



Bandaging: The Neglected Skill

by Paula Weiler

EMT Objectives

After reading this article, the EMT will be able to:

- describe the characteristics of external bleeding;
- explain the emergency medical care of the patient with external bleeding;
- demonstrate general bandaging techniques for external bleeding;
- demonstrate specific bandaging techniques for lacerations, punctures, impaled objects, amputations (e.g.).

Introduction

With the advent of more in-depth EMT training courses along with a greater emphasis on systems and pathophysiology, the EMT student does not often get a thorough grounding and practice in the basics, such as bandaging. EMT students frequently expect that there is some elaborate or complicated device which will automatically function as a dressing and bandage, and which will apply itself. Or they sometimes think: “*This [bandaging] is easy – I don’t have to study this!*” Life – and EMS – do not work this way. In order to control bleeding, replace the job of lost or damaged skin by reducing the possibility of infection, and help to relieve pain, proper bandaging is critical.

Types Of Bleeds

There are two types of bleeding we deal with as EMTs – external bleeding which is blood loss outside the skin, classified as *open wounds* and internal

bleeding which is blood loss inside the skin/body, classified as *closed wounds*. Excessive loss of blood (fluid) leads to hypovolemia and hypoperfusion (shock), in turn resulting in inadequate perfusion of the blood which then leads to tissue and organ death, ‘shock’ and death. Cells and tissues of the heart, brain, spinal cord and kidneys are most sensitive to hypoperfusion.

Internal bleeding is difficult to determine – and nearly impossible to control – in the field. Frequently, by the time we recognize that a patient is bleeding internally, they have already lost a considerable amount of blood. If you suspect your patient is bleeding internally, provide high-flow oxygen and rapid transport to the nearest trauma center.

External bleeding is classified as one of three types (see figure 1):

1. **Arterial** bleeding – this can be the most difficult to control due to the force behind the bleed. Arterial bleeding is usually recognized by

its bright red color due to oxygen rich blood and the blood spurts with each beat of the heart.

2. **Venous** bleeding – this type of bleeding is easier to control due to less force behind the bleed. Venous bleeding is usually recognized by its dark red or maroon color and its steady flow. **Caution:** bleeding from large veins may suck in an air bubble which can result in an embolism.

3. **Capillary** bleeding – this type of bleeding is the easiest to control because it is coming from very small capillaries and has no force behind the blood flow. This bleeding is red in color, is slow and ‘oozing’ and usually clots spontaneously.

Bandaging

When dealing with open wounds, external bleeding and injuries to the skin, we want to apply a dressing to the injury which will ‘help’ the

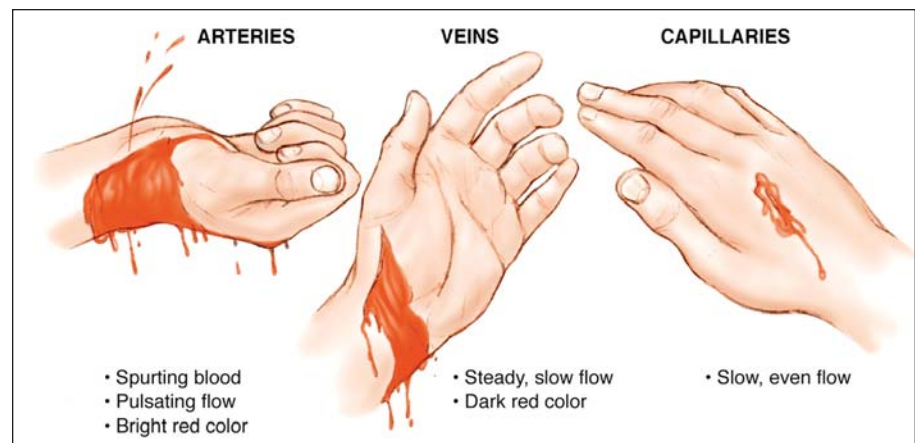


Figure 1: Types of bleeds.

CEU Article: Bandaging

-continued from page 10

damaged skin by completing the functions of the skin. The skin's most important function is to serve as a physical barrier to invasion of the body by germs. Persons with large external wounds and/or widespread burns lose this protection. Infection is a frequent complication, especially in patients with burns. Patients with burns to a large portion of the body often die from severe infections because the damaged skin is unable to prevent pathogens from entering the body.

The other purpose of bandaging open wounds is to assist in clotting. When there is an injury to a blood vessel, the blood vessel wall releases chemicals which cause vasoconstriction and activate the platelets. The combination of vessel contraction and loose platelets starts forming a plug. Clotting proteins are released (such as prothrombin) which eventually forms thrombin; these stimulate the formation of fibrin which binds to the platelet plug forming the final clot, which is much stronger than the original platelet plug. The external dressing can help stabilize clot formation.

Emergency Care of Skin Injuries and External Bleeding

1. Follow Patient Assessment procedures – use standard precautions.
2. Assess and treat A-B-Cs as needed and treat for shock as needed.
3. Prevent/reduce wound contamination by controlling bleeding and apply a sterile dressing.
4. Apply a bandage to hold the dressing in place.
5. Check PMS (pulse, motor, sensation evaluation) or CSM (circulation, sensation, motor evaluation) distal to the injury before and after treatment.

Principles of Bandaging

Use standard precautions (gloves, minimum), expose the wound and control bleeding using direct pressure, tourniquet and elevation. Clean the wound surface and apply a sterile dressing. Finally, apply the bandage.

Remember that a dressing is sterile and must completely cover the wound, and a bandage holds the dressing in place and should completely cover the dressing. Bandages do not have to be sterile.

If the bleeding continues and soaks through the dressing, apply additional pressure and add new dressings. Do not bandage too tightly (which could restrict circulation) or too loosely (which could allow the dressing to slip). Do not leave loose ends.

When bandaging an extremity wrap a large area to avoid point pressure and bandage from the smaller diameter of the limb to the larger diameter. You can apply a bandage across a joint, but do not bend the limb once the bandage is in place. Do not cover the tips of the fingers or toes as you will need to observe skin color changes and assess PMS; the exception to this rule is when the fingers and/or toes are burned as they will need to be covered to remove exposure to air.

Bandages can be as simple as using an adhesive bandage (which combines the dressing and bandage in one piece) or using sterile gauze pads with roller gauze, conforming roller gauze, cravats and open triangular bandages, to name a few types.

There are methods of applying several types of bandages which work the best to hold the dressing and stay in place, but there is no right or wrong way to apply a bandage as long as the appropriate emergency medical care is provided and the general principles given above are conformed to.

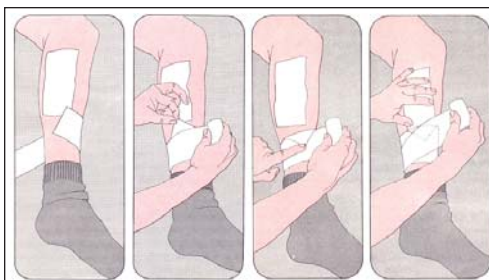
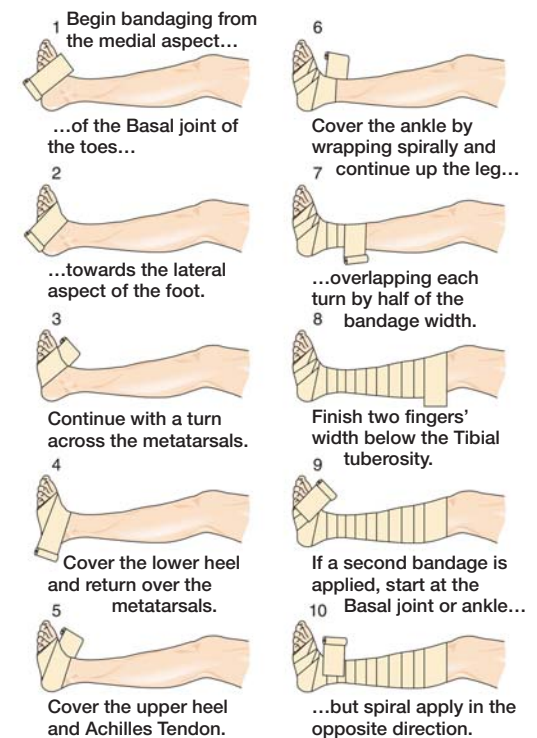


Figure 2: Anchoring a roller gauze bandage.

Figure 3: Applying a roller gauze bandage



Anchoring and Tying Off A Roller Gauze Bandage

When applying roller gauze the bandage should be anchored to prevent slipping during the application process. Apply the roller gauze slightly distal to the dressing and make a complete wrap around the limb folding an inner corner back onto itself. Then wrap around the limb again, covering that folded corner which helps to stabilize and anchor the bandage in place (see figure 2). Continue to wrap around the limb moving proximally until the dressing is completely covered. When complete the bandage can be tied off one of three ways:

1. Use a piece of tape to secure the end of the roller gauze in place,
2. Use a pair of scissors to cut the end of the roller gauze in half lengthwise and tie the ends around the limb securing the bandage, or
3. Make a backwards wrap of the roller gauze forming two loose ends which can then be tied around the limb securing the bandage.

-continues on page 12

Applying A Roller Gauze Bandage

Roller gauze bandages are frequently used on extremities because of their ease in wrapping the limb and holding the dressing in place. After anchoring the roller gauze bandage it is applied in a spiral motion around the limb, moving from the distal end of the injury to the proximal end of the injury (see figure 3) and then tied off. Conforming roller gauze bandages, such as Kling®, are easily applied because the bandage material ‘sticks’ to itself. Non-conforming gauze bandages require more attention and skill as the material ‘gaps’ and must be applied using a spiral reverse method.

Applying Fingertip Bandages

When bandaging the fingers sterile gauze dressings are used to wrap each finger individually, and then a 1" roller gauze is wrapped around the finger(s) in a spiral roll to secure the dressing in place. The spiral bandage can be secured at the base of the finger, or can be extended in a figure 8 application around the wrist for additional security (see figure 4).



Figure 4

Applying a Figure 8 Bandage: Figure 8 bandages (named for the number 8 shape they create as they are applied - see figure 5) are particularly useful on joints such as knees and elbows, and on the hand/wrist and foot/ankle combinations. They also work on shoulder/ neck injuries and are applied using roller gauze. Anchor the bandage at the distal end of the



Figure 5

bandage and then wrap the roller gauze in a figure-8 shape with the cross-bar of the 8 frequently at the joint area. Tie off the bandage when complete.

Open Triangular Bandages

Triangular bandages are large triangles of cloth (usually muslin) in an isosceles triangle shape with a right angle between the two equal sides - this right angle is called the ‘point’ of the triangular bandage (see figure 6).



Figure 6

The open triangular bandage is used to cover large areas of skin; either for a large injury such as a large avulsion, or for a burned area of skin. Common areas where an open triangular bandage can be applied are the head, foot, hand, back and chest. The Boy Scouts live up to their motto of *Be Prepared* by wearing their uniform neckerchiefs, which double as a triangular bandage and can be folded into a cravat.

Applying Cravat Bandages

Cravat bandages (named from the French word cravate for band or scarf) are often used to cover dressings around joints or large areas which roller gauze bandages cannot easily cover. A cravat bandage is usually folded from an open triangular bandage to a 2" to 3" width, depending on the application, although cloth can be cut specifically into cravat bandages. When applying a cravat bandage the midpoint of the cravat is centered over the dressing and the cravat is then wrapped in opposite directions around the extremity and back towards the midpoint where the ends are tied off together (see figures 7&8).

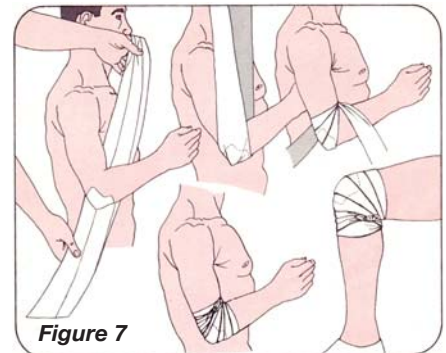


Figure 7

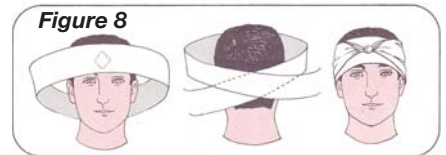


Figure 8

Cravat bandages can also be used in specialized bandages in specific locations such as a pressure bandage for a laceration to the palm of the hand (see figure 9). Don't forget to place a roller gauze in the palm of the hand first!

Cravats and open triangular bandages can be combined to cover large areas of the back or chest, shoulder or hip and buttocks.

Or cravat bandages can be used as an improvised tourniquet to control severe bleeding with or without an

-continues on page 14

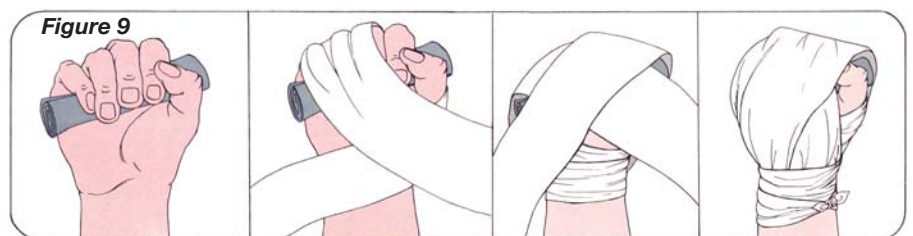


Figure 9

CEU Article: Bandaging

-continued from page 12

accompanying amputation. The cravat is tied in a knot around a windlass. The windlass is tightened until the bleeding is controlled. The ends of the cravat or a second cravat are used to secure the windlass to prevent loss of pressure.

Amputations

An amputation is forcible removal of a body part, frequently an extremity but it can also be a single finger, tip of the nose or lobe of the ear, as examples. *Never complete an amputation*, even if it makes it easier to transport the patient. Apply direct pressure to control the bleeding and elevate if possible. If the amputation is a clean cut across the extremity the elasticity of the arteries usually will constrict the artery and control most if not all of the bleeding. If direct pressure does not control the bleeding then a tourniquet must be applied (see figure 10). If it is possible, have someone

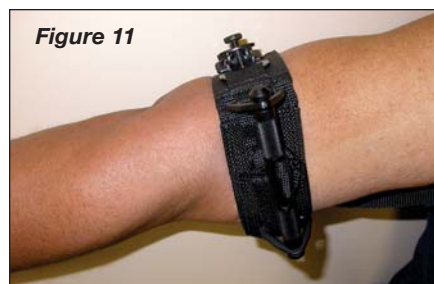


attempt to find the amputated part, wrap it in a moist sterile dressing and keep cool (do not freeze). Transport the amputated part to the hospital with the patient.

A tourniquet is applied approximately 2" proximal to the injury/amputation. If that places the tourniquet on a joint, then the tourniquet is moved an additional 2" proximal to the joint. The tourniquet is tightened until the bleeding is controlled and then it is secured in place so the pressure is maintained. A notation is also made in a visible location that a tourniquet has been applied, just in

case the extremity with the tourniquet is covered over and cannot be easily seen.

An improvised tourniquet – utilizing a cravat and a strong stick or pen as a windlass – or a commercial tourniquet (see figure 11) can be used.



Avulsions

An avulsion is a flap of skin which has been either partially or completely torn loose. As an example, the scalp may be avulsed if the patient has gone through the front windshield of a car. Emergency medical care of an avulsion, after taking standard precautions, would be to clean the wound surface with sterile water or saline, fold the skin flap back to its normal position and use bulky pressure dressings to stabilize the skin. A pressure dressing is made of multiple layers of sterile gauze dressings placed directly on the injury, secured in place with a bandage, and the knot from the bandage is tied directly over the injury to provide additional pressure to control the bleeding. If the avulsed skin cannot be replaced back in position, wrap the avulsed skin in a moist sterile dressing and transport with the patient.

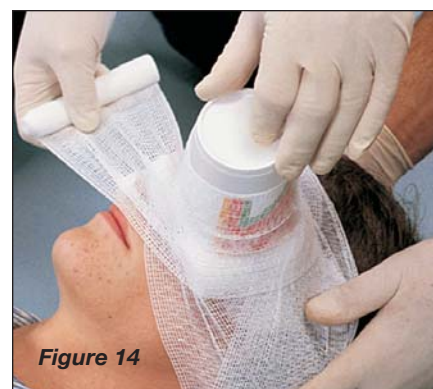
Penetrating/Impaled Objects

Impaled/penetrating objects remain in the body and frequently help control bleeding by placing direct pressure on the injured blood vessels. Penetrating objects should be bandaged in place unless the object creates an airway problem, interferes with potential CPR or the object is too large to transport in the ambulance. If the object must be removed, remove the object in the direction it went into the body, apply a pressure dressing over the wound after it has been removed, position the patient to allow appropriate drainage and monitor the



patient closely.

To bandage around an impaled object, first control any bleeding with direct pressure on the area around the impaled object, then stack bulky dressings on the sides of the impaled object and bandage snugly in place to prevent any motion (see figure 12). A donut made from a cravat can be used in lieu of bulky dressings, but it still needs to be bandaged security in place. Impaled objects in the eye should be covered with a plastic or paper cup over the impaled object and a figure 8 wrap around the cup to stabilize it (see figures 13 & 14).



Paula Weiler has been a NJ EMT since 1980 – with two squads in the NJSFAC's 3rd and 20th Districts – and a NJ EMT Instructor since 1983. She taught at the Bergen County Law & Public Safety Institute for nearly 30 years and now teaches at the S. Carol White EMS Academy and the Passaic County Community College Public Safety Academy.

