(8) Completion of "urgency" block—

(a) ROUTINE.

(b) TODAY.

(c) PREOP.

(d) STAT.

Section V. ADMINISTRATION OF OXYGEN

14-47. General

a. Regardless of the source of respiratory insufficiency, certain general principles of patient management apply prior to the administration of oxygen (O_2):

- Any patient in respiratory distress should receive O_2.
- Any patient whose illness or injury suggests the possibility of hypoxia should receive O_2.

If there is any question whether O_2 should be administered or withheld (as in cases of suspected hypoxia), administer O_2.

b. Oxygen is a colorless, odorless gas normally present in the atmosphere in a concentration of approximately 21 percent. It is normally stored in steel cylinders under a pressure of approximately 2,000 pounds per square inch (psi). These cylinders (Figure 14-38) are given letter designations according to their size: "E" which is 4.5 inches by 30 inches and "G" which is 8.5 inches by 55 inches.

c. Oxygen flow is controlled by a regulator that reduces the cylinder's high pressure to a safe range of approximately 50 psi and controls the flow from 1 to 15 liters per minute. The regulator is attached to the cylinder by a yoke designed so that it will fit only one type of gas cylinder. Gas cylinders are colored-coded by contents; in the United States, oxygen cylinders are always green.

14-48. Oxygen Masks and Cannulas

a. Different masks and cannulas are available to provide oxygen to the patient with respiratory insufficiency. The main characteristics of these masks and cannulas are summarized in Table 14-3.

(1) The simple plastic face mask (Figure 14-39) can deliver up to 60 percent oxygen, depending on the oxygen flow rate and the patient's depth of respiration. Exhaled air is vented through holes in each side of the mask. At low flow rates with deep respirations, the patient may draw in a larger amount of outside air, thus diluting the oxygen concentration received. Generally, a flow rate of between 8 and 12 liters per minute will insure adequate oxygen delivery.

(2) The venturi mask is designed to mix oxygen with air and permit the delivery of accurate low oxygen concentrations. Masks are available to delivery 24 percent, 28 percent, 35 percent, and 40 percent oxygen. They are especially useful in the management of patients with chronic obstructive pulmonary disease and carbon dioxide (CO_2) retention.

(3) Nonbreathing masks have an oxygen reservoir. They are also equipped with a one-way valve to allow the inhalation of oxygen from the reservoir bag and exhalation through the valve. The oxygen flow rate is adjusted to prevent collapse of the bag during inspiration. The flow rate with this type of mask is usually 10 to 12 liters per minute. If the mask is fitted tightly to the face, it can delivery O_2 concentrations approaching 100 percent. This mask is well suited to situations where there is severe hypoxia.

(4) Nasal cannulas (prongs) (Figure 14-40) are made of plastic tubing and have two plastic tips that are inserted into the nostrils (Figure 14-40A). They will deliver an oxygen concentration of from 25 to 40 percent with a 4 to 6 liter per minute flow rate. Nasal prongs are usually well tolerated but can cause soreness around the nostrils. They can deliver a limited amount of maximum oxygen concentration.

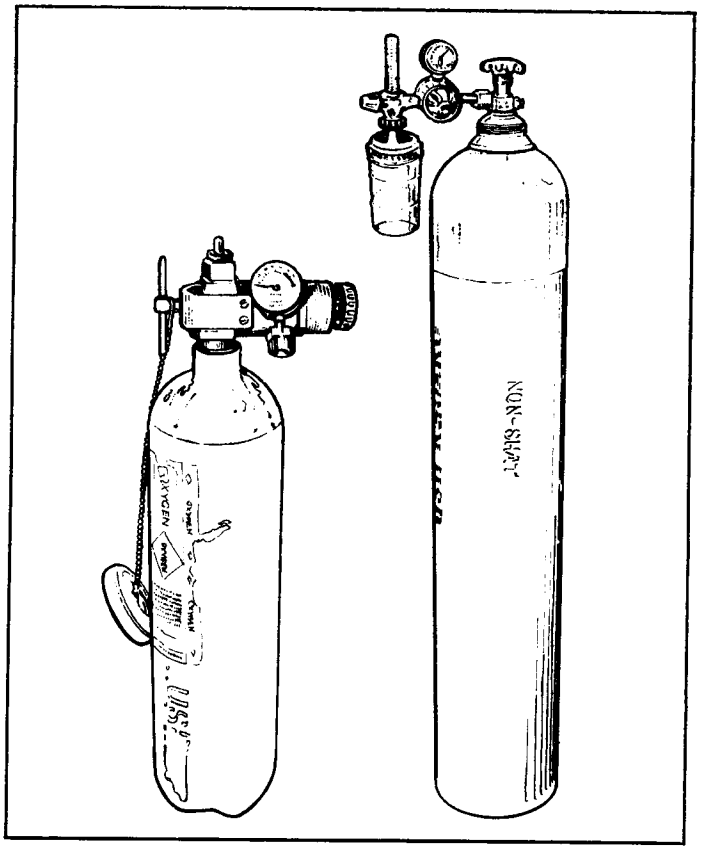

Figure 14-38. Oxygen (O_2) cylinders.

Table 14-3. Types of Masks and Cannulas for Providing Supplemental Oxygen

Device	Flow Rate Used (liters per minute)	O_2 Concentrations Delivered (percentage)	Comments
Nasal cannula	4-6	25-40	Usually well tolerated.
Plastic face mask	10	50-60	
Venturi mask 24 percent	4	24	Long-term treatment of patients with COPD; limited usefulness in the field.
28 percent	8	28	
35 percent	8	35	
40 percent	8	40	
Nonbreathing mask	10-12	90	Permits administration of high concentration of O_2.

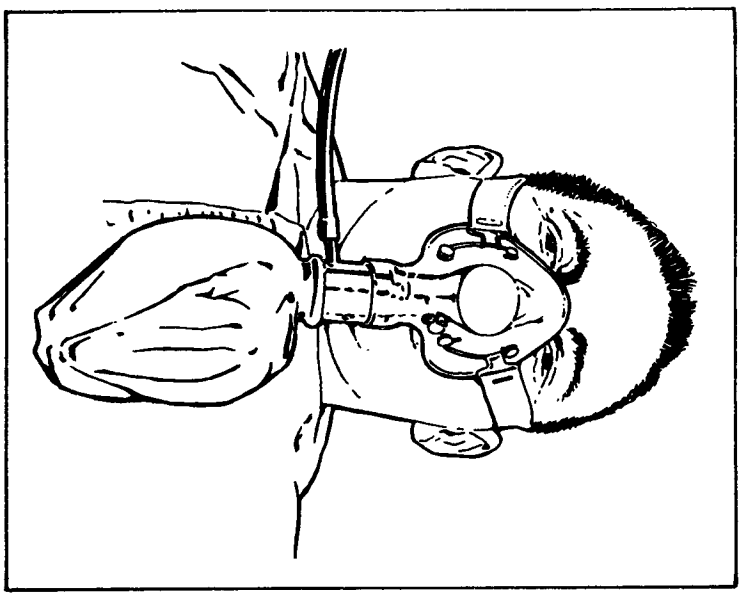

Figure 14-39. The plastic face mask.

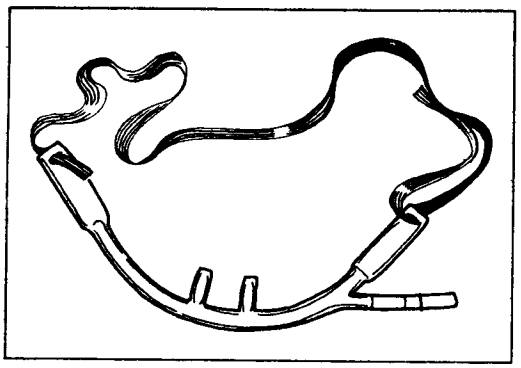

Figure 14-40. Nasal cannula.

b. The plastic face mask or nonbreathing mask is preferred in most cases because they can deliver higher concentrations of oxygen. There are some patients, however, who can barely tolerate the mask and complain of a suffocating feeling; for these patients the nasal cannula can be used. No matter which device is chosen, explain to the patient its function and why it is required. Let the patient know that the mask may feel confining but that it actually provides more air than unaided breathing. This explanation may help the patient accept the mask with less anxiety.

14-49. Administration of Oxygen

Use the following procedure in the administration of oxygen:

a. Secure the oxygen cylinder in an upright position.

b. With the wrench supplied, slowly open and quickly close the cylinder to flush out any debris.

c. Inspect the regulator valve to insure that it is the right type for an oxygen tank and that the washer is intact.

d. Install and tighten the regulator securely on the cylinder (Figure 14-41).

e. Open the main cylinder valve (Figure 14-41A) slowly to approximately one half turn beyond the point where the regulator valve becomes pressurized.

f. Open the control valve (Figure 14-41C) to the desired flow rate as indicated on the regulator gauge (Figure 14-41D).

g. To stop oxygen administration—

(1) Shut off the regulator control valve until the flow rate is zero.

(2) Shut off the main cylinder valve.

(3) Bleed the control valve and main cylinder valve by opening the control valve until the needle or ball indicator shows zero flow.

(4) Close the control valve.

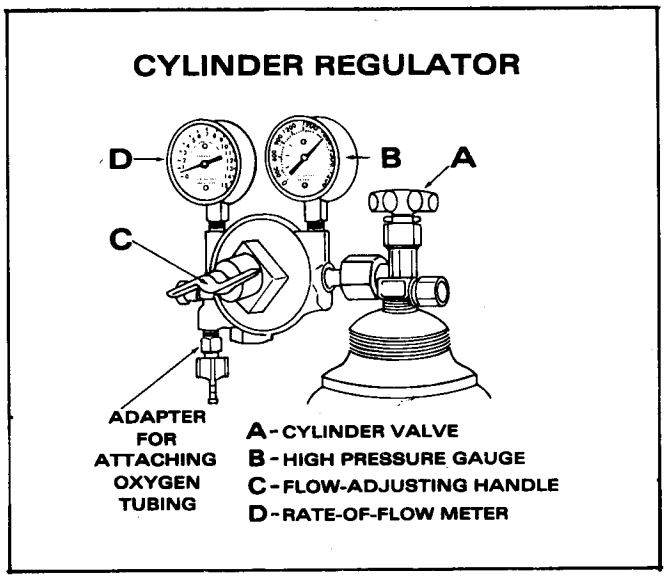

Figure 14-41. O_2 cylinder with regulator.

14-50. Safety Precautions When Handling Oxygen Cylinders

a. Keep combustible materials such as oil or grease away from the cylinders, regulators, fittings, valves, or hoses.

b. Close all valves when oxygen cylinders are not in use, even if they are empty.

c. Secure oxygen cylinders to prevent them from tipping over. In transit, keep them in an appropriate rack or carrier, or space permitting, strap them onto the litter with the patient.

d. When working with an oxygen cylinder, always remain to one side. Never place any part of your body over the cylinder valves. A defective cylinder can launch a loosely fitting regulator with enough force to severely injure anyone in its path.

e. DO NOT smoke in any area where oxygen cylinders are in use or are being stored.

f. DO NOT subject the oxygen cylinders to temperatures above $120^{o}F$.

g. DO NOT use oxygen cylinders without properly fitted regulator valves. Never attempt to modify a regulator valve designed for another type of gas cylinder for use with an oxygen cylinder.

Section VI. CATHETERIZATION/THE URINARY (FOLEY) CATHETER

14-51. General

a. The Foley, or indwelling, catheter is inserted into the bladder to maintain a free flow of urine and is used for a variety of purposes:

- Emptying the bladder to allow an infected area to heal free of contaminated urine.
- Keeping an incontinent (unable to control bladder function) patient dry.
- Retraining or restoring normal bladder function.
- Maintaining an accurate intake and output record.

b. Foley catheters are available in various sizes; the size to be used depends upon the physical structure of the patient. The physician may designate the catheter size when he writes the order for the catherization. The Foley catheter is a double lumen rubber tube; the main tube is identified by the openings in the tip and the wide base at the opposite end. The second tube is connected and sealed along the side of the main tube; the end of the tube is fixed in a manner that allows it to be inflated with air or sterile liquid, causing an inflated balloon to be formed around the main tube. This balloon prevents the catheter from slipping out of the bladder. The plastic drain tube with the attached plastic drain pouch is inserted into the main tube of the catheter. The complete drainage set up is known as a closed drainage system (Figure 14-42).

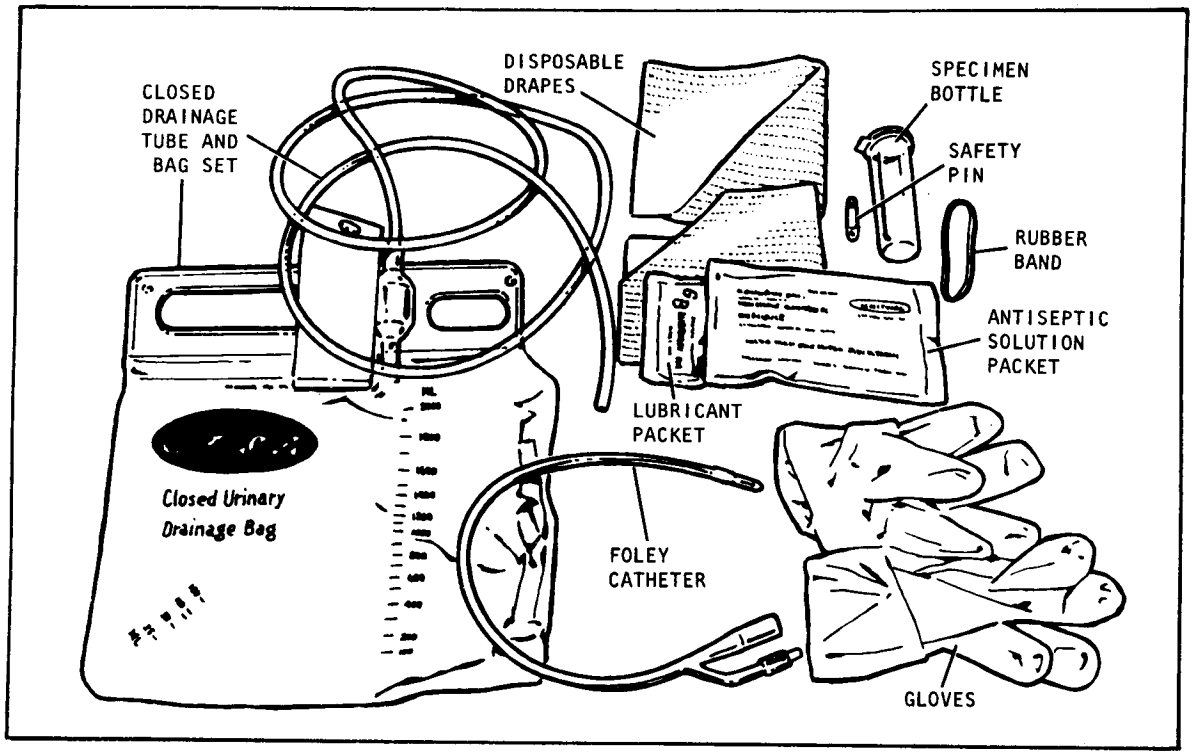

Figure 14-42. Foley catheter set up.

c. It is unlikely that you will have to perform urinary bladder catheterization in a field situation; however, when you are working in a hospital or clinical environment, there may be a requirement for you to use this skill. Catheterization can be an unpleasant experience for the patient; gaining his trust and confidence can do a great deal to make him more comfortable during the procedure.

14-52. Catheterization of the Urinary Bladder

a. Equipment necessary for the procedure.

- Sterile gloves.
- Sterile cleansing sponges.
- Antiseptic solution (pHisoHex or Betadine).
- Foley catheter with 5 ml balloon (normally a No. 14 French for women or a No. 16 for men).
- Sterile towels.
- Syringe with needle, containing 5 ml saline solution.
- Clamp.
- Water-soluble lubricant.
- Connecting tube and collecting bag.
- Sterile basin.

NOTE

Prepackaged catheterization sets are now widely available and suitable for this procedure. When such a set is to be used, the equipment listed above will not be needed.

b. Catheterization of a male patient (Figure 14-43).

(1) Place a towel beneath the patient's penis.

(2) Wash your hands and put on sterile gloves. Arrange equipment on the sterile towel so it is handy.

(3) Retract the patient's foreskin (if present) with the left hand and hold the penis by the shaft. This hand is now no longer sterile.

(4) Use the clamp to pick up a sterile sponge soaked in antiseptic solution with the right hand. Wash the glans in a circular motion from the urethral meatus outward. Cleanse the glans thoroughly three to five times using a new, sterile sponge each time.

(5) Touch nothing but the catheter with the right hand. Liberally lubricate the catheter with sterile surgical lubricant.

(6) Raise the shaft of the penis straight up with the left hand and *gently* introduce and pass the catheter. Slowly advance it almost to its bifurcation (the Y-shaped division in the catheter tube) before inflating the balloon.

(7) Inflate the balloon using the syringe containing saline solution.

NOTE

Some catheters require a needle to inflate the balloon and others have a Leuer-Lok connector. Be aware of the type you use to prevent problems when trying to inflate the balloon.

(8) Pull back gently on the catheter until slight resistance is felt. This indicates that the balloon is flush against the bladder wall.

(9) After obtaining a urine specimen, connect the catheter to the drainage system. Many prepackaged catheter kits already have the catheter and drainage systems connected.

(10) Tape the tubing (not the catheter) to the inner surface of the thigh. Avoid placing tension on the catheter.

(11) Never allow the bladder to empty all at once if it is full. Drain 500 cc's of urine at one time, clamp the catheter for 15 minutes, then drain another 500 cc's. Continue this procedure until the bladder is empty.

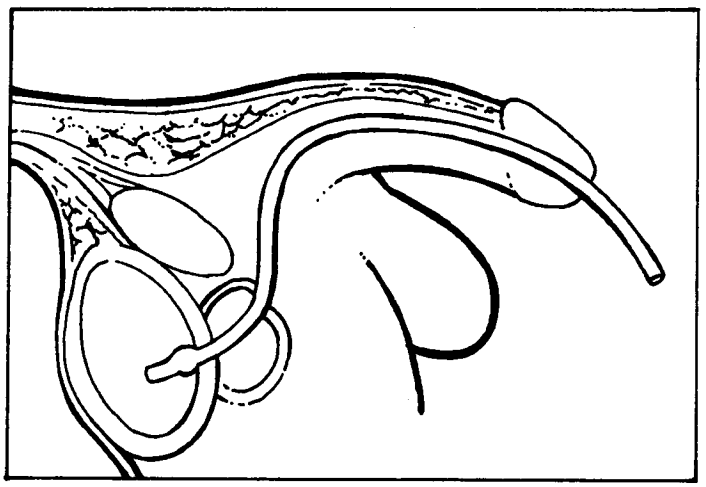

Figure 14-43. Male catheterization.

c. Catheterization of a female patient (Figure 14-44).

(1) Place the patient in a supine position (on her back), with knees bent. Place pillows or padding under the buttocks to insure that her hips are canted upward.

(2) Use the same sterile procedure described in paragraph 14-52*b* above.

(3) Clean the urethral meatus thoroughly with antiseptic solution.

(4) Lubricate the catheter tip and advance it *gently* into the urethra.

(5) Follow the remainder of the procedure outlined in paragraph 14-52*b*(7) through (11).

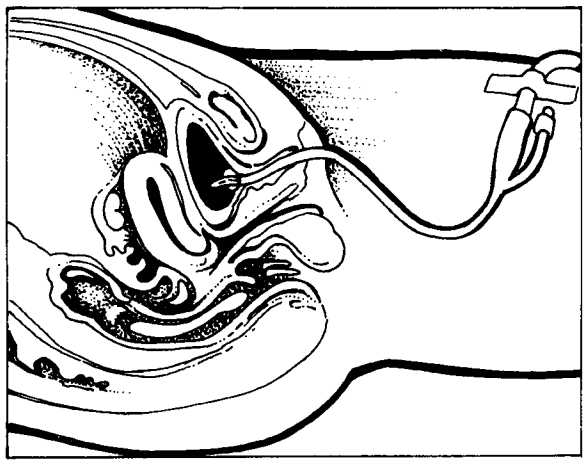

Figure 14-44. Female catheterization.

14-53. Care/Management of the Patient with a Foley Catheter

a. Procedure for care of a Foley catheter.

(1) Wash your hands thoroughly to reduce possible contamination.

(2) Place the patient in a supine position.

(3) Observe the skin at point of insertion and surrounding area. Check for redness, skin eruptions, or swelling.

(4) Gently cleanse the area with soap and water, rinse and blot dry. Apply antiseptic ointment to urethral meatus if ordered or in accordance with local SOP.

(5) Insure that the tubing remains close to the patient's body.

(a) Place nonallergenic tape around the drain tube approximately 12 to 18 inches from the point of insertion and secure it to the skin on the patient's thigh or abdomen.

(b) Place the tube so that it is comfortable for the patient and there is no tension or unnecessary pull on the skin.

(6) Maintain tubing alignment.

(a) The drainage tube should lie on top of the bed in a straight line. It must be kept free of kinking, twisting, and the pressure of added weight.

(b) Tubing must not be clamped together to allow urine to flow freely into the bottle.

(7) Keep the gravity-flow drainage even.

(a) Pin or tape the longest part of the tube to the bed linen to prevent the tubing from falling over the side of the bed. This also keeps the tubing above the drainage bottle to maintain an even free-gravity flow.

(b) Attach the drainage container to the side of the bed frame.

(c) Change the position of the drainage container as you change the position of the patient.

(8) Empty the drainage container.

(a) The drainage container can be emptied without disconnecting the closed system.

(b) Remove the cap from the drainage container outlet tube, release drainage clamp, and let contents flow into a graduated pitcher.

(9) Measure and discard, or save, the urine as indicated by the order.

(10) Position the bed side rails and leave the patient safe and comfortable.

(11) Record all applicable information on the patient's chart.

b. Additional catheter care information.

(1) At times, the patient will say that he has the urge to urinate. Check the catheter and drainage tube to insure that both are free of any solid matter. If clogging has occurred, the catheter may need to be irrigated with sterile saline solution to remove it.

(2) A second source of discomfort may be the position of the catheter in the bladder. The opening of the catheter may be lying against the bladder wall or it may be above the urine level so that it is impossible for the

urine to drain. Gently reposition the patient so that the flow will be continuous. Catheter size may affect urine flow, particularly if the catheter tube is too small for adequate drainage.

(3) Careful monitoring of the catheter patient will do a great deal to insure that pain and/or discomfort are kept to a minimum and that the catheterization procedure will serve its purpose.

Section VII. NASOGASTRIC TUBES

14-54. General

Gastrointestinal intubation is the insertion of a specific tube through the nose (naso) or throat into the stomach (gastro) or the intestine. The primary reasons for this relatively common procedure are to—

a. Drain the stomach or intestinal tract by means of a suction apparatus. It is used to prevent postoperative vomiting, postoperative obstruction of the intestinal tract, and gas formation in the stomach or intestine after an operation.

b. Diagnose a disease or to identify and determine the cause of a pathological condition.

c. Wash out stomach contents, as in the case of a person who has ingested poison.

d. Provide a route for feeding a patient who is unable to take food by mouth.

14-55. Types of Nasogastric Tubes

Several types of nasogastric tubes are commonly used for intubation; each has a specific purpose in addition to decompression and drainage of the gastrointestinal tract. The two most common types are the Levin tube and the vented sump (Salem sump).

a. The Levin tube (Figure 14-45) is a single lumen (bore) tube approximately 3 feet in length, fitted with holes along one side 6 to 9 inches from its distal tip.

b. The Salem sump tube (Figure 14-46) is a double lumen tube approximately 3 to 4 feet in length. The large lumen is designed to function in the same manner as a Levin tube. The second lumen (the small blue tube) is a vent which is left open to the atmosphere and equalizes the pressure or suction in the stomach. This reduces the chances of the sump becoming blocked by being pulled up against the lining of the stomach.

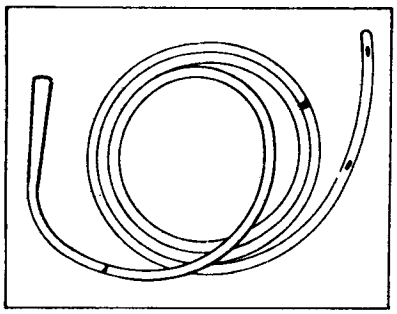

Figure 14-45. Levin tube.

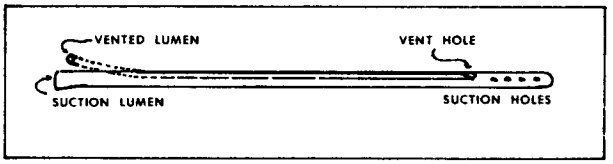

Figure 14-46. Salem sump tube.

14-56. Insertion of the Nasogastric Tube

a. Prepare the intubation equipment.

(1) Assemble an emesis basin, tissues, a water-based lubricant, a 20 to 50 cc's aspirating syringe, adhesive tape, and a glass of water.

(2) If the tube needs added stiffness for insertion, immerse it in a pan of ice until the desired degree of stiffness if obtained (usually 15 to 30 minutes).

b. Explain the procedure to the patient.

(1) The patient may be in pain and frightened of the procedure. You need to reassure him that you will be as gentle as possible and that you will tell him what is being done as the procedure progresses.

(2) Explain to the patient that passing the tube down the back of the throat is painless, but that it could cause gagging. Tell him to breathe deeply through his mouth so that he will be less likely to become nauseated and vomit.

c. Position the patient.

(1) The patient is usually placed in the Fowler's position (head raised 18 to 20 inches above the body) to allow the tube to move by gravity down the digestive tract. This also enables the patient to expel vomitus if necessary.

(2) The supine position can be used if the patient's condition warrants it.

d. Provide the patient with an emesis basin and tissues.

e. Measure the tube for insertion distance. Measure the distance from the patient's nose to the nearest earlobe and down to the navel. This is approximately the distance from the lips to the stomach. Mark this distance by placing a piece of tape at this point on the tube.

f. Assume a comfortable working position and lubricate the tip of the gastric tube.

(1) Stand at the right side of the patient. Grasp the tip of the tube in the right hand and hold the remainder of the tube in the left hand. (Reverse hand positions if left handed.)

(2) For easier insertion, use water or a water-base lubricant to moisten the tip of the tube. *Do not use an oil-base lubricant.*

g. Begin the tube insertion procedure.

(1) Have the patient swallow a mouthful of water as the tube is passed down the esophagus to the stomach. Bend the patient's head forward so that his chin rests on his neck.

(2) The tube is inserted one of two ways:

(a) Through the mouth—pass the tube over the top and middle of the tongue toward the back of the throat.

(b) Through the nose (Figure 14-47)—pass the tube gently up one nostril and down the back of the throat, rotating it slowly between your thumb and index finger. Check the position of the tube as it passes down the back of the patient's throat by having him open his mouth and holding down his tongue with a tongue depressor.

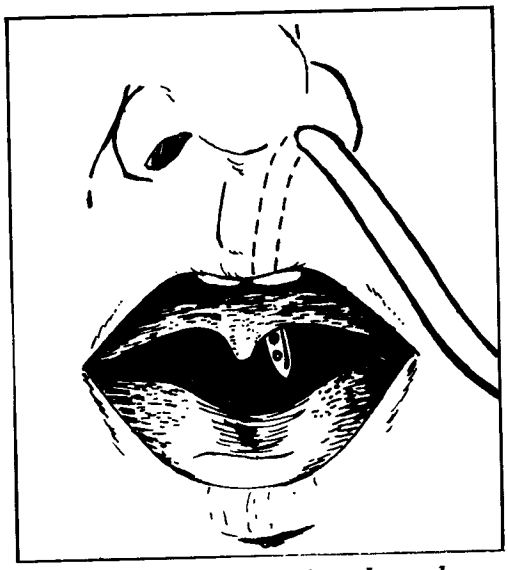

Figure 14-47. Tube insertion through nose.

h. Push the tube slowly, firmly, and gently into the stomach.

(1) Attempting to pass the tube too fast stimulates the nerve endings in the back of the throat which in turn stimulates the vomiting center of the brain, causing the patient to vomit.

(2) Continue to have the patient swallow water as the tube is passed (Figure 14-48). Movement of the throat caused by swallowing will ease the tube's passage.

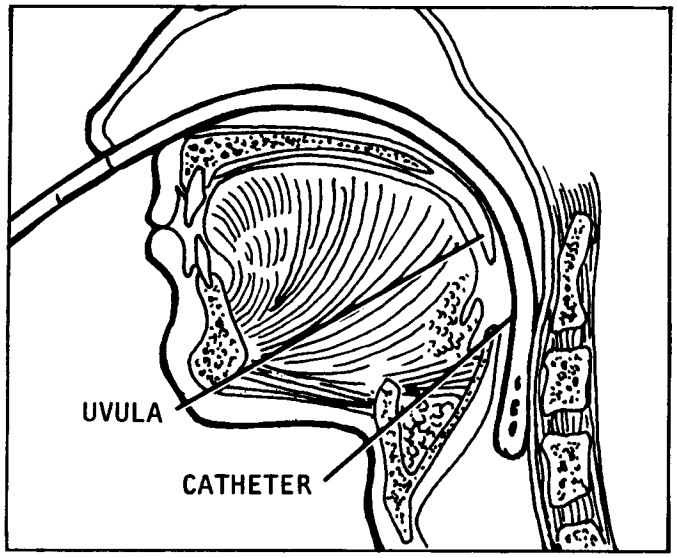

Figure 14-48. Movement of tube down throat.

i. Test to see if the tube is in the stomach.

(1) Attach an aspirating syringe to the open end of the tube and pull the plunger back. This action should pull gastric juice through the tube into the syringe.

(2) Use a bulb or Asepto syringe to inject 15 to 30 cc of air into the suction lumen of the tube while you listen with a stethoscope placed over the stomach. You should be able to hear a "gurgling" sound as the air in injected.

CAUTION

The tube MUST be tested to determine if it is in the trachea instead of the stomach:

(a) Observe the patient for cyanosis (bluish tinge to the skin) or dyspnea (difficult breathing).

(b) Place the free end of the tube in a glass of water and observe for air bubbles.

(c) Hold the free end of the tube near your ear and listen for a crackling sound.

(d) Instruct the patient to try and hum. If he is unable to do this, the tube is properly placed. If any of the conditions noted in (*a*), (*b*), or (*c*) are observed, REMOVE THE TUBE IMMEDIATELY.

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CAUTION

If fresh bleeding is apparent, stop the procedure and notify the physician immediately.

(5) Observe the contents of the irrigating solution. Note the color, consistency, and odor on the patient's chart.

(6) When the irrigation is complete, attach the gastric tube to the drain tube of the suction machine and turn the power on to the machine.

NOTE

Other methods can be used to unplug the tubing:

(a) Change the position of the tube by gently pushing it in and pulling it out. Suction must be turned off and the tube disconnected from the suction machine.

(b) Use a gentle "milking" action on the tube to free the blockage. Hold the tube securely and gently squeeze the tubing between your palm and fingers. Move carefully along the tubing in this manner until suction is restored.

(7) Insure that the patient is left clean and comfortable after the irrigation procedure is complete.

14-58. Care of the Patient with a Nasogastric Tube

a. One of the most uncomfortable aspects of the nasogastric tube is the constant irritation by the tube on the back of the throat. The physician may permit the patient to suck on ice chips, throat lozenges, or hard candy to keep his throat and the tube slightly moist.

b. The patient's nose may also become tender, sore, and cracked. Good hygiene procedure must be followed to keep this irritation to a minimum and reduce the chance of infection.

c. The patient is often hypersensitive to odors; his room and belongings must be kept immaculately clean and sanitary. Unsavory stimuli in the environment can cause him to become nauseated and to vomit.

d. When caring for patients with a gastric tube, you should remember to:

(1) Provide frequent and meticulous oral hygiene and nose care—

(a) Since a patient with a gastric tube is to be given nothing by mouth, the mouth can become very dry and the lips may become cracked.

(b) To keep the mouth and lips moist, swab the oral cavity with a cotton swab that has been moistened in equal parts of glycerine and lemon juice. Mouth wash may also be used if the patient is able to spit the liquid out; it must not be swallowed.

(2) Provide for the patient's freedom of movement as much as possible by securing the suction tubing to the patient's clothing or skin.

(3) Insure that the patient does not lie on the tubing; do not permit the tubing to become kinked.

(4) When you are checking suction machine operation, first check to see that it is properly attached to the wall outlet and the patient, that the power is turned on, and that the tubes are not kinked; also check to see that the drainage bottle is not overflowing. If the machine still does not provide suction after these checks have been made, notify your supervisor at once.

(5) Observe and record the contents of drainage bottles accurately. Report any unusual contents immediately to your supervisor.

14-59. Suction Devices Used with Nasogastric Tubes

a. Portable electric suction machine (Figure 14-49).

(1) This machine has a gauge that permits regulation of the amount of suction. It is particularly useful when the drainage becomes thick and viscous.

(2) When the machine is used, your main responsibility will be to see that the drainage bottle does not overflow. If this should occur, drainage could back up into the vacuum bottle, then into the motor itself.

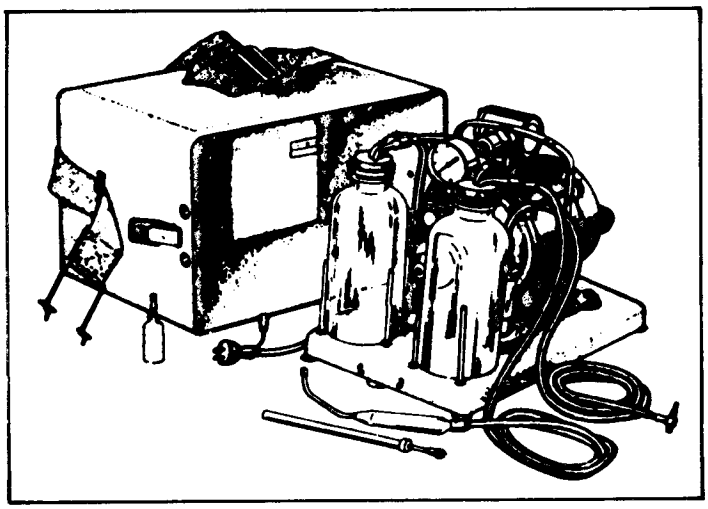

Figure 14-49. Portable electric suction machine.

b. Gomco thermotic pump (Figure 14-50).

(1) This is an electric pump that provides intermittent suction through alternating air pressure by expanding and contracting the air. Suction can be regulated by a "low" or "high" pressure button.

(2) Again, close observation of the drainage bottle contents is important to prevent overflow. Check the machine frequently to be sure that it is pulling the drainage from the stomach or intestine. As the pressure alternates during the suction cycle, red and green lights will alternate on the operating unit.

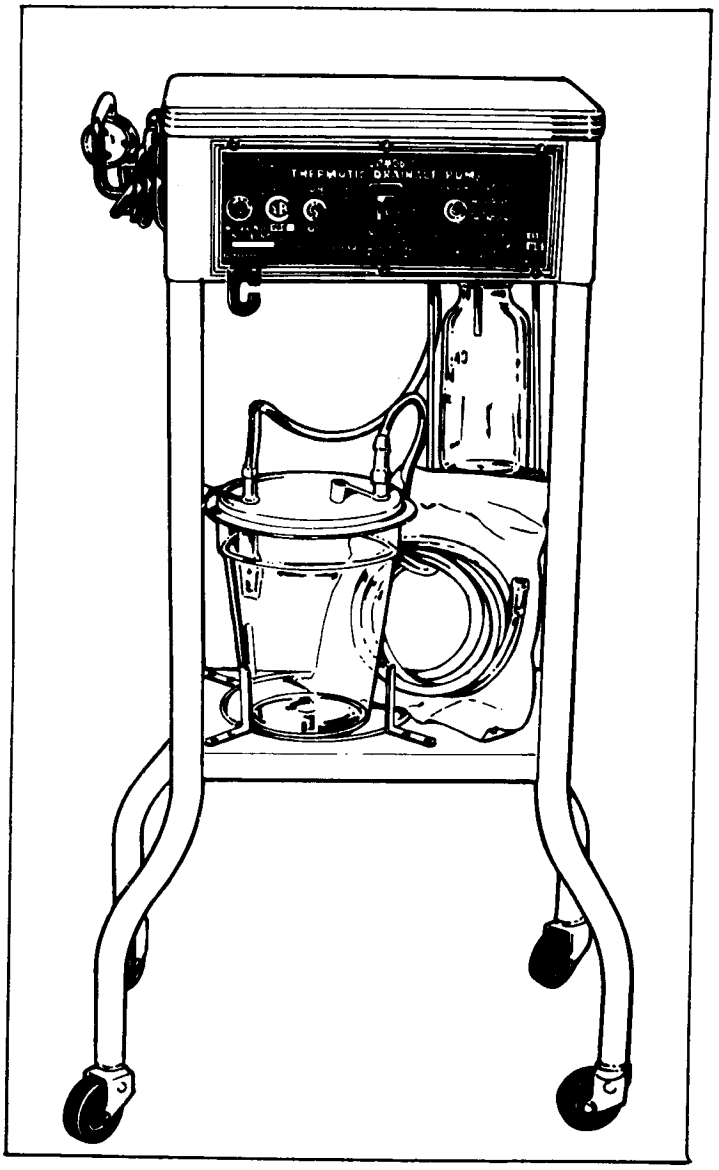

Figure 14-50. Gomco thermotic pump.

Section VIII. PATIENT/SURGICAL PREPARATION

14-60. General

Most wounds will require suturing or other minor surgical procedure. The wound area must be thoroughly cleansed prior to any operative procedure in order to remove any bacteria. You will frequently be called upon to prepare a wound area for a physician. The general rules of medical and surgical asepsis must be followed to prevent infection with possible loss of limb or life.

14-61. Procedure for Operative Treatment Preparation

a. Assemble and prepare equipment.

(1) Sponge basin.

(2) Solution cup.

(3) Gauze pad, 4 inch by 8 inch.

(4) Asepto syringe.

(5) Safety razor and blade.

(6) Sterile water or saline.

(7) Povidone-iodine (Betadine) solution.

(8) Protective pad.

(9) Sterile gloves.

(10) Antimicrobial soap.

b. Prepare the patient.

(1) Position the patient as indicated by the physician or your supervisor.

(2) Place the protective pad under the area to be treated.

(3) Explain the procedure to the patient to insure his understanding and cooperation.

(4) Expose the wound/injury site by removing or cutting away clothing and bandages of dressings. Do not expose any more of the patient's body than is necessary.

(a) Moisten any stuck bandages/dressings with sterile saline to loosen them.

(b) Use blunt-tipped bandage scissors to cut clothing and bandages.

(5) Focus available light on the area to be treated.

c. Perform patient care handwash.

d. Prepare to treat wound.

(1) Remove stoppers/caps from solution bottles.

(2) Open prep set.

(a) Open outer wrapper with bare hands.

(b) Glove one hand and open inner wrapper.

CAUTION

Do not touch unsterile items with gloved hand.
Keep gloved hand above work surfaces.

(c) Use your ungloved hand to pick up bottle and pour a small amount of solution into trash receptacle.

(d) Pick up sterile basin with gloved hand, step back slightly and pour sterile solution into basin.

(e) Pour povidone-iodine into solution cup.

(f) Glove bare hand.

e. Irrigate the wound.

(1) Use an aseptic syringe.

(2) Use large amounts of saline solution. If saline solution is not available, use sterile water.

CAUTION

Do not begin irrigation except under the direct supervision of a physician. Bleeding may occur when the wound is irrigated as clots are dislodged and washed away.

f. Cleanse the wound area.

(1) Place a sterile gauze pad over the wound and hold in place.

(2) Cleanse the skin area using povidone-iodine solution.

(3) Cleanse the area 3 to 4 inches (7.62 to 10.16 centimeters) around the wound.

(4) When cleansing the wound area, use gentle friction and a circular motion, working outward from the edges of the wound.

g. Shave the wound area.

(1) Check the physician's orders to be sure that the shaving procedure is to be accomplished.

(2) Shave any hair you can see at the edge of the wound or in the area being cleansed.

(3) Shave an area at least 3 inches (7.62 centimeters) around the wound and scrub with antimicrobial soap.

NOTES

1. Do not shave inside the wound. Any hair inside can be removed after the area is anesthetized.

2. Apply tension to the skin by gently pulling the skin taut. Shave with short gentle strokes to minimize pulling.

3. Clip long, thick hair first; then shave.

h. Repeat cleansing procedure.

(1) Upon completion, rinse with sterile saline to remove loose hair and prevent hair from entering wound.

(2) Blot skin dry with sterile gauze.

(3) Replace sterile gauze over wound.

(4) Notify physician that wound area has been prepared. Do not dress wound in the event that sutures are required.

i. Remove gloves and place them in the contaminated waste container.

j. Remove prep equipment.

(1) Remove protective pad from under patient. Use care not to contaminate clean area.

(2) Discard all disposable items in the contaminated waste container.

(3) Clean and store nondisposable items according to local SOP.

k. Perform patient care handwash.

l. Record procedure on Field Medical Card or Chronological Record of Medical Care Card.

14-62. Wound Irrigation

A wound irrigation (washing) is performed to—

a. Clean a wound by using large amounts of fluid to remove secretions, clots, foreign matter, or microorganisms.

b. Instill (administer drop-by-drop) medication in a wound.

14-63. Procedure for Irrigating a Wound

a. Verify that a wound irrigation is to be performed.

(1) Check the physician's orders, the Therapeutic Documentation Care Plan, or follow supervisor's instructions.

(2) The instructions will specify the amount and type of solution to be used to irrigate the wound.

b. Obtain the necessary equipment and supplies.

(1) Asepto (bulb-ended) syringe (300 to 500 milliliter capacity). If this syringe is not available, use the largest regular syringe stocked.

(2) Prescribed irrigating solution (normal saline is usually the preferred irrigating solution).

(3) Emesis basin.

(4) Sterile gloves.

(5) Mask.

(6) Sterile dressing.

(7) Sterile 4 inch by 8 inch gauze sponges.

(8) Sterile solution basin.

(9) Protective pad.

(10) Sterile drapes or towels.

c. Provide privacy and explain the procedure to the patient.

(1) Place a screen or curtain around the patient's bed. If he is in a private room, close the door.

(2) Explain the procedure to the patient to lessen his apprehension and gain his confidence and cooperation.

d. Position the patient to allow maximum exposure of the wound.

e. Position the protective pad.

(1) Assist the patient, if necessary, to raise his body.

(2) Place the protective pad directly under the wound. The pad serves as protection for the patient's bedding.

f. Carefully remove soiled dressings and bandages.

g. Perform patient care handwash.

h. Put on protective face mask to prevent contamination of the wound by microorganisms.

(1) Place the mask on your face and pull the elastic band over your head.

(2) Do not touch or adjust your mask while you are irrigating the wound.

i. Prepare wound irrigation equipment.

(1) Create a sterile field.

(2) Remove the solution basin from its package using sterile technique.

(3) Pour the prescribed irrigation solution into the basin without contaminating the sterile field.

(a) Insure that you are using the correct solution before you begin.

(b) If you are using a standard sterile water solution or normal saline solution, check the date and time on the bottle. If you open a new bottle, write the date and time that it was opened.

NOTE

Once opened, the water or saline solution is considered sterile for 24 hours.

(c) Open the package containing the Asepto syringe and place it on the sterile field using sterile technique.

(d) Open the 4 inch by 8 inch sponges and place them on the sterile field using sterile technique.

j. Don sterile gloves.

k. Place sterile drapes around the wound area to absorb excess drainage flow from the wound during the irrigation procedure.

l. Position the basin on the sterile drape adjacent to the area of the body to be irrigated.

m. Irrigate the wound.

(1) Grasp the syringe, depress the bulb, and insert the tip of the syringe into the irrigating solution.

(2) Release the bulb and allow the bulb to fill.

(3) If you are using a regular syringe, pull back on the plunger to aspirate the solution into the syringe.

(4) Hold the tip of the syringe as close to the wound as possible without touching it.

(5) Depress the bulb (or plunger) of the syringe and direct the flow of solution to all parts of the wound. Use firm pressure, but not excessive force.

NOTES

1. Pay particular attention to those areas showing debris, exudate (cellular material deposited by blood vessels, usually as the result of inflammation), and/or drainage.

2. Take extra care when irrigating a wound in which an abscess has formed.

   a. If the pressure within an abscess is unrelieved, it may cause a sinus tract.

   b. All internal surfaces of the wound should be inspected for tracts. You may have to use your gloved hand or a sterile object to gently pull back the flesh. Use care to prevent tearing of healing tissues.

(6) Repeat steps (1) through (5) until all of the irrigating solution is used or until all debris, exudate, or drainage is flushed out of the wound.

(7) Observe the wound drainage for quality and characteristics of debris, such as pus, blood color, odor, and consistency.

n. Dry the wound and apply a sterile dressing, if applicable.

(1) Remove a 4 inch by 8 inch sterile gauze sponge from the sterile field.

(2) Pat the wound dry, starting from the center and moving outward toward the edges.

(3) Remove emesis basin and drapes.

(4) Apply a sterile dressing to the wound, if applicable.

(5) Remove protective pad.

o. Reposition the patient.

p. Clean and store irrigation equipment.

(1) Discard contaminated waste according to local SOP.

(2) Clean and store nondisposable items according to local SOP.

q. Perform patient care handwash.

r. Report and record necessary information on patient's chart.

14-64. Patient Isolation

a. The primary purpose of placing patients in isolation is to minimize the possible spread of communicable diseases. The physician will determine the equipment for isolation; however, the responsibility for proper management of the isolated patient belongs to everyone involved including the patient himself.

b. Care for the isolated patient is essentially the same as it is for any patient, but there must be a marked increase in the emphasis on the principles of medical asepsis. For more detailed information concerning the management of isolated patients, refer to your local infection control or isolation SOP.

Section IX. INTRAVENOUS INFUSIONS

14-65. General

a. Intravenous infusions (IV) are started for two primary reasons.

(1) To provide a route for replacement of fluid, electrolytes, or blood products.

(2) To provide a direct way of administering drugs. In cases of low cardiac output (shock), blood is shifted away from the skin and skeletal muscles; drugs administered subcutaneously or intramuscularly are absorbed at a slow and unpredictable rate. Intravenous infusion insures that drugs reach the circulatory system promptly.

b. Intravenous needles (cannulas) are designed for three different applications.

(1) Hollow needle (also known as the butterfly).

(2) Plastic catheter inserted over a hollow needle (angiocath).

(3) Plastic catheter inserted through a hollow needle.

The over-the-needle catheter is generally preferred because it is more easily secured and less cumbersome than the other types. The catheter used should be a large bore (14 to 16 gauge for an adult), particularly if large quantities of fluid must be infused.

14-66. Procedure for Starting an Intravenous Infusion

a. Explain to the patient what is going to be done.

(1) Very few people are entirely free from anxiety about needles and IV's; when they are ill, these anxieties increase.

(2) Try to reduce this fear by explaining why the IV line is necessary and exactly what you are going to be doing.

b. Assemble the supplies and equipment needed.

(1) Select the fluid ordered by the physician and inspect the container.

(2) The container should be checked for leakage, contamination, cloudiness, and expiration date.

(3) Select the appropriate infusion set and cannula.

c. Also assemble the following:

(1) Antiseptic cleansing solution (preferably an iodine swab).

(2) Sterile 2 inch x 2 inch gauze dressing.

(3) Adhesive tape cut into strips of appropriate length.

(4) Constricting band (preferably soft rubber).

d. To select a suitable vein:

(1) Apply the constricting band at the patient's midarm above the elbow. Check to make sure that a pulse is still present after the band is in place.

(2) Inspect the hand and forearm for a vein that appears to be straight and lies on a flat surface. It should be well fixed, not roll, and should feel springy when palpated. You should avoid:

(a) IV's in those areas that require immobilizing a joint.

(b) Areas where an arterial pulse is palpable close to the vein.

(c) Veins of the lower extremities which can hamper the patient's ambulation.

(d) Veins near injured areas or distal to injuries.

e. Prepare the venipuncture site.

(1) Scrub the selected area with iodine swab, starting from the area above the vein.

(2) Wipe the area in widening circles around the site, leaving a wide margin.

f. Enter the vein.

(1) Stabilize the vein by applying pressure on it below the point of entry.

(2) Puncture the skin with the bevel of the needle pointing upward.

(a) Enter the vein from either side or from above.

(b) You should be able to feel the needle "pop" through into the vein.

(c) When you have entered the vein, blood will return through the needle.

(3) If using an over-the-needle catheter, advance it approximately 2 millimeters beyond the point where the blood return was first encountered.

(4) Slide the catheter over the needle into the vein and withdraw the needle.

(5) Release the constricting band and connect the infusion line to the catheter.

(6) Observe line for fluid flow in a steady stream. If flow is slow, pull back very slightly on the catheter to move the tip from the wall of the vein.

(7) After a good flow is established, check for infiltration.

(8) Cover the puncture site with povodine-iodine ointment, cover with sterile dressing, and tape the catheter securely in place.

(9) Loop the IV tubing and tape it to the skin adjacent to the infusion site.

CAUTION

Do not tape the connecting point between the catheter and the infusion set.

(10) Adjust the infusion flow to the rate ordered by the physician.

14-67. Solutions Used in Intravenous Therapy

a. Dextrose in water (D5W) solution—used to treat dehydration, to supply small amounts of calories for energy, and to supply water for body needs.

b. Lactate Ringer's solution—resembles the electrolyte structure of normal blood serum. Used to treat dehydration and to restore normal fluid after extracellular shift (a result of burns or infection).

c. Normal saline, 0.9 percent solution—used to correct excessive fluid loss or to correct excessive acid or alkalinity in body fluids.

14-68. Care of the Patient with an Intravenous Infusion

a. After starting an IV infusion, it will be necessary for you to maintain the infusion and manage the procedure in a safe and accurate manner. You must strictly adhere to aseptic procedures and techniques.

b. Proper patient care also requires you to take steps to intervene to prevent IV infusion complications and disturbances while managing the patient. Table 14-4 shows possible complications and the proper corrective actions. Table 14-5 shows possible IV disturbances and the intervention measures to be taken.

Table 14-4. Complications of IV Therapy

COMPLICATIONS	SYMPTOMS	CAUSES	CORRECTIVE ACTIONS	PREVENTIVE MEASURES
1. *Infiltration* catheter/ needle becomes dislodged or penetrates through the vein allowing IV fluid to leak and to accumulate into surrounding venipuncture tissue).	• Discoloration of site. • Swollen site. • Pain, tenderness, burning, or irritation at the infusion site.	• Solution is flowing at a sluggish rate.	• Stop infusion. • Remove IV and restart it in an alternate location. • Apply cold pack to site if infiltration has occurred within the past one-half hour. A cold pack will help reduce the pain and swelling. • Apply warm wet compresses to promote absorption if infiltration has occurred for over 30 minutes. A warm wet compress will stimulate circulation, therefore promoting the absorption of the infiltrated solution into surrounding tissues.	• Use splint for stability (a splint prevents dislodgement of IV catheter/needle). • Tape catheter/ needle securely. Avoid looping of tubing below bed level.

Table 14-4. Complications of IV Therapy, continued

COMPLICATIONS	SYMPTOMS	CAUSES	CORRECTIVE ACTIONS	PREVENTIVE MEASURES
2. *Phlebitis* (inflammation of the wall of the vein). Associated problems of phlebitis include— • thrombophlebitis, which is an inflammation of the vein accompanied by the formation of the clot. • thrombosis, which is the formation of a clot in a blood vessel without accompanying inflammation.	• Swelling and redness around venipuncture site. • Tenderness of tissue around venipuncture site. • Foul-smelling discharge from venipuncture site.	• Injury to vein during venipuncture or from later needle movement. • Irritation to vein by— • Long-term therapy. • Irritating or incompatible additives. • Use of vein that is too small to handle the amount or type of solution. • Sluggish flow rate that allows clot to form at end of needle.	• Stop infusion. • Remove IV and restart it in an alternate location. • Document observations.	• Keep the infusion flowing at the prescribed rate. • Stabilize the catheter/needle with a splint. • Select a large vein when irritating drugs and fluids are given. • Maintain strict aseptic techniques. • Change catheters and tubing every 48 to 72 hours. • Change bags, bottles, and dressings every 24 hours.
3. *Circulatory overload* (state of increased circulating volume usually due to transfusions or administering too much IV fluid that increase the blood pressure in the veins).	• Rise in blood pressure. • Dilation of veins with neck veins sometimes visibly engorged. • Rapid breathing, shortness of breath, rales. • Wide variance between liquid input and urine output.	Fluid is delivered too fast.	• Slow down the infusion to keep the vein open. • Raise patient's head to slow down the rapid circulation to the heart. • Notify the physician.	• Check the flow rate at frequent intervals to insure the desired rate is being maintained.

Table 14-4. Complications of IV Therapy, continued

COMPLICATIONS	SYMPTOMS	CAUSES	CORRECTIVE ACTIONS	PREVENTIVE MEASURES
4. *Air embolism* (the obstruction of a blood vessel by air carried via the bloodstream).	• Abrupt drop in blood pressure. • Chest pain. • Weak, rapid pulse. • Cyanosis (slightly blue, dark purplish, or gray discoloration of the skin. • Loss of consciousness.	• Solution runs dry. • Air bubbles are present in IV tubing.	• Notify supervisor immediately. • Administer oxygen. • Turn the patient on his left side and place him in a shock position to keep air in the right side of the heart. This position allows the pulmonary artery to absorb small air bubbles.	• Clear all air from tubing before attaching it to the patient. • Monitor solution closely and obtain new container, if required. Do not allow solution to run dry. • Check to see that all connections are secure.
5. *Infection* (the state or condition in which the body or part of it is invaded by disease-producing bacteria or viruses).	• Swelling, redness, and soreness around infusion site (localized infection is usually accompanied by inflammation, but inflammation may occur without infection). • Foul-smelling, yellowish discharge from venipuncture site. • Sudden rise in temperature and pulse.	• Poor aseptic technique. • Unsterile venipuncture technique. • Contamination of equipment during manufacture, storage or use. • Failure to keep the site clean or to change the IV equipment regularly. • Cross-contamination from one patient to another. • Excessive movement of the needle.	• Stop infusion. • Report observations to supervisor. • Send IV equipment to the laboratory for bacterial analysis. • Clean site, apply antimicrobial ointment, and apply a new sterile dressing. • Document all changes of dressing and equipment with your initials, time, and date.	• Use complete aseptic techniques when initiating an IV infusion. • Anchor catheter/needle firmly with tape. • Check vein daily for evidence of tenderness of signs of inflammation. • Apply antimicrobial ointment to infusion site at the time of insertion and at periodic intervals in accordance with the local SOP.

Table 14-5. Disturbances of IV Therapy

COMPLICATIONS	SIGNS OF DISTURBANCES	CAUSES	INTERVENTION MEASURES
Disturbance of infusion (any disturbance or failure of infusion equipment to deliver correct prescribed solution infusion rate).	• Flow rate slowing down or speeding up. • Solution flow stopping.	• Solution container is empty. • Drip chamber is less than half full. • Control clamp is closed. • Defect in the equipment. • Tubing is kinked or caught under patient.	• Frequent observations of flow rate and equipment. • Stop flow and notify supervisor. • Squeeze drip chamber until it is half full. • Consult supervisor and readjust it to restore prescribed drip rate. • Report defect immediately to supervisor. • Untangle the line or reposition patient so that the solution flows through the tube at the prescribed rate.

14-69. Procedure for Managing a Patient with an Intravenous Infusion

a. Document the IV therapy.

(1) Label the IV site dressing once the infusion has started and with each change of dressing.

(2) Change the dressing every 24 hours to keep the site clean and to prevent irritation and contamination.

(3) To label the IV dressing—

(a) Cut a piece of adhesive tape and write your initials, the time, and the date.

(b) Place the labeled tape gently over the dressing.

CAUTION

Do not label the tape after it has been placed on the dressing. This could irritate or injure the IV site.

(4) Label solution containers after the infusion has started and with each change of solutions. Bags and/or bottles should be changed every 24 hours to prevent irritation and contamination.

(5) To label containers, cut a piece of adhesive tape and write the patient's name and ID number, the flow rate, the date and time the container was started, and your initials. Place the tape on the bag or bottle.

(6) Prepare and attach a solution timing label.

(a) Place a piece of adhesive tape vertically on the container.

(b) Write on the tape the approximate time the solution should reach each volume mark on the container.

(c) Indicate on the bottom of the label the time the container should be empty.

(7) Label IV tubing once the infusion has started and with each change of tubing. Tubing should be changed every 48 to 72 hours. (Your local SOP will specify the exact frequency for tubing changes.)

(8) To label IV tubing—

(a) Wrap a strip of tape around the tubing, leaving a tab.

(b) Mark the date and time the tubing was changed on the tab.

(9) Record the following information on the appropriate patient chart:

(a) Date and time of puncture.

(b) Type of solution.

(c) Flow rate.

(d) Type and gauge of needle/cannula set.

(e) Insertion site.

(f) Patient's condition.

b. Replace the intravenous solution container. Adhere to strict aseptic techniques throughout the following replacement procedure:

(1) Perform a patient care handwash.

(2) Select a new container of the correct solution.

(3) Clamp the tubing shut to prevent air from entering during the replacement procedure.

(4) Remove the old container from the IV stand. If a solution bag is used, remove the spike.

(5) Hang the new container on the IV stand. Insert spike in new bag, if applicable.

(6) Adjust the flow rate in accordance with instructions.

(7) Label the solution container.

c. Replace the IV tubing.

(1) Change tubing in accordance with local SOP. (This is also a convenient time to change the IV site dressing.)

(2) Perform a patient care handwash.

(3) Slow the infusion to keep the vein open. Flow rate should be adjusted to 7 to 10 drops per minute.

(4) Disconnect the old tubing from the bottle or bag.

(5) Cover the open end of the disconnected tubing with the spike cover from the new tubing. Be careful to maintain sterility—the other end of the tubing is still connected to the catheter.

(6) Prime the new tubing and substitute for the old tubing.

(a) Place a sterile gauze under the catheter/needle hub.

(b) Grasp the new tubing between the fingers of one hand.

(c) Grasp the catheter/needle hub with a sterile gauze pad between thumb and index finger and carefully disconnect the old adapter.

(d) Remove the protective cap from the new tubing adapter and quickly connect the adapter to the hub.

(e) Secure tubing and dressing to the patient's arm.

d. Change the dressing. Use the following procedure to change the dressing every 24 hours:

(1) Perform a patient care handwash.

(2) Obtain the necessary equipment—

(a) Adhesive tape.

(b) Antiseptic swab.

(c) Sterile gauze pads, 2 inch x 2 inch.

(d) Antimicrobial ointment.

(3) Hold needle hub while loosening the old dressing. Discard the old dressing in the contaminated waste container.

(4) Clean skin around the insertion site with antiseptic swab. Check for infection and inflammation.

(5) Apply small amount of microbial ointment over the insertion site to help prevent infection.

(6) Secure catheter/needle, tubing, and new dressing to patient's arm.

e. Discontinue the infusion.

(1) Perform patient care handwash.

(2) Remove tape and dressing without dislodging needle.

(3) Clamp the tubing to stop the flow of solution. This will keep the solution from leaking into the tissue.

(4) Remove the needle gently and press an antiseptic sponge over the injection site.

(a) Do not twist, raise, or lower the needle—this could damage the vein.

(b) Pull the needle straight out without hesitation, following the course of the vein.

(c) Apply pressure with a gauze sponge for a short time. Follow this with a small dry pressure dressing (use either a plastic strip or an antiseptic sponge secured in place with a piece of tape).

(d) Remove the IV equipment and store/dispose of according to your local SOP.

Section X. MEASURING PATIENT INTAKE/OUTPUT

14-70. General

a. Observations concerning a patient's intake and output provide the physician with essential information about the patient's fluid balance. This information is considered to be an important sign regarding a patient's condition. Most postoperative patients and patients with indwelling catheters or those on IV infusion therapy are designated as requiring intake-output measurement. If there is any doubt that a patient is taking enough fluid for optimum kidney function or there is a need to verify the effectiveness of a drug, all fluids consumed or excreted are measured to aid in making a diagnosis.

b. Definitions.

(1) *Intake.* Intake consists of all fluids taken into the patient's body. Items that require intake measurement include—

(a) All fluids taken orally.

(b) Foods such as gelatin, ice cream, or ice that are fluid at room temperature.

(c) Foods such as melons that contain a large amount of liquid.

(d) Intravenous infusions.

(e) Blood transfusions.

(f) Nasogastric and bladder irrigations that are not returned.

(2) *Output.* Output consists of all liquids released by the body. Items that require output measurement include—

(a) Urine—both voided and drained.

(b) Liquid stool.

(c) Vomitus.

(d) Drainage from any suction device such as a nasogastric tube.

c. Intake and output records. A DD Form 792 (Twenty-Four Hour Patient Intake and Output Worksheet) is kept at the patient's bedside. It provides space in which to record the time, type, description, and amount in cubic centimeters (cc's) of fluid intake and output. Intake equivalents are shown on this form, with a list of serving levels (in cc's) of the most common serving containers used in the health care environment.

14-71. Procedure for Measuring a Patient's Intake

a. Verify the requirement to measure the patient's intake.

b. Explain the procedure to the patient.

(1) Tell him that all fluids taken by mouth must be recorded for accurate measurement.

(2) Insure that he is aware of any restrictions on the amount of fluids he may consume.

(3) Encourage him to drink extra liquids if the physician or supervisor has indicated a need to force fluids.

c. Identify the items requiring intake measurement including—

(1) Fluids taken orally.

(2) Intravenous infusion fluids.

(3) Blood transfusions.

(4) Irrigating solutions not returned.

CAUTION

If a patient is on restricted fluids or has only certain amounts of fluids available for consumption during a shift, note the amount allowed. **DO NOT GUESS.**

d. Calculate amount of fluid intake.

(1) Use graduated calibrated containers (cylindrical vessels marked by a series of lines).

(2) Be aware of the amounts customarily contained in drinking utensils to determine the amount consumed. Plastic utensils contained in field equipment have different capacities.

(3) For partially consumed contents, estimate the portion consumed by noting the amount the container holds. Subtract the existing cc's from the total amount in a full container to determine the amount consumed.

(4) For IV intake:

(a) Estimate the amount of fluid remaining in the glass bottle by reading the fluid level on the graduated scale or tape.

(b) Estimate the amount of fluid remaining in the plastic bag by grasping the sides of the bag, pulling them until taut, and reading the fluid level on the tape or graduated scale.

(c) Subtract existing cc's from the total number of cc's in a full container to determine the amount infused.

(d) Record intake. Enter time that IV is discontinued and amount of solution infused. Compute total intake at the end of an 8-hour shift, or as directed.

14-72. Procedure for Measuring a Patient's Output

a. Verify the requirement to measure the patient's output.

b. Explain the procedure to the patient. Remind ambulatory patients to—

(1) Male patients—void in urinal provided in designated area or in a graduated container.

(2) Female patients—void in bedpan or in specially designed container placed under toilet seat. Contents of this container must be poured into a graduated vessel for accurate measurement.

c. Identify the types of output items that require measurement. An output estimate will be used if accurate measurement is not possible.

d. Measure output.

(1) Collect urine, liquid stool, vomitus, and nasogastric drainage in appropriate vessels.

(2) Pour into calibrated graduated container.

(3) Place graduate on level surface to read scale. Note level reached by top of fluid in graduate.

NOTE

Accurate output measurement is sometimes impossible. Estimate output amount as small, moderate, or large when— (1) the patient is urine or stool incontinent; (2) the patient has not vomited into a container; (3) you encounter wound drainage, bleeding, or profuse perspiration.

e. Clean and store or discard supplies and equipment.

(1) Discard disposable items in proper waste receptacle.

(2) Dispose of collection vessel contents in accordance with local SOP.

(3) Wash, rinse, and store vessels.

f. Perform patient care handwash.

g. Record output in appropriate section of DD Form 792.

(1) Note time, type, and amount of output.

(2) Color, odor, and consistency are also to be noted, if required.

Section XI. ORAL AND NASOTRACHEAL SUCTIONING

14-73. General

a. Suctioning is performed for the purpose of removing accumulated secretions from the patient's nose, mouth, and/or tracheobronchial tree in order to maintain an open airway as well as to remove lung secretions that

block gaseous exchange. Removal of these secretions can be carried out through the oropharyngeal (mouth) or nasotracheal (nose) routes or through artificial airways such as endotracheal or tracheostomy tubes. (An endotracheal tube is inserted into the trachea through the nose or mouth; a tracheostomy tube is inserted through a surgical incision into the trachea.)

b. Suctioning is performed on patients who have lost their ability to swallow and to cough up secretions, due to unconsciousness, a stroke, or other disease process. The suctioning procedure should be performed ONLY when needed. Frequent suctioning causes trauma to the mucous linings of the respiratory tract. Edema and hemorrhage can occur in the airway from irritation caused by the suctioning catheter.

c. Nasotracheal suctioning can also cause the following complications:

(1) Trauma to the mucosal linings of the respiratory tract.

(2) Hypoxemia.

(3) Infections in the lungs (pneumonia).

(4) Atelectasis (collapsed lung).

(5) Cardiac arrest.

Postoperative patients must be turned and encouraged to cough and deep breathe frequently (usually every 2 hours) following surgery. This practice will be helpful in preventing postoperative complications, such as pneumonia and reducing the need for suctioning.

d. There is no specific order to follow when suctioning a patient using different routes. Whenever routes are changed, the catheter and gloves must be changed. Numerous organisms are normally found in the nose and pharynx. Sterile techniques must be used for all nasotracheal suctioning to prevent the introduction of "foreign" organisms into the lungs.

14-74. Procedure for Performing Oral and Nasotracheal Suctioning

a. Verify need for suctioning. Check patient for:

(1) Increased respirations accompanied by labored or difficult breathing.

(2) Moist, noisy, rattling, or gurgling sounds while breathing.

(3) Secretions drooling from the mouth.

(4) Check the physician's orders, Nursing Care Plan, or the supervisor's directive. These documents will normally indicate the frequency of suctioning.

b. Perform patient care handwash.

NOTES

1. When performing suctioning, every effort must be made to prevent the introduction of pathogens into the patient's lower airways.

2. Clean technique and thorough handwashing are essential for suctioning of the oral and nasal cavities. Sterile technique is MANDATORY for deep suctioning in the tracheobronchial tree and suctioning through the endotracheal and tracheostomy tubes. Follow aseptic techniques for all suctioning of the airway to minimize the spread of microorganisms that are not normally found in the air passages.

c. Obtain the necessary equipment.

(1) Disposable suction equipment (if available) contains a catheter, gloves, carton for solution, and packet of solution.

OR

(2) Sterile, disposable suction catheters (sized by use of the French scale: the smaller the number, the smaller the catheter (12 is smaller than 14 according to this scale). These two sizes are the most commonly used for suctioning the adult patient.

AND

(3) Sterile saline.

(4) Sterile solution basin.

(5) Sterile gloves.

(6) Suction apparatus (Figure 14-51).

NOTE

Suctioning of the airway requires a source of vacuum. Most hospitals that have piped-in oxygen also have a piped-in vacuum source (Figure 14-51A). When a piping system is not available, portable suction units must be used (Figure 14-51B). Most portable suction units must be connected to an electrical source; however, a portable field unit is nonelectrical.

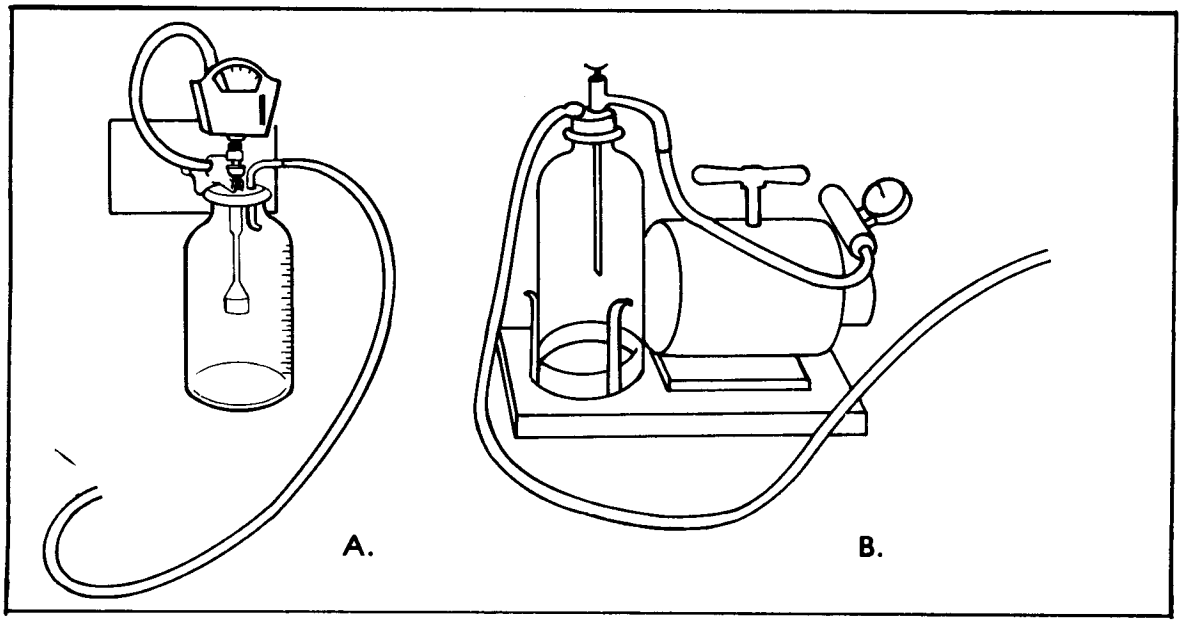

Figure 14-51. Suction apparatus.

d. Identify the patient.

(1) If the patient is conscious, ask him his name and check his bed card or identification band

(2) If the patient is unconscious, compare the name on the bed card and identification band . Insure that the name is the same on both.

e. Explain the procedure. Explain the suctioning procedure to the patient to lessen his fears and gain his cooperation.

f. Provide privacy. Place screen or curtain around the patient's area or close the door if he is in a room.

g. Position the patient. Place the patient in a semi-Fowler's position.

(1) The semi-Fowler's position is a semi-sitting position in which the patient manages secretions better and breathes easier.

(2) In some cases (such as spinal injuries), the patient will have to be suctioned in whatever position he is in at the time.

h. Check pressure on the suction apparatus.

(1) Turn on the suction apparatus.

(a) Suction pressure is usually expressed in inches (in) of mercury (Hg) on the portable unit and in millimeters (mm) of mercury (Hg) on the wall-mounted units.

(b) Recommended pressure settings for adult patients:

- Portable unit—7 to 15 inches Hg.
- Wall-mounted unit—120 to 150 mm Hg.

(c) If pressures are not within these limits, notify your supervisor before continuing.

(2) Place thumb over the end of the suction tubing and observe the pressure gauges (Figure 14-52).

CAUTION

If the pressure is too low, the secretions cannot be removed. If the pressure is too high, the mucous lining may be forcibly torn away and pulled into the catheter openings.

(3) Turn off the suction unit after the correct pressure has been verified.

i. Prepare the necessary materials. Open the disposable suction set (if used) or prepare materials for separate setup.

(1) Open the sterile solution basin on the bedside table.

(2) Pour sterile solution into solution basin without contaminating solution, basin, or sterile field.

CAUTION

Catheters should not be left in solutions. Even antibacterial solutions can promote the growth of certain types of bacteria.

(3) Open suction catheter package (following package directions) to expose the suction part of the catheter.

(4) Open sterile gloves. If gloves are wrapped separately from suction catheter, open catheter package first.

j. Oxygenate the patient (tracheal suctioning only). Provide additional oxygen for the patient prior to endotracheal stimulation and suctioning to prevent further hypoxemia (oxygen deficiency in the blood).

(1) If the patient is on oxygen therapy, increase the percentage of oxygen to 100 percent for 1 minute.

(2) If the patient is not on oxygen, have him take a minimum of five deep breaths.

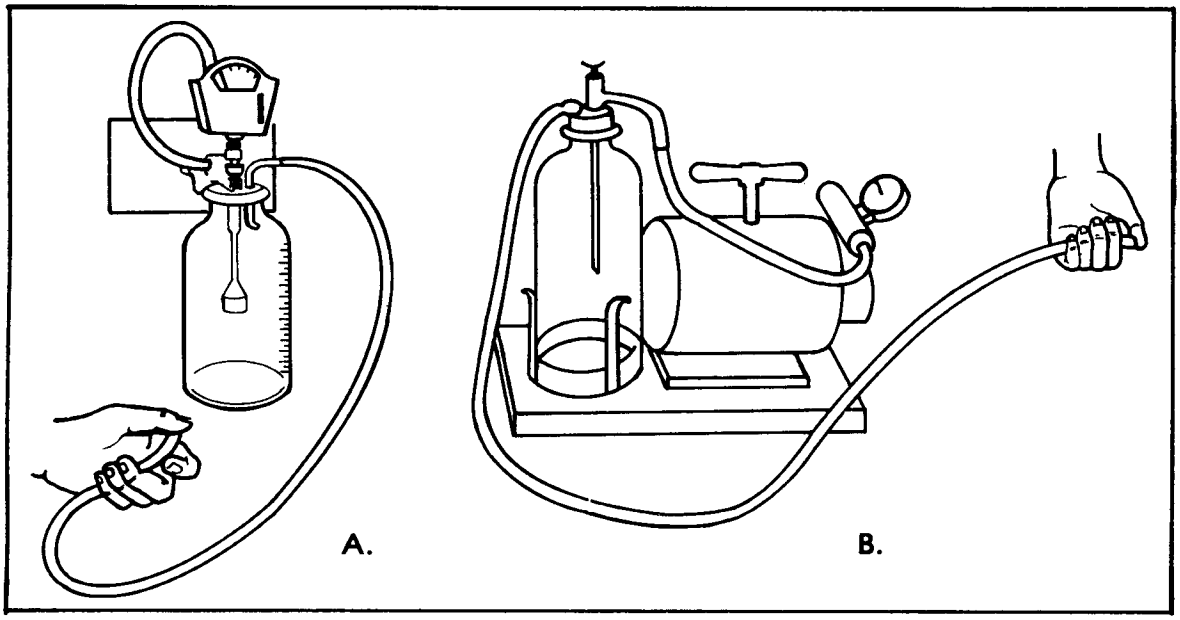

Figure 14-52. Checking pressure gauges of suctioning apparatus.

NOTES

1. Suctioning not only removes accumulated secretions but the oxygen as well.
2. If the patient is not on oxygen therapy, the bag-valve-mask method can also be used for oxygenation.
3. Endotracheal suctioning is used for patients receiving oxygen and for those with artificial airways.

k. Put on sterile gloves. Put sterile glove on dominant hand. Some suction kits provide only one glove for use on the dominant hand that handles sterile items.

l. Remove catheter from package. Remove the sterile catheter from the package with gloved hand. Keep the catheter coiled to prevent contamination.

m. Attach catheter to suction tubing. Attach suction catheter to tubing from suction apparatus. Attach the suction part of the catheter to the tubing held by the ungloved hand (Figure 14-53).

(1) Turn the suction apparatus on with ungloved hand.

(2) Hold the catheter in the gloved hand and insert the tip in the basin of sterile solution.

(3) Place thumb over the suction port and observe saline entering the drainage bottle.

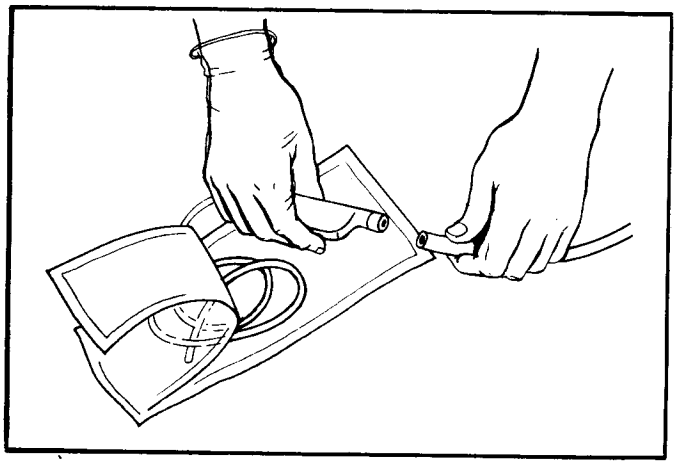

Figure 14-53. Connecting catheter to suction apparatus.

NOTE

If no saline enters the drainage bottle, the catheter is blocked and another catheter should be used.

n. Suction the patient.

(1) Oral route.

(a) Insert the tip of the catheter into the patient's mouth without suction.

NOTE

If the patient is uncooperative (clenches teeth, bites, or chews catheter), suction by the nasopharynx may be required for removing secretions from the back of the throat. In this case, insert the catheter into the nose, without suction, 3 to 5 inches. Apply suction, and withdraw the catheter using a rotating motion. This will also remove secretions from the nose.

CAUTION

Be aware that advancing the catheter too far into the back of the patient's throat may stimulate the patient's gag reflex, which could lead to vomiting and aspiration of stomach contents.

(b) Apply suction by placing the thumb of the ungloved hand over the suction port. This aspirates secretions from the back of the throat, along the outer gums and cheeks, and around the base of the tongue.

(c) Suctioning should not be continuous for more than 10 to 15 seconds. Suctioning removes oxygen as well as secretions; therefore, longer periods of continuous suctioning may result in an oxygen deprivation that is too severe for the patient.

(d) If the patient is alert and cooperative, tell him to cough to help bring secretions up to the back of the throat so they can be easily removed.

(e) Clear the catheter by inserting the tip in the saline solution and suction the solution through the catheter until it is clear.

NOTE

If an oral pharyngeal airway is in place, insert the catheter alongside the airway, then back into the pharynx.

(f) Repeat steps (*b*) and (*c*) above until all secretions have been aspirated.

NOTES

1. When the patient's breathing efforts become less labored and difficult, and noisy, rattling, or gurgling sounds are no longer noted, the suctioning should be discontinued.

2. With some patients, the complete absence of gurgling or rattling sounds cannot be achieved. If the sounds are still present after aspirations, notify the supervisor.

3. If the suctioning must be repeated, allow the patient to rest between each aspiration.

(g) Turn off the suction apparatus and disconnect the suction catheter from the tubing. Discard the catheter in the contaminated trash receptacle.

(2) Nasotracheal route.

(a) Instruct the patient to open his mouth and stick out his tongue (Figure 14-54A).

(b) Insert the suction catheter into the nasopharynx without suctioning (Figure 14-54B).

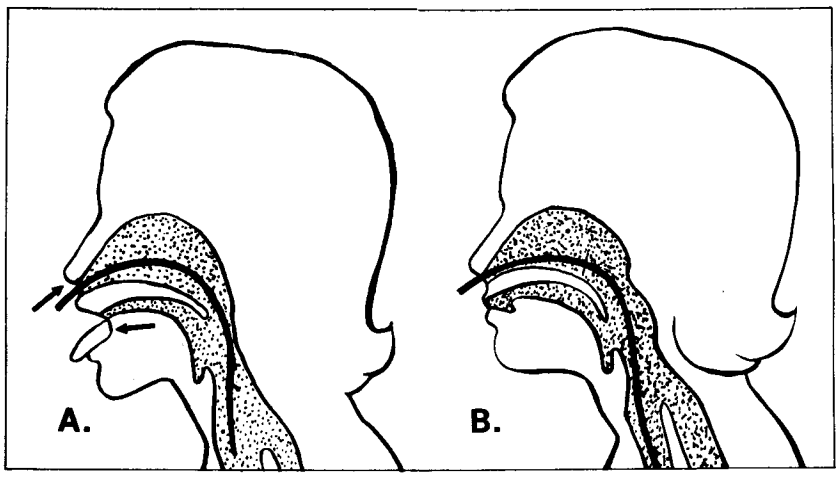

Figure 14-54. Inserting catheter into trachea.

NOTES

1. To estimate the distance the catheter is to be inserted, measure from the patient's nose to the ear, then to the larynx.

2. Generally, it is easier to insert a catheter into the right nostril than into the left, due to less septal deviation (a slight deformity of the wall separating the two nasal cavities, causing a partial or complete blockage of the nostril). If an obstruction is met, remove the catheter and try the left nostril. If an obstruction is still met, remove the catheter and call for assistance.

(c) Stimulate the cough reflex by gently moving the catheter.

(d) Quickly and gently advance the catheter into the trachea when the patient coughs.

NOTES

1. When the patient coughs, the epiglottis (a lid-like cartilage overhanging the larynx and trachea) is raised (opened), permitting easier insertion of the catheter.

2. If the patient can cough up enough secretions to clear his lungs and/or the bronchial tree adequately, the rest of the procedure may not be necessary.

(e) Suction secretions by placing your thumb over the suction port.

(f) Aspirate the patient for brief periods and allow him to rest between suctionings. Introduce the catheter carefully and suction thoroughly but quickly.

(g) Check the patient during and after the procedure for skin coloration change or increased pulse rate.

NOTE

Pulse rate increases with hypoxemia. Listen for changing breathing sounds. As secretions are removed, breathing should become quiet again.

(h) Rinse the catheter as required between suctionings.

o. Remove catheter and glove(s).

(1) Disconnect the catheter from the suction tubing and discard in trash receptacle.

(2) Remove glove(s) and discard in trash receptacle.

p. Leave the patient comfortable.

(1) Straighten and tighten bed linens.

(2) Place the patient in the semi-Fowler's position if his condition permits.

(3) Raise the bedside rails, if indicated.

(4) Place call bell/light within easy reach of the patient.

q. Discard used items.

(1) Discard disposable items in trash receptacle.

(2) Clean and store nondisposable items in accordance with the local SOP.

(3) Replenish supplies as needed.

r. Record procedure. Record the following:

(1) Time.

(2) Respirations (rate, labored, noisy).

(3) Procedure: route (oral, nasopharynx, nasotracheal).

(4) Type and amount of secretions obtained.

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