured members of the party. Assess the scene for further hazards such as rockfall, avalanches, or dangerous animals. Avoid approaching the victim from directly above if there is a possibility of a rock or snow slide. Do not allow your sense of urgency to transform an accident into a risky and foolish rescue attempt.
- **Organize an effective team.** Designate a leader. This person should subsequently direct all first-aid efforts and delegate duties, rather than perform them, when possible. If the leader becomes intimately involved in a specific function, he loses the ability to maintain a team effort.
- **Perform a primary survey:** This is a rapid evaluation in which life threatening conditions, such as airway compromise or severe bleeding, are recognized and simultaneous management is begun.
- **Speak loudly to the victim as you approach.** A response indicates that he is breathing and has a pulse. If the victim is not responsive, begin with the ABC’s of resuscitation.
- **Initiate and maintain spine precautions:** If a patient is unconscious after trauma or has neck or back pain, the rescuer should immobilize the head and neck and prevent any movement of the torso. A cervical collar can be improvised from a sleeping pad or rolled up clothing, while rolled up towels and clothing are placed on either side of the head and neck to further prevent any movement.
- **Perform a secondary survey:** The secondary survey is a head to toe examination of the patient, looking for evidence of injury.
- **Protect the victim:** If it is cold, place insulating garments or sleeping bags underneath and on top of the victim to protect him from hypothermia. Remove and replace any wet clothing. If it is hot, loosen the victim’s clothing and create shade. If the victim is in a dangerous area, move him to a safer location while maintaining spine immobilization if indicated.
- **Plan the evacuation:** Plans for evacuation should be initiated early. The leader should evaluate the victim’s injuries, party size, and terrain. Develop a plan for either evacuating the patient or obtaining professional assistance.

PRIMARY SURVEY

A = Airway

Immediately determine if the patient is breathing by placing your ear and cheek close to the victim’s mouth and nose to try to detect air movement. At the same time, look for movement of the chest and abdomen. In cold weather, look for a vapor cloud or feel for warm air movement. If no movement of air is detected, clean the mouth out with your fingers and open the airway, using the chin lift or jaw thrust maneuver to prevent unnecessary movement of the neck. The jaw thrust is performed by placing your hands on either side of the victim’s face and pushing the base of the jaw up and forward.

B = Breathing

If the patient doesn’t breathe on his own after establishing an airway, as described above, then begin mouth-to-mouth resuscitation.

C = Check for circulation

Place your index and middle finger on the victim’s throat over the Adam’s apple and then slide your fingers down the side of the victim’s neck to the space between the Adam’s apple and neck muscle to palpate the carotid pulse. Hold your fingers here for at least 30 seconds and feel for any pulsations. If no pulse is detected, mouth-to-mouth resuscitation should be combined with chest compressions.

Check for Severe Bleeding

During the primary survey, evidence of severe bleeding should be identified and controlled with direct pressure. Do not allow the bleeding to continue while looking for a sterile dressing. Use whatever is available initially while someone else obtains sterile dressing material. Place the sterile dressing material over the wound and maintain direct and firm pressure. A pressure dressing can be applied later with a 4x4 gauze dressing and elastic bandage to free up your hands.

Treatment

If the situation is desperate and the victim is literally dying before your eyes, there is only one thing that you can do to possibly save his life. You must relieve the pressure from inside the chest (pleural decompression), and allow the lung to re-expand. This procedure takes courage and improvisation in the wilderness. Pleural decompression should not be undertaken lightly and should be attempted only if the victim appears to be dying. The possible complications include infection, profound bleeding from puncture of the heart, lung, or a major blood vessel, or even laceration of the liver or spleen.

How to Perform Pleural Decompression

Caution: This technique should only be performed in the wilderness by a trained individual on a victim who would die if the procedure were not done.

1. Swab the entire chest with povidone-iodine or other antiseptic.
2. If sterile gloves are available, they should be put on after the rescuer’s hands have been washed.
3. If local anesthesia is available, inject it into the skin at the site to numb the area.
4. Insert a large-bore intravenous catheter (14-gauge), needle, or any pointy, sharp object that is available (the object should not be wider than a pencil) into the chest just above the third rib in the midclavicular line (midway between the top of the shoulder and the nipple, in line with the nipple estimates this location). If you hit the rib, move the needle or pointy object upward slightly until it passes over the top of the rib, thus avoiding the blood vessels that course along the bottom of every rib. A gush of air will signal that you have entered the correct space and should not push the object any farther. This will convert the tension pneumothorax into an open pneumothorax.
5. Leave the object in place and put the cut-out finger portion of a rubber glove with a slit cut into the end over the opening to create a one-way flutter valve that allows air out, but not in.
6. Anchor the object to the chest wall with tape so that it cannot be pulled out or forced farther into the chest.
7. If a hole was made with a knife, monitor the victim closely, and if signs of tension redevelop, repeat the procedure above.

Open (Sucking) Chest Wound

If an object such as a bullet or knife enters the chest, a wound that opens into the lung can develop. Each time the victim breathes, a sucking sound can often be heard as air passes in and out through the hole.

Signs and Symptoms

1. Painful and difficult breathing;
2. A sucking sound may be heard each time the victim breathes;
3. Bubbles may be seen at the wound site when the victim exhales;
4. Bubbles of air may be felt (crackling sounds) on touching the chest wall near the injury;
5. The patient may develop signs of a tension pneumothorax (see above).

Treatment

1. Seal the opening immediately with any airtight substance and cover it with a 4x4 gauze pad, taping it on three sides. Taping three edges produces a flutter valve effect. When the victim inhales, the free edge will seal against the skin. As he exhales, the free edge will allow air in the chest cavity to escape.
2. If an object is stuck in the chest, do not remove it. Place airtight material next to the skin around it, and stabilize it with bulky dressings or pads. Several layers of dressings, clothing, or handkerchiefs placed on the sides of the object will help stabilize it.
3. An airtight dressing can be improvised from a 4x4 gauze pad impregnated with petroleum jelly, honey, or antibiotic ointment. Saran Wrap or clean plastic will also work. Tape the dressing in place on three sides only.