Section XII. APPLICATION OF HEAT AND COLD

14-75. General

The application of heat and cold discussed in this section is limited to those commonly administered in a ward or clinic. A doctor's order or local SOP is necessary for all applications of heat and cold. The physician will usually indicate the form of application, the area to be covered, the temperature of the application, and the duration and frequency of treatment. It is your responsibility to apply the prescribed form of heat or cold so that the treatment is beneficial, rather than injurious, to the patient.

14-76. Effects of Heat

Heat applied to the skin surfaces provides soothing comfort and speeds up the healing process. Heat dilates the superficial blood vessels (vasodilation) in the area of application. This increases blood supply and adds nutrients and oxygen to the tissues, supporting and maintaining body tissue and stimulating the growth of new tissue. There is an increase in white blood cells, which ward off infection, combat disease organisms, and aids to decrease the formation of pus (suppuration). The dilated blood vessels and increased blood supply in the area of heat application cause the skin to appear pinkish or reddish, although this color is more difficult to detect in dark-skinned or black patients. Heat is used to relieve pain due to muscle spasm, to relieve inflammation, to promote localization of purulent material (containing pus) and its drainage, and to relieve chilling.

14-77. Effects of Cold

a. When cold is applied to the skin or a part of the body, constriction of the superficial blood vessels (vasoconstriction) occurs. The skin becomes pale and cool. The diminished blood flow in the area of application reduces the oxygen and nutrients available to the cells and slows down cellular metabolism. This decreased cellular activity leads to the numbing or anesthetic effect associated with cold. Prolonged exposure to cold lessens pain as well as sensation. If cold continues to interfere with adequate circulation, it can cause damage to body tissues, such as necrosis (death of tissue) caused by severe frostbite.

b. Medically, the effects of cold applications are employed to reduce edema resulting from sprains, strains, and contusions. Hypothermia is often used to cool the patient's body in order to reduce metabolic needs and the amount of anesthetic required during prolonged surgery. Cold packs are used to control bleeding (ice collars applied after tonsillectomy) and aid in the reduction of edema following an injury. The physician usually will indicate the temperature to be used for cold applications (tepid, cool, cold, or very cold).

14-78. Effects on the Autonomic Nervous System

Although the procedure of applying heat or cold to the body is relatively simple, the effect on the body is much more complex. Changes in the body's external temperature activate the autonomic nervous system, which produces systemic responses in the body.

a. Heat. The systemic response begins with the thermal receptors in the skin, which send messages to the temperature control center in the brain (hypothalmus) indicating that the skin is now warmer. The hypothalmus responds by dilating the vessels in the area to allow more blood to flow through them and to distribute the heat. This regulatory function helps to

maintain a uniform internal temperature and to prevent damage to the tissue cells. The amount of blood diverted to the skin through vasodilation reduces the amount of blood circulating through internal organs and other structures. This protects the internal organs and delicately balanced body functions from harmful effects due to increased temperature. Application of heat to a small area of skin produces a milder systemic response than application to a larger area. Systemic circulatory changes may cause faintness, a faster pulse, and some degree of dyspnea. For these reasons, you must take the patient's vital signs frequently, and observe the skin when heat is applied to a large area of the body.

b. *Cold.* The systemic effects of cold are the reverse of those occurring in the application of heat. The diversion of blood volume from the skin to the vital interior organs insures their continuing function. The body acts to conserve body heat when cold affects the entire body or large portions of it. Muscles are stimulated to contract; the resulting shivering action produces some heat and squeezes more blood out of vessels with in the muscles.

14-79. Patient Safety

a. The body is able to tolerate large changes in external temperatures; however, moist applications to the skin of temperatures that are warmer than 110°F (43.3°C) or colder than 40°F (4.4°C) can seriously damage body tissue. Individual sensitivity to temperature changes varies; the very young and the very old particularly are unable to tolerate such changes. When the temperature affects a large body area, the skin becomes less tolerant to extremes of temperatures. The skin is better able to tolerate brief treatments than prolonged applications of heat or cold. Also, thin-skinned areas of the body and those not usually exposed tend to be more sensitive to temperature changes than areas like the palm of the hand or the sole of the foot, which are exposed and have thicker layers of skin.

b. There is always a problem when the treatment is ordered by descriptive adjective, since the questions of "how hot is hot?" and "how cold is cold?" must be answered. The range of temperature from hot to cold, in relation to therapeutic applications, falls within these limits:

ACCEPTED TEMPERATURE RANGES FOR APPLICATION OF HEAT:

Fahrenheit		**Centigrade**
105° to 115°	very hot	41° to 46°
98° to 105°	hot	37° to 41°
93° to 98°	warm	34° to 37°

ACCEPTED TEMPERATURE RANGES FOR APPLICATION OF COLD:

Fahrenheit		Centigrade
80° to 93°	tepid	26.7° to 33.9°
65° to 80°	cool	18.3° to 26.7°
55° to 65°	cold	12.3° to 18.3°
Below 55°	very cold	below 12.5°

Added to the temperature in degrees is the moisture factor—moist heat and cold are both more penetrating and more intense in their effect on body tissue.

14-80. Local Application of Heat

A local application is one that is used on a specific part of the body. These applications are usually in the form of either dry or moist heat. To protect the patient from burns due to heat applications—

a. Measure the temperature with a solution (bath) thermometer, if possible.

NOTE

When a thermometer is not available, place the pack against the inner aspect of your arm. If any doubt exists that the application is too hot, cool it down. You must always remember that what might feel comfortably warm on normal, healthy skin could be dangerously hot if applied to the skin of infants, old people, or individuals with impaired circulation.

b. Always use a protective cloth cover. Never apply directly against the skin.

c. Observe the condition of the skin frequently for signs of burning or blistering and be attentive to any complaints by the patient.

d. Caution the patient not to attempt to increase the temperature of water in hot water bottles.

(1) *Dry heat.* Heat is commonly used as dry applications and may be applied by a hot water bottle or a chemical heating pad. There are also various other methods such as thermoregulated electric pad and heat cradle, but these are used infrequently.

(a) Hot water bottle.

1. Fill a pitcher with hot water. Test the temperature with a bath thermometer. The temperature should not be more than 120°F.

2. Pour water into bottle to one-half capacity. Expel air by gradually resting the bottle flat on a table until the water reaches the neck of the bottle. Expelling the air makes the bottle pliable so that it will conform to body contours.

3. Secure the stopperless closure by folding over the the neck tabs in proper sequence (A tab first, B tab second, and so on) (Figure 14-55).

4. Test for leaks. Wipe surface dry. Cover with a hand towel or other dry cloth cover.

5. Apply to prescribed area. Tell the patient that it is intended only for the area to which applied.

6. Check skin area before refilling and reapplying. Do not apply if an area of heat-induced redness is apparent.

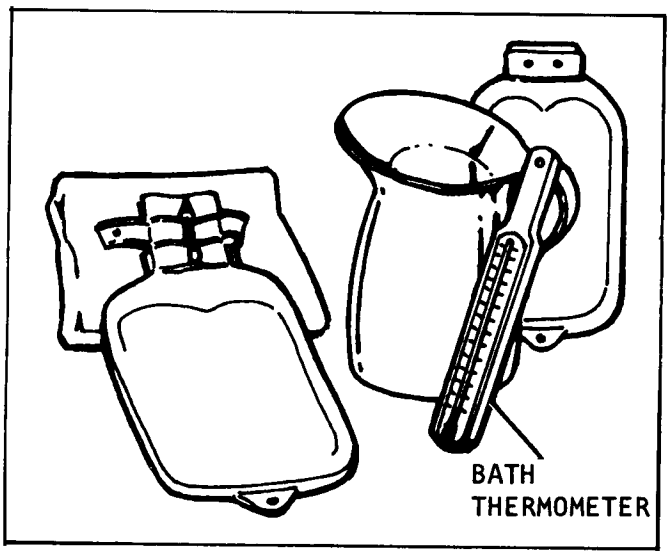

Figure 14-55. Preparation of hot water bottle.

(b) Chemical heating pad, water-activated (Figure 14-56).

1. The chemical heating pad comes complete with a stick and a waterproof cover.

2. Clear the opening in the upper corner of the pad with the small stick and pour in 30 cc's of cold water.

3. Manipulate (knead) the bag briskly between your hands to mix the water and chemicals. Place the bag in the waterproof container, or wrap it in a towel or other covering, and apply the pad to the patient as directed.

CAUTION

The amount of heat that continues to be generated for several hours by chemical reaction *cannot* be controlled; you must check frequently to be sure the pad is not too hot for the patient. Apply additional padding between the patient and the heating pad if it is too hot.

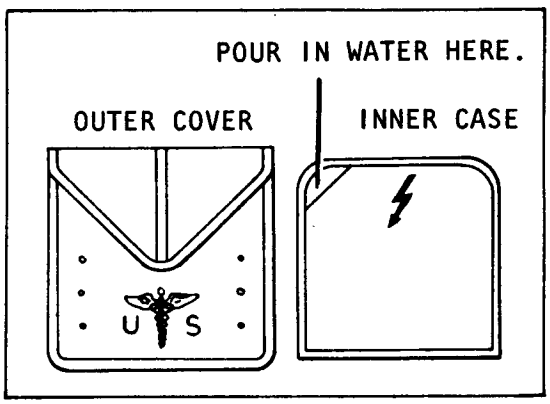

Figure 14-56. Chemical heating pad, water-activated.

(2) *Moist heat.* Moist heat is usually applied as a soak, compress, or pack. Solutions such as sterile water, normal saline, and a number of medicated solutions will usually be specified by the doctor if other than tap water is to be used. You must remember that water is more effective than air as a conductor of heat. In addition to observation for reaction to heat, skin exposed to moisture for a prolonged period must be observed for any sign of maceration (destructive softening, puffiness, or wrinkling of the surface). Maceration is prevented by exposing the skin to air for 1/2 to 1 hour between reapplications of moist heat; this step is important when moist heat is prescribed as a "continuous application."

14-81. Arm or Foot Soaks

a. A soak is the direct immersion of a body part (arm or foot) in warm water or in a medicated solution. Tap water is generally used for soaks. The physician usually indicates the type of solution, the body area to be soaked, the temperature of the solution (usually 105^{o}-110^{o}F), and the duration of the treatment.

b. Procedure.

(1) Assemble supplies and equipment. Choose a container for the solution sufficiently large enough to accommodate the area to be soaked.

(2) Explain the procedure to the patient. Heat the solution to the prescribed temperature.

(3) Position the patient. Drape him so that the area is exposed, but maintain his privacy and warmth.

NOTE

If patient has soiled dressings, use aseptic technique to remove them and discard the soiled dressing in accordance with local SOP.

(4) Pour the heated solution into the soaking basin. If medication is to be added to the solution, this is the time to add it. Be sure that it is mixed thoroughly with the solution.

(5) Test the temperature of the solution and keep it constant during the treatment. If no thermometer is available, use the anterior aspect of your wrist to test the temperature. A solution that feels hot on the wrist will probably be too hot for the patient.

(6) Immerse the specified body part gradually into the solution so that the patient becomes accustomed to the temperature change. Soak the body part for the specified period of time.

(7) Remove affected body part from the solution. Support the body part as you remove it and remove the soaking basin. Dry the affected part thoroughly. If there is an open wound, pat dry around it, not directly on it. Apply a dressing if needed.

NOTE

When ordered for treatment of an open wound, sterile equipment and solution are used to reduce contamination; once the part is immersed, however, any organisms present contaminate the solution and sterility cannot be maintained. The initial use of sterile equipment and a sterile towel to dry the area provides a margin of safety.

14-82. Local Application of Moist Heat, Clean Technique

a. Use clean technique for local applications, compresses, or packs applied to intact skin. The difference between a compress and a pack is in the material used and the body area on which it is used. A pack (also referred to as massive wet dressings) is usually applied to an extensive body area such as an entire leg or arm; a compress is normally applied to a limited body area and consists of warm, moist gauze pads or clean folded washcloths.

b. Compresses and packs differ from soaks in that they are used for a longer period of time and are usually applied at a higher temperature. They are applied at the hottest temperature the patient can tolerate without burning the superficial tissue. The material can be wrung out manually (hands or forceps) so that it does not drip on the patient when applied, but it must remain moist enough to conduct the desired amount of heat.

c. Because compresses and packs usually cool off rapidly, the length of time they retain heat depends on the temperature of the solution, the thickness of the material, and the type of insulation used. Generally, they remain hot for 15 to 20 minutes, then have to be reheated and reapplied.

d. Procedure for applying moist, hot compresses to a bed patient.

(1) Place a hot plate on a table convenient to use. Plug in the plate and turn switch to low heat setting.

(2) Place basin of water, at a temperature of 110°-115°F, on the hot plate. Do not allow solution to be hotter than the hands can comfortably stand. Place gauze pads or folded washcloths in the hot solution.

(3) Place patient in comfortable position, with protective pad under the body part to be treated in order to protect bed.

(4) Lift hot wet compress from basin. Wring out as dry as possible. Test heat of compress against inner surface of forearm. Lay hot compress gradually on area to be treated, lifting corners to eliminate any steam.

(5) Observe skin carefully for redness before reapplying compress. If no unfavorable skin reaction is observed, exchange the cooled compress for a heated one, continuing reapplications for the prescribed length of time, usually for 20 minutes.

(6) Turn off hot plate and disconnect wall plug after each treatment. Compress may be reused if not soiled.

NOTE

If compresses are to be self-applied by the patient, demonstrate the entire procedure to the patient and have him repeat it. Check from time to time to see that instructions are being followed and to observe skin area.

e. Moist hot packs (clean).

(1) Gather appropriate equipment. Place a hot plate on a table convenient to use.

(2) Place basin of solution, at a temperature of 110°-115°F on the hot plate. Solution should be no hotter than your hands can comfortably stand. Place two bath towels (folded in half) in the basin of hot solution.

(3) Place patient in comfortable position with extremity to be treated elevated properly and completely exposed. Place protective pads under the extremity and over the pillows. On top of protective bed covering, place dry bath towel and rubber or plastic sheeting to bind the hot pack in place.

(4) Wring out and test hot towels by touching one to your forearm. Place one hot folded towel under and one over the extremity to be treated in order to completely inclose it. Fold plastic or rubber layer over the extremity to inclose the hot moist towels. Then fold over the dry towel and pin or fold securely to keep the pack in place.

(5) Apply hot water bottles or chemical heating pad to the outside of the towel binding as needed to maintain the pack's heat.

(6) Reapply hot pack as prescribed, checking condition of the skin each time. When properly applied, it is possible to maintain the required amount of heat and moisture for about 1 hour with each hot towel application.

(7) When hot pack is discontinued, pat skin dry.

(8) If pack is to be continued day and night, set up a schedule for reapplying to allow a required period of skin exposure to air. Use clean towels next to the skin to prevent a sour odor. Wash and gently dry the inclosed skin area to remove perspiration and skin secretions before the air exposure period.

14-83. Local Applications of Cold

a. Cold is applied to small localized areas of the body in dry form by means of an ice bag or in moist form by means of iced, moist compresses. Continuing contact with cold produces numbness as well as constriction of bood vessels. While both of these effects may be desired, the area to which cold is applied must be watched closely since the patient may not complain of symptoms indicating possible tissue damage. Local signs of unfavorable reactions to cold include pallor, blueness, or mottling (blotchy) discoloration of the skin. If these signs are noticed, discontinue the application immediately and report the observation. When continuous moist cold is ordered, remove for 20 minutes every 2 hours.

b. Application of ice bag. The ice bag may be a dual-purpose, hot water bottle or an ice collar. (A securely tied plastic sack or latex rubber glove may also be used when a flexible, lightweight container is needed to apply ice to an eye or the nose.)

(1) Crack or crush the ice to eliminate large pieces or sharp edges.

(2) Fill the container only half full with ice; expel all air so that it will be flexible. Close securely and test for leaks.

(3) Wipe the surface of the container dry. Inclose it completely in a dry cloth, cloth bag, stockinette, several layers of gauze, or a hand towel.

(4) Apply container so that it is in contact with the designated local area, propping where necessary to relieve weight and pressure.

(5) Check and refill as necessary to keep the local area cold for the prescribed period.

NOTE

Always change the cover if it becomes moist.

(6) Observe the skin area carefully. Discontinue application and report unfavorable reactions immediately (STAT).

(7) When treatment is discontinued, drain, wash, dry, and inflate the bag with air before returning it to its proper storage place.

c. Application of cold compresses. The compress should be several layers thick and of sufficient size to cover the designated area. Gauze pads or clean, folded washcloths are used. These are often self-applied, following instruction and initial assistance.

(1) Place protective cover under the part to be treated to protect the bedding.

(2) Place large pieces of ice and a small amount of water in a hand basin or sponge bowl. Place compresses or clean folded washcloth (in sufficient number to permit frequent exchange) in the ice water.

(3) Squeeze excess moisture from a chilled compress and apply the compress quickly to designated area. Do no cover the compress.

(4) As the compress loses its coolness, exchange it for a freshly chilled and moistened one. This step is repeated every 5 or 6 minutes for the 15- or 20-minute application period.

(5) When treatment is discontinued, wash and dry the basin.

(6) Start each application with clean water and ice. Replace gauze or washcloth as they become soiled.

14-84. General Application of Cold

A general application is one that is applied to the entire body. Cooling of the entire body is usually accomplished by means of a special hypothermia unit (cooling blanket) used under the supervision of an anesthetist, or by using a cooling sponge bath.

14-85. Sterile Technique for Applications

a. Sterile technique must be followed when applying moist hot or cold applications to broken, infected, or burned skin area, and medical asepsis must be observed when draining wounds are involved. An important goal is to prevent the contamination of a wound and to control the spread of organisms from an infected wound. The clean procedures described for soaks, compresses, and packs must, therefore, be modified to include the use of aseptic supplies and techniques.

b. Sterile applications are most often used for smaller body parts, and various medications can be prescribed by the doctor. The necessary supplies include—

- Bottle or flask of sterile solution.
- Disposable sterile irrigating set.

- Sterile gauze dressings.
- Sterile gloves or forceps, as required.

If the irrigating set is not used, a sterile basin may be needed to hold the solution. When using the sterile irrigating set, the solution is poured aseptically into the container and drawn up in the Asepto syringe, and the sterile dressings are moistened with the solution. Sterile gloves or forceps may be needed to wring out the excess solution from the compresses and apply them in place. A sterile dry pad or dressing applied over the moist one helps retain the temperature of the compress or pack.

Section XIII. THERAPEUTIC BATHS

14-86. General

a. When there is a need to quickly decrease a patient's temperature, a tepid or cold sponge bath may be required. This technique is based on the principle that the body loses heat through the conduction of heat to a cooler substance such as water or alcohol.

b. To verify that a sponge bath is needed, the patient's rectal temperature should be taken. If the rectal temperature is greater than 106°F (41°C), immediate cooling of the patient is necessary. The rectal temperature should be checked every 10 minutes and not allowed to fall to less than 101°F (38°C).

c. The following equipment is needed to administer a tepid sponge bath:

(1) Two bath blankets.

(2) Basin of tepid water.

(3) Two bath towels.

(4) Eight wash cloths.

(5) Rectal thermometer.

(6) Sphygmomonometer.

(7) Stethoscope.

14-87. Administering the Sponge Bath

a. Before starting sponge bath, the patient's vital signs must be taken. These vital signs will serve as a baseline for comparison to determine

the effectiveness of the treatment. The most important vital sign is the patient's temperature. Before sponging the patient, apply cold, wet compresses to the groin, axillae, and neck.

b. Sponging is done by slowly stroking the skin surface area with long, soothing strokes, using the wet washcloths. The areas to sponge are the face, trunk, and abdomen for about 5 minutes, the entire back and buttocks for about 5-10 minutes, then each extremity for about 5 minutes. Each area should be gently dried with a towel after it is sponged.

c. Observe the patient closely for shivering. If shivering occurs, cover him completely with the bath blanket and apply gentle friction to the torso and extremities. Remember the patient's first reaction to the bath is chilliness; this disappears as the body adjusts to the cold temperature. The bath must be continued for at least 25-30 minutes. The rectal temperature must be checked every 10 minutes after the bath is stopped. The temperature can be expected to drop further to normal. The bath should be discontinued if cyanosis and/or shivering does not stop when friction (rubbing) is applied to the skin.

d. In the field you must decide when a tepid, cold, or alcohol sponge bath is necessary. If the patient's temperature is 106°F (41°C) or higher, a sponge bath is indicated. You will need—

(1) Tepid water,

(2) Ice, if available.

(3) Alcohol, if available.

In certain situations it may not be feasible to remove the patient's clothes. Therefore, you must be able to improvise as needed to cool the patient immediately.

14-88. The Field Expedient Sponge Bath

a. Unbutton the clothing as much as possible after the temperature is taken, then apply cool compresses to the groin, axillae, and neck.

b. After the cool compresses are applied, use a cravat or field dressing to sponge the patient, using soothing strokes over the skin, one side at a time.

CAUTION

Do not use alcohol in sensitive areas of the body such as the face, axillae, or groin.

c. Another method used to cool the patient is to pour water over him and use whatever is available to fan him for approximately 20 minutes. After 20 minutes, check the vital signs and temperature. If temperature is still above 101°F (38°C), repeat the procedure.

d. Observe the patient closely for shivering. Shivering increases the production of body heat; if this happens, the effectiveness of the bath is lessened.

e. Stop treatment if pulse increases, cyanosis (bluish discoloration) is noted, or shivering starts.

14-89. Completion of the Sponge Bath

After the bath, provide for the patient's safety and comfort. Dry the patient and provide dry clothing, if necessary. Record the treatment, vital signs, length of treatment time, date, patient's tolerance, and type of bath.

Section XIV. MANAGING A PATIENT REQUIRING CHEST TUBE DRAINAGE

14-90. General

a. Normal breathing in a human operates on the principle of negative pressure (the pressure in the chest cavity is lower than the pressure of outside air, causing air to rush into the lungs). Whenever the chest is opened (by surgery or trauma), there is a loss of negative pressure, which can cause a collapse of the lungs.

b. Pleura is the membrane that covers the chest walls and lungs and produces a serous fluid (moist and slippery secretions) to reduce friction during respiration. The parietal pleura lines the chest cavity and the visceral pleura covers the lungs. When conditions produce a space between these pleural layers, breathing is changed and the lungs can no longer fully expand (Figure 14-57).

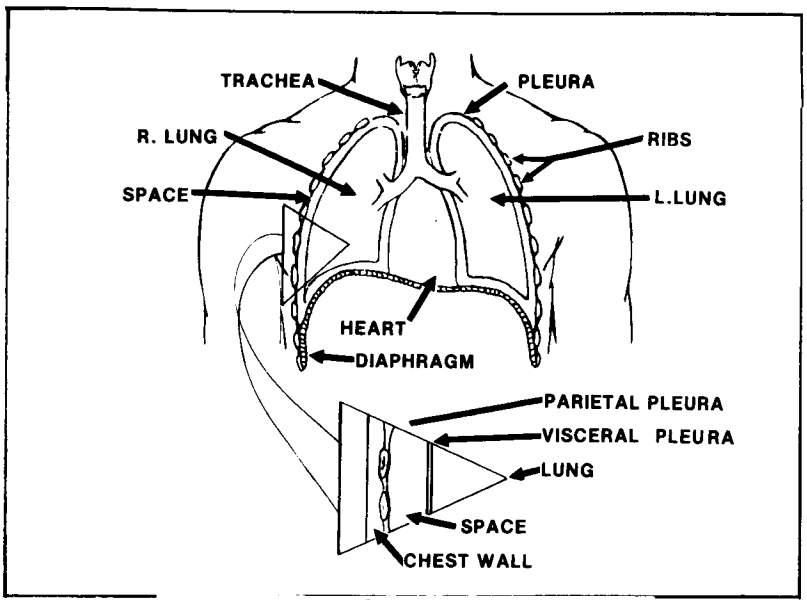

Figure 14-57. The respiratory system.

c. Blood and air collect in the pleural space as a result of penetrating wounds, a fractured rib that punctures a lung, the rupture of a blister (bleb) on the lung surface, or a surgical procedure. A chest tube is inserted by a physician as an emergency treatment or at the completion of surgery. It is connected to an underwater-seal drainage bottle or to a disposable pleural drainage system.

d. There are many connections in the drainage system, and the breakdown of any one could cause a second collapse of a lung. Most equipment problems are the result of the system not being airtight. This is usually caused by a loose hose or connector and can lead to serious complications if not detected and corrected.

e. There are two basic types of apparatus used for underwater-seal chest drainage:

(1) Drainage without suction, including 1-, 2-, and 3-bottle setups. The 1-bottle setup is most commonly used when suction assistance is not required.

(2) Drainage with suction is used when water-seal drainage alone does not eliminate free air from the pleural cavity in sufficient quantities to permit lung expansion.

14-91. Managing a Patient Requiring Chest Tube Drainage

a. Wash hands and put on sterile gloves.

b. Attach drainage tube from the pleural cavity to the tubing that leads to a long tube with the end submerged in sterile normal saline (Figure 14-58).

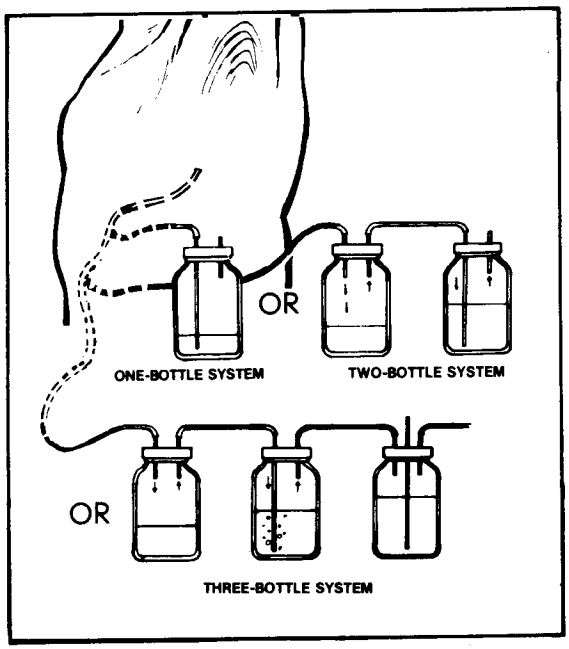

Figure 14-58. Drainage system.

c. Tape points where tubing is connected. Taping the connections insures that the tubing and connectors do not become loose or slip apart and an airtight seal is maintained.

d. Place tube approximately 1 inch (2.5 cm) below the water level (Figure 14-59).

e. Vent short tube so that it is left open to the atmosphere (Figure 14-59).

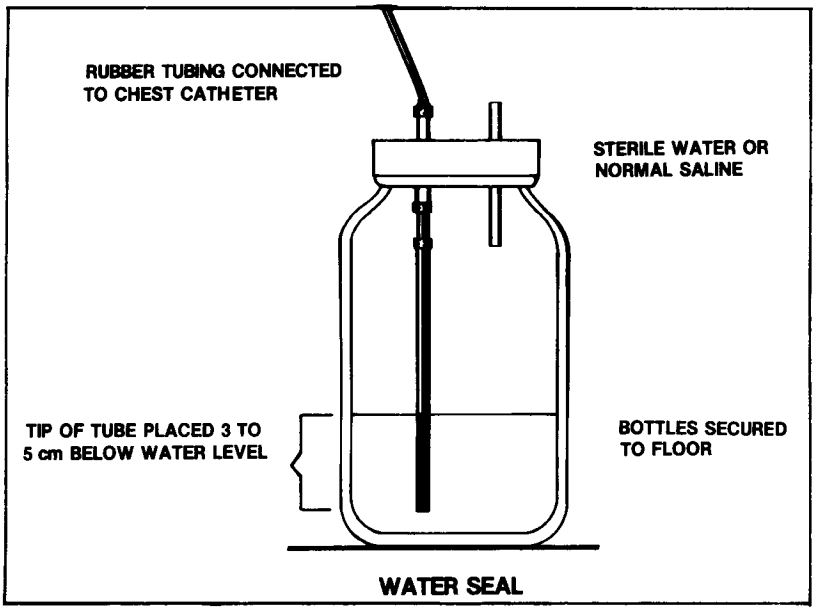

Figure 14-59. Tube below water level and vent short tube.

f. Mark original fluid level with tape on the outside of the drainage bottle (Figure 14-60). Mark hourly/daily increments as ordered (date and time) at the drainage level.

CAUTION

Grossly bloody drainage will appear in the bottle during the immediate postoperative period and if more than 100 cc/hr, notify your supervisor *immediately*.

NOTES

1. Marking will show the amount of fluid loss and the rate fluid is collecting in drainage bottle.

2. Drainage usually declines progressively after 24 hours.

3. When drainage bottles are changed or discontinued, subtract the measured water from the total to obtain the fluid drainage total.

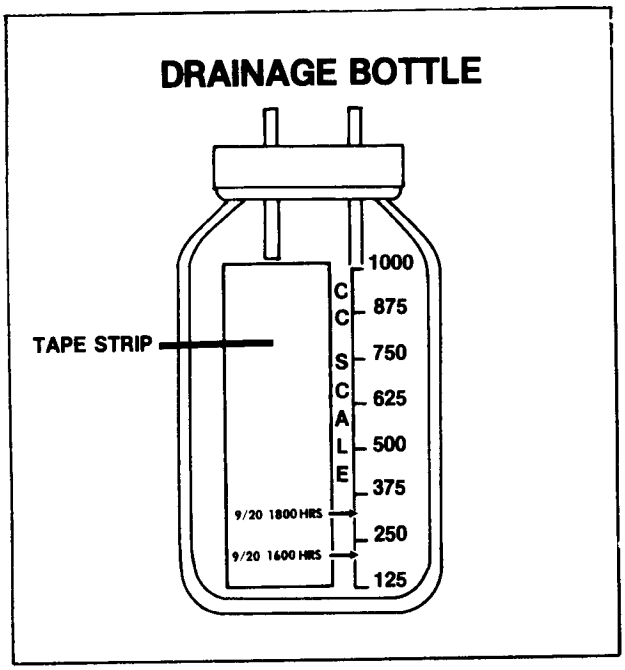

Figure 14-60. Original fluid level mark.

g. Assure that the chest drainage system is airtight at all times.

(1) Vigorous bubbling of the chest tube bottle *when suction is not being applied* indicates a leak in the system. All connections should be checked to insure that an airtight system exists. Vigorous bubbling may be caused by a loose connection or a defect in the lung. Report this to your supervisor *immediately*.

(2) If a connector is completely disconnected or the drainage bottle is broken, immerse the end of the tube in a container of sterile water, thereby providing a water seal. Notify your supervisor *immediately*. An entire sterile drainage system will need to be reconnected to the chest tube.

NOTE

When the system is not completely airtight and in water seal, the patient will have an immediate pneumothorax. If a container of sterile water is not available, attach a Heimlich valve (Figure 14-61) to the open end of the tubing and the system will be complete until the underwater seal can be obtained. A field expedient Heimlich valve can be made by dampening the inside of a penrose drain and taping it to the open end of the tube or taping a finger of a sterile glove to the open end of the tube and cutting the tip of the finger (Figure 14-61). These methods provide a flutter valve effect which will allow air to escape on expiration and seal on inspiration so that air cannot enter the plural cavity through the tubing.

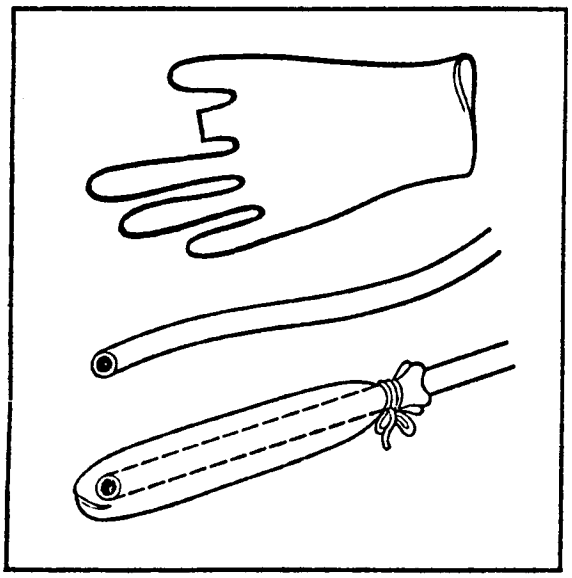

Figure 14-61. Finger of glove as Heimlich (flutter) valve.

h. Fasten tubing to drawsheet with rubber bands and safety pins. This will allow gravity flow to occur.

CAUTION

1. Kinking, looping, or pressure on the drainage tube can produce back pressure, and possibly force drainage back into the pleural space, impede drainage from the pleural space, or cause a tension pneumothorax.

2. Tubing should not loop or interfere with the patient's movement.

3. Do not clamp a chest tube unless directed by and under the supervision of a physician.

i. Allow the patient to assume a comfortable position.

(1) Encourage good body alignment.

(2) Encourage patient to change positions frequently.

(3) Place a rolled towel under the tubing when the patient is in the lateral position.

NOTES

1. Often patients are most comfortable in the Fowler's or semi-Fowler's position.

2. Proper positioning helps breathing and promotes better air exchange. Pain medication may be indicated to enhance comfort and deep breathing.

3. Frequent position change prevents postural deformity and contractures, as well as promoting drainage.

4. The rolled towel will protect the tubing from the weight of the patient's body.

j. Initiate range-of-motion exercises of the arm and shoulder on the affected side several times daily to help avoid ankylosis (stiff joint) of the shoulder and assist in lessening postoperative pain and discomfort.

k. "Milk" the tubing in the direction of the drainage bottle on an HOURLY basis. (See Figure 14-62).

l. Insure that there is fluctuation of the fluid level in the long glass tube.

NOTES

1. Changes in the water level in the tube indicates that there is effective communication between the pleural cavity and the drainage bottle, provides a visual indication that the system is operating properly, and is a gauge of intrapleural pressure.

2. Changes in the level of fluid in the tubing will stop when—

   (a) The lung has reexpanded.

   (b) The tubing is obstructed by blood clots or fibrin.

   (c) A loop develops.

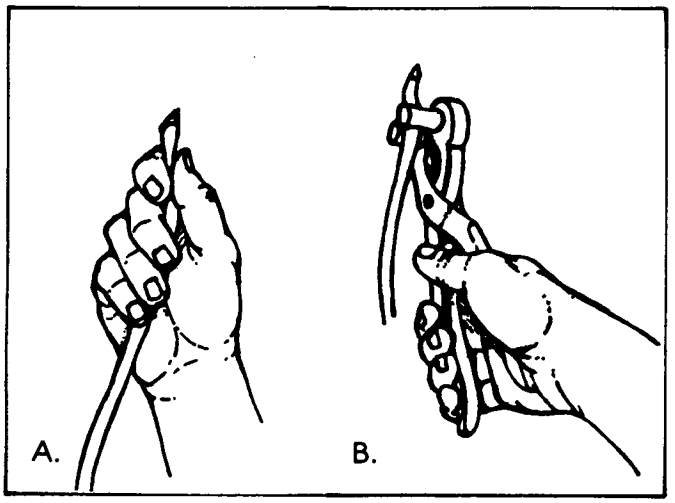

Figure 14-62. "Milking" by hand (A) or by mechanical device (B).

m. Observe for air leaks in the drainage system:

(1) This is indicated by constant bubbling in the underwater-seal bottle. However, if the system is hooked to a suction device, the underwater-seal bottle will bubble.

(2) For just a few seconds, clamp the tubing close to the chest wall if there are any air leaks, but *ONLY WHEN ORDERED BY THE PHYSICIAN.*

CAUTION

1. Leaking and trapping air in the pleural space can result in a tension pneumothorax.
2. If the leak is in the patient and the tube is clamped for more than a few seconds, air may back up in the pleural cavity and extend the patient's pneumothorax.

n. Report excessive bubbling in the water-seal chamber immediately in accordance with local SOP.

o. Observe for and immediately report the following:

(1) Rapid, shallow breathing.

(2) Cyanosis (bluish skin color).

(3) Complaints of pressure in chest or sharp chest pain.

(4) Subcutaneous emphysema (palpate for "crackling" sensation).

(5) Symptoms of hemorrhage.

NOTES

1. Many clinical conditions may cause these signs and symptoms.
2. Cyanosis results from poor oxygenation of the circulating blood.
3. When palpating for subcutaneous emphysema, the "crackling" sensation may also be felt.

p. Encourage the patient to breathe deeply and cough at frequent intervals.

(1) Deep breathing and coughing assist in raising the intrapleural pressure, thus emptying the accumulation in the pleural space and removing secretions from the tracheobronchial tree, with an expansion of the lung and prevention of atelectasis (collapsed or airless lung).

(2) If there are signs of incision pain, adequate pain medication is indicated.

q. Stabilize the drainage bottle on the floor with tape or in a special holder.

CAUTION

If any part of the apparatus is damaged, the closed system of drainage will be destroyed and the patient will be endangered by atmospheric pressure in the pleural space, with possible collapse of the lung. The drainage system must be kept airtight to reestablish negative intrapleural pressure.

r. If the patient must be transported on a stretcher, place the drainage bottle below chest level, as close as possible to the floor. The drainage apparatus must be kept at a level lower than the patient's chest, to prevent backflow of fluid into the pleural space.

s. Assist physician in removing tube.

(1) Remove tape, dressing, and sutures.

(2) Instruct the patient to perform the Valsalva maneuver (forcible exhalation against a closed glottis, holding the breath).

(3) Quickly remove the chest tube.

(4) Simultaneously, apply a small bandage made airtight with petrolatum gauze covered by 4 inch by 4 inch gauze.

(5) Cover thoroughly and seal with adhesive tape.

NOTES

1. The tube is removed as directed after the lung has re-expanded (usually from 24 hours to several days).

2. It is the physician's responsibility to remove the tubes and apply the dressing after tube removal.

3. During tube removal, the priorities are preventing air from entering the pleural cavity as the tube is withdrawn and preventing infection.

(6) Dispose of soiled items in accordance with the local SOP. Nondisposable items should be thoroughly cleaned and stored.

14-92. Indications of a Properly Working Drainage System

a. Observe for moderate bubbling in the suction control chamber of the Pleur-Evac or bottle system (if the patient is receiving suction or has a pneumothorax).

(1) If bubbling stops, check for properly operating suction apparatus.

(2) Excessive bubbling may indicate an air leak in the tubes or the patient's chest. Notify your supervisor immediately.

b. Observe for water level fluctuation in the water-seal chamber or Pleur-Evac bottle system, as patient inhales or exhales.

(1) If fluctuation ceases, check for kinked, looped, or wedged tubes. Look for clots in the tubes. Notify your supervisor if these measures do not help.

(2) Cessation of fluctuation may mean that the lung has re-expanded and no longer requires drainage.

14-93. Observations to be Made During Chest Drainage Procedure

a. Observe the following through the plastic connector between the chest tube and the drainage tube:

(1) Amount of drainage.

(2) Color.

(3) Consistency.

(4) Bloody drainage.

CAUTION

If any bloody drainage in excess of 100 ml per hour is noted, notify your supervisor IMMEDIATELY.

(5) Maintain up-to-date information on the drainage bottle label.

(6) Check the plastic connector hourly for the first 24 hours after chest tube insertion and every 8 hours thereafter.

b. Record the following information on the appropriate documents:

(1) Date and time of drainage bottle change.

(2) Amount, type of fluid, and color (example: pinkish; light red; dark red; or yellowish).

(3) Name of person changing drainage bottle.

(4) Statement indicating drainage specimen was/was not sent to the laboratory.

CHAPTER 15

OBSTETRIC AND GYNECOLOGIC EMERGENCIES

Section I. THE FEMALE REPRODUCTIVE SYSTEM

15-1. General

In this chapter, the basic structures and functions of the female reproductive system will be discussed, as well as the stages of pregnancy and the progression of normal labor and delivery.

15-2. Anatomy and Physiology

a. The female reproductive system includes the ovaries, fallopian tubes, uterus, and vagina. The female reproductive organs are located in the pelvic cavity. The uterus is situated in the pelvic cavity between the bladder and the rectum. The bladder orifice, or urethra, is above the vaginal opening. The rectum and its opening, the anus, is located below the vagina. The vaginal, urethral, and rectal orifices open into the perineum (Figure 15-1). Any trauma to the reproductive organs can also cause injury to the bladder, urethra, rectum, and/or anus because of the close location of these organs to each other.

b. The ovaries, two almond-shaped organs that produce ova (eggs), are located in the left and right lower quadrants. During reproductive years, the ovaries release a mature ovum about once a month. Progesterone and estrogen, the female sex hormones, also are produced by the ovaries. In the nonpregnant woman, estrogen and progesterone secretions vary each month. In the pregnant woman, these hormone secretions vary according to the stage of pregnancy.

(1) *Estrogen* thickens the lining of the uterus (endometrium), fallopian tubes, and vagina. In addition, estrogen produces secondary female sexual characteristics. Estrogen also affects kidney functions. It decreases sodium chloride which decreases urine output and increases extracellular fluid volume.

(2) *Progesterone* can act only on tissues that have been filled by estrogen. Progesterone prepares the reproductive tract for implantation of a fertilized egg. It also prepares the breasts for lactation (milk production).

c. The *fallopian tubes* permit passage of the ova from the ovaries to the uterus. At their ovarian ends, the fallopian tubes are funnel-shaped and fringed with small, finger-like structures, which insure that the ova reach the fallopian tubes from the ovaries. The fallopian tubes are narrower at their uterine ends.

d. The *ovum* travels through the fallopian tube into a pear-shaped, muscular organ called the uterus (womb). In the nonpregnant woman, the uterus is about 3 inches high, 2 inches wide, and 1 inch thick. It is located between the bladder and the rectum. In the pregnant woman, the uterus enlarges and rises upward. By the end of pregnancy, the uterus is approximately 12 inches high, 9 inches wide, and 8 inches thick.

e. The *uterus* has three layers: the perimetrium, the myometrium, and the endometrium. The perimetrium is the peritoneal covering of the uterus that separates it from the abdominal cavity. The myometrium, a thick,

muscular wall, forms most of the uterus. The thickness of the endometrium, the inner lining of the uterus, varies cyclically each month in nonpregnant women.

f. During the early part of the menstrual cycle, the endometrium thickens to prepare for ovulation (release of a mature ovum). If the ovum is fertilized, it will implant in the endometrium and develop into a fetus. If the ovum is not fertilized, however, the uterus sheds its endometrial lining 14 days after ovulation. A menstrual period, a discharge of bloody fluid from the uterus, is produced by the shedding of the endometrial lining.

g. During labor and delivery, the fetus and placenta pass through the cervix and the neck of the uterus, which is fully dilated at delivery. The cervix connects the uterus to the vagina. The vagina is a muscular tube leading to the external genitalia. The vagina serves also as the birth canal during labor and delivery.

h. The ovaries, fallopian tubes, uterus, and vagina receive blood from the ovarian, uterine, and vaginal arteries. The blood supply to the internal reproductive organs is complex and if injured and/or left untreated, bleeding may be excessive and/or fatal.

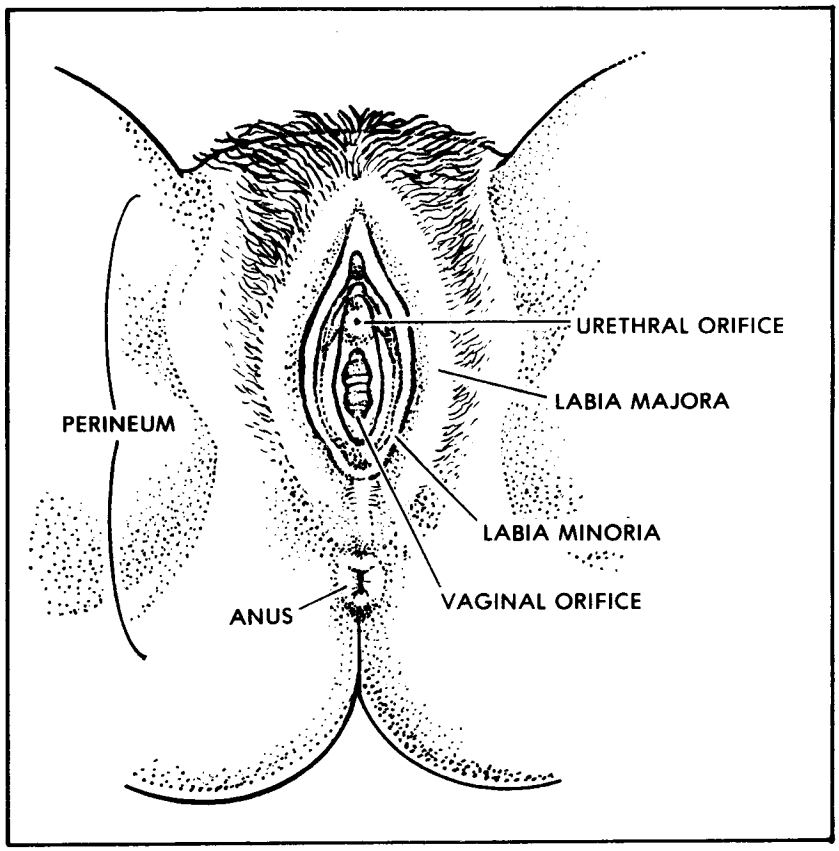

Figure 15-1. Perineum.

i. The external female genitalia include the vulval structures, the labia majora and the labia minora. The labia majora are large, rounded, lateral skin folds. The labia minora are smaller skin folds that are between the labia majora and vaginal opening and are usually hidden by them.

j. The breasts are secretory glands located on the anterior chest wall. During pregnancy, estrogen and progesterone act on the breasts to prepare them for lactation following delivery. After delivery, hormones (prolactin and oxytocin) secreted by the pituitary gland, stimulate the breasts to produce milk.

Section II. PREGNANCY AND CHILDBIRTH

15-3. General

Pregnancy begins when an ovum unites with a sperm cell that has been introduced into the female reproductive tract. The union of the ovum and sperm cell is called fertilization, and occurs in the outer third of the fallopian tube. The fertilized ovum passes into the uterus and implants in the endometrium. Implantation usually occurs in the upper part of the uterus.

a. The fertilized ovum develops into a fetus. The fetus is nourished by the placenta. The placenta, a special disk-shaped organ, develops during pregnancy and attaches to the inner wall of the uterus. Oxygen and nutrients pass from the mother's bloodstream into the fetal bloodstream through the placenta. Carbon dioxide and waste products also pass from the fetal blood vessels into the mother's blood vessels through the placenta. Maternal and fetal blood vessels are in close contact with the placenta, but the two bloodstreams do not mix.

b. Fetal blood enters and leaves the placenta through blood vessels contained in the umbilical cord (Figure 15-2). These umbilical blood vessels enter the fetus through the umbilicus, or navel. Two umbilical arteries carry unoxygenated blood from the fetus to the placenta. A single umbilical vein returns oxygenated blood to the fetus. The combined blood flow into the placenta from the fetal and maternal circulation is large in volume; therefore, any disturbance to the placenta (example, separation from the uterine wall or change in position) will cause extensive bleeding and can endanger both the fetus and the mother. In addition, blood supply to the entire uterus increases during pregnancy; therefore, uterine injuries also can produce extensive bleeding.

c. While in the uterus, the fetus is inclosed in the amniotic sac (bag of waters). This sac contains amniotic fluid in which the fetus floats freely. The amniotic fluid helps protect the fetus from mechanical injury. At the end of pregnancy, the amniotic sac contains about 1 liter of amniotic fluid. During or before labor, this sac ruptures, and amniotic fluid flows out through the cervix and the vagina. This is the "breaking of the waters." It usually means that delivery will occur within a few hours. During this time, the baby's head begins to enter the birth canal (Figure 15-3).

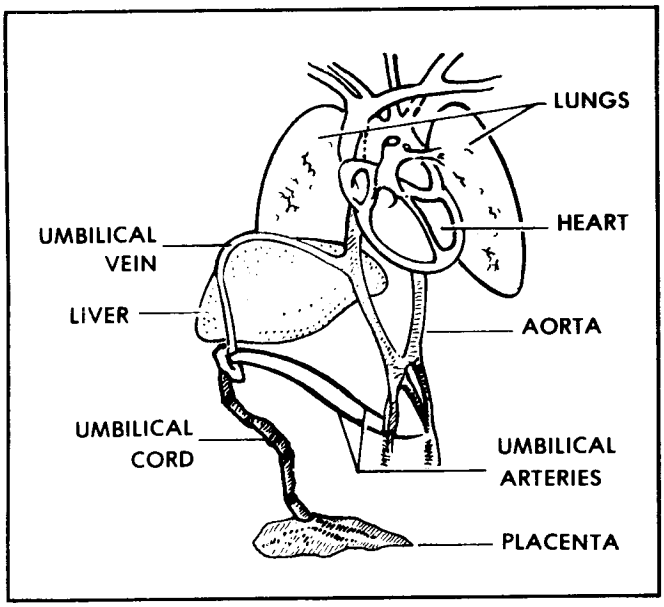

Figure 15-2. Fetal blood supply.

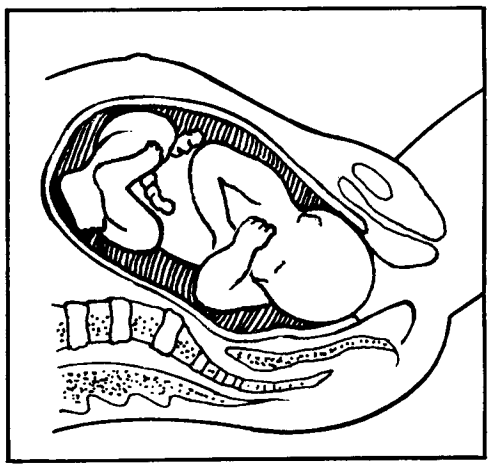

Figure 15-3. Movement of baby through birth canal.

d. Although it is impossible to determine exactly when fertilization actually occurs, it is easy to determine when the last menstrual period began. The date of the last menstrual period will provide an approximate date of delivery—called the estimated date of confinement. *Each 4-week period of pregnancy is called a lunar month. There are 10 lunar months in a normal pregnancy.* Each 3-month period is called a trimester.

e. During the first 4 weeks of pregnancy (1st lunar month), the pregnant woman stops menstruating, her breasts enlarge, and she sleeps more than usual. Because the pregnant uterus presses on the bladder, she may also urinate more frequently.

f. From the 5th through the 8th week (2d lunar month) she may experience nausea and vomiting (morning sickness) in addition to the above symptoms. In the 9th through 12th weeks of pregnancy (3d lunar month), the uterus can be felt above the symphysis pubis, and urinary frequency returns to normal. The pregnant woman begins to feel fetal movement between the 16th and 18th weeks (4th lunar month).

g. The fetal heart sounds can be heard after the 12-14 week with an ultrasonic stethoscope and at 20 weeks or 5 months with a fetoscope. By the end of the 24th week (6th lunar month), the examiner can feel fetal movement. Figure 15-4 shows the location of the top of the uterus at each month of pregnancy.

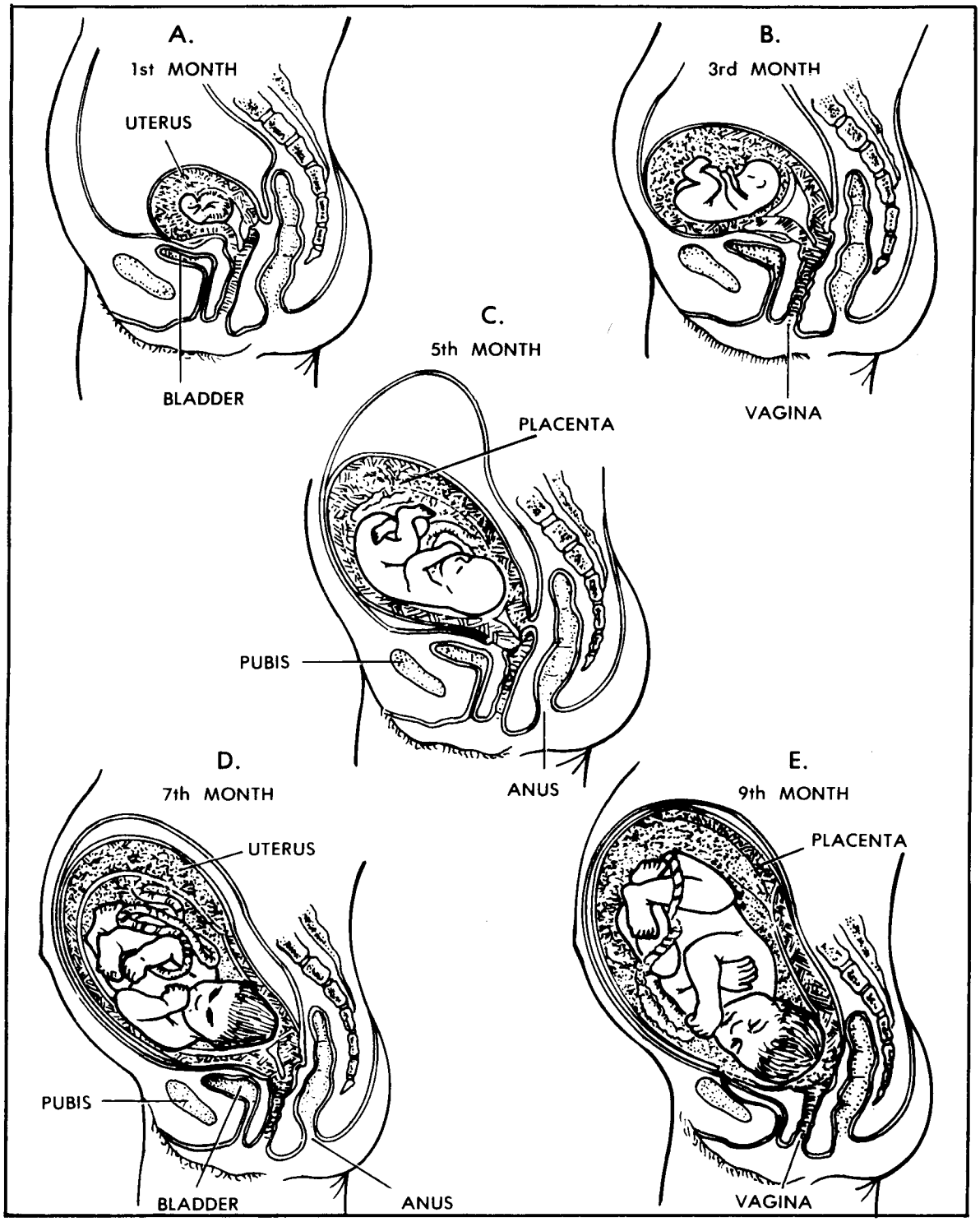

Figure 15-4. Fundus uteri at each month of pregnancy.

h. During the 37th through 40th week (10th lunar month), the uterus drops back down as the presenting part descends into the pelvis. The uterus presses on the bladder and rectum, causing urinary frequency and constipation.

i. Labor is the process by which the uterus expels the fetus, placenta, and membranes through the birth canal (vagina) by means of uterine contractions. Labor is divided into three stages and will be discussed later in this chapter.

j. Before labor begins, the head of the fetus settles into the pelvis. The cervix then begins to efface (thin). Effacement may be completed before labor begins or may continue during the first stage of labor.

k. At the beginning of labor, contractions are far apart. As labor progresses, contractions occur closer together. During the most active stage of labor, contractions occur every 2 to 3 minutes and last 30 to 45 seconds.

l. The first stage begins with the first uterine contraction and ends when the cervix is completely effaced and dilated (open). A completely dilated cervix is about 10 centimeters wide. The first stage lasts about 12 hours in a woman who has previously borne a child. The amniotic sac frequently ruptures when the cervix is completely expanded. A small amount of blood and mucus may be expelled from the vagina at the start of labor. This blood and mucus has formed a plug in the cervix and is called the "bloody show"; it appears as the cervix (the mouth of the uterus) begins to open.

m. The second stage of labor begins when the cervix is fully dilated and ends with the birth of the baby. Normally, the head descends first; this type of delivery is called cephalic (head). If the buttocks descend first, it is called a breech delivery. During the second stage of labor, the woman will bear down with each contraction. As the presenting part of the fetus presses on the rectum, the woman will feel an urge to defecate. The presenting part will appear and disappear at the vaginal opening between contractions. Eventually, the presenting part will remain visible between contractions. This is called crowning (Figure 15-5). In a normal delivery, the head will appear first and the shoulders and trunk soon after. The second stage of labor lasts about an hour in a woman having a first baby and from 15 to 20 minutes in a woman who has previously borne a child.

n. The third stage of labor is from the birth of the baby to the complete expulsion of the placenta and membranes. When the placenta separates from the uterine wall, a small amount of blood gushes out through the vagina. The placenta and membranes are then expelled from the uterus and through the vagina by uterine contractions (Figure 15-6). The third stage of labor usually lasts about 15 minutes.

15-4. Normal Delivery (Childbirth)

a. Assisting in the birth of a baby is one of the few instances in which you have the opportunity to participate in a unique situation because you are dealing with two patients, the mother and the baby, both of whom require skilled attention.

b. When you arrive at the scene of a woman in labor, you must first determine whether there is time to transport the patient to the hospital. To make this decision, you should answer the following questions:

(1) Has the mother had a baby before? Labor during a first pregnancy is usually slower than in subsequent pregnancies; therefore, there may be more time for transport during a first labor.

(2) How frequent are the contractions? Contractions more than 5 minutes apart are a good indication that there will be enough time to get the patient to a nearby hospital. Contractions less than 2 minutes apart, especially in a multiparous woman (a woman who has had more than one pregnancy) signal impending delivery.

(3) Has the amniotic sac ruptured and, if so, when? If the sac ruptures more than 12 hours before birth occurs, the likelihood of fetal infection is increased, and the hospital staff should be alerted. Furthermore, delivery may be more difficult when the amniotic sac has ruptured prematurely because amniotic fluid serves as a lubricant.

(4) Does the mother feel as though she has to move her bowels? This sensation is caused by the fetal head in the vagina pressing against the rectum and indicates that delivery is imminent.

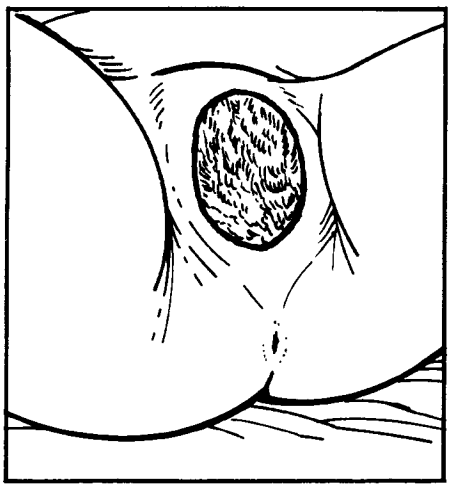

Figure 15-5. Crowning.

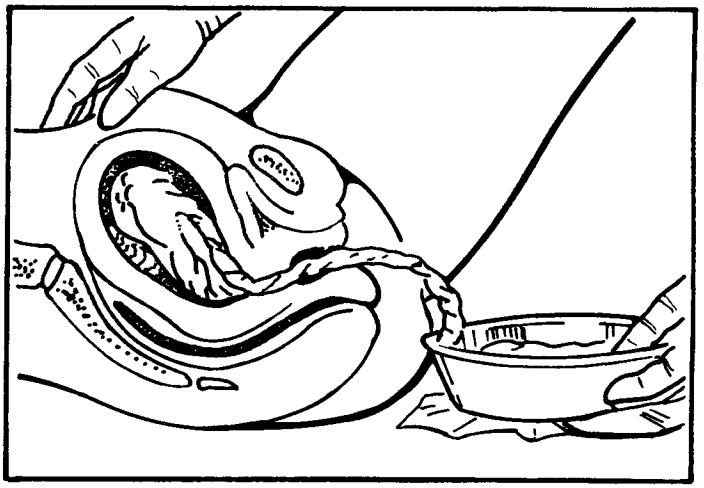

Figure 15-6. Delivery of the placenta.

(5) Is the baby's head presenting and visible through the vaginal opening (crowning)? The mother should be examined to see if this is occurring. When crowning does occur, the vaginal opening will bulge outward and the presenting part of the fetus will be visible at the opening (see Figure 15-5). Crowning indicates that the fetus is about to be born and that there will not be time to go to the hospital before delivery. The examination is a visual inspection only. If there is enough time to transport the patient to the hospital, she should be placed in a reclining position. Any underclothing that may obstruct delivery should be removed. You should:

- Never allow the mother to go to the toilet.
- Never hold the mother's legs together.
- Never attempt to delay or restrain delivery in any way.

To do so can result in the death of both the mother and the baby.

c. The patient should be positioned on her back and made as comfortable as possible. Make the environment as clean as possible using a clean sheet, articles of clothing, and/or newspaper. If available, a folded sheet drape should be placed under her buttocks. She then should bend her knees and spread her thighs apart as shown in Figure 15-7. As soon as the medical specialist and the assistant finish positioning the mother, the assistant should start an intravenous (IV) line of lactated Ringer's solution at TKO (to keep open) rate. You should move to the mother's head and be prepared to turn it to the side if she vomits. An oxygen tank and suction apparatus should be available, if possible.

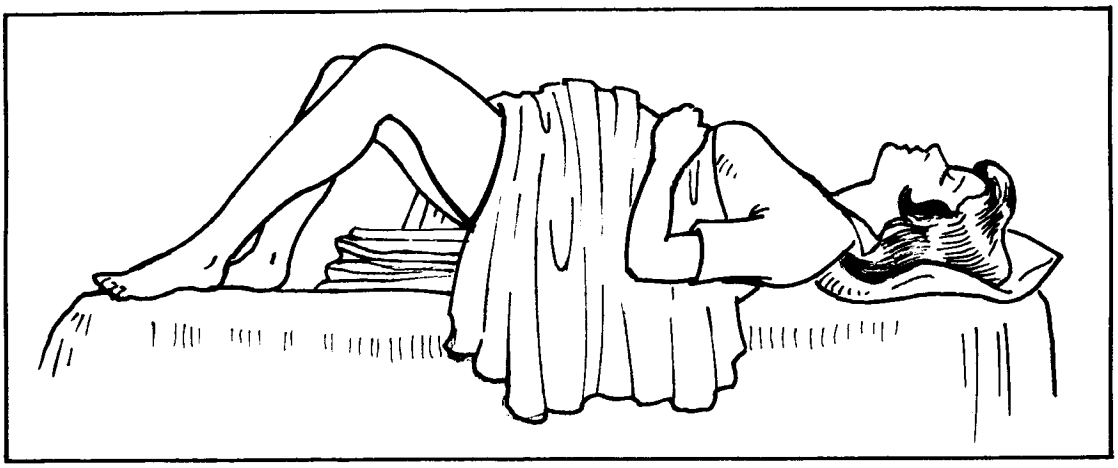

Figure 15-7. Mother in birth position.

d. Hands should be washed thoroughly before the obstetrical (OB) kit is opened (if an OB kit is available). Betadine scrub solution should be kept with the kit for this purpose. The OB kit should be opened and you should put on sterile gloves. The mother should be draped with four towels so that everything except the vaginal opening is throughly covered. If the baby is

coming fast, it is more important for you to assist in the delivery than to put on drapes or gloves. You should encourage the mother to relax and to take slow, deep breaths through her mouth and should continue to reassure her and explain everything that is being done.

e. Your role is to assist the mother in the delivery. You do not actually deliver the baby or pull the baby out. The baby is born with the assistance of the mother; you guide it and support it as it passes through the vagina (birth canal) and is born.

f. When the baby's head begins to emerge from the vagina, it should be supported gently to prevent explosive delivery. The head is the largest part of the baby's body; once the head is born, the rest will come out almost spontaneously. This procedure is illustrated in Figure 15-8.

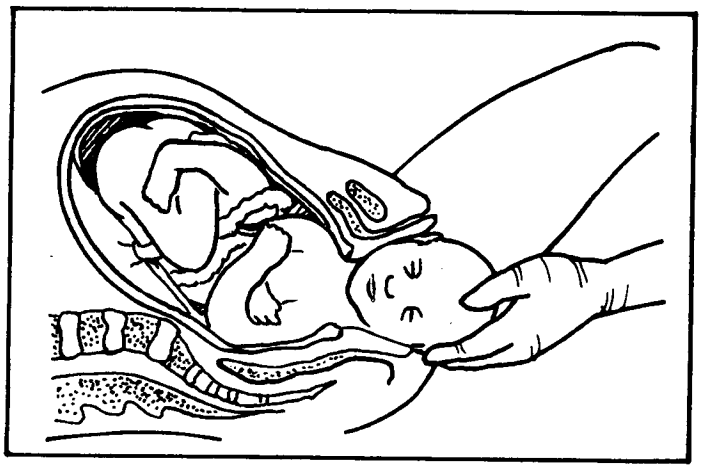

Figure 15-8. Support baby's head at birth.

g. You should never attempt to pull the baby from the vagina. If the membranes cover the head after it emerges, the amniotic sac should be torn with fingers or forceps and removed from the infant's face to permit the amniotic fluid to escape, enabling the infant to breathe.

CAUTION

ANY INSTRUMENT TO TEAR THE AMNIOTIC SAC SHOULD BE USED WITH EXTREME CARE.

h. You must be sure the umbilical cord is not wrapped around the infant's neck; if so, it should be slipped gently over the shoulder or head as illustrated in Figure 15-9.

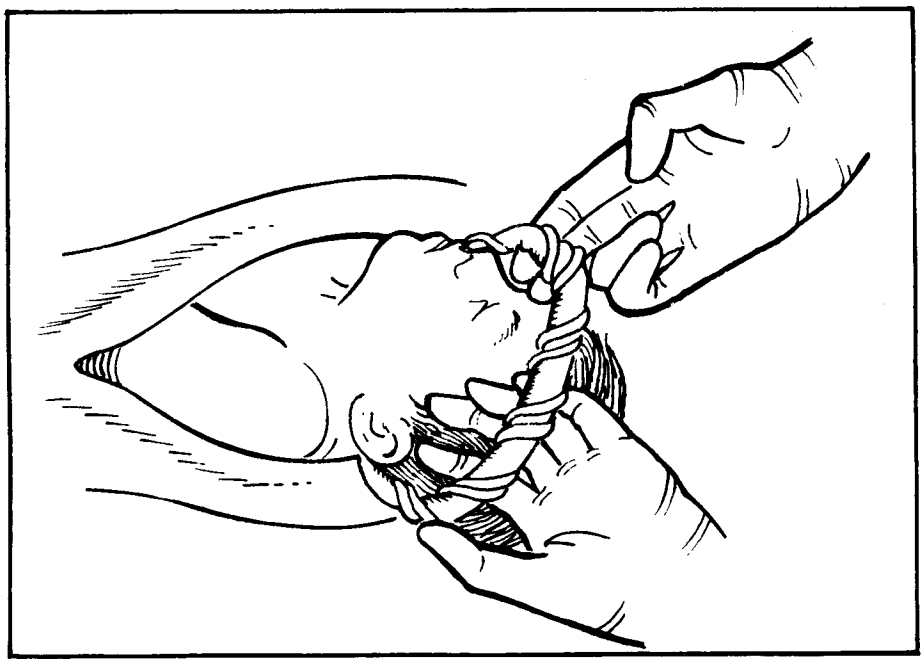

Figure 15-9. Slipping cord over baby's head.

i. If this maneuver fails and the cord is still wrapped tightly around the baby's neck, umbilical clamps (or tie off with a string) should be placed rapidly on the cord 2 inches apart and the cord should be cut between the clamp or string to release pressure from the infant's neck (Figure 15-10).

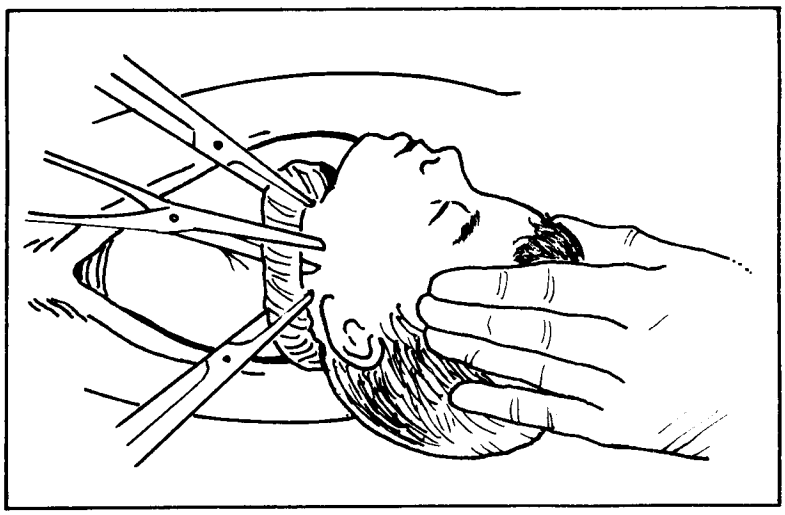

Figure 15-10. Cutting the cord.

j. Continue to support the head as the shoulders emerge (Figure 15-11).

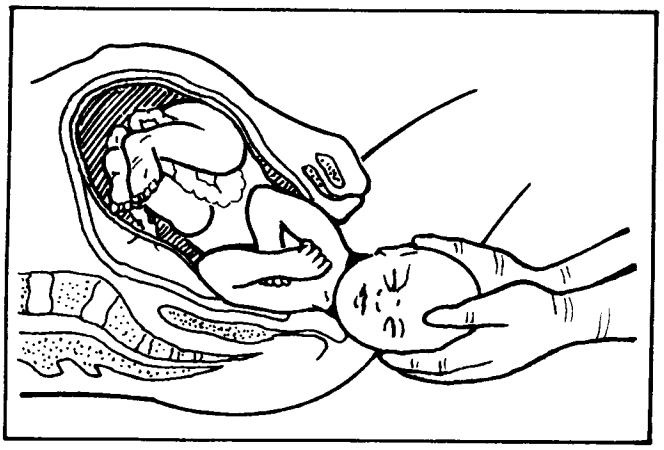

Figure 15-11. Supporting the head as shoulders emerge.

k. The shoulders and body should be delivered as shown in Figures 15-12A and 15-12B. You should avoid touching the mother's anus during delivery.

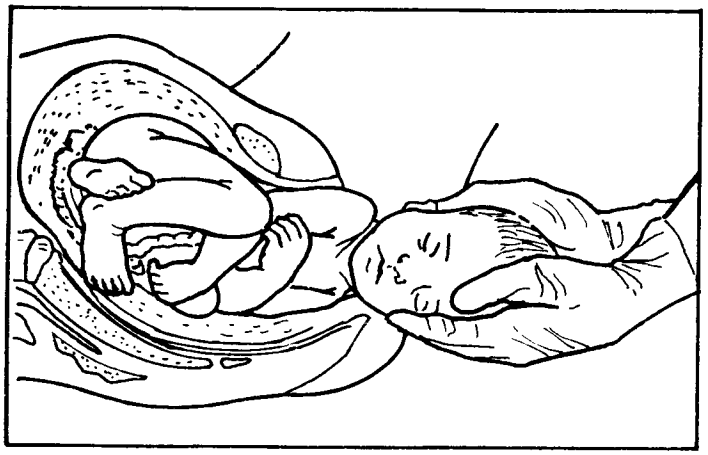

Figure 15-12A. Assisting in delivery of shoulders.

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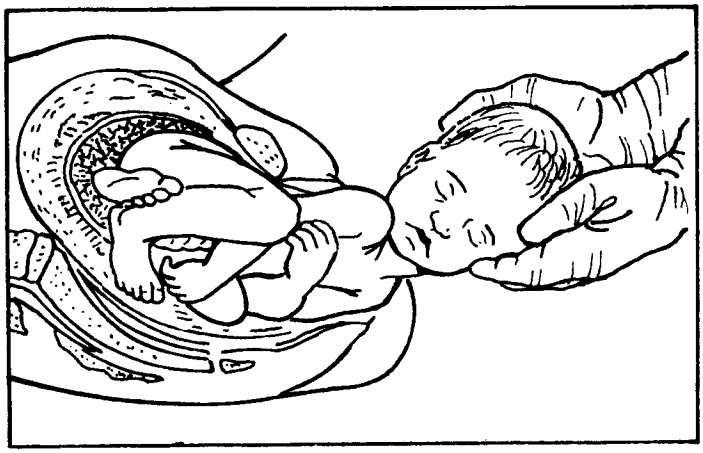

Figure 15-12B. Assisting in delivery of shoulders.

l. The time of birth should be recorded.

m. After the baby is fully delivered, it should be supported along the length of your arm, with one arm and shoulder supported by your cupped fingers. The infant's head should be held downward to aid in drainage (see Figure 15-13). Wrap the baby in a clean blanket, article of clothing, or newspaper to keep the infant warm. It is essential to prevent heat loss from the infant.

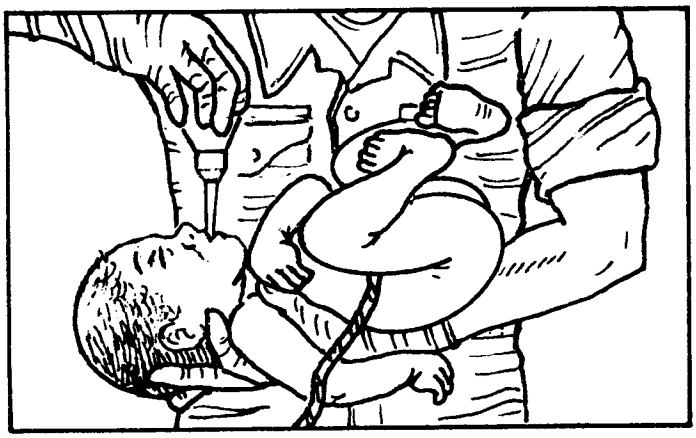

Figure 15-13. Post-delivery action.

n. Newborn infants must be held carefully because they are slippery. Blood and mucus from the nose and mouth should be wiped away with a piece of sterile gauze. The mouth and both nostrils should be suctioned with a bulb aspirator. You should squeeze the bulb before inserting the tip of the aspirator and then place the tip in the mouth or nostrils and release the bulb slowly. This procedure is illustrated in Figure 15-13. Clear the bulb syringe of its contents and repeat suctioning the infant as often as needed.

o. If the baby does not breathe spontaneously, you should stimulate the infant by rubbing the back gently or slapping the sole of the feet. If there is still no response, you should start mouth-to-mouth or mouth-to-nose resuscitation, remembering that newborn infants are very little and require very small puffs of air. Mechanical resuscitation devices should never be used on a newborn infant. If spontaneous breathing begins, 5 liters of oxygen (0_2) should be administered by mask for a few minutes until the baby's color is pink. If breathing is still absent, however, and no precordial (atrium) pulse can be determined with the stethoscope, cardiac compression should be started and cardiopulmonary resuscitation (CPR) should be continued en route to the medical treatment facility (MTF). The baby should be kept wrapped in a blanket as much as possible.

15-5. Care of the Umbilical Cord

a. If the infant has been delivered normally and is breathing well, the cord should be clamped about 6 inches from the infant's navel with two clamps set 3 inches apart as shown in Figure 15-14.

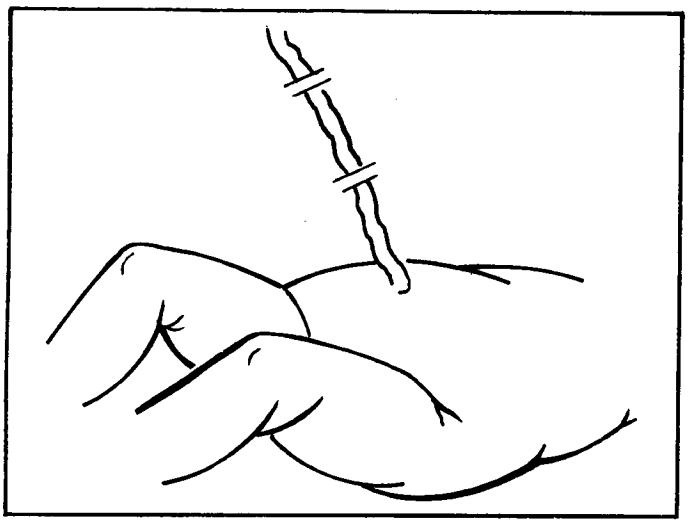

Figure 15-14. Tying off the umbilical cord.

b. If clamps are unavailable, two umbilical ties can be substituted. The cord should be cut between the two ties and handled gently because it will tear easily. The end of the cord that is attached to the infant must be examined to be certain there is no bleeding. If there is bleeding from the cut end, the cord nearest the clamp should be tied and re-examined. The baby should then be wrapped in a sterile blanket to maintain body temperature.

15-6. The Placenta

a. The third stage of labor is the delivery of the placenta and membranes (afterbirth). One individual should stand at the mother's head and keep an eye on the infant, while you tend to the delivery of the placenta. The placenta usually is delivered spontaneously within 15 to 30 minutes after the infant's birth (Figure 15-6).

b. Bleeding can be expected as the placenta separates from the uterine wall. When vaginal bleeding occurs, the uterus should be gently massaged as shown in Figure 15-15. The uterine massage will stimulate the uterus to contract, thus constricting blood vessels within its walls and decreasing bleeding. Allowing the infant to nurse following the delivery of the placenta will control bleeding because nursing stimulates the release of oxytocin. Oxytocin, in addition to causing milk ejection, stimulates uterine contraction which constricts uterine blood vessels.

c. You should never pull the umbilical cord to deliver the placenta. Pulling can invert the uterus (cause it to turn inside out). When the placenta is delivered, it should be *placed in a basin, towel, or plastic bag and taken to the medical treatment facility* where it will be examined for completeness. This procedure is necessary because pieces of placenta retained in the uterus cause persistent bleeding.

d. The perineum (the skin between the anus and the vagina) should be examined for lacerations, and pressure applied to any bleeding tears with a sanitary napkin. A sanitary napkin should be placed over the vagina and the mother's legs lowered; she then should be prepared for transport to a medical treatment facility. *If the physician orders it,* an IV line of lactated Ringer's solution may be started. Ten units of oxytocin (Pitocin) may be added to the IV solution and administered at the prescribed rate of flow.

e. If the placenta is not delivered within 15 to 30 minutes after the baby is delivered, the mother and baby should be transported without delay to a medical treatment facility so a physician can remove it. If the placenta does not deliver and there is heavy bleeding, do not wait at all, but transport the mother and baby immediately.

f. If the mother is hemorrhaging, do the following things during transport:

(1) Place the mother in the shock position with the legs elevated and keep her warm.

(2) Give oxygen (O_2), if available.

(3) Place a sterile pad (sanitary napkin) over the vaginal opening. DO NOT put anything into the vagina.

(4) Gently massage the mother's lower abdomen as shown in Figure 15-15 to cause the uterus to contract and expel the placenta. You will feel a grapefruit-sized object, which is the uterus. DO NOT push the uterus toward the vagina, but rub it with a light circular motion. You will be able to feel it contract and become firm.

(5) If the baby is in good condition, place the baby at the mother's breast to encourage it to nurse. Breast stimulation will help the uterus to contract and thereby reduce bleeding.

g. Normally, after the placenta and membranes are expelled, there is a loss of about ½ pint of blood. *Always* take the placenta to the medical treatment facility for a doctor to examine so that he can be sure none of it is left in the uterus. Even a small part of it retained in the uterus can cause continued bleeding and infection.

h. After the placenta and membranes are expelled, put a sterile pad over the vaginal opening. Lower the mother's legs and support them together. Normally, nothing more will be passed from the vagina. Care should be taken to insure the mother, baby, and placenta arrive at the medical treatment facility safely.

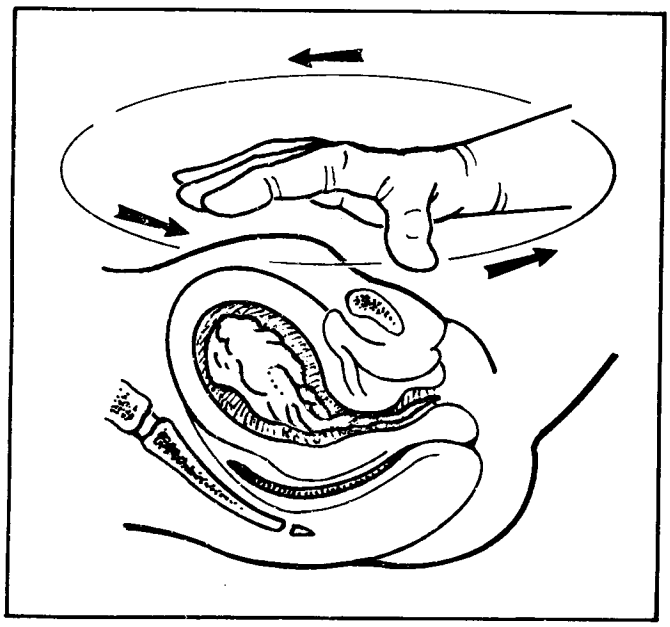

Figure 15-15. Massaging the uterus.

15-7. Complications of Delivery

a. Three types of problems that can accompany delivery will be discussed in this section:

- Postpartum hemorrhage.
- Uterine inversion.
- Pulmonary embolism.

You should be prepared to treat each of these situations as it occurs.

b. Postpartum hemorrhage occurs after delivery and is characterized by internal or external bleeding.

(1) Internal bleeding may be caused by—

- Retained placental tissue.
- Inadequate uterine contractions.
- Clotting disorders.

If bleeding is severe, uterine massage as shown in Figure 15-15 should be continued and the baby should be allowed to nurse. You can add 10 units of oxytocin (Pitocin) to the IV solution of lactated Ringer's and administer at the prescribed rate of flow. If bleeding persists, the circulation can be supported with an IV line of normal saline, lactated Ringer's solution, or plasma derivative. The patient should be transported rapidly to a medical treatment facility and the usual measures for shock should be applied. *Vaginal examination or blind packing of the vagina should be avoided.* Gentle uterine massage should be continued en route to the hospital.

(2) External bleeding is bleeding from perineal tears and can be managed with firm pressure. It may be essential to open the labia to apply packs to the bleeding site.

c. Inversion or turning inside out of the uterus can occur as a result of excessive pressure on the uterus or from pulling on the umbilical cord in an effort to deliver the placenta. Shock commonly accompanies *uterine inversion.* Should this condition occur in the field, you should perform the following procedures:

(1) Keep patient flat.

(2) Administer oxygen (O_2), if available.

(3) Start two IV lines with Ringer's solution or colloid, running them as fast as necessary to maintain blood pressure (B/P).

(4) Never try to remove the placenta if it is still attached. Try once to replace the uterus manually by exerting pressure first on the area closest to the cervix. If the uterus cannot be replaced easily, pack all protruding tissues lightly with moist, sterile towels, and move the patient rapidly to a medical treatment facility.

d. Sudden dyspnea, trachypnea, trachycardia, and/or hypotension in the deliverying or delivered mother can signal *pulmonary embolism*, either from a blood clot or from amniotic fluid. Field treatment is the same as for any patient with pulmonary embolism and includes administration of oxygen, electrocardiogram monitoring, and rapid transport to a medical treatment facility.

15-8. Abnormal Deliveries

Deliveries in which the fetal head does not present first are classified as abnormal deliveries. Three abnormal presentations will be discussed in this section.

- Breech presentation.
- Prolapsed umbilical cord.
- Limb presentation.

These three situations can be potentially life threatening to the infant and you should become familiar with the special problems of each emergency situation.

a. Breech Presentation. Breech presentation occurs when the buttocks rather than the head present first. Breech delivery is not simple. If delivery is imminent, the mother should be prepared as discussed earlier and the buttocks and trunk of the baby should be allowed to deliver spontaneously (Figure 15-16). Once the legs are clear, the baby's body should be supported on the palm of the hand and the anterior surface of the arm, thus allowing the head to deliver. If the head is not delivered within 3 minutes, action must be taken to prevent suffocation of the baby. Suffocation can occur when the baby's face is pressed against the vaginal wall or when the umbilical cord is compressed by the baby's head in the vagina. To establish an airway for the baby, you should—

(1) Place a gloved hand in the vagina, positioning the palm toward the baby's face.

(2) Form a "V" with the fingers on either side of the baby's nose.

(3) Push the vaginal wall away from the baby's face until the head is delivered.

(4) To relieve pressure on the umbilical cord, use one of the techniques listed below:

(a) Place the patient in a Trendelenburg (supine) position.

(b) Place a gloved hand inside the vagina with fingers separated and allow the cord to pass through the opening created by the fingers between the cervical side wall and the baby's head.

(5) *Never try to pull the baby out of the vagina or allow an explosive delivery.* If the head DOES NOT deliver within 3 minutes after an airway has been established, the mother should be placed in a supine position and transported immediately to the nearest medical treatment facility. *The baby's airway should be maintained throughout transport.*

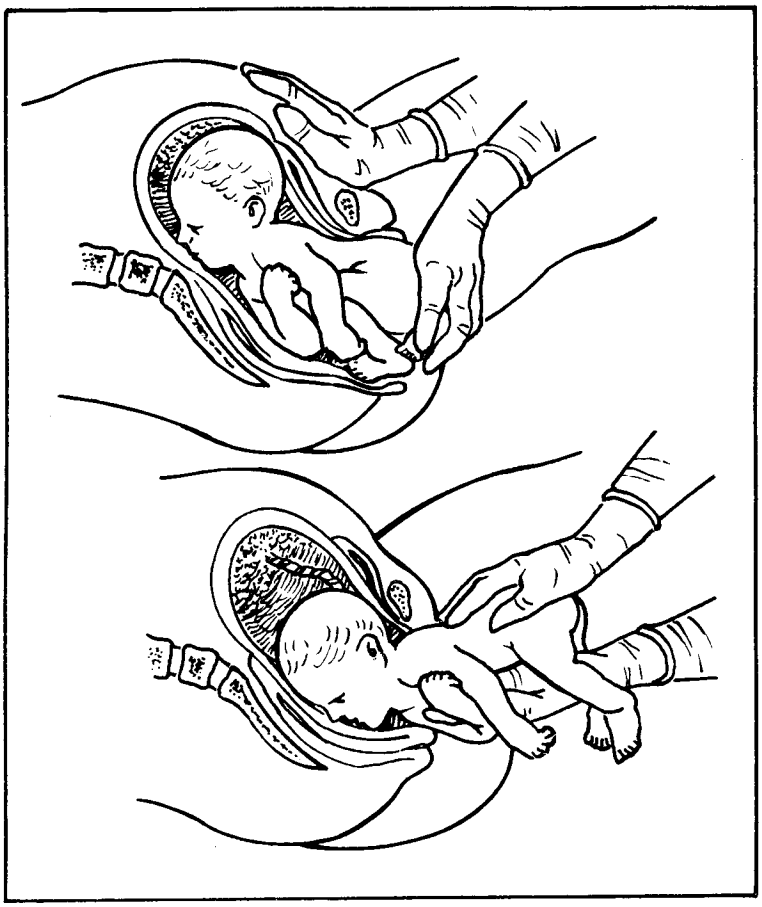

Figure 15-16. Breech presentation.

b. Prolapsed Umbilical Cord. Prolapsed umbilical cord occurs when the cord comes out of the vagina before the baby as shown in Figure 15-17. The baby is in danger of suffocation; therefore, you should do the following:

(1) Immediately place the mother into Trendelenburg's or knee-chest position.

(2) Administer oxygen to the mother, if available.

(3) Keep the mother warm.

(4) With the gloved hand in the vagina, gently elevate the baby's head or presenting part to relieve pressure on the cord. Once this is done, do not withdraw your hand. You must keep pressure off the cord until delivery of the baby (see Figure 15-18).

(5) *NEVER* attempt to push the cord back, or reposition the cord.

(6) Transport the mother and the baby to the hospital at once while elevating the baby's head. The pressure should be evenly distributed to avoid injury to the baby's soft skull.

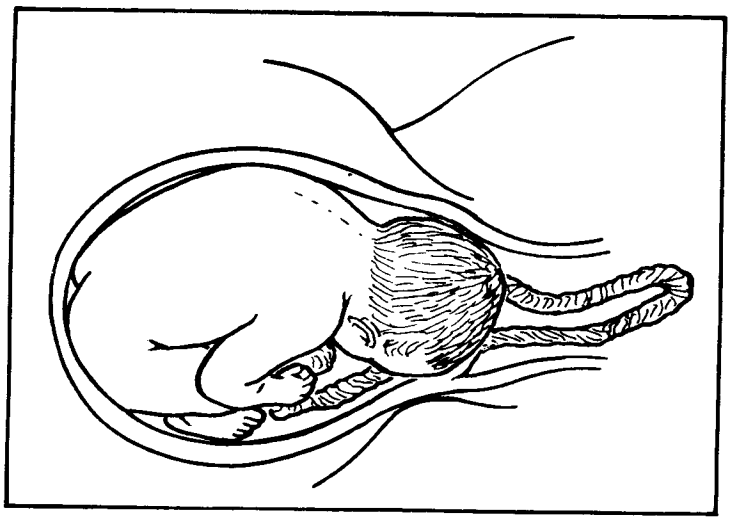

Figure 15-17. Prolapsed umbilical cord.

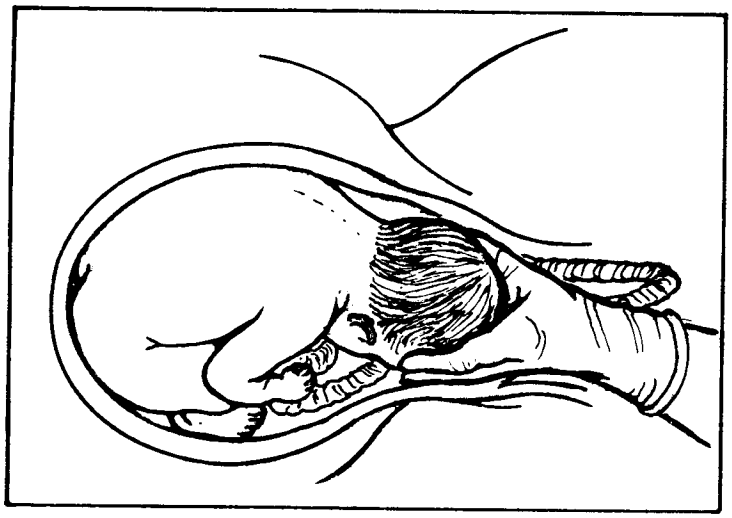

Figure 15-18. Initial corrective action—prolapsed cord.

NOTE

Breech presentation and prolapsed umbilical cord are the only two circumstances in which the medical specialist should place his hand in the mother's vagina.

c. Limb Presentation. The presentation of an arm or leg through the vagina is an indication for immediate transport to the nearest medical treatment facility—the only place where such a delivery should be attempted.

15-9. Multiple Births

Multiple births usually do not present any unique problems. Twins are delivered in the same manner as single babies. Twins should be expected if the mother's abdomen appears unusually large, or if it remains large after the first baby is delivered. If twins are expected, the mother should be transported to the nearest medical treatment facility as rapidly as possible consistent with the mother's safety. The cord should be tied to prevent hemorrhage from the twins after the first baby is born. The mother should be transported to the nearest medical treatment facility for the delivery of the second twin if the second baby is not delivered within 10 minutes of the first. Twins are usually smaller than single births, like premature infants, and need special protection against a fall in body temperature. It is very important that the twins be kept warm during transport to the nearest medical treatment facility.

15-10. Premature Births

a. Premature birth is defined as any baby born after 19 weeks but before 37 weeks of pregnancy. Low birth weight infants weigh less than 5.5 pounds (2.500 grams) and may also be premature. Premature births need special care. Birth weight alone is not an adequate definition for prematurity because low birth weight infants may be fully mature. Premature babies may be over 5.5 pounds (2,500 grams) if they are edematous, or if the mothers are diabetic. To distinguish premature from mature infants, you should observe the creases on the soles of the baby's feet, the breast size, type of scalp hair, and presence or absence of cartilage in their outer ears. Premature infants develop problems because they are so small and their organs are immature. Premature infants have trouble maintaining a normal body temperature because they have more surface area relative to their size than older infants and, therefore, lose heat more rapidly in a cool environment; they also have less subcutaneous fat to insulate them against heat loss.

b. Small blood losses are also more serious in premature infants because of their small size. The 5.5 pound infant has a total blood volume of about 275 milliliters (ml). Therefore, 30 ml blood loss represents 10 percent of the infant's total blood volume.

c. Premature infants often develop respiratory problems because their lungs are immature. Alveoli and alveolar capillaries begin developing at 28 weeks gestation. Surfactant, which lowers alveolar surface tension and allows even expansion of the alveoli, develops at about 28 weeks gestation.

d. Hypoxemia due to respiratory problems leads to cardiovascular problems in the premature infant. Before birth, blood is shunted past the lungs and oxygenated in the placenta. After birth, special mechanisms change the blood flow pattern so that blood is oxygenated in the lungs. These special mechanisms, however, depend on adequate oxygenation of the blood by the lungs. When oxygenation is inadequate because of lung immaturity, blood continues to be shunted past the lungs. This worsens the hypoxemia.

Hypoxemia, because of respiratory and cardiovascular problems, produces cyanosis and leads to bradycardia and hypotension. Bradycardia in newborn infants is a heart rate less than 100 beats per minute.

e. The premature infant also does not tolerate asphyxia that normally occurs during labor and delivery as well as the full term infant. The mature infant survives some asphyxia during labor and delivery by metabolizing liver and heart glycogen stores. The premature infant has less stored glycogen and, therefore, is less able to tolerate asphyxia.

f. To manage the premature infant, you should—

(1) Keep the baby warm; wrap the baby in aluminum foil and blankets to reduce heat loss (Figure 15-19).

(2) Keep the baby's mouth and nose clear of fluid with a bulb syringe.

(3) Prevent bleeding from the umbilical cord because these infants cannot tolerate the loss of even small amounts of blood.

(4) Give oxygen (if available) into a tent constructed from aluminum foil above the infant's head. *DO NOT BLAST it directly into the infant's face.*

(5) Prevent contamination because premature infants are highly susceptible to infection.

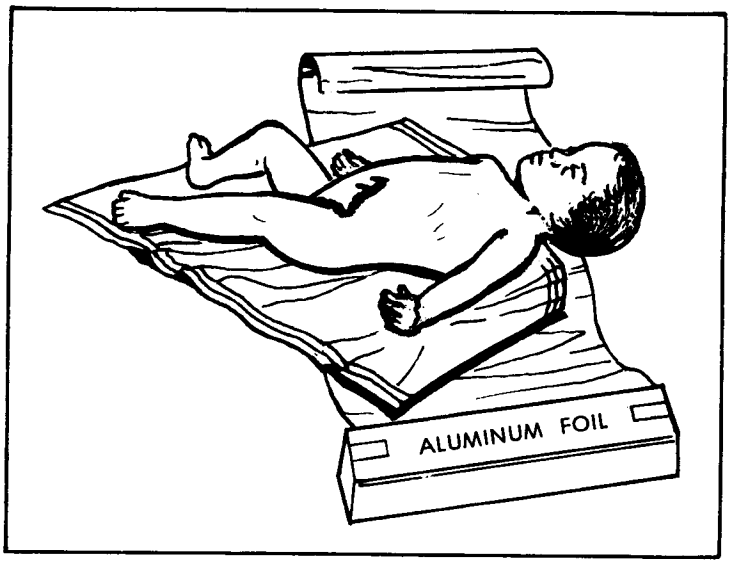

Figure 15-19. Premature infants need special care.

15-11. APGAR Scoring

It is essential for the newborn to be completely evaluated immediately after birth to determine adequacy of vital function. The scoring system is based on heart rate, respiratory effort, muscle tone, reflect irritability, and color. Sixty seconds after the birth of the infant, these five signs are evaluated and each given a score of 0, 1, or 2. When added together, numerical ratings yield a total score of 10. The total score of 10 indicates that the infant is in excellent condition. The majority of infants are vigorous and have a total score of 7 to 10; they cough or cry within seconds of delivery and require no further resuscitation. Infants with a score in the 4 to 6 range are moderately depressed. They may be pale or blue 1 minute after delivery with poorly sustained respiration and flaccid muscle tone. Such infants will require some form of resuscitation. In the APGAR scoring, the five signs to be evaluated are most easily remembered by using the acronym APGAR as shown in Table 15-1.

Table 15-1. APGAR Scoring System

	Score (points given according to status)		
Clinical Signs	**0**	**1**	**2**
A— Appearance (color)	Blue, pale	Body pink, extremities blue	Completely pink
P— Pulse (heart rate)	Absent	Slow or less than 100 beats per minute	Greater than 100 beats per minute
G— Grimace (reflex irritability)	No response	Grimace reflex irritability)	Cough or sneeze
A— Activity (muscle tone)	Limp	Some flexion of extremities	Active motion
R— Respiration (respiratory effort)	Absent	Slow, irregular	Good crying

15-12. Delivery Without Sterile Supplies

At times it is necessary to assist a patient in delivering a baby when proper equipment and supplies are not available. The technique described below will be useful under those circumstances.

a. Place the mother on a firm surface on her back as shown in Figure 15-7, with her knees up, her feet flat on the surface, and her legs spread apart. The mother's head and shoulders should be propped up with one or two pillows. Lift the buttocks about 2 inches above the table surface by placing a pad (newspaper, sheets, or blankets) under the buttocks.

b. Clean sheets and towels which have not been used since previous laundering are safe and may be used for preparing the patient. Sheets and newspaper should be spread around the delivery area to help mop up the large quantities of amniotic fluid that will be released during birth.

c. Your hands should be washed as thoroughly as possible. Conduct the delivery of the baby as if gloves were available. As soon as the baby is born, turn the head to one side and use a clean finger to finger sweep (wipe) out the baby's mouth, taking precaution not to induce vomiting (Figure 15-20).

d. *DO NOT* tie or clamp the cord with string, shoelaces, or the like, and *DO NOT CUT THE CORD.* Keep the baby at the side of the mother's buttocks at the same level or below the entrance of her vagina but out of the pool of amniotic fluid and blood. As soon as the placenta is delivered, wrap it in newspaper or a towel, leave it attached to the baby, and place it with the baby who can now be moved. The placenta always should be slightly above the baby. This can be accomplished by placing it on folded blankets or towels stacked beside the infant. The mother, baby, and the placenta can now be transported as safely and as rapidly as possible to the nearest MTF.

e. The baby must be kept warm. If necessary, wrap it in an article of clothing or whatever is available. In case of hemorrhage by the mother, the baby should be put to the breast and the uterus gently massaged as described in Figure 15-15.

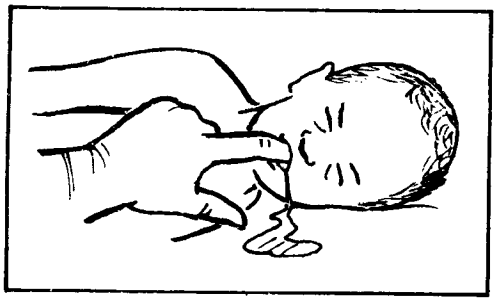

Figure 15-20. Finger sweep.

Section III. PATHOPHYSIOLOGY AND MANAGEMENT OF GYNECOLOGIC EMERGENCIES

15-13. General

In general, there is little that you can do to treat gynecologic emergencies in a field environment. Most common gynecologic emergencies require the attention of a physician or the use of specialized treatment resources not found in the aid bag or emergency vehicle. However, you can greatly aid the physician and the hospital staff by obtaining an adequate history from the patient.

15-14. Abdominal Pain

A gynecologic problem, that is, a problem related to the female reproductive organs, should be suspected in any woman who complains about abdominal pain. The following questions should be asked to obtain information necessary for possible treatment.

a. When was the patient's last menstrual period? Was it unusual in any way? Has she had any bleeding between menstrual periods or bleeding following menopause?

b. Has she missed a menstrual period? Does she use any form of contraception? Could she be pregnant?

c. Has she had any vaginal discharge? What color was it? Was it foul smelling?

d. Where is the pain located? What is it like (sharp, dull, constant, intermittent)? What makes it better? What makes it worse? Is it made worse by sexual intercourse? How long has it been between the onset of the pain and the last menstrual period?

e. Pelvic inflammatory disease (PID) often results from gonorrhea and is one of the most common sources of abdominal pain in women. The pain is localized to one of the lower quadrants. It may spread to the right shoulder and is often quite severe. In many cases, the pain begins about the time of the menstrual period. It may be accompanied by fever and vomiting. The pain frequently is worsened by sexual intercourse. The patient usually complains of moderate to heavy vaginal discharge. The patient's recent menstrual history is often characterized by missed periods and by bleeding between periods.

f. Physical examination often reveals a very ill-appearing patient. In general, blood pressure is normal and pulse is elevated. Fever may be present. Palpating the abdomen causes moderate to extreme pain and should be done very gently. No treatment in the field is necessary for patients with PID. Such patients should be made comfortable in whatever position they prefer and transported gently to the hospital.

g. Other possible sources of abdominal pain in women include ectopic pregnancy (that is, the fetus growing in a location outside of the uterus, for example, in the fallopian tube), ruptured ovarian cyst, and nongynecologic causes such as appendicitis and cystitis (bladder inflammation). Differentiating these conditions in the field is not vitally important, because management for the most part consists of support and transportation of the patient. Ectopic pregnancies, however, must be distinguished from other causes of abdominal pain as they can lead to hypovolemic shock. Recognition and treatment of ruptured ectopic pregnancies are discussed in paragraph 15-19 below.

15-15. Vaginal Bleeding

a. Vaginal Bleeding with No History of Trauma. In questioning a patient who complains of vaginal bleeding, it is important for you to try to estimate the amount of blood lost. What may seem like an alarming amount to the patient may be clinically insignificant. The patient should be asked how

long she has been bleeding and how many sanitary napkins and/or tampons she has used. You should determine whether the bleeding has been heavier or lighter than during a normal menstrual period, as well as what the patient has used to absorb the blood (towels generally soak up less blood than a sanitary napkin). Blood loss can be assessed further in the physical examination by checking for variations in pulse rate because of change in posture. An increase in pulse rate of more than 20 beats per minute when the patient goes from a supine to a sitting position suggests blood loss greater than one unit. If this finding is positive, you should treat the patient like any other patient in impending shock by:

- Administering oxygen (if available).
- Placing the patient supine with the legs slightly elevated.
- Starting an IV line with lactated Ringer's solution and infusing it rapidly.
- Closely monitoring the vital signs en route to the hospital.

b. Vaginal Bleeding Accompanied by Genital Trauma. Rape or other trauma may result in lacerations of the external female genitalia. Lacerations may be accompanied by heavy bleeding. Usually this bleeding can be controlled simply by applying external pressure over the laceration. Bleeding from the internal genitalia can be massive. It is both useless and dangerous to introduce packs blindly into the vagina in an attempt to control the bleeding. A pack should be used only if bleeding is life threatening, in which case a sterile towel or sterile 2-inch gauze tape should be packed tightly into the vagina. The Military Anti-Shock Trousers (MAST) apparatus will probably not help control bleeding from the internal genitalia but will provide an autotransfusion effect of approximately two units and should, therefore, be applied. In a case of massive hemorrhage, the patient with severe vaginal bleeding needs at least one and preferably two or three IV lines for rapid infusion of lactated Ringer's solution, or a plasma derivative. Other standard measures for shock can be applied. Vital signs must be monitored minute by minute, and transportation to the hospital should be rapid.

Section IV. MANAGEMENT OF OBSTETRIC EMERGENCIES

15-16. General

a. Emergency obstetrics situations in which you will be likely to become involved include normal labor and delivery, complications of labor and delivery, and conditions that can be life threatening to the pregnant woman or to the fetus before labor.

b. Serious medical problems that the pregnant woman may encounter before labor are termed antepartum complications. In this section, several antepartum complications are discussed, including hemorrhage, supine hypotensive syndrome, and toxemia.

15-17. Antepartum Hemorrhage Complications

Hemorrhage complications occurring before delivery are classified as antepartum complications. Five antepartum hemorrhage conditions are discussed in this section: abortion, ectopic pregnancy, abruptio placentae, placenta previa, and uterine rupture.

15-18. Abortion

Abortion is defined as loss of pregnancy before the 20th week of gestation (the 20th week of fetal growth). It often is referred to as a "miscarriage." Abortions can occur spontaneously or can be induced. Induced abortions performed under sterile conditions in authorized medical settings are termed therapeutic abortions. Abortions that occur naturally fall into one of the four categories discussed below.

a. Threatened Abortion (Figure 15-21A). Signs and symptoms of threatened abortion include vaginal bleeding, pain resembling menstrual cramps, and, occasionally, dilation of the cervix. This condition can progress to complete abortion, or may subside and the pregnancy may continue. A woman with a threatened abortion should be evaluated at the hospital. The treatment is bedrest.

b. Inevitable Abortion (Figure 15-21B). An abortion that cannot be prevented is termed an inevitable abortion. Signs of an impending abortion include vaginal bleeding (which can be very heavy), uterine contractions, and cervical dilation. For a patient with such symptoms, you should start an IV line with lactated Ringer's solution. The patient should be transported to the hospital as quickly as possible.

c. Incomplete Abortion (Figure 15-21C). An incomplete abortion occurs when part of the fetus is expelled and a portion of the products of conception remain within the uterus. This situation causes hemorrhage and continued cervical dilation. The patient should be treated for shock if it is present. Products of conception protruding from the cervix should be gently removed to prevent sepsis. You should consult a physician for instruction in treating a patient with an incomplete abortion.

d. Missed Abortion (Figure 15-21D). In a missed abortion, the fetus dies before 20 weeks gestation but is retained in the uterus for at least 2 months after death. When the uterus hardens, fetal heart sounds are no longer present. The patient with a missed abortion should be taken to the hospital for further treatment.

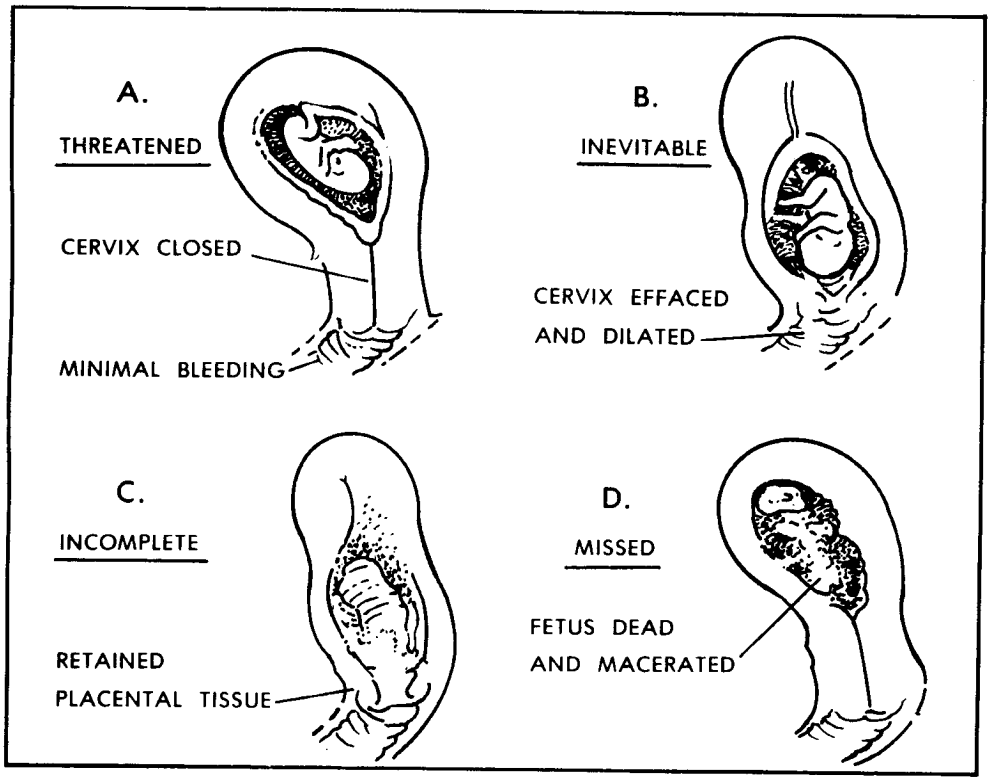

Figure 15-21. Types of abortion.

15-19. Ectopic Pregnancy

a. The fertilized ovum may implant abnormally in the fallopian tube, ovary, or abdomen, rather than in the uterus. Implantation in the fallopian tube (tubal pregnancy) is far more common than implantation in either the ovary or the abdomen (such a condition is very rare). Ectopic pregnancy is also 10 times more frequent in women who become pregnant with an intrauterine device (IUD) in place.

b. Fertilization normally occurs in the fallopian tubes. In a tubal pregnancy, the fertilized ovum fails to travel into the uterus and is implanted in the fallopian tube as shown in Figure 15-22. Abnormalities of either the ovum or the fallopian tubes can prevent the ovum from reaching the uterus.

c. When the fertilized ovum implants in the muscular layer of the fallopian tube, it invades maternal blood vessels. The fallopian tube does not enlarge as the fetus grows, and the tube eventually ruptures. This rupture may be either internal in the tube lumen or external in the abdominal cavity, and the resulting blood loss may be entirely hidden.

d. The patient with a ruptured tubal pregnancy may complain of severe pain localized to one lower quadrant. She may have vaginal bleeding. If blood enters the abdominal cavity, it will irritate the peritoneum and cause fever. The accumulated blood produces a mass that is tender to palpation.

e. As blood loss continues, hypovolemic shock develops. The pulse becomes rapid and the skin becomes pale, cold, and moist. When the body can no longer compensate for the decreased blood volume, the blood pressure falls. Hypovolemic shock due to ruptured ectopic pregnancy should be treated in the same way as hypovolemic shock due to other causes. To treat this type of shock in a pregnant patient, you should:

- Administer oxygen (if available).
- Support ventilation, if necessary.
- Take vital signs.
- Apply and inflate the MAST. (Do not inflate abdominal section.)
- Start two or more large-bore (14- to 16-gauge needles) IV lines, and then rapidly infuse lactated Ringer's solution.
- Place the patient in a supine position with her feet elevated 30^{o} (no higher than 12 inches).
- Keep the patient warm.
- Monitor state of consciousness, pulse, and blood pressure during transport.

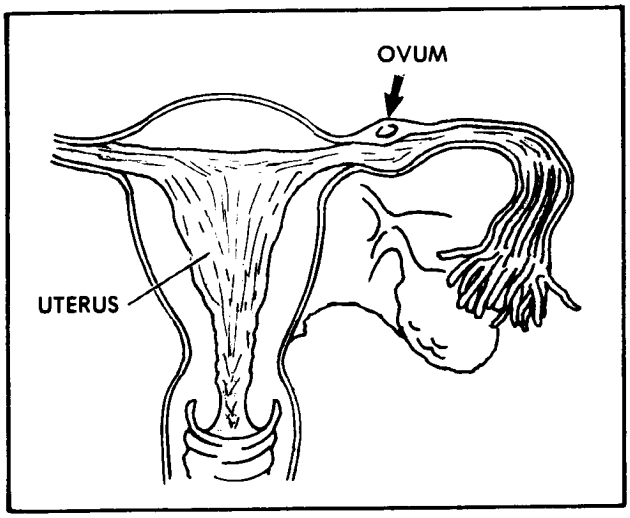

Figure 15-22. Tubal pregnancy.

15-20. Abruptio Placentae

Abruptio placentae occurs when a normally implanted placenta separates prematurely from the uterine wall during the last trimester of pregnancy. The patient experiences severe lower abdominal pain and the uterus becomes rigid. Shock may be more severe than the apparent blood loss would seem to indicate. Figure 15-23 shows the baby and abruptio placentae.

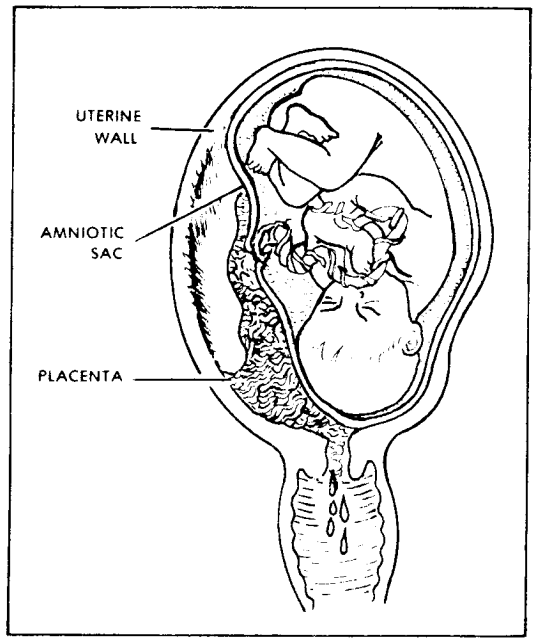

Figure 15-23. Baby and abruptio placentae.

15-21. Placenta Previa

Placenta previa is a condition in which the placenta—rather than the baby—is the presenting part. This condition occurs in the third trimester. Again, hemorrhage may be severe from the highly vascular placental tissue. Pain is frequently absent in this disorder. Figure 15-24 shows the baby and placenta previa.

15-22. Uterine Rupture

a. Uterine rupture is manifested by sudden, severe abdominal pain. Bleeding may not be apparent externally, but profound shock can occur from internal hemorrhage.

b. To treat the patient for shock, you should:

(1) Place the patient horizontally on a stretcher, preferably on her left side.

(2) Administer oxygen (if available).

(3) Apply the MAST to produce autotransfusion. (Do not inflate abdominal section.)

(4) Start at least two large-bore IV lines, and administer 5 percent dextrose in normal saline (D5NS), 5 percent dextrose in lactated Ringer's solution, or a plasma derivative as rapidly as needed to maintain blood pressure.

(5) Transport the patient to the hospital.

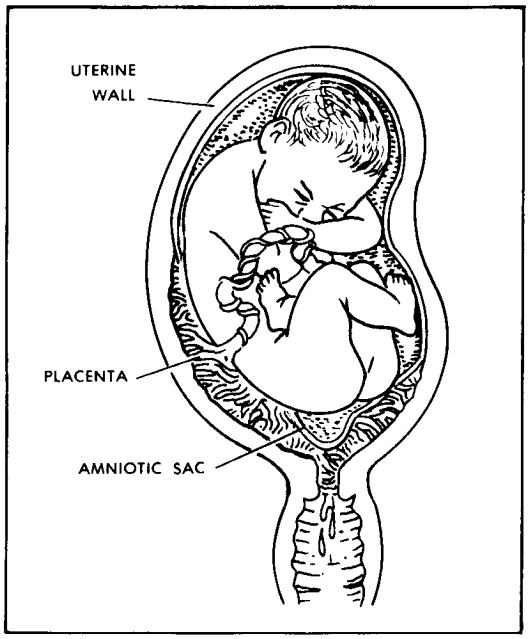

Figure 15-24. Baby and placenta previa.

15-23. Other Antepartum Conditions

You may also encounter other serious antepartum conditions such as supine hypotensive syndrome and toxemia.

a. Supine Hypotensive Syndrome. The pregnant woman near term has a large, heavy mass in her abdomen. When she is supine, this mass, which includes the weight of the uterus, fetus, and placenta, tends to compress the inferior vena cava. Venous return to the heart is thereby reduced and, as a result, cardiac efficiency decreases. These changes are especially pronounced when the mother's vascular volume is low to begin with, such as in antepartum hemorrhage. When a pregnant patient near term who is hypotensive or complains of dizziness is encountered, she should be placed on her left side. Severe hypotension indicates a possibility of significant internal hemorrhage. Severe hypotension should be treated like hypovolemic shock as discussed above.

b. Toxemia of Pregnancy. Toxemia of pregnancy has two stages, preeclampsia and eclampsia. Preeclampsia is characterized by hypertension (blood pressure greater than 140/90), proteinuria (protein in the urine), and edema during the last 3 months of pregnancy. Eclampsia follows preeclampsia and includes convulsions and coma in addition to the signs of preeclampsia.

(1) In preeclampsia, renal blood flow and glomerular filtration are below the normal level for pregnant women. Thus, urine output and sodium excretion decrease. This condition increases extracellular fluid volume and produces edema in the ankles, fingers, and face. Other symptoms of preeclampsia are headache, midupper quadrant abdominal pain, and blurred vision. Elevated blood pressure and edema, however, are necessary for a

diagnosis of preeclampsia. You, therefore, should report the blood pressure and the presence or absence of edema in every pregnant woman examined. The patient with preeclampsia should be evaluated by a physician in the emergency department for possible hospitalization. When transporting the patient, you should remember to be prepared to treat preeclampsia, because it can progress to eclampsia with convulsions and coma.

(2) Eclampsia can occur before, during, or after labor. It begins with convulsions that are usually followed by coma.

(a) The eclamptic patient, like the preeclamptic patient, has pronounced hypertension and edema. Her urine will be scant and bloody. She also may show signs and symptoms of pulmonary edema.

(b) Although the physician should be contacted for specific directions in treating eclampsia, you can do the following:

1. Establish and maintain an airway; administer oxygen (if available).

2. Start an IV line with D5W to keep open. *DO NOT USE normal saline or lactated Ringer's solution, as they will increase the fluid overload.*

3. Transport the patient to the hospital as soon as possible.

NOTE

In antepartum hemorrhage of any kind, you should not attempt to examine the patient internally.

Section V. THE RAPE VICTIM

15-24. General

Rape presents a difficult and complex problem, involving physical and emotional trauma as well as possible legal ramifications. It is essential that a complete history be obtained from the rape victim. In questioning the patient, you must use tact and sensitivity. The patient may find it extremely difficult to discuss what has happened and may fear or feel hostile toward a male medical specialist. ***A FEMALE CHAPERONE SHOULD ALWAYS BE PRESENT DURING AN EXAMINATION OF A FEMALE PATIENT.*** Every effort should be made to understand the patient's feelings and to respond with kindness and reassurance. The emotional trauma of rape is usually more prolonged and severe than the physical trauma. The attitude shown toward the patient during her care can have a serious influence on her future psychological and physical recovery.

15-25. Clinical Procedures

a. A primary assessment should be conducted of the rape victim. You should observe whether the patient's clothes are torn or in disarray. You also should check for trauma elsewhere on the patient's body, especially around the thighs, lower abdomen, and buttocks. If vaginal bleeding is significant, it should be treated as outlined in paragraph 15-15.

b. The report you submit should state only what the patient said, not what you observed. Your personal opinion should not be included in the report. *Every rape is a potential court case, and the report is a legal document.* Therefore, you should be thorough and accurate.