University of Mosul

College of Nursing

Basic Skills

Fundamentals of Nursing

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Basic Skills

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First stage

Basic Skills

Fundamental of Nursing Skills

- Performing Hand Hygiene
- Applying and Removing Personal Protective Equipment (Gloves, Gown, Mask, Eyewear)
- Applying and Removing Sterile Gloves (Open Method)
- Applying a Sterile Gown and Gloves (Closed Method)
- Assessing Body Temperature
- Assessing a Peripheral Pulse
- Assessing an Apical Pulse
- Assessing Respirations
- Assessing Blood Pressure
- Measuring Oxygen Saturation
- Cleaning a Sutured Wound and Changing a Dressing on a Wound with a Drain
- Preparing Medications from Ampules
- Preparing Medications from Vials
- Mixing Medications Using One Syringe
- Administering an Intradermal Injection for Skin Tests
- Administering a Subcutaneous Injection
- Administering an Intramuscular Injection
- Adding Medications to Intravenous Fluid Containers
- Administering Intravenous Medications Using IV Push
- Starting an Intravenous Infusion
- Performing Urinary Catheterization

Performing Hand Hygiene

PURPOSES

- To reduce the number of microorganisms on the hands
- To reduce the risk of transmission of microorganisms to clients

Equipment

- Soap
- Warm running water
- Paper towels

Performance

1. If you are washing your hands where the client can observe you, introduce yourself and explain to the client what you are going to do and why it is necessary.
2. Turn on the water and adjust the flow.
- There are five common types of faucet controls:

a. Hand-operated handles.
b. Knee levers.
c. Foot pedals.
d. Elbow controls. Move these with the elbows instead of the hands.
e. Infrared control. Motion in front of the sensor causes water to start and stop flowing automatically.

- Adjust the flow so that the water is warm.

3. Wet the hands thoroughly by holding them under the running water and apply soap to the hands.
- Hold the hands lower than the elbows so that the water flows from the arms to the fingertips. Note that this is a different technique than is used when performing surgical hand

washing. Nurses will learn to perform that level of hand washing if they are working in the operating room.

- If the soap is liquid, apply 4 to 5 mL (1 tsp). If it is bar soap, granules, or sheets, rub them firmly between the hands.

4. Thoroughly wash and rinse the hands.
- Use firm, rubbing, and circular movements to wash the palm, back, and wrist of each hand. Be sure to include the heel of the hand. Interlace the fingers and thumbs, and move the hands back and forth. ❶ The WHO (2009) recommends these steps:

a. Right palm over left dorsum with interlaced fingers and vice versa
b. Palm to palm with fingers interlaced
c. Backs of fingers to opposing palms with fingers interlocked
d. Rotational rubbing of left thumb clasped in right palm and vice versa.

Continue these motions for about 30 seconds.

Rub the fingertips against the palm of the opposite hand.

- Rinse the hands.

5. Thoroughly pat dry the hands and arms.
- Dry hands and arms thoroughly with a paper towel without scrubbing.

6. Turn off the water.
- Use a new paper towel to grasp a hand-operated control.

Performing Hand Hygiene

Applying and Removing Personal Protective Equipment (Gloves, Gown, Mask, Eyewear)

PURPOSES

• To protect health care workers and clients from transmission of potentially infective materials

Equipment

As indicated according to which activities will be performed, ensure that extra supplies are easily available.

• Gown
• Mask
• Eyewear
• Clean gloves

Performance

Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate.

2. Perform hand hygiene.

3. Apply a clean gown.

• Pick up a clean gown, and allow it to unfold in front of you without allowing it to touch any area soiled with body substances.

• Slide the arms and the hands through the sleeves.

• Fasten the ties at the neck to keep the gown in place.

• Overlap the gown at the back as much as possible, and fasten the waist ties or belt.

4. Apply the face mask.

- Locate the top edge of the mask. The mask usually has a narrow metal strip along the edge.
- Hold the mask by the top two strings or loops.
- Place the upper edge of the mask over the bridge of the nose, and tie the upper ties at the back of the head or secure the loops around the ears. If glasses are worn, fit the upper edge of the mask under the glasses.
- Secure the lower edge of the mask under the chin, and tie

the lower ties at the nape of the neck.

- If the mask has a metal strip, adjust this firmly over the bridge of the nose.
- Wear the mask only once, and do not wear any mask longer than the manufacturer recommends or once it becomes wet.
- Do not leave a used face mask hanging around the neck.
- • The Practice Guidelines provide further instructions on
- applying a face mask.

5. Apply protective eye wear if it is not combined with the face mask.

6. Apply clean gloves.

• No special technique is required.

- • If wearing a gown, pull the gloves up to cover the cuffs o fthe gown. If not wearing a gown, pull the gloves up to cover the wrists.

7. To remove soiled PPE, remove the gloves first since they are the most soiled.

• If wearing a gown that is tied at the waist in front, undo the ties before removing gloves.

• Remove the first glove by grasping it on its palmar surface, taking care to touch only glove to glove.

• Pull the first glove completely off by inverting or rolling the glove inside out.

• Continue to hold the inverted removed glove by the fingers of the remaining gloved hand. Place the first two fingers of the bare hand inside the cuff of the second glove.

Pull the second glove off to the fingers by turning it inside out. This pulls the first glove inside the second glove.

Using the bare hand, continue to remove the gloves, which are now inside out, and dispose of them in the refuse container.

8. Perform hand hygiene.

9. Remove protective eyewear and dispose of properly or place in the appropriate receptacle for cleaning.

10. Remove the gown when preparing to leave the room.

• Avoid touching soiled parts on the outside of the gown, if possible.

• Grasp the gown along the inside of the neck and pull down over the shoulders. Do not shake the gown.

• Roll up the gown with the soiled part inside, and discard it in the appropriate container.

11. Remove the mask.

• Remove the mask at the doorway to the client's room. If using a respirator mask, remove it after leaving the room and closing the door.

• If using a mask with strings, first untie the lower strings of the mask.

Untie the top strings and, while holding the ties securely, remove the mask from the face. If side loops are present, lift the side loops up and away from the ears and face. Do not touch the front of the mask.

• Discard a disposable mask in the waste container.

• Perform proper hand hygiene again.

Applying and Removing Personal Protective Equipment (Gloves, Gown, Mask, Eyewear)

❶ Overlapping the gown at the back to cover the nurse's uniform.

❷ A face mask and eye protection covering the nose, mouth, and eyes. Custom Medical Stock Photo/Custom Medical Stock Photo.

❸ Plucking the palmar surface of a contaminated glove.

❹ Inserting fingers to remove the second contaminated glove.

❺ Holding contaminated gloves that are inside out.

Applying and Removing Sterile Gloves (Open Method)

PURPOSES

• To enable the nurse to handle or touch sterile objects freely without contaminating them.

• To prevent transmission of potentially infective organisms from the nurse's hands to clients at high risk for infection.

Equipment

• Packages of sterile gloves

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary.

2. Perform hand hygiene and observe other appropriate infection prevention procedures.

Provide for client privacy.

4. Open the package of sterile gloves.

• Place the package of gloves on a clean, dry surface.

Some gloves are packed in an inner as well as an outer package. Open the outer package without contaminating the gloves or the inner package.

Remove the inner package from the outer package.

• Open the inner package

Put the first glove on the dominant hand.

• If the gloves are packaged so that they lie side by side, grasp the glove for the dominant hand by its folded cuff edge (on the palmar side) with the thumb and first finger of the nondominant hand. Touch only the inside of the cuff.

• If the gloves are packaged one on top of the other, grasp the cuff of the top glove as above, using the opposite hand.

• Insert the dominant hand into the glove and pull the glove on. Keep the thumb of the inserted hand against the palm of the hand during insertion.

against the palm, it is less likely to contaminate the outside of the glove.

• Leave the cuff in place once the unsterile hand releases the glove.

Put the second glove on the nondominant hand.

• Pick up the other glove with the sterile gloved hand, inserting the gloved fingers under the cuff and holding the gloved thumb close to the gloved palm.

Pull on the second glove carefully. Hold the thumb of the gloved first hand as far as possible from the palm.

• Adjust each glove so that it fits smoothly, and carefully pull the cuffs up by sliding the fingers under the cuffs.

7. Remove and dispose of used gloves.

• There is no technique for removing sterile gloves that is different from removing unsterile gloves. If they are soiled with secretions, remove them by turning them inside out.

• Perform hand hygiene.

8. Document that sterile technique was used in the performance of the procedure.

Applying and Removing Sterile Gloves (Open Method)

❶ Picking up the first sterile glove.

❷ Putting on the first sterile glove.

❸ Picking up the second sterile glove.

❹ Putting on the second sterile glove.

Applying a Sterile Gown and Gloves

PURPOSES

• To enable the nurse to work close to a sterile field and handle sterile objects freely

• To protect clients from becoming contaminated with microorganisms on the nurse's hands, arms, and clothing

Equipment

• Sterile pack containing a sterile gown

• Sterile gloves

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, and why it is necessary.

2. Perform hand hygiene and observe other appropriate infection prevention procedures.

3. Provide for client privacy.

Applying a Sterile Gown

4. Open the package of sterile gloves.

• Remove the outer wrap from the sterile gloves and leave the gloves in their inner sterile wrap on the sterile field.

5. Unwrap the sterile gown pack.

6. Perform proper hand hygiene.

7. Apply the sterile gown.

• Grasp the sterile gown at the crease near the neck, hold it away from you, and permit it to unfold freely without touching anything, including your uniform.

- Put your hands inside the shoulders of the gown without touching the outside of the gown.
- Work the hands down the sleeves only to the beginning of the cuffs.
- Have a coworker grasp the neck ties without touching the
- outside of the gown and pull the gown upward to cover the
- neckline of your uniform in front and back.

Applying Sterile Gloves (Closed Method)

8. Open the sterile glove wrapper while the hands are still covered by the sleeves.

9. Put the glove on the nondominant hand.

• With the dominant hand, pick up the opposite glove with the thumb and index finger, handling it through the sleeve.

• Lay the glove on the opposite gown cuff, thumb side down, with the glove opening pointed toward the fingers.
• Use the nondominant hand to grasp the cuff of the glove through the gown cuff, and firmly anchor it.
• With the dominant hand working through its sleeve, grasp the upper side of the glove's cuff, and stretch it over the cuff of the gown.
• Pull the sleeve up to draw the cuff over the wrist as you extend the fingers of the nondominant hand into the glove's fingers.
10. Put the glove on the dominant hand.
• Place the fingers of the gloved hand under the cuff of the remaining glove.
• Extend the fingers into the glove as you pull the glove up over the cuff of the gown.

Completion of Gowning

11. Complete gowning as follows.
• Have a coworker hold the long end of the waist tie of your gown, using sterile gloves or a sterile forceps.
• Turn completely around until the tie the coworker is holding is in front of you.
• Have a coworker take the two ties at each side of the gown and tie them at the back of the gown, making sure that your uniform is completely covered.
• When worn, sterile gowns should be considered sterile in front from the waist to the shoulder.
12. Remove and dispose of used gown and gloves.
• If soiled, remove the attire by turning it inside out.
13. If appropriate, document that sterile technique was used in the performance of the procedure.

Applying a Sterile Gown and Gloves

❶ Putting on a sterile gown.

❷ Working the hands down the sleeves of a sterile gown.

❸ A coworker ties the neck ties of a sterile gown.

❹ Opening the sterile glove wrapper.

❺ Positioning the first sterile glove for the nondominant hand.

❻ Pulling on the first sterile glove.

❼ Extending the fingers into the second glove of the dominant hand.

Assessing Body Temperature

PURPOSES

• To establish baseline data for subsequent evaluation

• To identify whether the core temperature is within normal range

• To determine changes in the core temperature in response to specific therapies (e.g., antipyretic medication, immunosuppressive therapy, invasive procedure)

• To monitor clients at risk for imbalanced body temperature (e.g., clients at risk for infection or diagnosis of infection; those who have been exposed to temperature extremes)

Equipment

• Thermometer

• Thermometer sheath or cover

• Water-soluble lubricant for a rectal temperature

• Clean gloves for a rectal temperature

• Towel for axillary temperature

• Tissues/wipes

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.

2. Perform hand hygiene and observe appropriate infection prevention procedures. Apply gloves if performing a rectal temperature.

3. Provide for client privacy.

4. Position the client appropriately (e.g., lateral or Sims' position for inserting a rectal thermometer).

5. Place the thermometer

6. Wait the appropriate amount of time. Electronic and tympanic thermometers will indicate that the reading is complete through a light or tone. Check package instructions for length of time to wait prior to reading chemical dot or tape thermometers.

7. Remove the thermometer and discard the cover or wipe with a tissue if necessary. If gloves were applied, remove and discard them.

• Perform hand hygiene.

8. Read the temperature and record it on your worksheet. If the temperature is obviously too high, too low, or inconsistent with the client's condition, recheck it with a thermometer known to be functioning properly.

9. Wash the thermometer if necessary and return it to the storage location.

10. Document the temperature in the client record.

Assessing Body Temperature

Oral Place the tip on either side of the frenulum. ❶

Rectal Apply clean gloves. Instruct the client to take a slow deep breath during insertion. ❷

Never force the thermometer if resistance is felt. Insert 3.5 cm (1.5 in.) in adults.

Axillary Pat the axilla dry if very moist. The tip is placed in the center of the axilla. ❸

Tympanic Pull the pinna slightly upward and backward for an adult. ❹

Point the probe slightly anteriorly, toward the eardrum.

Insert the probe slowly using a circular motion until snug.

Assessing a Peripheral Pulse

PURPOSES

- To establish baseline data for subsequent evaluation
- To identify whether the pulse rate is within normal range
- To determine the pulse volume and whether the pulse rhythm is regular
- To determine the equality of corresponding peripheral pulses on each side of the body
- To monitor and assess changes in the client's health status
- To monitor clients at risk for pulse alterations (e.g., those with a history of heart disease or experiencing cardiac arrhythmias, hemorrhage, acute pain, infusion of large volumes of fluids, or fever)
- To evaluate blood perfusion to the extremities

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.
2. Perform hand hygiene and observe appropriate infection prevention procedures.
3. Provide for client privacy.
4. Select the pulse point. Normally, the radial pulse is taken, unless it cannot be exposed or circulation to another body area is to be assessed.
5. Assist the client to a comfortable resting position. When the radial pulse is assessed, with the palm facing downward, the client's arm can rest alongside the body or the forearm can rest at a 90-degree angle across the chest. For the client who can sit, the forearm can rest across the thigh, with the palm of the hand facing downward or inward.
6. Palpate and count the pulse. Place two or three middle fingertips lightly and squarely over the pulse point.

- Count for 15 seconds and multiply by 4. Record the pulse in beats per minute on your worksheet. If taking a client's pulse for the first time, when obtaining baseline data, or if the pulse is irregular, count for a full minute. If an irregular pulse is found, also take the apical pulse.

Assessing a Peripheral Pulse

7. Assess the pulse rhythm and volume.

• Assess the pulse rhythm by noting the pattern of the intervals between the beats. A normal pulse has equal time periods between beats. If this is an initial assessment, assess for 1 minute.

• Assess the pulse volume. A normal pulse can be felt with moderate pressure, and the pressure is equal with each beat. A forceful pulse volume is full; an easily obliterated pulse is weak. Record the rhythm and volume on your worksheet.

8. Document the pulse rate, rhythm, and volume and your actions in the client record

Assessing pulses: Radial

Assessing pulses: Brachial

Assessing pulses: Carotid

Assessing a Peripheral Pulse

Assessing pulses: Femoral

Assessing pulses: Popliteal

Assessing pulses: Posterior tibial

Assessing pulses: Dorsalis pedis

Assessing an Apical Pulse

PURPOSES

• To obtain the heart rate of an adult with an irregular peripheral pulse

• To establish baseline data for subsequent evaluation

• To determine whether the cardiac rate is within normal range and the rhythm is regular

• To monitor clients with cardiac, pulmonary, or renal disease and those receiving medications to improve heart action

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.

2. Perform hand hygiene and observe appropriate infection prevention procedures.

3. Provide for client privacy.

4. Position the client appropriately in a comfortable supine position or in a sitting position. Expose the area of the chest over the apex of the heart.

5. Locate the apical impulse. This is the point over the apex of the heart where the apical pulse can be most clearly heard.

• Palpate the angle of Louis (the angle between the manubrium, the top of the sternum, and the body of the sternum). It is palpated just below the suprasternal notch and is felt as a prominence

• Slide your index finger just to the left of the sternum, and palpate the second intercostal space.

• Place your middle or next finger in the third intercostal space, and continue palpating downward until you locate the fifth intercostal space.

• Move your index finger laterally along the fifth intercostal space toward the MCL.

6. Auscultate and count heartbeats.

• Use antiseptic wipes to clean the earpieces and diaphragm of the stethoscope.

• Warm the diaphragm of the stethoscope by holding it in the palm of the hand for a moment.

Assessing an Apical Pulse

• Insert the earpieces of the stethoscope into your ears in the direction of the ear canals, or slightly forward.

• Tap your finger lightly on the diaphragm.

• Place the diaphragm of the stethoscope over the apical impulse and listen for the normal S1 and S2 heart sounds, which are heard as "lub-dub."

• If you have difficulty hearing the apical pulse, ask the supine client to roll onto his or her left side or the sitting client to lean slightly forward.

• If the rhythm is regular, count the heartbeats for 30 seconds and multiply by 2. If the rhythm is irregular or for giving certain medications such as digoxin, count the beats for 60 seconds.

7. Assess the rhythm and the strength of the heartbeat.

• Assess the rhythm of the heartbeat by noting the pattern of intervals between the beats. A normal pulse has equal time periods between beats.

• Assess the strength (volume) of the heartbeat. Normally, the heartbeats are equal in strength and can be described as strong or weak.

8. Document the pulse rate and rhythm, and nursing actions in the client record. Also record pertinent related data such as variation in pulse rate compared to normal for the client and abnormal skin color and skin temperature.

Second intercostal space.

Third intercostal space.

Assessing an Apical Pulse

Fifth intercostal space, MCL.

A, Stethoscope with both a bell and a diaphragm.
B, Close- up of a bell (left) and a diaphragm (right).

Taking an apical pulse using the flat-disc stethoscope.

Assessing Respirations

PURPOSES

• To acquire baseline data against which future measurements can be compared

• To monitor abnormal respirations and respiratory patterns and identify changes

• To monitor respirations before or after the administration of a general anesthetic or any medication that influences respirations

• To monitor clients at risk for respiratory alterations (e.g., those with fever, pain, acute anxiety, chronic obstructive pulmonary disease, asthma, respiratory infection, pulmonary edema or emboli, chest trauma or constriction, brainstem injury)

Equipment

• Clock or watch with a sweep second hand or digital seconds indicator

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.

2. Perform hand hygiene and observe appropriate infection prevention procedures.

3. Provide for client privacy.

4. Observe or palpate and count the respiratory rate.

• The client's awareness that the nurse is counting the respiratory rate could cause the client to purposefully alter the respiratory pattern. If you anticipate this, place a hand against the client's chest to feel the chest movements with breathing, or place the client's arm across the chest and observe the chest movements while supposedly taking the radial pulse.

• Count the respiratory rate for 30 seconds if the respirations are regular. Count for 60 seconds if they are irregular. An inhalation and an exhalation count as one respiration.

5. Observe the depth, rhythm, and character of respirations.

• Observe the respirations for depth by watching the movement of the chest.

• Observe the respirations for regular or irregular rhythm.

• Observe the character of respirations—the sound they produce and the effort they require.

6. Document the respiratory rate, depth, rhythm, and character on the appropriate record

Assessing Blood Pressure

PURPOSE

• To obtain a baseline measurement of arterial blood pressure for subsequent evaluation

• To determine the client's hemodynamic status (e.g., cardiac output: stroke volume of the heart and blood vessel resistance)

• To identify and monitor changes in blood pressure resulting from a disease process or medical therapy (e.g., presence or history of cardiovascular disease, renal disease, circulatory shock, or acute pain; rapid infusion of fluids or blood products)

Equipment

• Stethoscope or DUS

• Blood pressure cuff of the appropriate size

• Sphygmomanometer

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.

2. Perform hand hygiene and observe appropriate infection prevention procedures.

3. Provide for client privacy.

4. Position the client appropriately.

• The adult client should be sitting unless otherwise specified. Both feet should be flat on the floor.

• The elbow should be slightly flexed with the palm of the hand facing up and the arm supported at heart level. Readings in any other position should be specified. The blood pressure is normally similar in sitting, standing, and lying positions, but it can vary significantly by position in certain persons.

5. Wrap the deflated cuff evenly around the upper arm. Locate the brachial artery. Apply the center of the bladder directly over the artery. artery to be compressed if the reading is to be accurate.

• For an adult, place the lower border of the cuff approximately 2.5 cm (1 in.) above the antecubital space.

6. If this is the client's initial examination, perform a preliminary palpatory determination of systolic pressure.

• Palpate the brachial artery with the fingertips.
• Close the valve on the bulb.
• Pump up the cuff until you no longer feel the brachial pulse.
At that pressure the blood cannot flow through the artery. Note the pressure on the sphygmomanometer at which pulse is no longer felt.
• Release the pressure completely in the cuff, and wait 1 to 2 minutes before making further measurements.
7. Position the stethoscope appropriately.
• Cleanse the earpieces with antiseptic wipe.
• Insert the ear attachments of the stethoscope in your ears so that they tilt slightly forward.
• Ensure that the stethoscope hangs freely from the ears to the diaphragm.
• Place the bell side of the amplifier of the stethoscope over the brachial pulse site.
• Place the stethoscope directly on the skin, not on clothing over the site.
• Hold the diaphragm with the thumb and index finger.
8. Auscultate the client's blood pressure.
• Pump up the cuff until the sphygmomanometer reads 30 mmHg above the point where the brachial pulse disappeared.
• Release the valve on the cuff carefully so that the pressure decreases at the rate of 2 to 3 mmHg per second.
• As the pressure falls, identify the manometer reading at Korotkoff phases 1, 4, and 5.
• Deflate the cuff rapidly and completely.
• Wait 1 to 2 minutes before making further determinations.
• Repeat the above steps to confirm the accuracy of the reading— especially if it falls outside the normal range (although this may not be routine procedure for hospitalized or well clients). If there is greater than 5 mmHg difference between the two readings, additional measurements may be taken and the results averaged.
9. If this is the client's initial examination, repeat the procedure on the client's other arm. There should be a difference of no more than 10 mmHg between the arms. The arm found to have the higher pressure should be used for subsequent examinations
• If appropriate, set the device for the desired number of minutes between blood pressure determinations.
• When the device has determined the blood pressure reading, note the digital results.
10. Remove the cuff from the client's arm.

11. Wipe the cuff with an approved disinfectant.

12. Document and report pertinent assessment data according to agency policy. Record two pressures in the form "130/80" where "130" is the systolic (phase 1) and "80" is the diastolic (phase 5) pressure.

❶ Measuring blood pressure in a client's thigh.

Measuring Oxygen Saturation

PURPOSES

- To estimate the arterial blood oxygen saturation
- To detect the presence of hypoxemia before visible signs develop

Equipment

- Nail polish remover as needed
- Alcohol wipe
- Sheet or towel
- Pulse oximeter

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.
2. Perform hand hygiene and observe appropriate infection prevention procedures.
3. Provide for client privacy.
4. Choose a sensor appropriate for the client's weight, size, and desired location. Because weight limits of sensors overlap, a pediatric sensor could be used for a small adult.

- If the client is allergic to adhesive, use a clip or sensor without adhesive. If using an extremity, apply the sensor only if the proximal pulse and capillary refill at the point closest to the site are present. If the client has low tissue perfusion due to peripheral vascular disease or therapy using vasoconstrictive medications, use a nasal sensor or a reflectance sensor on the forehead. Avoid using lower extremities that have a compromised circulation and extremities that are used for infusions or other invasive monitoring.

5. Prepare the site.

- Clean the site with an alcohol wipe before applying the sensor.
- It may be necessary to remove a female client's dark nail polish.
- Alternatively, position the sensor on the side of the finger rather than perpendicular to the nail bed.

6. Apply the sensor, and connect it to the pulse oximeter.

- Make sure the LED and photodetector are accurately aligned, that is, opposite each other on either side of the finger, toe, nose, or earlobe. Many sensors have markings to facilitate correct alignment of the LEDs and photodetector.

• Attach the sensor cable to the connection outlet on the oximeter. Turn on the machine according to the manufacturer's directions. Appropriate connection will be confirmed by an audible beep indicating each arterial pulsation.

Some devices have a wheel that can be turned clockwise to increase the pulse volume and counterclockwise to decrease it.

• Ensure that the bar of light or waveform on the face of the oximeter fluctuates with each pulsation.

7. Set and turn on the alarm when using continuous monitoring.

• Check the preset alarm limits for high and low oxygen saturation and high and low pulse rates. Change these alarm limits according to the manufacturer's directions as indicated. Ensure that the audio and visual alarms are on before you leave the client. A tone will be heard and a numberwill blink on the faceplate.

8. Ensure client safety.

• Inspect and/or move or change the location of an adhesive toe or finger sensor every 4 hours and a spring-tension sensor every 2 hours.

• Inspect the sensor site tissues for irritation from adhesive sensors.

9. Ensure the accuracy of measurement.

• Minimize motion artifacts by using an adhesive sensor, or immobilize the client's monitoring site.

• If indicated, cover the sensor with a sheet or towel to block large amounts of light from external sources (e.g., sunlight, procedure lamps, or bilirubin lights in the nursery).

• Compare the pulse rate indicated by the oximeter to the radial pulse periodically.

10. Document the oxygen saturation on the appropriate record at designated intervals.

Cleaning a Sutured Wound and Changing a Dressing on a Wound with a Drain

PURPOSES

- To promote wound healing by primary intention
- To prevent infection
- To assess the healing process
- To protect the wound from mechanical trauma

Equipment

- Bath blanket (if necessary)
- Moisture-proof bag
- Mask (optional)
- Acetone or another solution (if necessary to loosen adhesive)
- Clean gloves
- Sterile gloves
- Sterile dressing set; if none is available, gather the following sterile items:
- Drape or towel
- Gauze squares
- Container for cleaning solution
- Cleaning solution (e.g., normal saline)
- Two pairs of forceps
- Gauze dressings and surgipads
- Applicators or tongue blades to apply ointments
- Additional supplies required for the particular dressing (e.g., extra gauze dressings and ointment, if ordered)
- Tape, tie tapes, or binder

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Discuss how the results will be used in planning further care or treatments.
2. Perform hand hygiene and observe other appropriate prevention control procedures.
3. Provide for client privacy.
4. Remove binders (see Chapter 36) and tape.

- Remove binders, if used, and place them aside. Untie tie tapes, if used. Montgomery straps (tie tapes) are commonly used for wounds requiring frequent dressing changes.
- If adhesive tape was used, remove it by holding down the skin and pulling the tape gently but firmly toward the wound.

5. Remove and dispose of soiled dressings appropriately.

• Apply clean gloves and remove the outer abdominal dressing or surgipad.

• Lift the outer dressing so that the underside is away from the client's face.

• Place the soiled dressing in the moisture-proof bag without touching the outside of the bag.

• Remove the underdressings, taking care not to dislodge any drains. If the gauze sticks to the drain, support the drain with one hand and remove the gauze with the other.

• Assess the location, type (color, consistency), and odor of wound drainage, and the number of gauzes saturated or the diameter of drainage collected on the dressings.

• Discard the soiled dressings in the bag as before.

• Remove and discard gloves in the moisture-proof bag.

• Perform hand hygiene.

6. Set up the sterile supplies.

• Open the sterile dressing set, using surgical aseptic technique.

• Place the sterile drape beside the wound.

• Open the sterile cleaning solution and pour it over the gauze sponges in the plastic container.

• Apply sterile gloves.

7. Clean the wound, if indicated.

• Clean the wound, using your gloved hands or forceps and gauze swabs moistened with cleaning solution.

• If using forceps, keep the forceps tips lower than the handles at all times.

• Use the cleaning methods illustrated.

• Use a separate swab for each stroke and discard each swab after use.

• If a drain is present, clean it next, taking care to avoid reaching across the cleaned incision. Clean the skin around the drain site by swabbing in half or full circles from around the drain site outward, using separate swabs for each wipe

• Support and hold the drain erect while cleaning around it. Clean as many times as necessary to remove the drainage.

• Dry the surrounding skin with dry gauze swabs as required. Do not dry the incision or wound itself.

8. Apply dressings to the drain site and the incision.

• Place a precut 4×4 gauze snugly around the drain , or open a 4×4 gauze to 4×8 in., fold it lengthwise to 2×8 in., and place it around the drain so that the ends overlap.

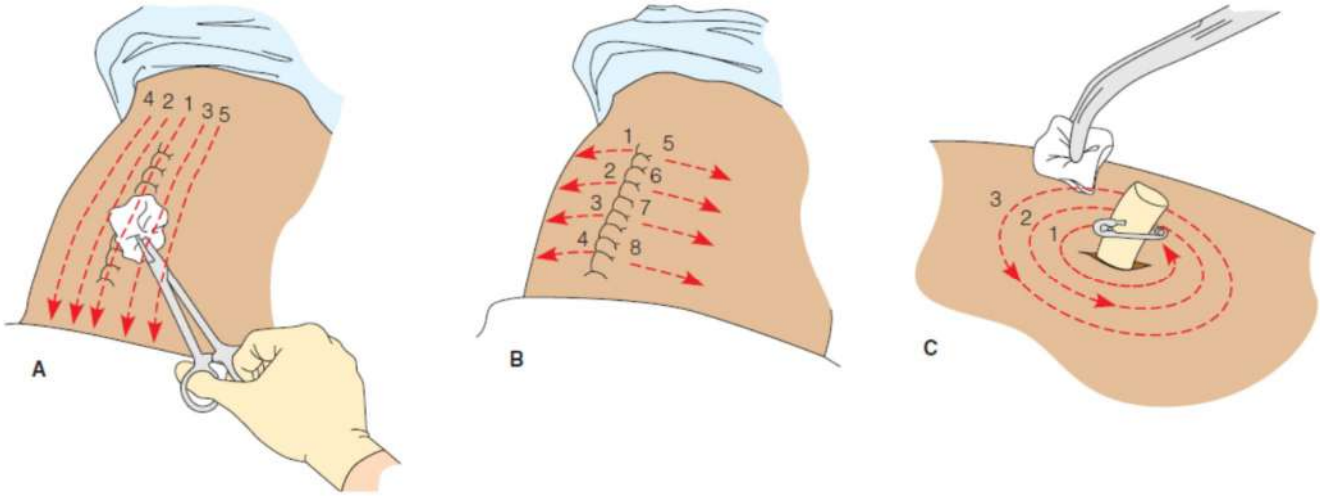
• Apply the sterile dressings one at a time over the drain and the incision. Place the bulk of the dressings over the drain area and below the drain, depending on the client's usual position.

• Apply the final surgipad. Remove and discard gloves. Secure the dressing with tape or ties.

• Perform hand hygiene.

9. Document the procedure and all nursing assessments.

Montgomery straps holding dressing.



Methods of cleaning surgical wounds: A, cleaning the wound from top to bottom, starting at the center; B, cleaning a wound outward from the incision; C, cleaning around a Penrose drain site. For all methods, a clean sterile swab is used for each stroke.

Preparing Medications from Ampules

Equipment

- Client's MAR or computer printout
- Ampule of sterile medication
- File (if ampule is not scored) and small gauze square or plastic ampule opener
- Antiseptic swabs
- Syringe
- Needle for administering the medication
- Filter needle or straw for withdrawing medication from the ampule

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures.
2. Prepare the medication ampule for drug withdrawal.
- Flick the upper stem of the ampule several times with a fingernail.
- Use an ampule opener or place a piece of sterile gauze or alcohol wipe between your thumb and the ampule neck or around the ampule neck, and break off the top by bending it toward you to ensure the ampule is broken away from yourself and away from others.

or

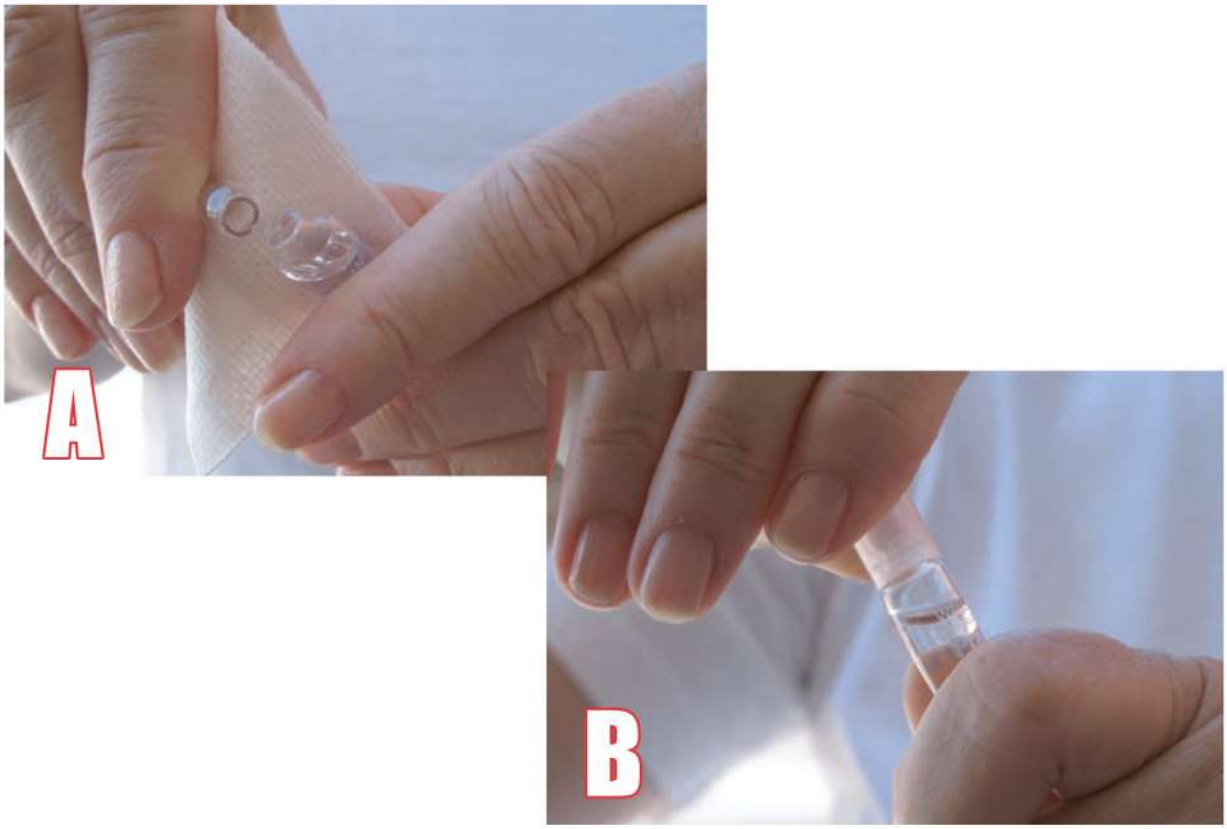
- Place the antiseptic wipe packet over the top of the ampule before breaking off the top.
- Dispose of the top of the ampule in the sharps container.

3. Withdraw the medication.
- Place the ampule on a flat surface.
- Attach the filter needle/straw to the syringe.
- Remove the cap from the filter needle and insert the needle into the center of the ampule. Do not touch the rim of the ampule with the needle tip or shaft.

With a single-dose ampule, hold the ampule slightly on its side, if necessary, to obtain more than the ordered amount of medication.

- Dispose of the filter needle by placing in a sharps container.
- If giving an injection replace the filter needle with a regular needle, tighten the cap at the hub of the needle, and push solution into the needle, to the prescribed amount.

Preparing Medications from Ampules



❶ A, Breaking the neck of an ampule using a gauze pad; B, breaking the neck of an ampule using an ampule opener.

❷ Withdrawing a medication A, from an ampule on a flat surface; and B, from an inverted ampule.

Preparing Medications from Vials

Equipment

- Client's MAR or computer printout
- Vial of sterile medication
- Antiseptic swabs
- Safety needle and syringe
- Filter needle (check agency policy)
- Sterile water or normal saline, if drug is in powdered form

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures.

2. Prepare the medication vial for drug withdrawal.

- Mix the solution, if necessary, by rotating the vial between the palms of the hands, not by shaking.

Remove the protective cap, or clean the rubber cap of a previously opened vial with an antiseptic wipe by rubbing in a circular motion.

3. Withdraw the medication.

- Attach a filter needle, as agency practice dictates, to draw up premixed liquid medications from multidose vials.
- Ensure that the needle is firmly attached to the syringe.
- Remove the cap from the needle, then draw up into the syringe the amount of air equal to the volume of the medication

to be withdrawn.

- Carefully insert the needle into the upright vial through the center of the rubber cap, maintaining the sterility of the needle.
- Inject the air into the vial, keeping the bevel of the needle above the surface of the medication.
- Withdraw the prescribed amount of medication using either of the following methods:

a. Hold the vial down (i.e., with the base lower than the top), move the needle tip so that it is below the fluid level, and withdraw the medication. Avoid drawing up the last drops of the vial.

or

b. Invert the vial, ensure the needle tip is below the fluid level, and gradually withdraw the medication.

Preparing Medications from Vials

- Hold the syringe and vial at eye level to determine that the correct dosage of drug is drawn into the syringe. Eject air remaining at the top of the syringe into the vial.
- When the correct volume of medication plus a little more (e.g., 0.25 mL) is obtained, withdraw the needle from the vial, and replace the cap over the needle using the scoop method, thus maintaining its sterility.
- If necessary, tap the syringe barrel to dislodge any air bubbles present in the syringe.
- If giving an injection, replace the filter needle, if used, with a regular or safety needle of the correct gauge and length. Eject air from the new needle and verify correct medication volume before injecting the client.
- Once the medication is reconstituted, store it in a refrigerator or as recommended by the manufacturer.
- Discard vial if sterility is compromised or questionable.
- Remember to use a sterile syringe and needle/cannula for each access to the multidose vial.

Preparing Medications from Vials

❶ Injecting air into a vial.

❷ Withdrawing a medication from a vial that is held with the base down.

❸ Withdrawing a medication from an inverted vial.

Mixing Medications Using One Syringe

Equipment

• Client's MAR or computer printout

• Two vials of medication; one vial and one ampule; two ampules; or one vial or ampule and one cartridge

• Antiseptic swabs

• Sterile syringe and safety needle or insulin syringe and needle (If insulin is being given, use a small-gauge hypodermic needle, e.g., #26 gauge.)

• Additional sterile subcutaneous or intramuscular safety needle (optional)

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures.

2. Prepare the medication ampule or vial for drug withdrawal.

• If using insulin, thoroughly mix the solution in each vial prior to administration. Rotate the vials between the palms of the hands.

• Clean the tops of the vials with antiseptic swabs.

3. Withdraw the medications.

Mixing Medications from Two Vials

• Take the syringe and draw up a volume of air equal to the volume of medications to be withdrawn from both vials A and B.

• Inject a volume of air equal to the volume of medication to be withdrawn into vial A. Make sure the needle does not touch the solution.

• Withdraw the needle from vial A and inject the remaining air into vial B.

• Withdraw the required amount of medication from vial B.

• Using a newly attached sterile needle, withdraw the required amount of medication from vial A. Avoid pushing the plunger because that will introduce medication B into vial A. If using a syringe with a fused needle, withdraw the medication from vial A. The syringe now contains a mixture of medications from vials A and B.

Mixing Medications from One Vial and One Ampule

• First prepare and withdraw the medication from the vial.

• Then withdraw the required amount of medication from the ampule.

Mixing Medications Using One Syringe

Variation: Mixing Insulins

The following is an example of mixing 10 units of regular insulin and 30 units of neutral protamine Hagedorn (NPH) insulin, which contains protamine.

• Inject 30 units of air into the NPH vial and withdraw the needle. (There should be no insulin in the needle.) The needle should not touch the insulin. ❶

• Inject 10 units of air into the regular insulin vial and immediately withdraw 10 units of regular insulin. ❷ and ❸ Always withdraw the regular insulin first.

• Reinsert the needle into the NPH insulin vial and withdraw 30 units of NPH insulin. ❹ (The air was previously injected into the vial.) Be careful to withdraw only the ordered amount and to not create air bubbles. If excess medication has been drawn up, discard the syringe and begin the procedure over again.

❶

❷


❸


❹

Administering an Intradermal Injection for Skin Tests

PURPOSE

• To provide a medication that the client requires for allergy testing and TB screening

Equipment

• Client's MAR or computer printout

• Vial or ampule of the correct medication

• Sterile 1-mL syringe calibrated into hundredths of a milliliter (i.e., tuberculin syringe) and a #25- to #27-gauge safety needle that is 1/4 to 5/8 inch long

• Alcohol swabs

• 2×2 sterile gauze square (optional)

• Clean gloves (according to agency protocol)

• Bandage (optional)

• Epinephrine on hand in case of allergic anaphylactic reaction

PERFORMANCE

1. Perform hand hygiene and observe other appropriate infection prevention procedures.

2. Prepare the medication from the vial or ampule for drug withdrawal.

3. Prepare the client

• Prior to performing the procedure, introduce self and verify the client's identity using agency protocol.

4. Explain to the client that the medication will produce a small wheal, sometimes called a bleb. A wheal is a small raised area, like a blister. The client will feel a slight prick as the needle enters the skin. Some medications are absorbed slowly through the capillaries into the general circulation, and the bleb gradually disappears. Other drugs remain in the area and interact with the body tissues to produce redness and induration (hardening), which will need to be interpreted at a particular time (e.g., in 24 or 48 hours). This reaction will also gradually disappear.

5. Provide for client privacy.

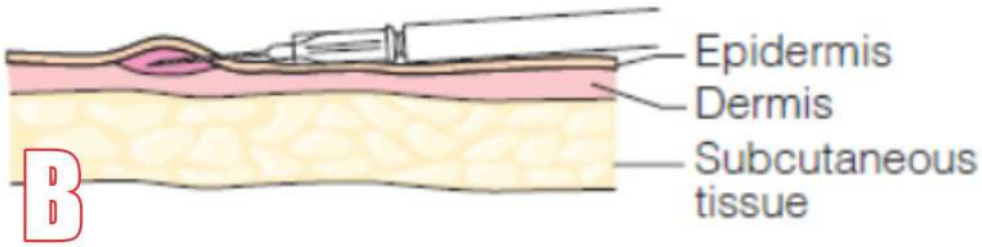
6. Select and clean the site.

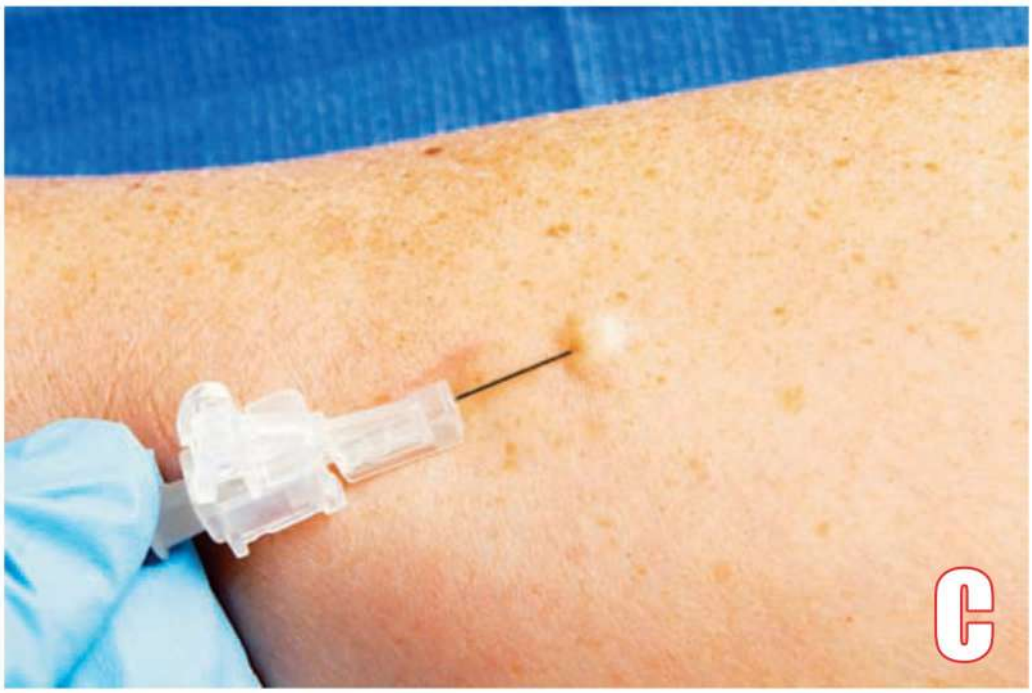
• Select a site (e.g., the forearm about a hand's width above the wrist and three or four finger widths below the antecubital space).

• Avoid using sites that are tender, inflamed, or swollen and those that have lesions.

• Apply gloves as indicated by agency policy.
• Cleanse the skin at the site using a firm circular motion starting at the center and widening the circle outward. Allow the area to dry thoroughly.
7. Prepare the syringe for the injection.
• Remove the needle cap while waiting for the antiseptic to dry.
• Expel any air bubbles from the syringe. Small bubbles that adhere to the plunger are of no consequence.
• Grasp the syringe in your dominant hand, close to the hub, holding it between thumb and forefinger. Hold the needle almost parallel to the skin surface, with the bevel of the needle up.
8. Inject the fluid.
• With the nondominant hand, pull the skin at the site until it is taut. For example, if using the ventral forearm, grasp the client's dorsal forearm and gently pull it to tighten the ventral skin.
• Insert the tip of the needle far enough to place the bevel through the epidermis into the dermis. The outline of the bevel should be visible under the skin surface.
• Stabilize the syringe and needle. Inject the medication carefully and slowly so that it produces a small wheal on the skin.
• Withdraw the needle quickly at the same angle at which it was inserted. Activate the needle safety device. Apply a bandage if indicated.
• Do not massage the area.
• Dispose of the syringe and needle into the sharps container.
• Remove and discard gloves.
• Perform hand hygiene.
• Circle the injection site with ink to observe for redness or induration (hardening), per agency policy.
9. Document all relevant information.
• Record the testing material given, the time, dosage, route, site, and nursing assessments.

Administering an Intradermal Injection for Skin Tests





❶ For an intradermal injection: A, the needle enters the skin at a 5° to 15° angle; B, C, the medication forms a bleb or wheal under the pidermis.

Administering a Subcutaneous Injection

PURPOSES

• To provide a medication the client requires (see specific drug action)

• To allow slower absorption of a medication compared with either the intramuscular or intravenous route

Equipment

• Client's MAR or computer printout

• Vial or ampule of the correct sterile medication

• Syringe and needle (e.g., 3-mL syringe, #25-gauge needle or smaller, 3/8 or 5/8 in. long)

• Antiseptic swabs

• Dry sterile gauze for opening an ampule (optional)

• Clean gloves

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures (e.g., clean gloves).

2. Prepare the medication from the ampule or vial for drug withdrawal.

• See Skill 35–2 (ampule) or 35–3 (vial).

• If the medication is insulin or heparin, the dosage needs to be verified by another nurse.

3. Provide for client privacy.

4. Prepare the client.

• Prior to performing the procedure, introduce self and verify the client's identity using agency protocol.

• Assist the client to a position in which the arm, leg, or abdomen can be relaxed, depending on the site to be used.

• Obtain assistance in holding an uncooperative client.

5. Explain the purpose of the medication and how it will help, using language that the client can understand. Include relevant information about effects of the medication.

6. Select and clean the site.

• Select a site free of tenderness, hardness, swelling, scarring, itching, burning, or localized inflammation. Select a site that has not been used frequently.

• Apply clean gloves.

• As agency protocol indicates, clean the site with an antiseptic swab. Start at the center of the site and clean in a widening circle to about 5 cm (2 in.). Allow the area to dry thoroughly.

• Place and hold the swab between the third and fourth fingers of the nondominant hand, or position the swab on the client's skin above the intended site.

7. Prepare the syringe for injection.

• Remove the needle cap while waiting for the antiseptic to dry. Pull the cap straight off to avoid contaminating the needle by the outside edge of the cap.

• Dispose of the needle cap.

8. Inject the medication.

• Grasp the syringe in your dominant hand by holding it between your thumb and fingers. With palm facing to the side or upward for a 45° angle insertion, or with the palm downward for a 90° angle insertion, prepare to inject.

• Using the nondominant hand, pinch or spread the skin at the site, and insert the needle using the dominant hand and a firm steady push. Recommendations vary about whether to pinch or spread the skin and at what angle to administer subcutaneous injections. The most important consideration is the depth of the subcutaneous tissue in the area to be injected. If the client has more than 1/2 inch of adipose tissue in the injection site, it would be safe to administer the injection at a 90° angle with the skin spread. If the client is thin or lean and lacks adipose tissue, the subcutaneous injection should be given with the skin pinched and at a 45° to 60° angle. One way to check that the pinch of skin is subcutaneous tissue is to ask the client to flex and extend the elbow. If any muscle is being held in the pinch, you will feel it contract and relax. If so, release the pinch and try again.

• When the needle is inserted, move your nondominant hand to the end of the plunger. Some nurses find it easier to move the nondominant hand to the barrel of the syringe and the dominant hand to the end of the plunger.

• Inject the medication by holding the syringe steady and depressing the plunger with a slow, even pressure.

• It is recommended that with many subcutaneous injections, especially insulin, the needle should be embedded within the skin for 5 seconds after complete depression of the plunger to ensure complete delivery of the dose.

9. Remove the needle.

• Remove the needle smoothly, pulling along the line of insertion while depressing the skin with your nondominant hand.

• If bleeding occurs, apply pressure to the site with dry sterile gauze until it stops. Bleeding rarely occurs after subcutaneous injection.

10. Dispose of supplies appropriately.

• Activate the needle safety device or discard the uncapped needle and attached syringe into designated receptacles.

• Remove and discard gloves.

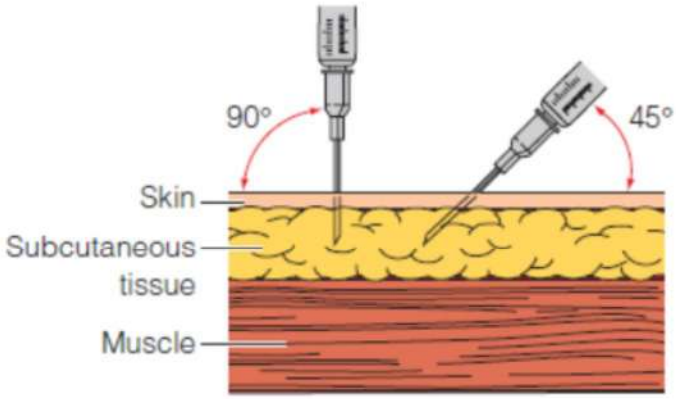
• Perform hand hygiene.

11. Document all relevant information.

• Document the medication given, dosage, time, route, and any assessments.

• Many agencies prefer that medication administration be recorded on the medication record. The nurse's notes are used when prn medications are given or when there is a special problem.

12. Assess the effectiveness of the medication at the time it is expected to act and document it.



❶ Inserting a needle into the subcutaneous tissue using 90° and 45° angles.

❷ Administering a subcutaneous injection into pinched tissue.

Administering an Intramuscular Injection

PURPOSE

• To provide a medication the client requires (see specific drug action)

Equipment

• Client's MAR or computer printout

• Sterile medication (usually provided in an ampule or vial or prefilled syringe)

• Syringe and needle of a size appropriate for the amount and type of solution to be administered

• Antiseptic swabs

• Clean gloves

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures.

2. Prepare the medication from the ampule or vial for drug withdrawal.

• Whenever feasible, change the needle on the syringe before the injection.

• Invert the syringe needle uppermost and expel all excess air.

3. Provide for client privacy.

4. Prepare the client.

• Prior to performing the procedure, introduce self and verify the client's identity using agency protocol.

• Assist the client to a supine, lateral, prone, or sitting position, depending on the chosen site. If the target muscle is the gluteus medius (ventrogluteal site), have the client in the supine position flex the knee(s); in the lateral position, flex the upper leg; and in the prone position, toe in.

• Obtain assistance in holding an uncooperative client.

5. Explain the purpose of the medication and how it will help, using language that the client can understand. Include relevant information about effects of the medication.

6. Select, locate, and clean the site.

• Select a site free of skin lesions, tenderness, swelling, hardness, or localized inflammation and one that has not been used frequently.

• If injections are to be frequent, alternate sites. Avoid using the same site twice in a row.

• Locate the exact site for the injection.

• Apply clean gloves.

• Clean the site with an antiseptic swab. Using a circular motion, start at the center and move outward about 5 cm (2 in.).

• Transfer and hold the swab between the third and fourth fingers of your nondominant hand in readiness for needle withdrawal, or position the swab on the client's skin above the intended site. Allow skin to dry prior to injecting medication.

7. Prepare the syringe for injection.

• Remove the needle cover and discard without contaminating the needle.

• If using a prefilled unit-dose medication, take caution to avoid dripping medication on the needle prior to injection. If this does occur, wipe the medication off the needle with a sterile gauze. Some sources recommend changing the needle if possible.

8. Inject the medication using the Z-track technique.

• Use the ulnar side of the nondominant hand to pull the skin approximately 2.5 cm (1 in.) to the side. Under some circumstances, such as for an emaciated client or an infant, the muscle may be pinched.

• Holding the syringe between the thumb and forefinger (as if holding a pen), pierce the skin quickly and smoothly at a 90° angle (see Figure 35–39), and insert the needle into the muscle.

• Hold the barrel of the syringe steady with your nondominant hand and aspirate by pulling back on the plunger with your dominant hand.

- Aspirate for 5 to 10 seconds. If the needle is in a small blood vessel, it takes time for the blood to appear. If blood appears in the syringe, withdraw the needle, discard the syringe, and prepare a new injection.

• If blood does not appear, inject the medication steadily and slowly (approximately 10 seconds per milliliter) while holding the syringe steady if using the ventrogluteal site.

• After injection, wait 10 seconds if using the ventrogluteal site.

9. Withdraw the needle.

• Withdraw the needle smoothly at the same angle of insertion.

• Apply gentle pressure at the site with a dry sponge.

• It is not necessary to massage the area at the site of injection.

• If bleeding occurs, apply pressure with a dry sterile gauze until it stops.

Administering an Intramuscular Injection

10. Activate the needle safety device or discard the uncapped needle and attached syringe into the proper receptacle.

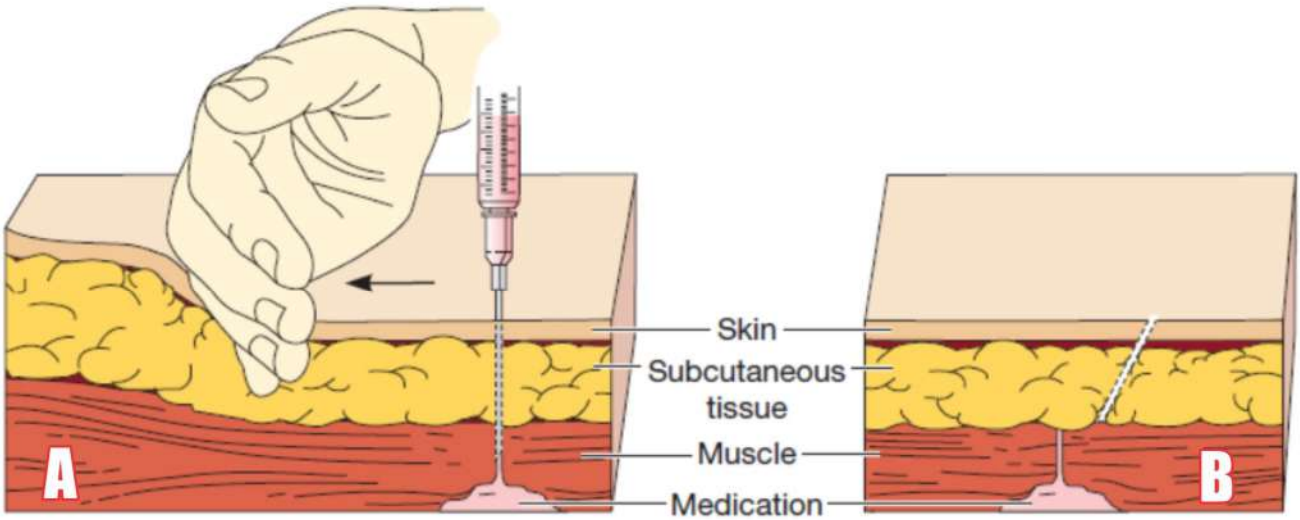
11. Remove and discard gloves.

• Perform hand hygiene.

12. Document all relevant information.

• Include the time of administration, drug name, dose, route, and the client's reactions.

13. Assess the effectiveness of the medication at the time it is expected to act.



❶ Inserting an intramuscular needle at a 90° angle using the Z-track method: A, skin pulled to the side; B, skin released. Note: When the skin returns to its normal position after the needle is withdrawn, a seal is formed over the intramuscular site. This prevents seepage of the medication into the subcutaneous tissues and subsequent discomfort.

❷ Holding the syringe between the thumb and forefinger. Note that the nurse is using the Z-track technique.

❸ In addition to pulling the skin to the side, the nondominant hand is holding the barrel of the syringe to prevent it from moving while the dominant hand aspirates by pulling back on the plunger.

Adding Medications to Intravenous Fluid Containers

PURPOSES

- To provide and maintain a constant level of a medication in the blood
- To administer well-diluted medications at a continuous and slow rate

Equipment

- Client's MAR or computer printout
- Correct sterile medication
- Diluent for medication in powdered form (see manufacturer's instructions)
- Correct solution container, if a new one is to be attached
- Antiseptic swabs
- Sterile syringe of appropriate size (e.g., 5 or 10 mL) and a 1- to 1 1/2-inch, #20- or #21-gauge sterile safety needle if not using a needleless system
- IV additive label

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures.
2. Prepare the medication ampule or vial for drug withdrawal.

- Check the agency's practice for using a filter needle to withdraw premixed liquid medications from multidose vials or ampules.

3. Add the medication.

To New IV Container

- Locate the injection port. Clean the port with the antiseptic or alcohol swab.
- Remove the needle cap from the syringe, insert the needle through the center of the injection port, and inject the medication into the bag. Activate the needle safety device.
- Mix the medication and solution by gently rotating the bag or bottle.
- Complete the IV additive label with name and dose of medication, date, time, and nurse's initials. Attach it on the bag or bottle.
- Clamp the IV tubing. Spike the bag or bottle with IV tubing and hang the IV.
- Regulate infusion rate as ordered. Often a controller device such as an IV pump is used to ensure accurate rate of infusion.

To an Existing Infusion

- Determine that the IV solution in the container is sufficient for adding the medication.
- Confirm the desired dilution of the medication, that is, the amount of medication per milliliter of solution.

• Close the infusion clamp.

• Wipe the medication port with the alcohol or disinfectant swab.

• While supporting and stabilizing the bag with your thumb and forefinger, carefully insert the syringe needle through the port and inject the medication.

• Remove the bag from the pole and gently rotate the bag.

• Rehang the container and regulate the flow rate.

• Complete the medication label and apply to the IV container.

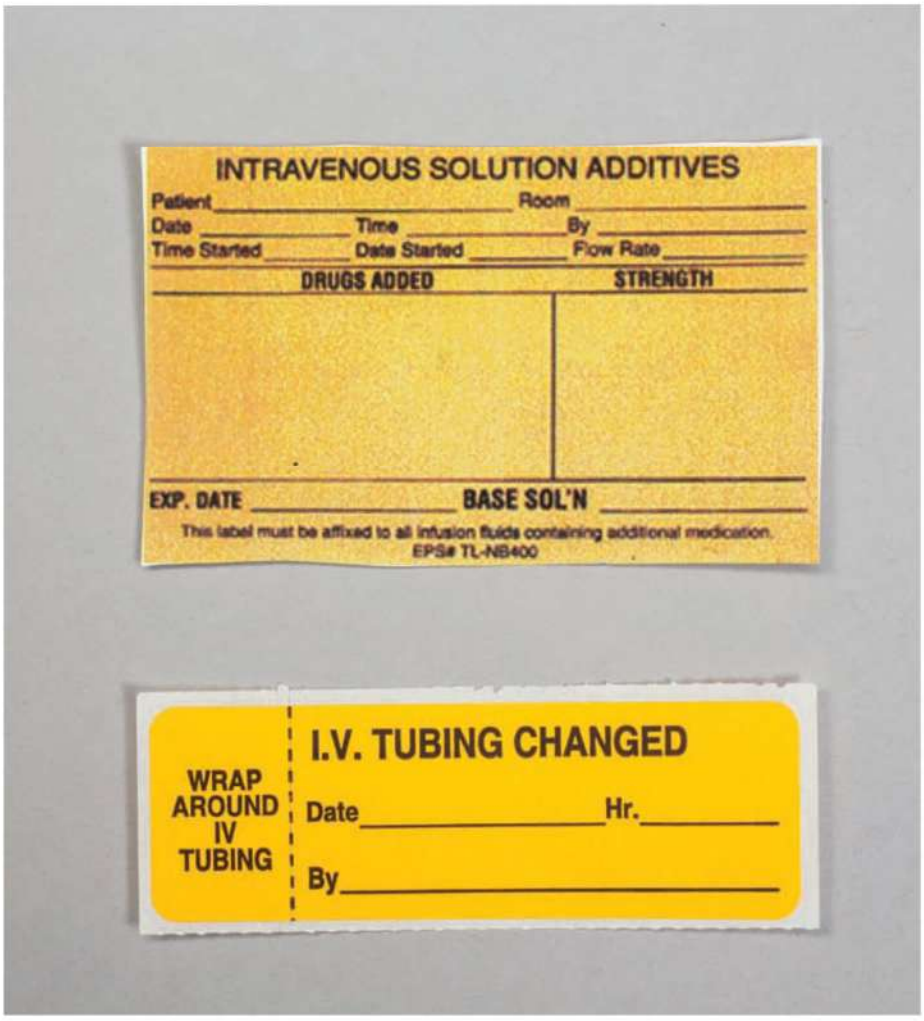
4. Dispose of the equipment and supplies according to agency practice.

5. Document the medication(s) on the appropriate form in the client's record.

❶ Cleanse the injection port with an alcohol swab.

❷ Inserting a medication through the injection port of an infusing container.

❸ Rotating an IV bag to distribute a medication.



❹ Top, label indicating a medication added to an IV infusion; bottom, label for indicating when the IV tubing was changed.

PURPOSE

• To achieve immediate and maximum effects of a medication

Equipment

IV Push for an Existing Line

• Client's MAR

• Medication in a vial or ampule

• Sterile syringe (3 to 5 mL) (to prepare the medication)

• Sterile needles, #21 to #25 gauge, 2.5 cm (1 in.) (needle not needed if using a needleless system)

• Antiseptic swabs

• Watch with a digital readout or second hand

• Clean gloves

IV Push for an IV Lock

• Client's MAR

• Medication in a vial or ampule

• Sterile syringe (3 to 5 mL) (to prepare medication)

• Sterile syringe (3 mL) (for the saline or heparin flush)

• Vial of normal saline to flush the IV catheter or vial of heparin flush solution or both depending on agency practice.

• Antiseptic swabs

• Watch with a digital readout or second hand

• Clean gloves.

Performance

1. Perform hand hygiene and observe other appropriate infection prevention procedures.

2. Prepare the medication.

Existing Line

• Prepare the medication according to the manufacturer's direction

.IV Lock

a. Flushing with saline:

• Prepare two syringes, each with 1 mL of sterile normal saline.

b. Flushing with heparin (if indicated by agency policy) and saline:

• Prepare one syringe with 1 mL of heparin flush solution (if indicated by agency policy).

• Prepare two syringes with 1 mL each of sterile, normal saline.

• Draw up the medication into a syringe.

5. Provide for client privacy.

6. Prepare the client.

• Prior to performing the procedure, introduce self and verify the client's identity using agency protocol.

• If not previously assessed, take the appropriate assessment measures necessary for the medication. If any of the findings are above or below the predetermined parameters, consult the primary care provider before administering the medication.

7. Explain the purpose of the medication and how it will help, using language that the client can understand. Include relevant information about the effects of the medication.

8. Administer the medication by IV push.

IV Lock with Needle

• Clean the injection port with the antiseptic swab.

• Insert the needle of the syringe containing normal saline through the injection port of an IV lock and aspirate for blood.

• Flush the lock by injecting 1 mL of saline slowly.

• Observe the area above the IV catheter for puffiness or swelling. This indicates infiltration into tissue, which would require removal of the IV catheter.

• Remove the needle and syringe. Activate the needle safety needleless system. device.

• Clean the lock's diaphragm with an antiseptic swab.

• Insert the needle of the syringe containing the prepared medication through the center of the injection port.

• Inject the medication slowly at the recommended rate of infusion. Use a watch or digital readout to time the injection.❷

• Observe the client closely for adverse reactions. Remove the needle and syringe when all medication is administered.

• Activate the needle safety device.

• Clean the injection port of the lock.

• Attach the second saline syringe, and inject 1 mL of saline.

If heparin is to be used, insert the heparin syringe and inject the heparin slowly into the lock.

IV Lock with Needleless System

- Clean the injection port of the lock.
- Insert syringe containing normal saline into the injection port.
- Flush the lock with 1 mL of sterile saline.
- Remove the syringe.
- Insert the syringe containing the medication into the port. ❸
- Inject the medication following the precautions described previously.
- Withdraw the syringe.
- Repeat injection of 1 mL of saline.

Existing Line

- Identify the injection port closest to the client. Some ports have a circle indicating the site for the needle insertion.
- Clean the port with an antiseptic swab.
- Stop the IV flow by closing the clamp or pinching the tubing above the injection port. ❹
- Connect the syringe to the IV system.

a. Needle system:

- Hold the port steady.
- Insert the needle of the syringe that contains the medication through the center of the port.

b. Needleless system:

- Remove the cap from the needleless injection port. Connect the tip of the syringe directly to the port. ❺
- Inject the medication at the ordered rate. Use the watch or digital readout to time the medication administration.
- Release the clamp or tubing.
- After injecting the medication, withdraw the needle and activate the needle safety device. For a needleless system, detach the syringe and attach a new sterile cap to the port.

9. Dispose of equipment according to agency practice.

10. Remove and discard gloves.

- Perform hand hygiene.

11. Observe the client closely for adverse reactions.

12. Determine agency practice about recommended times for changing the IV lock. Some agencies advocate a change every 48 to 72 hours for peripheral IV devices.

13. Document all relevant information.

• Record the date, time, drug, dose, and route; client response; and assessments of infusion or heparin lock site if appropriate.

❶ Inserting a needle through the injection port of an IV lock.

❷ Using a watch to time the rate of a medication injection.

❸ A blunt plastic cannula replaces the sharp steel needle.

❹ Stopping the IV flow by pinching the tubing above the injection port.

❺ Injecting a medication by IV push to an existing IV using a needleless system.

Starting an Intravenous Infusion

PURPOSES

- To supply fluid when clients are unable to take in an adequate volume of fluids by mouth
- To provide salts and other electrolytes needed to maintain electrolyte balance
- To provide glucose (dextrose), the main fuel for metabolism
- To provide water-soluble vitamins and medications
- To establish a lifeline for rapidly needed medications

Equipment

Substitute appropriate supplies if the client has tape, antiseptic, or latex allergies

- Infusion set
- Sterile parenteral solution
- IV pole
- Nonallergenic tape
- Clean gloves
- Tourniquet
- Antiseptic swabs such as 10% povidone-iodine or 2% chlorhexidine gluconate with alcohol or 70% isopropyl alcohol. Chlorhexidine is becoming the standard of practice and is the antiseptic preferred by the INS (Phillips & Gorski, 2014, p. 338).
- IV catheter (Choose an IV catheter of the appropriate type and size based on the size of the vein and the purpose of the IV. A #20- to #22-gauge catheter is indicated for most adults. Always have an extra catheter and ones of different sizes available.)
- Sterile gauze dressing or transparent semipermeable membrane (TSM) dressing (preferred)
- Stabilization device
- Splint, if required
- Towel or bed protector
- Local anesthetic (optional and per agency policy)
- Electronic infusion device or pump (The nurse decides what device is needed as appropriate to the client's condition.)

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate. Venipuncture can cause discomfort for a few seconds, but there should be no ongoing pain after insertion.

If possible, explain how long the IV will need to remain in place and how it will be used.

2. Perform hand hygiene and observe other appropriate infection prevention procedures.

3. Position the client appropriately.

• Assist the client to a comfortable position, either sitting or lying. Expose the limb to be used but provide for client privacy.

(Note: Steps 4 through 10 may be performed outside of the client's room and then the system transported to the client's bedside.)

4. Apply a medication label to the solution container if a medication is added.

• In many agencies, medications are added and labels are applied to IV containers in the pharmacy; if they are not, apply the label upside down on the container.

5. Open and prepare the infusion set.

• Remove tubing from the package and straighten it out.

• Slide the tubing clamp along the tubing until it is just below the drip chamber to facilitate its access.

• Close the clamp.

• Leave the ends of the tubing covered with the plastic caps until the infusion is started.

6. Spike the solution container.

• Expose the insertion site of the bag or bottle by removing the protective cover.

• Remove the cap from the spike and insert the spike into the insertion site of the bag or bottle. ❶

7. Hang the solution container on the pole.

• Adjust the pole so that the container is suspended about 1 m (3 ft) above the client's head.

8. Partially fill the drip chamber with solution.

• Squeeze the chamber gently until it is half full of solution. ❷

9. Prime the tubing as described below. The term prime means "to make ready" but in common use refers to flushing the tubing to remove air.

• Remove the protective cap and hold the tubing over a container.
Maintain the sterility of the end of the tubing and the cap.

• Release the clamp and let the fluid run through the tubing until all bubbles are removed. Tap the tubing if necessary with your fingers to help the bubbles move.

• Reclamp the tubing and replace the tubing cap, maintaining
sterile technique.

• If an infusion control pump, electronic device, or controller is being used, follow the manufacturer's directions for inserting the tubing and setting the infusion rate.

10. Perform hand hygiene again just prior to client contact.

11. Select the venipuncture site.

• Use the client's nondominant arm, unless contraindicated (e.g., mastectomy, fistula for dialysis). Identify possible venipuncture sites by looking for veins that are relatively straight. The vein should be palpable, but may not be visible, especially in clients with dark skin. Consider the catheter length; look for a site sufficiently distal to the wrist or elbow such that the tip of the catheter will not be at a point of flexion.

• Check agency protocol about shaving if the site is very hairy. Shaving is not recommended.

• Place a towel or bed protector under the extremity to protect
linens (or furniture if in the home).

12. Dilate the vein.

• Place the extremity in a dependent position (lower than the client's heart).

• Apply a tourniquet firmly 15 to 20 cm (6 to 8 in.) above the venipuncture site. ❸
Explain that the tourniquet will feel tight.

• Use the tourniquet on only one client. This avoids cross contamination
to other clients. Be sure to ask if the client has a latex allergy.

• For older adults with fragile skin, instead of applying a tourniquet, place the arm in a dependent position to allow the veins to engorge.

• If the vein is not sufficiently dilated:

a. Massage or stroke the vein distal to the site and in the direction of venous flow toward the heart.

b. Encourage the client to clench and unclench the fist.

c. Lightly tap the vein with your fingertips.

• If the preceding steps fail to distend the vein so that it is palpable, remove the tourniquet and wrap the extremity in a warm towel for 10 to 15 minutes.

13. Minimize insertion pain as much as possible.

• Although the pain of insertion should be brief, prevention can and should be offered. Transdermal analgesic creams (e.g., EMLA, Synera) may be used, depending on policy.

Allow at least 30 to 60 minutes for the topical analgesic to take effect (Phillips & Gorski, 2014).

• If desired and permitted by policy, inject 0.3 mL of 1% lidocaine (without epinephrine) intradermally over the site where you plan to insert the IV catheter. (Be sure to first apply gloves and clean the skin site as described in step 14.) Allow 5 to 10 seconds for the anesthetic to take effect (Phillips & Gorski, 2014).

14. Apply clean gloves and clean the venipuncture site.

• Clean the skin at the site of entry with a topical antiseptic swab (e.g., 2% chlorhexidine, or alcohol). Some institutions may use an anti-infective solution such as povidone-iodine (check agency protocol). Check for allergies to iodine or shellfish before cleansing skin with Betadine or iodine products.

• When using chlorhexidine solution (preferred), use a backand- forth motion for a minimum of 30 seconds to scrub the insertion site and surrounding area (Phillips & Gorski, 2014).

Allow the site to completely air dry before inserting the catheter.

Do not fan, blow on, or wipe the skin.

• When using povidone-iodine, apply using swab sticks in a concentric circle beginning at the catheter insertion site and moving outward. The iodine should be in contact with the skin for 2 minutes or longer to completely dry for adequate antisepsis.

15. Insert the catheter and initiate the infusion.

• Remove the catheter assembly from its sterile packaging. Review instructions for using the catheter because a variety of needle safety devices are manufactured. Remove the cover of the needle (stylet).

• Use the nondominant hand to pull the skin taut below the entry site.

• Holding the over-the-needle catheter at a 15- to 30-degree angle with needle (stylet) bevel up, insert the catheter through the skin and into the vein. A sudden lack of resistance is felt as the needle (stylet) enters the vein. Use a slow steady insertion technique and avoid jabbing or stabbing motions.

• Once blood appears in the lumen or clear "flashback" chamber of the needle, lower the angle of the catheter until it is almost parallel with the skin, and advance the needle (stylet) and catheter approximately 0.5 to 1 cm (about 1/4 in.) farther. ❹ Holding the needle assembly steady, advance the catheter until the hub is at the venipuncture site. The exact technique depends on the type of device used.

• If there is no blood return, try redirecting the catheter assembly again toward the vein. If the stylet has been withdrawn from the catheter even a small distance, or the catheter tip has been pulled out of the skin, the catheter must be discarded and a new one used.

• If blood begins to flow out of the vein into the tissues as the catheter is inserted, creating a hematoma, the insertion has not been successful. This is sometimes referred to as a blown vein. Immediately release the tourniquet and remove the catheter, applying pressure over the insertion site with dry gauze. Attempt the venipuncture in another site, in the opposite arm if possible.

• Release the tourniquet.

• Put pressure on the vein proximal to the catheter to eliminate or reduce blood oozing out of the catheter. Stabilize the hub with thumb and index finger of the nondominant hand.

• Remove the protective cap from the distal end of the tubing and hold it ready to attach to the catheter, maintaining the sterility of the end.

• Stabilize the catheter hub and apply pressure distal to the catheter with your finger. ❺

• Carefully remove the stylet, engage the needle safety device if it does not engage automatically, and attach the end of the infusion tubing to the catheter hub. Place the stylet directly into a sharps container. If this is not within reach, place the stylet into its original package and dispose in a sharps container as soon as possible.

• Initiate the infusion or flush the catheter with sterile normal saline. ❻

16. Stabilize the catheter and apply a dressing.

• Secure the catheter according to the manufacturer's instructions and agency policy. Several methods are used to stabilize the catheter including the use of a dressing and securement device. If tape is used, it must be sterile tape or surgical strips and they should be applied only to the catheter adapter and not placed directly on the catheter–skin junction site. Use of a manufactured stabilization device is preferred (INS, 2011a).

• Apply a dressing. Two methods are used for applying a dressing: a sterile gauze dressing secured with tape and a TSM dressing. ❼ Most common is the TSM because it allows for continuous assessment of the site and is more comfortable than gauze and tape (Phillips & Gorski, 2014, p. 345). Do not use ointment of any kind under a TSM dressing. Additional tape may be used to secure the IV catheter below the TSM, if necessary.

• Label the dressing with the date and time of insertion,gauge, and your initials. ❽

• Apply an IV site protector, if available. Protective devices areavailable that help prevent dislodgement of the IV catheterand still provide easy assessment of the IV site. ❾

• Loop the tubing and secure it with tape.

17. Discard the tourniquet.

• Remove and discard gloves.

• Perform hand hygiene.

18. Ensure appropriate infusion flow.

• Apply a padded arm board to splint the joint if needed.

• Adjust the infusion rate of flow according to the order.

19. Label the IV tubing.

• Label the tubing with the date and time of attachment and your initials. ❿ This labeling may also be done when the infusion is started.

20. Document all assessments and interventions.

• Record the venipuncture on the client's chart. Some agencies provide a special form for this purpose. Include the date and time of the venipuncture; type, length, and gauge of the needle or catheter; venipuncture site, how many attempts were made, amount and type of solution used, including any additives (e.g., kind and amount of medications); flow rate; the type of dressing applied; and the client's general response.

Starting an Intravenous Infusion

❶ Inserting the spike.

❷ Squeezing the drip chamber.

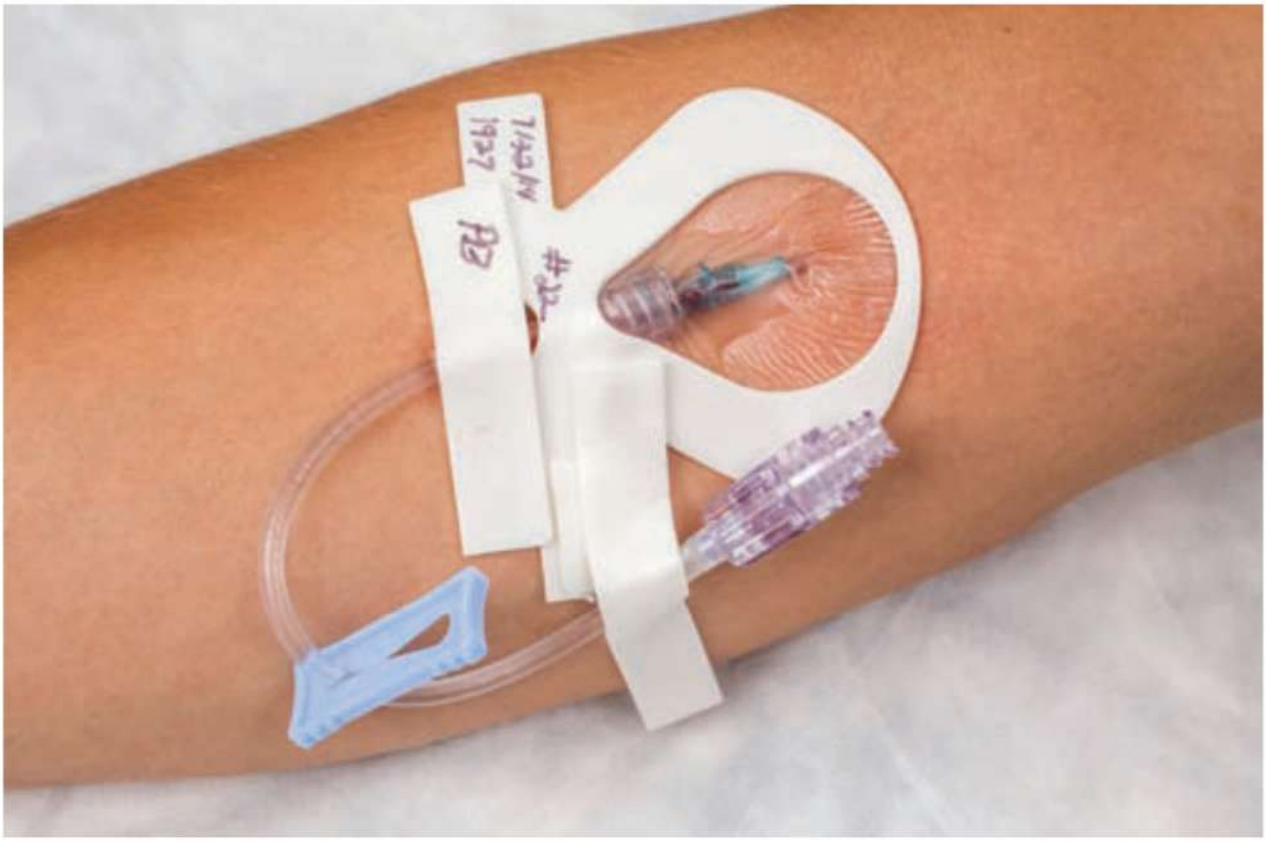
❸ Two types of tourniquets.

❹ Blood is noted in the flashback chamber once the stylet has entered the vein.

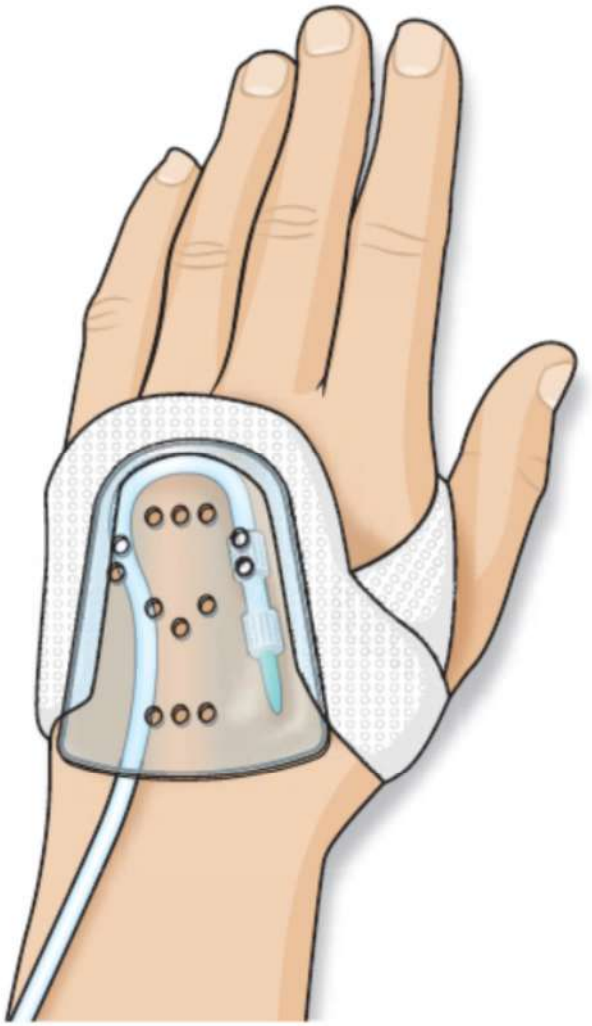
❺ Stabilize the catheter hub and occlude the vein with finger(s) while removing the stylet.

❻ The catheter is stabilized while gently flushing it to determine patency.

❼ Applying a sterile one-piece IV stabilization and TSM dressing device.



❽ IV site is labeled with date, time, size of catheter, and initials.



❾ IV site protective device.

❿ Tubing labeled with date, time, and nurse's initials.

Performing Urinary Catheterization

PURPOSES

- To relieve discomfort due to bladder distention or to provide gradual decompression of a distended bladder
- To assess the amount of residual urine if the bladder empties incompletely
- To obtain a sterile urine specimen
- To empty the bladder completely prior to surgery
- To facilitate accurate measurement of urinary output for critically ill clients whose output needs to be monitored hourly
- To provide for intermittent or continuous bladder drainage and/ or irrigation
- To prevent urine from contacting an incision after perineal surgery

Equipment

- Sterile catheter of appropriate size (An extra catheter should also be at hand.)
- Catheterization kit ❶ or individual sterile items:
- Sterile gloves
- Waterproof drape(s)
- Antiseptic solution
- Cleansing balls
- Forceps
- Water-soluble lubricant
- Urine receptacle
- Specimen container
- For an indwelling catheter:
- Syringe prefilled with sterile water in amount specified by catheter manufacturer
- Collection bag and tubing
- 5–10 mL 2% Xylocaine gel or water-soluble lubricant for male urethral injection (if agency permits)
- Clean gloves
- Supplies for performing perineal cleansing
- Bath blanket or sheet for draping the client
- Adequate lighting (Obtain a flashlight or lamp if necessary.)

Performance

1. Prior to performing the procedure, introduce self and verify the client's identity using agency protocol. Explain to the client what you are going to do, why it is necessary, and how he or she can participate.
2. Perform hand hygiene and observe other appropriate infection prevention procedures.
3. Provide for client privacy.
4. Place the client in the appropriate position and drape all areas except the perineum.
   - Female: supine with knees flexed, feet about 2 feet apart, and hips slightly externally rotated, if possible
   - Male: supine, thighs slightly abducted or apart
5. Establish adequate lighting. Stand on the client's right if you are right-handed, on the client's left if you are left-handed.
6. If using a collecting bag and it is not contained within the catheterization kit, open the drainage package and place the end of the tubing within reach.
7. If agency policy permits, apply clean gloves and inject 10 to 15 mL Xylocaine gel into the urethra of the male client. Wipe the underside of the penile shaft to distribute the gel up the urethra. Wait at least 5 minutes for the gel to take effect before inserting the catheter.
8. Remove and discard gloves.
   - Perform hand hygiene.
9. Open the catheterization kit. Place a waterproof drape under the buttocks (female) or penis (male) without contaminating the center of the drape with your hands.
10. Apply sterile gloves.
11. Organize the remaining supplies:
    - Saturate the cleansing balls with the antiseptic solution.
    - Open the lubricant package.
    - Remove the specimen container and place it nearby with the lid loosely on top.
12. Attach the prefilled syringe to the indwelling catheter inflation hub. Apply agency policy and/or manufacturer recommendation regarding pretesting of the balloon.

13. Lubricate the catheter 2.5 to 5 cm (1 to 2 in.) for females, 15 to 17.5 cm (6 to 7 in.) for males, and place it with the drainage end inside the collection container.

14. If desired, place the fenestrated drape over the perineum, exposing the urinary meatus.

15. Cleanse the meatus. Note: The nondominant hand is considered contaminated once it touches the client's skin.

• Females: Use your nondominant hand to spread the labia so that the meatus is visible. Establish firm but gentle pressure on the labia. The antiseptic may make the tissues slippery but the labia must not be allowed to return over the cleaned meatus. Note: Location of the urethral meatus is best identified during the cleansing process. Pick up a cleansing ball with the forceps in your dominant hand and wipe one side of the labia majora in an anteroposterior direction.❸ Use great care that wiping the client does not contaminate this sterile hand. Use a new ball for the opposite side. Repeat for the labia minora. Use the last ball to cleanse directly over the meatus.

• Males: Use your nondominant hand to grasp the penis just below the glans. If necessary, retract the foreskin. Hold the penis firmly upright, with slight tension. Pick up a cleansing ball with the forceps in your dominant hand and wipe from the center of the meatus in a circular motion around the glans. Use great care that wiping the client does not contaminate the sterile hand. Use a new ball and repeat three more times. The antiseptic may make the tissues slippery but the foreskin must not be allowed to return over the cleaned meatus nor the penis be dropped.

16. Insert the catheter.

• Grasp the catheter firmly 5 to 7.5 cm (2 to 3 in.) from the tip. Ask the client to take a slow deep breath and insert the catheter as the client exhales. Slight resistance is expected as the catheter passes through the sphincter. If necessary, twist the catheter or hold pressure on the catheter until the sphincter relaxes.

• Advance the catheter 5 cm (2 in.) farther after the urine begins to flow through it.

• If the catheter accidentally contacts the labia or slips into the vagina, it is considered contaminated and a new, sterile catheter must be used. The contaminated catheter may be left in the vagina until the new catheter is inserted to help avoid mistaking the vaginal opening for the urethral meatus.

17. Hold the catheter with the nondominant hand.

18. For an indwelling catheter, inflate the retention balloon with the designated volume.

• Without releasing the catheter (and, for females, without releasing the labia), hold the inflation valve between two fingers of your nondominant hand while you attach the syringe (if not left attached earlier) and inflate with your dominant hand. If the client complains of discomfort, immediately withdraw the instilled fluid, advance the catheter farther, and attempt to inflate the balloon again.

• Pull gently on the catheter until resistance is felt to ensure that the balloon has inflated and to place it in the trigone of the bladder. ❹

19. Collect a urine specimen if needed. For a straight catheter, allow 20 to 30 mL to flow into the bottle without touching the catheter to the bottle. For an indwelling catheter preattached to a drainage bag, a specimen may be taken from the bag this initial time only.

20. Allow the straight catheter to continue draining into the urine receptacle. If necessary (e.g., open system), attach the drainage end of an indwelling catheter to the collecting tubing and bag.

21. Examine and measure the urine. In some cases, only 750 to 1,000 mL of urine are to be drained from the bladder at one time. Check agency policy for further instructions if this should occur.

22. Remove the straight catheter when urine flow stops. For an indwelling catheter, secure the catheter tubing to the thigh for female clients or the upper thigh or lower abdomen for male clients to prevent movement on the urethra or excessive tension or pulling on the retention balloon (Fisher, 2010; Herter & Kazer, 2010). Adhesive and nonadhesive catheter-securing devices are available and should be used to secure the catheter tubing to the client. ❺

23. Next, hang the bag below the level of the bladder. No tubing should fall below the top of the bag. ❻

24. Wipe any remaining antiseptic or lubricant from the perineal area. Replace the foreskin if retracted earlier. Return the client to a comfortable position. Instruct the client on positioning and moving with the catheter in place.

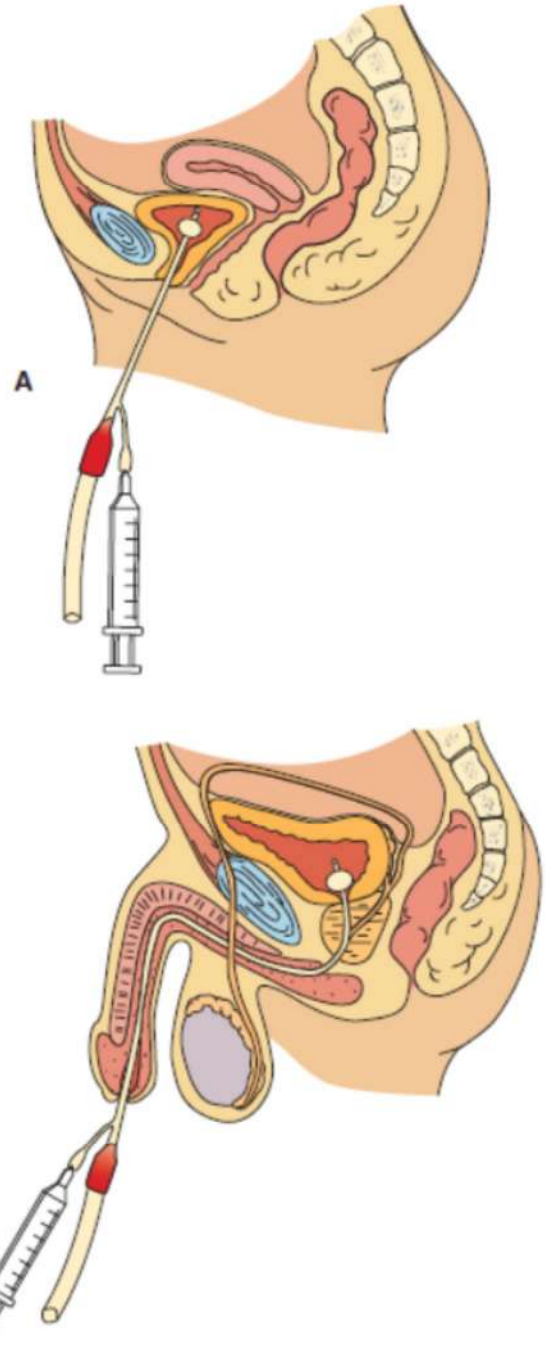
25. Discard all used supplies in appropriate receptacles.

26. Remove and discard gloves.

• Perform hand hygiene.

27. Document the catheterization procedure including catheter size and results in the client record using forms or checklists supplemented by narrative notes when appropriate.

A closed indwelling catheter insertion kit.



Placement of indwelling catheter and inflated balloon of a closed system in A, female client and B, male client.

Catheter securement devices: A, nonadhesive device (Velcro strap); B, adhesive device.

A One-way Foley catheter.

A Two-way Foley catheter.

A three-way Foley catheter often used for continuous bladder irrigation.

Basic Skills

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