

5B-1 INTRODUCTION

This appendix, covering one-man cardiopulmonary resuscitation, control of bleeding and shock treatment is intended as a quick reference for individuals trained in first aid and basic life support. Complete descriptions of all basic life support techniques are available through your local branch of the American Heart Association. Further information on the control of bleeding and treatment for shock is in the *Hospital Corpsman 3 & 2 Manual*, NAVEDTRA 10669-C.

5B-2 CARDIOPULMONARY RESUSCITATION

All divers must be qualified in cardiopulmonary resuscitation (CPR) in accordance with the procedures of the American Heart Association. Periodic recertification according to current guidelines in basic life support is mandatory for all Navy divers. Training can be requested through your local medical command or directly through your local branch of the American Heart Association.

5B-3 CONTROL OF MASSIVE BLEEDING

Massive bleeding must be controlled immediately. If the victim also requires resuscitation, the two problems must be handled simultaneously. Bleeding may involve veins or arteries; the urgency and method of treatment will be determined in part by the type and extent of the bleeding.

5B-3.1 External Arterial Hemorrhage. Arterial bleeding can usually be identified by bright red blood, gushing forth in jets or spurts that are synchronous with the pulse. The first measure used to control external arterial hemorrhage is direct pressure on the wound.

5B-3.2 Direct Pressure. Pressure is best applied with sterile compresses, placed directly and firmly over the wound. In a crisis, however, almost any material can be used. If the material used to apply direct pressure soaks through with blood, apply additional material on top; do not remove the original pressure bandage. Elevating the extremity also helps to control bleeding. If direct pressure cannot control bleeding, it should be used in combination with pressure points.

5B-3.3 Pressure Points. Bleeding can often be temporarily controlled by applying hand pressure to the appropriate pressure point. A pressure point is a place where the main artery to the injured part lies near the skin surface and over a bone. Apply pressure at this point with the fingers (digital pressure) or with the heel of the hand; no first aid materials are required. The object of the pressure is to compress the artery against the bone, thus shutting off the flow of blood from the heart to the wound.

- 5B-3.3.1 **Pressure Point Location on Face.** There are 11 principal points on each side of the body where hand or finger pressure can be used to stop hemorrhage. These points are shown in Figure 5B-1. If bleeding occurs on the face below the level of the eyes, apply pressure to the point on the mandible. This is shown in Figure 5B-1(A). To find this pressure point, start at the angle of the jaw and run your finger forward along the lower edge of the mandible until you feel a small notch. The pressure point is in this notch.
- 5B-3.3.2 **Pressure Point Location for Shoulder or Upper Arm.** If bleeding is in the shoulder or in the upper part of the arm, apply pressure with the fingers behind the clavicle. You can press down against the first rib or forward against the clavicle—either kind of pressure will stop the bleeding. This pressure point is shown in Figure 5B-1(B).
- 5B-3.3.3 **Pressure Point Location for Middle Arm and Hand.** Bleeding between the middle of the upper arm and the elbow should be controlled by applying digital pressure in the inner (body) side of the arm, about halfway between the shoulder and the elbow. This compresses the artery against the bone of the arm. The application of pressure at this point is shown in Figure 5B-1(C). Bleeding from the hand can be controlled by pressure at the wrist, as shown in Figure 5B-1(D). If it is possible to hold the arm up in the air, the bleeding will be relatively easy to stop.
- 5B-3.3.4 **Pressure Point Location for Thigh.** Figure 5B-1(E) shows how to apply digital pressure in the middle of the groin to control bleeding from the thigh. The artery at this point lies over a bone and quite close to the surface, so pressure with your fingers may be sufficient to stop the bleeding.
- 5B-3.3.5 **Pressure Point Location for Foot.** Figure 5B-1(F) shows the proper position for controlling bleeding from the foot. As in the case of bleeding from the hand, elevation is helpful in controlling the bleeding.
- 5B-3.3.6 **Pressure Point Location for Temple or Scalp.** If bleeding is in the region of the temple or the scalp, use your finger to compress the main artery to the temple against the skull bone at the pressure point just in front of the ear. Figure 5B-1(G) shows the proper position.
- 5B-3.3.7 **Pressure Point Location for Neck.** If the neck is bleeding, apply pressure below the wound, just in front of the prominent neck muscle. Press inward and slightly backward, compressing the main artery of that side of the neck against the bones of the spinal column. The application of pressure at this point is shown in Figure 5B-1(H). Do not apply pressure at this point unless it is absolutely essential, since there is a great danger of pressing on the windpipe and thus choking the victim.
- 5B-3.3.8 **Pressure Point Location for Lower Arm.** Bleeding from the lower arm can be controlled by applying pressure at the elbow, as shown in Figure 5B-1(I).
- 5B-3.3.9 **Pressure Point Location of the Upper Thigh.** As mentioned before, bleeding in the upper part of the thigh can sometimes be controlled by applying digital pressure in the middle of the groin, as shown in Figure 5B-1(E). Sometimes, however,

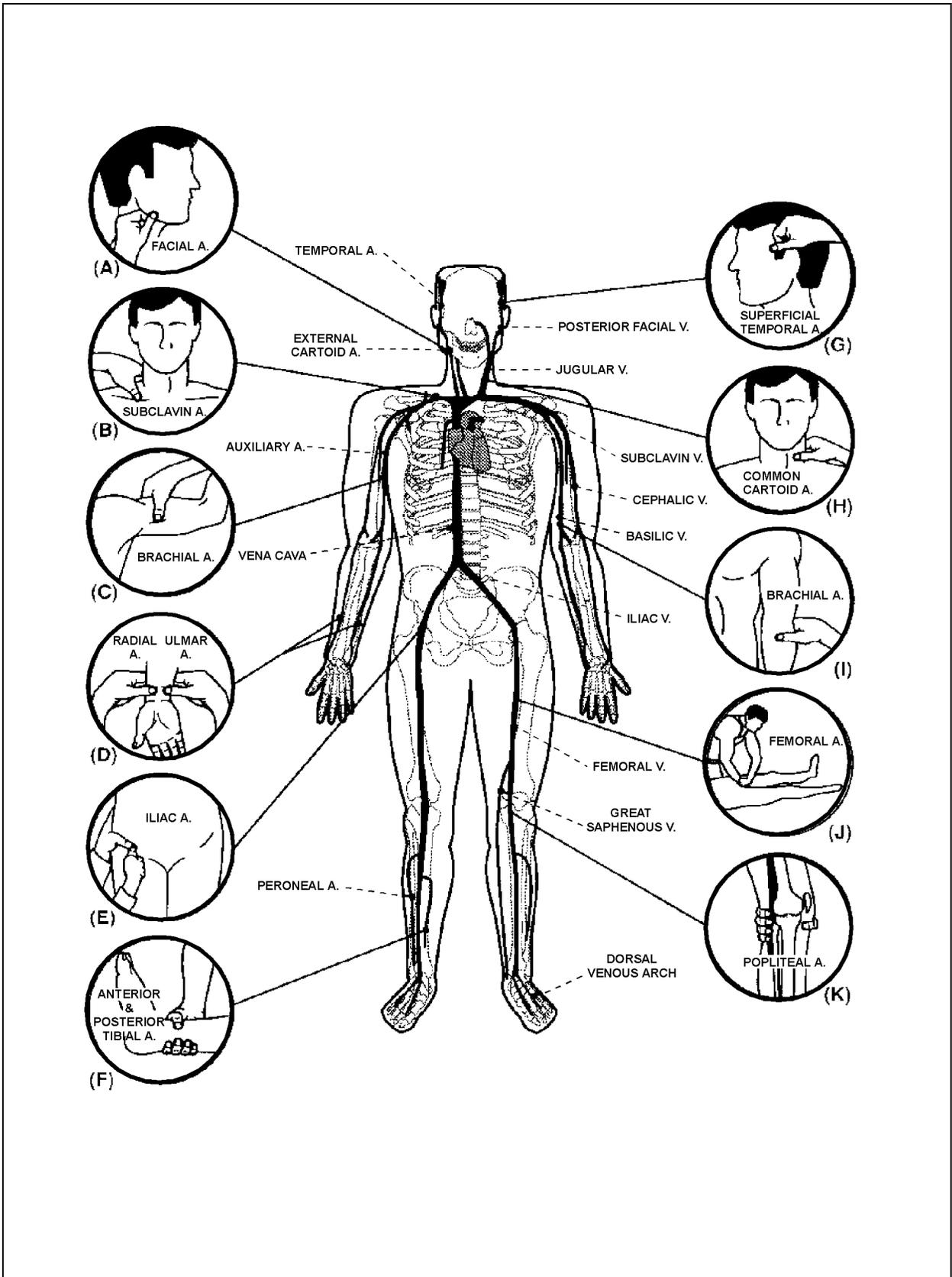


Figure 5B-1. Pressure Points.

it is more effective to use the pressure point of the upper thigh as shown in Figure 5B-1(J). If you use this point, apply pressure with the closed fist of one hand and use the other hand to give additional pressure. The artery at this point is deeply buried in some of the heaviest muscle of the body, so a great deal of pressure must be exerted to compress the artery against the bone.

5B-3.3.10 **Pressure Point Location Between Knee and Foot.** Bleeding between the knee and the foot may be controlled by firm pressure at the knee. If pressure at the side of the knee does not stop the bleeding, hold the front of the knee with one hand and thrust your fist hard against the artery behind the knee, as shown in Figure 5B-1(K). If necessary, you can place a folded compress or bandage behind the knee, bend the leg back and hold it in place by a firm bandage. This is a most effective way of controlling bleeding, but it is so uncomfortable for the victim that it should be used only as a last resort.

5B-3.3.11 **Determining Correct Pressure Point.** You should memorize these pressure points so that you will know immediately which point to use for controlling hemorrhage from a particular part of the body. Remember, the correct pressure point is that which is (1) NEAREST THE WOUND and (2) BETWEEN THE WOUND AND THE MAIN PART OF THE BODY.

5B-3.3.12 **When to Use Pressure Points.** It is very tiring to apply digital pressure and it can seldom be maintained for more than 15 minutes. Pressure points are recommended for use while direct pressure is being applied to a serious wound by a second rescuer, or after a compress, bandage, or dressing has been applied to the wound, since it will slow the flow of blood to the area, thus giving the direct pressure technique a better chance to stop the hemorrhage. It is also recommended as a stopgap measure until a pressure dressing or a tourniquet can be applied.

5B-3.4 **Tourniquet.** A tourniquet is a constricting band that is used to cut off the supply of blood to an injured limb. Use a tourniquet only if the control of hemorrhage by other means proves to be difficult or impossible. A tourniquet must always be applied ABOVE the wound, i.e., towards the trunk, and it must be applied as close to the wound as practical.

5B-3.4.1 **How to Make a Tourniquet.** Basically, a tourniquet consists of a pad, a band and a device for tightening the band so that the blood vessels will be compressed. It is best to use a pad, compress or similar pressure object, if one is available. It goes under the band. It must be placed directly over the artery or it will actually decrease the pressure on the artery and thus allow a greater flow of blood. If a tourniquet placed over a pressure object does not stop the bleeding, there is a good chance that the pressure object is in the wrong place. If this occurs, shift the object around until the tourniquet, when tightened, will control the bleeding. Any long flat material may be used as the band. It is important that the band be flat: belts, stockings, flat strips of rubber or neckerchiefs may be used; but rope, wire, string or very narrow pieces of cloth should not be used because they cut into the flesh. A short stick may be used to twist the band tightening the tourniquet. Figure 5B-2 shows how to apply a tourniquet.

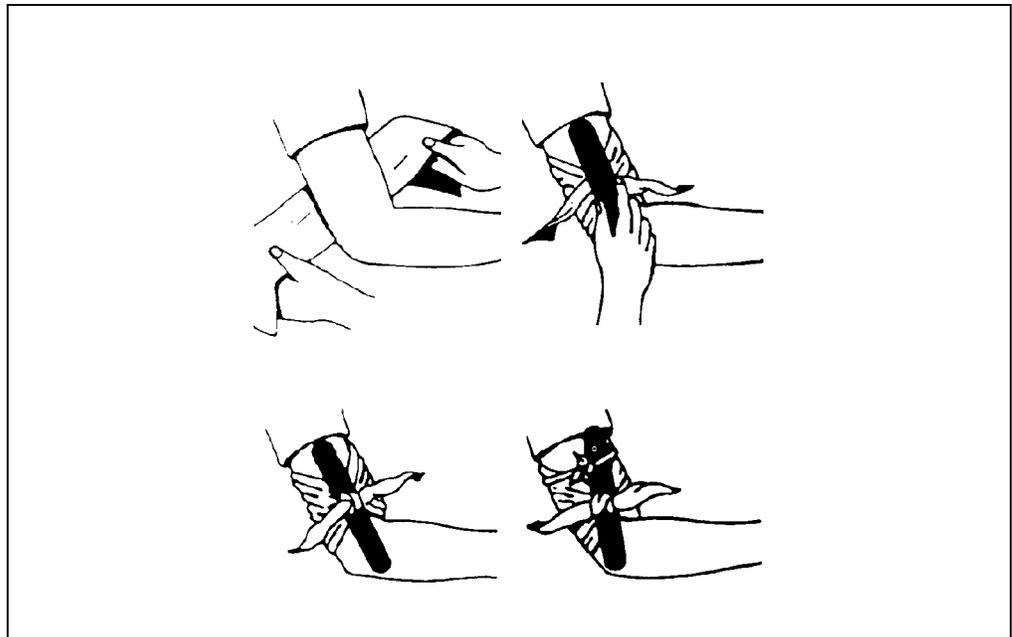


Figure 5B-2. Applying a Tourniquet.

- 5B-3.4.2 **Tightness of Tourniquet.** To be effective, a tourniquet must be tight enough to stop the arterial blood flow to the limb, so be sure to draw the tourniquet tight enough to stop the bleeding. However, do not make it any tighter than necessary.
- 5B-3.4.3 **After Bleeding is Under Control.** After you have brought the bleeding under control with the tourniquet, apply a sterile compress or dressing to the wound and fasten it in position with a bandage.
- 5B-3.4.4 **Points to Remember.** Here are the points to remember about using a tourniquet:
1. Don't use a tourniquet unless you can't control the bleeding by any other means.
 2. Don't use a tourniquet for bleeding from the head, face, neck or trunk. Use it only on the limbs.
 3. Always apply a tourniquet **ABOVE THE WOUND** and as close to the wound as possible. As a general rule, do not place a tourniquet below the knee or elbow except for complete amputations. In certain distal areas of the extremities, nerves lie close to the skin and may be damaged by the compression. Furthermore, rarely does one encounter bleeding distal to the knee or elbow that requires a tourniquet.
 4. Be sure you draw the tourniquet tight enough to stop the bleeding, but don't make it any tighter than necessary. The pulse beyond the tourniquet should disappear.

5. Don't loosen a tourniquet after it has been applied. Transport the victim to a medical facility that can offer proper care.
6. Don't cover a tourniquet with a dressing. If it is necessary to cover the injured person in some way, MAKE SURE that all the other people concerned with the case know about the tourniquet. Using crayon, skin pencil or blood, mark a large "T" on the victim's forehead or on a medical tag attached to the wrist.

5B-3.5 External Venous Hemorrhage. Venous hemorrhage is not as dramatic as severe arterial bleeding, but if left unchecked, it can be equally serious. Venous bleeding is usually controlled by applying direct pressure on the wound.

5B-3.6 Internal Bleeding. The signs of external bleeding are obvious, but the first aid team must be alert for the possibility of internal hemorrhage. Victims subjected to crushing injuries, heavy blows or deep puncture wounds should be observed carefully for signs of internal bleeding. Signs usually present include:

- Moist, clammy, pale skin
- Feeble and very rapid pulse rate
- Lowered blood pressure
- Faintness or actual fainting
- Blood in stool, urine, or vomitus

5B-3.6.1 Treatment of Internal Bleeding. Internal bleeding can be controlled only by trained medical personnel and often only under hospital conditions. Efforts in the field are generally limited to replacing lost blood volume through intravenous infusion of saline, Ringer's Lactate, or other fluids, and the administration of oxygen. Rapid evacuation to a medical facility is essential.

5B-4 SHOCK

Shock may occur with any injury and will certainly be present to some extent with serious injuries. Shock is caused by a loss of blood flow, resulting in a drop of blood pressure and decreased circulation. If not treated, this drop in the quantity of blood flowing to the tissues can have serious permanent effects, including death.

5B-4.1 Signs and Symptoms of Shock. Shock can be recognized from the following signs and symptoms.

- Respiration shallow, irregular, labored
- Eyes vacant (staring), lackluster, tired-looking
- Pupils dilated
- Cyanosis (blue lips/fingernails)
- Skin pale or ashen gray; wet, clammy, cold
- Pulse weak and rapid, or may be normal
- Blood pressure drop
- Possible retching, vomiting, nausea, hiccups
- Thirst

5B-4.2 Treatment. Shock must be treated before any other injuries or conditions except breathing and circulation obstructions and profuse bleeding. Proper treatment involves caring for the whole patient, not limiting attention to only a few of the disorders. The following steps must be taken to treat a patient in shock.

1. Ensure adequate breathing. If the patient is breathing, maintain an adequate airway by tilting the head back properly. If the patient is not breathing, establish an airway and restore breathing through some method of pulmonary resuscitation. If both respiration and circulation have stopped, institute cardiopulmonary resuscitation measures (refer to paragraph 5B-2).
2. Control bleeding. If the patient has bleeding injuries, use direct pressure points or a tourniquet, as required (refer to paragraph 5B-3).
3. Administer oxygen. Remember that an oxygen deficiency will be caused by the reduced circulation. Administer 100 percent oxygen.
4. Elevate the lower extremities. Since blood flow to the heart and brain may have been diminished, circulation can be improved by raising the legs slightly. It is not recommended that the entire body be tilted, since the abdominal organs pressing against the diaphragm may interfere with respiration. Exceptions to the rule of raising the feet are cases of head and chest injuries, when it is desirable to lower the pressure in the injured parts; in these cases, the upper part of the body should be elevated slightly. Whenever there is any doubt as to the best position, lay the patient flat.
5. Avoid rough handling. Handle the patient as little and as gently as possible. Body motion has a tendency to aggravate shock conditions.
6. Prevent loss of body heat. Keep the patient warm but guard against overheating, which can aggravate shock. Remember to place a blanket under as well as on top of the patient, to prevent loss of heat into the ground, boat or ship deck.
7. Keep the patient lying down. A prone position avoids taxing the circulatory system. However, some patients, such as those with heart disorders, will have to be transported in a semi-sitting position.
8. Give nothing by mouth.

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