2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., type of discharge present, irritation of labia, discomfort, degree and duration of pain relief).
3. Chart and report any signs and symptoms of adverse drug effects.
4. Perform and validate essential patient education about the drug therapy and other essential aspects of intervention for the disease process that is affecting the individual.

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- Gold Standard Patient Teaching Handouts in English and Spanish
- Interactive Drug Flashcards
- Interactive Review Questions for the NCLEX® Examination and more!

Review Questions for the NCLEX® Examination

1. When nitroglycerin ointment is prescribed, how long is the typical recommended drug-free period?
   1. 3 to 4 hours off every 24 hours
   2. 5 to 10 hours off every 24 hours
   3. 10 to 12 hours off every 24 hours
   4. 12 to 14 hours off every 24 hours

2. Fentanyl patches do not usually achieve a sufficient blood level for pain control until how many hours after their initial application?
   1. 6 hours
   2. 12 hours
   3. 18 hours
   4. 24 hours

3. A patient is to receive a medication via the buccal route. Which action does the nurse plan to implement?
   1. Place the medication inside the back of the patient's cheek
   2. Crush the medication before administration
   3. Offer the client a glass of water or juice after administration
   4. Use sterile technique to administer the medication

4. A patient has a prescription for a medication that is administered via an inhaler. To determine whether the patient requires a spacer for the inhaler, what does the nurse evaluate?
   1. The dosage of medication required
   2. The muscle coordination of the patient
   3. The time of administration
   4. The use of a DPI

5. A patient is ordered to have eyedrops administered daily to both eyes. Into which part of the eye are eyedrops instilled?
   1. The sclera
   2. The outer canthus
   3. The lower conjunctival sac
   4. The opening of the lacrimal duct

6. A nurse is preparing to administer eardrops to a 5-year-old child. What is the proper technique to use for this patient?
   1. Pull the earlobe downward and back
   2. Pull the earlobe forward and up
   3. Pull the earlobe upward and back
   4. Pull the earlobe downward and straight

chapter

9 Enteral Administration

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The routes of drug administration can be classified into *three* categories: enteral, parenteral, and percutaneous. With the enteral route, drugs are administered directly into the gastrointestinal tract by the oral, rectal, percutaneous endoscopic gastrostomy (PEG), or nasogastric (NG) method. The oral route is safe, convenient, and relatively economical, and dose forms are readily available for most medications. In case of a medication error or an intentional drug overdose, much of the drug can be retrieved for a reasonable time after administration. The major disadvantage of the oral route is that it has the slowest and least dependable rate of absorption of the commonly used routes of administration because of frequent changes in the gastrointestinal environment that are produced by food, emotion, and physical activity. Another limitation of this route is that a few drugs (e.g., insulin, gentamicin) are destroyed by digestive fluids and must be given parenterally for therapeutic activity. This route should not be used if the drug may harm or discolor the teeth or if the patient is vomiting, has gastric or intestinal suction, is likely to aspirate, or is unconscious and unable to swallow.

For patients who cannot swallow or who have had oral surgery, the NG or PEG method may be used. The primary purpose of the NG method is to bypass the mouth and the pharynx. Advantages and disadvantages are similar to those of the oral route. The irritation caused by the tube in the nasal passage and throat must be weighed against the relative immobility associated with continuous intravenous (IV) infusions, the expense, and the pain and irritation of multiple injections. For patients who require long-term NG methods, a permanent gastrostomy tube is placed for ongoing drug and feeding administration.

The administration of drugs via the rectal route has the advantages of bypassing the digestive enzymes and avoiding the irritation of the mouth, the esophagus, and the stomach. It may also be an acceptable alternative when nausea or vomiting is present. Absorption via this route varies depending on the drug product, the ability of the patient to retain the suppository or enema, and the presence of fecal material.

ADMINISTRATION OF ORAL MEDICATIONS

Objectives

1. Describe general principles of administering solid forms of medications.

Key Terms

capsules (KĂP-sŭlz) (p. 124)
lozenges (LŎ-zĕn-jĕz) (p. 125)
tablets (TĂB-lĕts) (p. 125)
orally disintegrating tablet (ŌR-ăl-ē dĭs-ĪN-tĕ-grāt-ĭng) (p. 125)
elixirs (ĕ-LĬK-sŭrz) (p. 126)
emulsions (ĕ-MŬL-shĕnz) (p. 126)
suspensions (sŭ-SPĔN-shĕnz) (p. 126)
syrups (SĬR-ĕps) (p. 126)
unit-dose packaging (YŪ-nĭt DŌS PĂK-ĕj-ĭng) (p. 126)
bar code (BĂR KŌD) (p. 126)
soufflé cup (sū-FLĀ KŬP) (p. 126)
medicine cup (MĔD-ĭ-sĭn KŬP) (p. 126)
medicine dropper (MĔD-ĭ-sĭn DRŎ-pŭr) (p. 127)
oral syringe (ŌR-ăl sĭ-RĪNJ) (p. 127)

DOSE FORMS

Capsules

Capsules are small, cylindrical, gelatin containers that hold dry powder or liquid medicinal agents (Figure 9-1). They are available in a variety of sizes, and they are a convenient way of administering drugs that have an unpleasant odor or taste. They do not require coatings or additives to improve the taste. The color and shape of the capsules as well as the manufacturer's symbol on the capsule surface are means of identifying the product.

Timed-Release Capsules

Timed-release or sustained-release capsules provide a gradual but continuous release of a drug, because the granules in the capsule dissolve at different rates (Figure 9-2). The advantage of this delivery system is

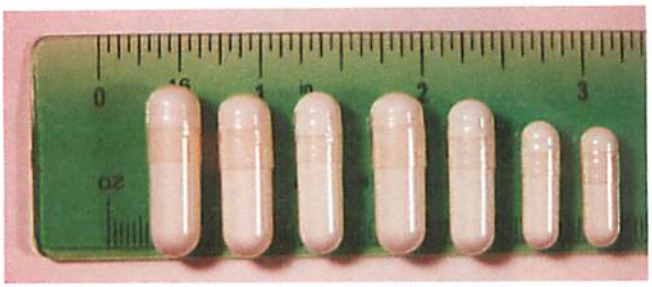

FIGURE 9-1 Various sizes and numbers of gelatin capsules, actual size.

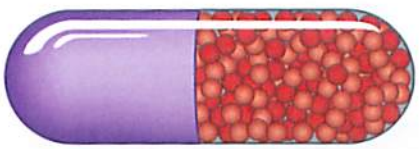

FIGURE 9-2 Timed-release capsule.

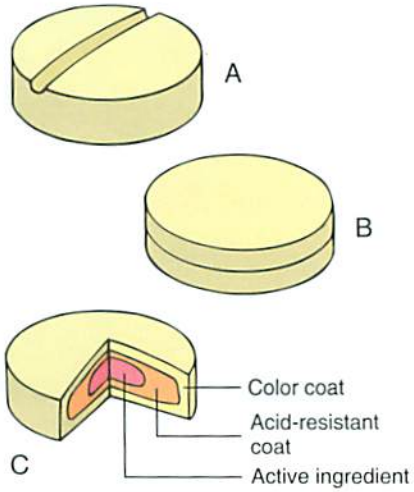

FIGURE 9-3 **A,** Scored tablet. **B,** Layered tablet. **C,** Enteric-coated tablet.

that it reduces the number of doses administered per day. Trade names that indicate that the drug is a timed-release product are Spansules, Gyrocaps, and Contin.

Medication Safety Alert

Timed-release capsules should NOT be crushed or chewed or have their contents emptied into food or liquids, because this may alter the absorption rate and could result in a drug overdose or subtherapeutic activity.

Lozenges or Troches

Lozenges are flat disks that contain a medicinal agent in a suitably flavored base. The base may be a hard sugar candy or a combination of sugar with sufficient gelatinous substances to give it form. Lozenges are held in the mouth to dissolve slowly, thereby releasing the therapeutic ingredients.

Pills

Pills are an obsolete dose form that is no longer manufactured because of the development of capsules and compressed tablets. However, the term is still used to refer to tablets and capsules.

Tablets

Tablets are dried powdered drugs that have been compressed into small disks. In addition to the drug, tablets also contain one or more of the following ingredients: binders, which are adhesive substances that allow the tablet to hold together; disintegrators, which are substances that encourage dissolution in body fluids; lubricants, which are required for efficient manufacturing; and fillers, which are inert ingredients that make the size of the tablet convenient. Tablets are sometimes scored or grooved (Figure 9-3, *A*); the indentation may then be used to divide the dose. When possible, it is best to request that the exact dose be prescribed rather than to attempt to divide even a scored tablet.

Tablets can be formed in layers (see Figure 9-3, *B*). This method allows otherwise incompatible medications to be administered at the same time.

An enteric-coated tablet has a special coating that resists dissolution in the acidic pH of the stomach but that is dissolved in the alkaline pH of the intestines (see Figure 9-3, *C*). Enteric-coated tablets are often used for administering medications that are destroyed by an acid pH.

A tablet that rapidly dissolves (usually within seconds) when placed on the tongue is known as an *orally disintegrating tablet.* These are differentiated from lozenges and from sublingual and buccal tablets, which take more than a minute to dissolve. Orally disintegrating tablets may be used for their rapid onset of action (e.g., for the treatment of migraine headache); for patients who have difficulty swallowing (e.g., patients with parkinsonism, Alzheimer's disease, or after a stroke); and for those for whom administration must be ensured (e.g., patients with schizophrenia, who often attempt to avoid prescribed medication).

Medication Safety Alert

Enteric-coated tablets must NOT be crushed or chewed because their active ingredients will be released prematurely and destroyed in the stomach.

FIGURE 9-4 Unit-dose packages.

FIGURE 9-5 Most unit-dose package labels include a bar code for the electronic charting of medication administration and inventory control.

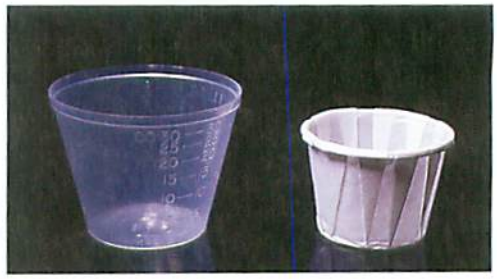

FIGURE 9-6 Medicine cup *(left)* and soufflé cup *(right)*.

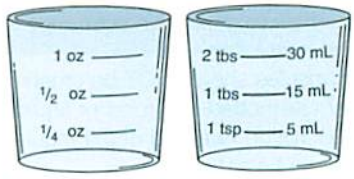

FIGURE 9-7 Measures on a medicine cup.

Elixirs

Elixirs are clear liquids that are made up of drugs that have been dissolved in alcohol and water. Elixirs are used primarily when the drug will not dissolve in water alone. After the drug is dissolved in the elixir, flavoring agents are often added to improve taste. The alcohol content of elixirs is highly variable, depending on the solubility of the drug.

Emulsions

Emulsions are dispersions of small droplets of water in oil or of oil in water. The dispersion is maintained by an emulsifying agent such as sodium lauryl sulfate, gelatin, or acacia. Emulsions are used to mask bitter tastes or to make certain drugs more soluble.

Suspensions

Suspensions are liquid dose forms that contain solid, insoluble drug particles dispersed in a liquid base. All suspensions should be shaken well before administration to ensure the thorough mixing of the particles.

Syrups

Syrups contain medicinal agents that have been dissolved in a concentrated solution of sugar, usually sucrose. Syrups are particularly effective for masking the bitter taste of a drug. Many preparations for pediatric patients are syrups, because children tend to like the flavored base.

EQUIPMENT

Unit Dose or Single Dose

Unit-dose packaging or single-dose packaging provides a single dose of medication in one package that is ready for dispensing (Figure 9-4). The package is labeled with both the generic and brand names, the manufacturer, the lot number, and the date of expiration. Depending on the distribution system, the patient's name may be added to the package by the pharmacy. Most unit-dose package labels include a bar code for administration, the electronic charting of medication administration, and inventory control (Figure 9-5).

Soufflé Cup

A soufflé cup is a small paper or plastic cup that is used to transport solid medication forms such as capsules and tablets to the patient to prevent contamination by handling (Figure 9-6). A tablet that must be crushed can be placed between two soufflé cups and then crushed with a pestle. This powdered form of the tablet can then be administered in a solution, if soluble, or it may be mixed with a small amount of food (e.g., applesauce).

Medicine Cup

A medicine cup is a plastic container with scales (metric, household) for measuring liquid medications (Figure 9-7). Examine the medicine cup carefully before pouring any medication to ensure that the proper scale is being used for measurement (Table 9-1). The medicine cup should be placed on a hard surface when measuring liquid medication and then read at eye

Table 9-1 Commonly Used Measurement Equivalents

HOUSEHOLD MEASUREMENT*	METRIC MEASUREMENT
2 Tbsp	30 mL
1 Tbsp	15 mL
2 tsp	10 mL
1 tsp	5 mL

tbsp, Tablespoon; *tsp*, teaspoon; *oz*, ounce; *mL*, milliliter.
*3 tsp = 1 Tbsp; 2 Tbsp = 30 mL = 1 oz.

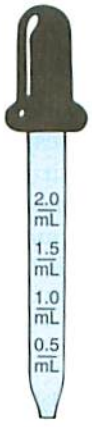

FIGURE 9-8 Medicine dropper.

level. The medicine cup is inaccurate for measuring doses of less than 1 teaspoon, although it is reasonably accurate for larger volumes. A syringe comparable to the volume to be measured should be used for smaller volumes. For volumes of less than 1 mL, a tuberculin syringe should be used.

Medicine Dropper

The **medicine dropper** may be used to administer eyedrops, eardrops, and, occasionally, pediatric medications (Figure 9-8). There is great variation with regard to the size of the drop formed, so it is important to use only the dropper supplied by the manufacturer for a specific liquid medication. Before drawing medication into a dropper, it is necessary to become familiar with the calibrations on the barrel. After the medication is drawn into the barrel, the dropper should not be tipped upside down, because the medication will run into the bulb, thereby causing some loss of the medication. Medications should not be drawn into the dropper and then transferred to another container for administration, because part of the medication will adhere to the second container, thus diminishing the dose delivered.

Teaspoon

Doses of most liquid medications are prescribed in terms using the teaspoon as the unit of measure (Figure 9-9). However, there is great variation between the volumes measured by various spoons in the home. In the hospital, 1 teaspoon is converted to 5 mL (see Table 9-1), and this is read on the metric scale of the medicine cup. For home use, an oral syringe is recommended. If this is not available, a teaspoon that is used specifically for baking may be used as an accurate measuring device.

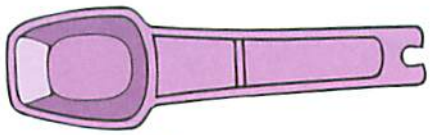

FIGURE 9-9 Measuring teaspoon.

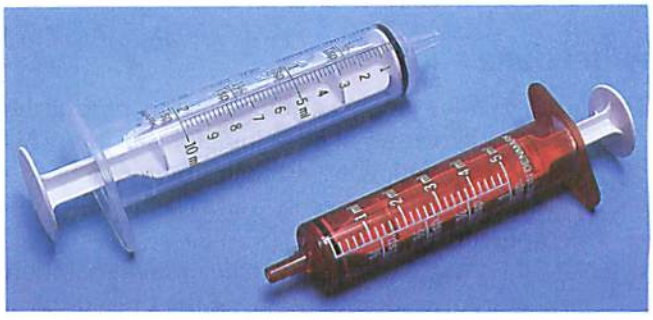

FIGURE 9-10 Plastic oral syringes.

FIGURE 9-11 Nipple.

Oral Syringe

A plastic **oral syringe** may be used to measure liquid medications accurately (Figure 9-10). Various sizes are available to measure volumes from 0.1 to 15 mL. Note that a needle will not fit on the tip.

Nipple

An infant feeding nipple with additional holes may be used for administering oral medications to infants (Figure 9-11). (See also "General Principles of Liquid-Form Oral Medication Administration—For an Adult or Child" on p. 132.)

ADMINISTRATION OF SOLID-FORM ORAL MEDICATIONS

Objective

2. Compare the different techniques that are used with a medication card system, a computer-controlled distribution system, and a unit-dose distribution system.

PROCEDURE PROTOCOL

The term *procedure protocol* will be used as part of the medication administration technique for this text. This term includes the following nursing interventions:

1. Perform hand hygiene, and assemble the equipment.
2. Use the seven RIGHTS of medication preparation and administration throughout the procedure.
   RIGHT PATIENT
   RIGHT DRUG
   RIGHT INDICATION
   RIGHT ROUTE OF ADMINISTRATION
   RIGHT DOSE
   RIGHT TIME OF ADMINISTRATION
   RIGHT DOCUMENTATION
3. Provide privacy for the patient, and thoroughly explain the procedure.
4. Perform a premedication assessment; see the individual drug monographs for details.

MEDICATION CARD SYSTEM

Perform premedication assessment. See individual drug monographs for details.

EQUIPMENT

- Medication tray
- Soufflé cup or medicine cup
- Medication cards

TECHNIQUE

1. Follow the procedure protocol described.
2. Read the entire medication card.
3. Obtain the prescribed medication from the cabinet.
4. Open the lid of the bottle, pour the correct number of capsules or tablets into the lid, and then return any extras to the container using the lid. (DO NOT touch the medication with your hands.)
5. Transfer the correct number of tablets or capsules from the lid to a soufflé cup or a medicine cup.
6. COMPARE the information on the medication card or medication record with the label on the stock bottle and the quantity of drug placed in the cup.
7. Replace the lid of the container.
8. RECHECK the SEVEN RIGHTS of the medication order.
9. Return the medication container to the shelf in the cabinet.
10. Place the patient's medication cup on the medication tray with the medication card or medication record.
11. Go to the patient's bedside when all medications are assembled for administration.
    - Check the patient's identification bracelet, and verify this information with that on the medication card or medication record. Have the patient state his or her name and birth date or two other identifiers.
    - Carefully explain to the patient the drugs being given; state their names, and provide education about the drugs being administered.
    - Check pertinent patient monitoring parameters (e.g., apical pulse, respiratory rate).
    - Offer the patient a sip of water to facilitate swallowing. Hand the medication to the patient for placement into the mouth.
12. Perform hand hygiene.

UNIT-DOSE SYSTEM

Perform premedication assessment. See individual drug monographs for details.

EQUIPMENT

- Medication cart
- Medication profile

TECHNIQUE

1. Follow the procedure protocol described.
2. Read the patient medication profile for drugs prescribed and times of administration.
3. Obtain the prescribed medication from the drawer in the medication cart that is assigned to the patient.
4. Compare the label on the unit-dose package with the patient medication profile. Check the expiration date on all medication labels.
5. Check the number of doses remaining in the drawer. (If the number of doses remaining is not consistent, investigate.)
6. Check the SEVEN RIGHTS of medication administration on the patient medication profile and the unit-dose package as it is removed from the drawer.
7. Proceed to the patient's bedside:
   - Check the patient's identification bracelet, and verify this against the medication profile. Have the patient state his or her name and birth date or two other identifiers.
   - Carefully explain to the patient the drugs being given; state their names, and provide education about the drugs being administered.
   - Check pertinent patient monitoring parameters (e.g., apical pulse, respiratory rate).

8. Hand the medication to the patient, and allow him or her to read the package label.
9. Offer the patient a sip of water to facilitate the swallowing of the medication. Retrieve the unit-dose package, open it, and place the contents in the patient's hand or a medication cup for placement into the mouth.
10. Perform hand hygiene.

ELECTRONIC CONTROL SYSTEM

Perform premedication assessment. See individual drug monographs for details.

EQUIPMENT

- Computerized medication system
- Medication profile

TECHNIQUE

1. Follow the procedure protocol described on the facing page.
2. Obtain and read the medication profile for the prescribed drugs and the time of administration.
3. Access the computerized medication system using the security access code and password.
4. Select the patient's name from the list of patients on the unit.
5. Review the patient's on-screen profile, and select the medications to be administered at this time.
6. Check all aspects of the on-screen order against the medication profile.
7. Check the label on the unit-dose package against the patient medication profile. Check the expiration dates on all medication labels.
8. Check the SEVEN RIGHTS of medication administration against the patient medication profile and the unit-dose package as it is removed from the drawer.
9. Proceed to the patient's bedside.
   - Check the patient's identification bracelet, and verify it against the profile. Have the patient state his or her name and birth date or two other identifiers.
   - With a computerized scanner system, scan the patient identification, the bar code on the unit-dose medication container, and the nurse's badge, or use the protocol for your institution.
   - Carefully explain to the patient the drugs being given; state their names, and provide education about the drugs being administered.
   - Check pertinent patient monitoring parameters (e.g., apical pulse, respiratory rate). Hand the medication to the patient, and allow him or her to read the package label.
   - Offer the patient a sip of water to facilitate swallowing. Retrieve the unit-dose package, open it, and place the contents in the patient's hand for placement into the mouth.
10. Perform hand hygiene.

GENERAL PRINCIPLES OF SOLID-FORM MEDICATION ADMINISTRATION

1. Allow the patient to drink a small amount of water to moisten the mouth so that swallowing the medication is easier.
2. Have the patient place the medication well toward the back of his or her tongue. Offer appropriate assistance.
3. Give the patient liquid to swallow the medication. Encourage the patient to keep his or her head forward while swallowing.
4. Drinking a full glass of fluid should be encouraged to ensure that the medication reaches the stomach and that it is diluted to decrease the potential for irritation.
5. Always remain with the patient while the medication is taken. DO NOT leave the medication at the bedside unless an order exists to do so (e.g., medication such as nitroglycerin may be ordered for the bedside).
6. Discard the medication container (e.g., a soufflé cup, a unit-dose package).
7. If the patient has difficulty swallowing and if liquid medications are not an option, use a tablet-crushing device. Ensure that the medication is not a capsule and that it is not a timed-release or enteric-coated product. Follow the guidelines for using the crushing device. Mix the crushed medication in a small amount of soft food such as applesauce, ice cream, custard, or jelly; this will help to counteract the bitter taste and consistency of the mixture (Figure 9-12).

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of medication administration and of the patient's responses to drug therapy. If using an electronic control system, the date, time, drug name, dose, and route of administration are automatically charted in the electronic MAR

FIGURE 9-12 Tablet crusher.

when the patient's identification badge, the bar-coded unit-dose medication container, and the nurse's badge have been scanned.

1. Chart the date, time, drug name, dosage, and route of administration.
2. Perform and record regular patient assessments for the evaluation of the therapeutic effectiveness (e.g., blood pressure, pulse, intake and output, improvement or quality of cough and productivity, degree and duration of pain relief).
3. Chart and report any signs or symptoms of adverse drug effects.
4. Perform and validate essential patient education about the drug therapy and other essential aspects of intervention for the disease process that is affecting the individual.

ADMINISTRATION OF LIQUID-FORM ORAL MEDICATIONS

Objective

3. Identify general principles used for liquid-form oral medication administration.

MEDICATION CARD SYSTEM

Perform premedication assessment. See individual drug monographs for details.

EQUIPMENT

- Medication tray
- Plastic syringe or medicine cup
- Medication card or record

TECHNIQUE

1. Follow the procedure protocol described on p. 128.
2. Gather medication cards, and verify their information against the Kardex or medication record, the health care provider's order, or both for accuracy.
3. Gather the remainder of the equipment.
4. Read the entire medication card or medication record.
5. Obtain the prescribed medication from the cabinet.
6. COMPARE the label on the container against the medication card.
7. Shake the medication, if required.
8. Remove the lid, and place it upside down on a flat surface to prevent contamination.
9. Proceed with one of the following measuring techniques.

Measuring With a Medicine Cup

- Hold the bottle of liquid so that the label is in the palm of the hand; this prevents the contents from smearing the label during pouring.

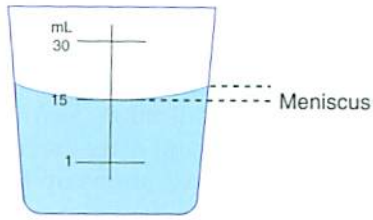

FIGURE 9-13 Reading meniscus. The meniscus is caused by the surface tension of the solution against the walls of the container. The surface tension causes the formation of a concave or hollowed curvature on the surface of the solution. Read the level at the lowest point of the concave curve.

FIGURE 9-14 Tray for medication card system.

- Examine the medicine cup, and locate the exact place where the measured volume should be measured; place your fingernail at this level.
- Place the medicine cup on a hard surface; pour the prescribed volume at eye level.
- Read the volume accurately at the level of the meniscus (Figure 9-13).
- COMPARE the information on the medication card or record against the label on the stock bottle and the quantity of drug placed in the cup.
- Replace the lid on the container.
- RECHECK the SEVEN RIGHTS of medication administration.
- Return the medication container to the shelf of the cabinet.
- Place the patient's medication cup on the medication tray with the medication card (Figure 9-14).
- Proceed to the patient's bedside when all medications are assembled for administration.

Measuring With an Oral Syringe

- See Chapter 10 for more information about reading the calibrations of a syringe.

FIGURE 9-15 Removing medication directly from a bottle.

FIGURE 9-16 Filling a syringe directly from a medicine cup.

- Select a syringe of a size that is comparable to the volume to be measured.
- *Method 1:* With a large-bore needle attached to the syringe, draw up the prescribed volume of medication. The needle is not necessary if the bottle opening is large enough to receive the syringe (Figure 9-15).
- *Method 2:* Using the cup and method 1, pour the amount of medication needed into a medicine cup, then use a syringe to measure the prescribed volume (Figure 9-16).

10. COMPARE the information on the medication card or record against the label on the stock bottle and the quantity of drug placed in the syringe.
11. Replace the lid on the container.
12. RECHECK the SEVEN RIGHTS of medication administration.
13. Return the medication container to the shelf of the cabinet.
14. Place the patient's medication syringe on the medication tray with the medication card directly under the syringe.
15. Proceed to the patient's bedside when all medications are assembled for administration.

Now That the Medication Is Ready to Be Administered, Proceed as Follows:

16. Check the patient's identification bracelet, and verify it against the medication card. Have the patient state his or her name and birth date, or two other identifiers.
17. Carefully explain to the patient the drugs being given; state their names, and provide education about the drugs being administered.
18. Check pertinent patient monitoring parameters (e.g., apical pulse, respiratory rate).
19. Hand the medication cup to the patient for the placement of the contents into his or her mouth, or administer the medication via the oral syringe.
20. Perform hand hygiene.

UNIT-DOSE SYSTEM

Perform premedication assessment. See individual drug monographs for details.

EQUIPMENT

- Medication cart
- Medication profile

TECHNIQUE

1. Follow the procedure protocol described on p. 128.
2. Read the patient medication profile for the prescribed drugs and times of administration.
3. Obtain the prescribed medication from the drawer in the medication cart assigned to the patient.
4. Check the label on the unit-dose package against the patient medication profile. Check the expiration dates on all medication labels.
5. Check the number of doses remaining in the drawer. (If the number of doses remaining is not consistent, investigate.)
6. RECHECK the SEVEN RIGHTS of the medication order against the patient medication profile and the unit-dose package as it is removed from the drawer.
7. Proceed to the patient's bedside:
   - Check the patient's identification bracelet, and verify it against the profile. Have the patient state his or her name and birth date or two other identifiers.

- Carefully explain to the patient the drugs being given; state their names, and provide education about the drugs being administered.
- Check pertinent patient monitoring parameters (e.g., apical pulse, respiratory rate).

8. Hand the unit-dose medication to the patient, and allow him or her to read the package label.
9. Retrieve the unit-dose package, open it, and place the container in the patient's hand for the placement of the contents into the patient's mouth.
10. Perform hand hygiene.

GENERAL PRINCIPLES OF LIQUID-FORM ORAL MEDICATION ADMINISTRATION

FOR AN ADULT OR CHILD

1. Never dilute a liquid medication unless specifically ordered to do so.
2. Always remain with the patient while the medication is taken. DO NOT leave the medication at the bedside unless an order exists to do so.

FOR AN INFANT

1. Check the infant's identification bracelet, and verify it against the medication card or profile.
2. Be certain that the infant is alert.
3. Position the infant so that his or her head is slightly elevated (Figure 9-17).
4. Administration:
   - *Oral syringe or dropper:* Place the syringe or dropper between the patient's cheek and gums, halfway back into the mouth. This placement will reduce the chance that the infant will spit out the medication with tongue movements. Slowly inject the medication, and allow the infant to swallow it. (Rapid administration may cause choking and aspiration.)
   - *Nipple:* When the infant is awake (and preferably hungry), place the nipple in the infant's mouth. When the baby starts to suck, place the medication in the back of the nipple with a syringe or dropper, and allow the baby to suck it in (see Figure 9-17). (The size of the nipple hole may need to be enlarged for suspensions and syrups.) Follow the medication with milk or formula, if necessary.
5. Perform hand hygiene.

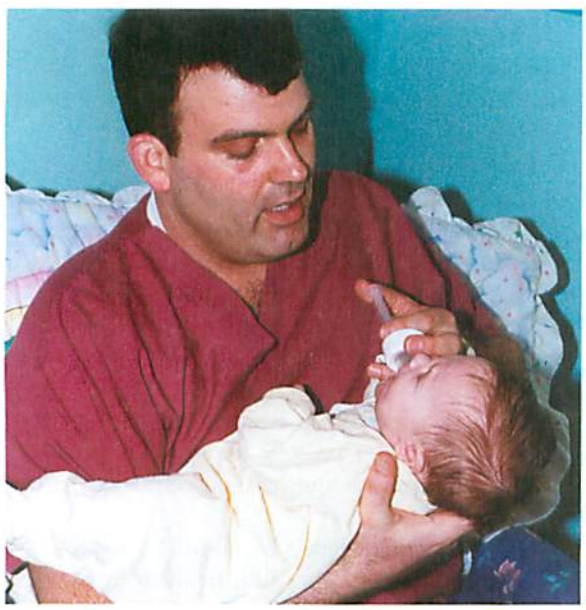

FIGURE 9-17 Position the infant in a "football hold" with the head slightly elevated. Place the nipple in the infant's mouth. When the baby starts to suck, place the medication in the back of the nipple, and allow the baby to suck.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of the medication administration and the patient's responses to drug therapy.

1. Chart the date, time, drug name, dosage, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness (e.g., blood pressure, pulse, output, improvement or quality of cough and productivity, degree and duration of pain relief).
3. Chart and report any signs and symptoms of adverse drug effects.
4. Provide and validate essential patient education to the caregiver and child, keeping in mind the child's developmental level. This should address the drug therapy and other essential aspects of intervention for the disease process that is affecting the individual.

ADMINISTRATION OF MEDICATIONS BY NASOGASTRIC TUBE

Objective

4. Cite the equipment needed, techniques used, and precautions necessary when administering medications via a nasogastric tube.

Key Term

nasogastric tube (nā-sō-GĂS-trĭk) (p. 132)

Medications are administered via a nasogastric tube (see Figure 9-19, *A* and *B*) to patients who have impaired swallowing, to those who are comatose, or to those who have a disorder of the esophagus. Whenever possible, the liquid form of a drug should be used for NG administration. If it is necessary to use a tablet or capsule, then the tablet should be crushed or the capsule pulled apart and the powder sprinkled in approximately 10-15 mL of water. (DO NOT crush enteric-coated tablets or open timed-release capsules.) The tube should be flushed with at least 30 mL of

A B C

FIGURE 9-18 Checking the location of the nasogastric (NG) tube. **A,** Aspirate stomach contents. **B,** Place a stethoscope over the stomach area, and listen for a "gurgling" sound as air is inserted. **C,** Listen for "crackling" sounds, which indicate the placement of the NG tube in the lung. Many clinical sites no longer use auscultation as a method to verify NG tube placement; they have instead switched to pH testing and radiographic verification. It is no longer recommended to place the end of the NG tube in a glass of water. Although bubbling with respirations indicates placement of the tube in the lung, the patient may inadvertently inhale additional water from the glass into the lungs.

water before and after the medicine is administered. This serves to clear the tube for drug delivery, it facilitates drug transport to the intestine, and it indicates whether the tube has been cleared. When more than one medication is to be administered at about the same time, flush 5 to 10 mL of water between each medication. (Remember to include the water that is used to flush the tubing as part of the total water requirements for the patient for a 24-hour period.)

Perform premedication assessment. See individual drug monographs for details.

EQUIPMENT

- Glass of water
- 20- to 30-mL syringe (adult patient)
- 1-mL syringe (young child)
- Stethoscope
- Bulb syringe with catheter tip
- pH tape and color verification
- Gloves

TECHNIQUE

Refer to the sections about the administration of solid-form or liquid-form oral medications for information about the preparation of doses.

1. Follow the procedure protocol described on p. 128.
2. Proceed to the patient's bedside when all medications are assembled for administration.
3. Check the patient's identification bracelet, and verify it against the medication card or drug profile. Have the patient state his or her name and birth date or two other identifiers.
4. Don gloves.
5. Carefully explain to the patient the procedure for the administration of medications into the NG tube. State the drug names, and provide education about the drugs being administered.
6. Position the patient upright, and check the location of the NG tube before administering any liquid (Figure 9-18, *A*). (NOTE: Radiographic confirmation of NG tube placement is performed when the tube is initially inserted. Thereafter, pH and color testing may be used to confirm placement.)

pH and Color Testing of Gastric Contents to Check for Tube Placement

- Flush the tube with 20 to 30 mL of air using a 30-mL or larger syringe.
- Aspirate part of the stomach contents using the bulb syringe. If unable to aspirate the stomach contents, reposition the patient on his or her left side, and try aspirating again.
- Check the color of the aspirated fluid; color verification guidelines are as follows:
  - Gastric fluid = green with sediment or off white
  - Intestinal fluid = yellow (bile colored)
  - Pleural fluid = clear to straw colored
  - Tracheobronchial fluid = off white or tan
- Check the pH of the gastric contents. The stomach pH is <3, the intestinal fluid pH is 6 to 7, and the respiratory fluid pH is >7. H2 antagonists (e.g., ranitidine, cimetidine, famotidine, nizatidine) affect the pH of the aspirated fluid in the following ways:
  - People not receiving H2 blockers:
    - Gastric pH = 1 to 4
    - Intestinal pH = >6
  - People receiving H2 blockers:
    - Gastric pH = 1 to 6
    - Intestinal pH = >6
    - Tracheobronchial or pleural aspirate pH = ≥7
- Return the stomach contents after the confirmation of correct tube placement.

7. After the placement of the NG tube in the stomach is confirmed, do the following:
   - Clamp the tubing and attach the bulb syringe. Pour the medication into the syringe while the tubing is still clamped.
   - Unclamp the tubing, and allow the medication to run in with the use of gravity. Add the specified amount of water (≥50 mL) to flush the medication through the tube and into the stomach. Clamp the tubing as soon as the water has flowed through the bulb syringe.
   - Clamp the tubing at the end of the medication administration. DO NOT attach the tubing to the suction source for at least 30 minutes because the medication will be suctioned out. Check to ensure that the tube is properly taped and secure.
   - Provide oral hygiene for the patient, if needed.
8. Perform hand hygiene.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of medication administration and the patient's responses to drug therapy.

1. Chart the verification of the NG tube placement.
2. Chart the date, time, drug name, dosage, and route of administration. Include all fluids given (including the fluid used to flush the tube) on the intake record.
3. Perform and record regular assessments for therapeutic effectiveness (e.g., blood pressure, pulse, output, improvement or quality of cough and productivity, degree and duration of pain relief).
4. Chart and report any signs and symptoms of adverse drug effects.
5. Perform and validate essential patient education about the drug therapy and other critical aspects of intervention for the disease process affecting the individual.

ADMINISTRATION OF ENTERAL FEEDINGS VIA GASTROSTOMY OR JEJUNOSTOMY TUBE

DOSE FORM

Enteral formulas are available in a variety of mixtures to meet the individual's needs. The four general categories are as follows: (1) intact nutrient (polymeric); (2) elemental; (3) disease or condition specific; and (4) modular nutrient. The type of formula ordered will be selected by the health care provider to meet the patient's energy requirements to maintain body functions and growth demands and to repair tissue that has been damaged or depleted by illness or injury (see Chapter 47).

EQUIPMENT

- Prescribed enteral formula
- Disposable or ready-to-hang bag for continuous administration
- Infusion pump specific for enteral formulas
- Blood glucose testing materials (if blood glucose levels ordered)
- Toomey syringe
- 50 mL of water
- Measuring container or graduated cylinder
- pH indicator tape
- Stethoscope
- Clamp (C clamp or ostomy plug)
- Towel or small incontinence pad

Optional Supplies to Cleanse Stoma Area

- Clean basin
- 4 × 4-inch gauze sponges
- Sterile saline or water
- Tape
- Gloves

TECHNIQUE

Position the patient in a semi-Fowler's position with a 30-degree head-of-bed elevation for 30 minutes before starting the feeding.

1. Follow the procedure protocol described on p. 128.
2. Proceed to the patient's bedside.
3. Check the patient's identification bracelet and verify it against the medication card or drug profile. Have the patient state his or her name and birth date or two other identifiers.
4. Carefully explain to the patient the drugs being given; state their names, and provide education about the drugs being administered.
5. Check patient positioning, and drape the patient to avoid unnecessary exposure. Place a towel or small incontinence pad under the feeding tube area to protect the area in case of accidental spills.
6. Don gloves.
   - If the stoma site needs cleansing, complete this at least once daily or as needed, and then proceed as follows:
     - If the area is crusted, place 4 × 4-inch gauze sponges in a solution of normal saline or water.
     - Place a saturated sponge around the stoma area, and then allow the solution to soften the crusted exudate.
     - Remove the sponges, and wipe from the tube or stoma area outward.
     - Rinse the area with saline- or water-soaked gauze sponges; pat dry.
     - Cleanse as per institutional policy.
7. Verify tube placement, and initiate the feeding:
   - *Gastrostomy tube* (Figure 9-19, *C*): Attach a Toomey syringe to the clamped tube; release the clamp. Slowly withdraw the plunger to aspirate the residual material. Observe the color and check the pH of the aspirated contents. (Use the

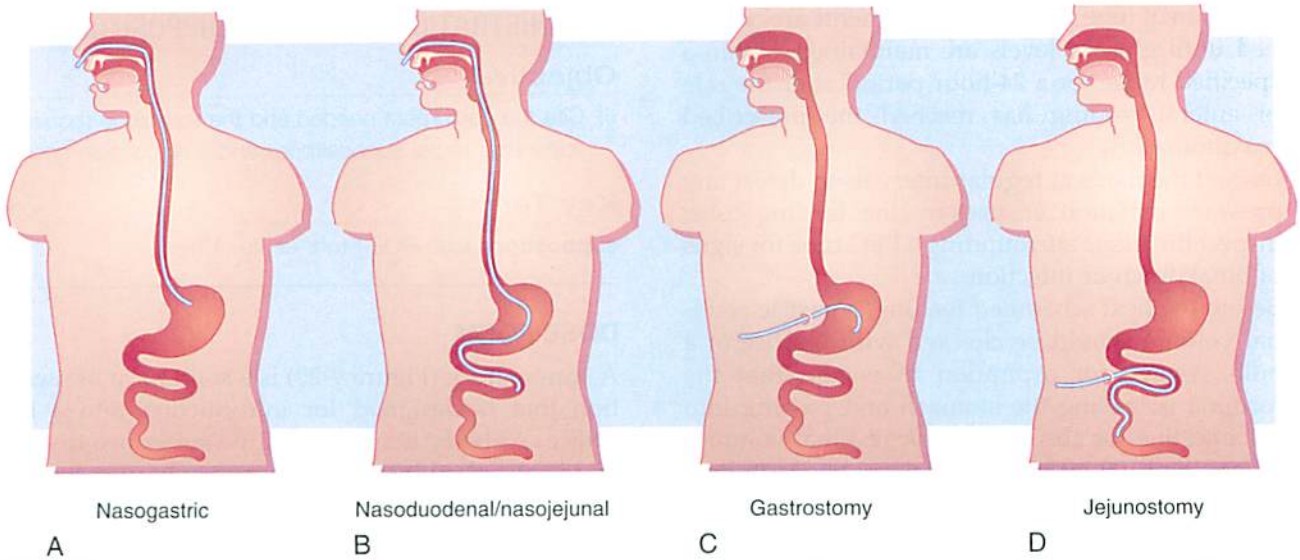

FIGURE 9-19 Types of gastrointestinal tubes. **A,** Nasogastric tube is passed from the nose into the stomach. **B,** Weighted nasoduodenal/nasojejunal tube is passed through the nose into duodenum/jejunum. **C,** Gastrostomy tube is introduced through a temporary or permanent opening on the abdominal wall (stoma) into the stomach. **D,** Jejunostomy tube is passed through a stoma directly into the jejunum.

principles described previously in the section entitled "Administration of Medications by Nasogastric Tube" to aspirate gastric contents.) Notify the health care provider if the residual is >100 mL (or amount specified) since the last bolus feeding 4 hours earlier. Reintroduce the gastric contents that were aspirated.

- *Jejunostomy tube* (Figure 9-19, *D*): Aspirate the intestinal secretions using the same method as described for a gastrostomy tube. Observe the color, and check the pH.

8. Flush the tube with 30 mL of water.
9. Clamp the tube (gastrostomy or jejunostomy).
10. Proceed with one of the following feeding techniques.

Intermittent Tube Feeding

- Remove a Toomey syringe from the container and remove the plunger. Reattach the Toomey syringe to the tubing while it is still clamped, pour the formula into the syringe, unclamp the tubing, and let the contents flow in by gravity. Continue filling the Toomey syringe as it drains until the prescribed amount is instilled. Do not allow air to enter the stomach and cause distention.
- Flush the tubing with 50 to 60 mL of water. This removes the formula from the tubing, maintains the patency of the tube, and prevents the formula that remains in the tube from supporting bacterial growth.
- Clamp or plug the ostomy tube, and then remove the Toomey syringe.
- Tell the patient to remain in a semi-Fowler's position or turn onto his or her right side for 30 to 60 minutes to help with the normal digestion of feeding and to prevent gastric reflux (with possible aspiration) or leakage.
- Wash and dry all reusable equipment, and store it in a clean area in the patient's environment until the next feeding. Change the equipment (e.g., syringes) in accordance with institutional policy (often every 24 hours).

Continuous Tube Feeding

- Fill a disposable feeding container with enough of the prescribed formula for an 8-hour period. Store the remaining formula in the refrigerator. Label the container with the date and time that the feeding was initiated. The formula must be at room temperature at the time of initiation.
- Hang the container on an IV pole, clear air from the tubing, and thread the tubing through the pump in the manner prescribed by the pump's manufacturer.
- Connect the tube from the enteral feeding source to the end of the feeding tube. Release the clamp from the tube.
- Set the flow rate of the enteral formula at the prescribed rate to deliver the formula in the correct volume over the specified time span. When initiating tube feedings, the rate is initially slow and gradually increased at specified intervals.
- Wash and dry all reusable equipment and store it in a clean area in the patient's environment until the next feeding. Change the equipment every 24 hours.

11. Blood glucose determination may be performed and the level recorded every 6 hours during the

initiation of tube feedings. Assessments are continued until glucose levels are maintained within a specified range for a 24-hour period after the rate of enteral feeding has reached the prescribed maximum flow.

12. Inspect the nares at regular intervals to detect any pressure irritation created by the feeding tube; inspect the tissue surrounding a PEG tube for signs of breakdown or infection.
13. Before the next scheduled feeding, a gastric residual volume should be checked with the use of a bulb syringe for aspiration to ensure that the formula is leaving the stomach and passing into the intestine for absorption. For residual volumes of less than 100 mL the residual can be readministered and the feeding can be resumed. If the residual volume is >100 mL, the health care provider should be notified. If the residual is "coffee-ground" in color, the health care provider should also be notified as this may be an indication of bleeding developing.
14. Perform hand hygiene.

Medication Safety Alert

Formula should be properly labeled with the time, date, type of formula, and strength. Check the date and time of preparation on formula that is mixed in the hospital pharmacy, and discard any unused portion after 24 hours. Commercially prepared vacuum-sealed formulas are generally stored at room temperature until used. Check the expiration date, and return the product if it is outdated. If the product has been opened, discard it in accordance with the manufacturer's recommendations or institutional policy.

For patients who are receiving enteral nutrition via intermittent tube feedings (using institutional guidelines), remember the following:

- Check the residual volume before each feeding.
- Check to ensure the presence of bowel sounds. The absence of bowel sounds indicates the need to contact the health care provider for orders before proceeding.
- Check the position of the tube to ensure that it is still in the stomach.
- During the initiation of enteral feedings by intermittent or continuous methods, blood glucose testing may be ordered.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of the formula administered, the cleansing of the stoma, and the patient's therapeutic response to the enteral feedings.

1. Chart the date and time; the amount, color, and pH of the residual that is aspirated; the amount, type, and strength of the formula that is instilled; and the amount of water that is used to rinse the tubing.

ADMINISTRATION OF RECTAL SUPPOSITORIES

Objective

5. Cite the equipment needed and the technique required to administer rectal suppositories and a disposable enema.

Key Term

suppository (suh-POZ-i-tohr-ee) (p. 136)

DOSE FORM

A **suppository** (Figure 9-20) is a solid form of medication that is designed for introduction into a body orifice. At body temperature, the substance dissolves and is absorbed by the mucous membranes. Suppositories should be stored in a cool place to prevent softening. If a suppository becomes soft and the package has not yet been opened, hold the foil-wrapped suppository under cold running water, or place it in ice water for a short time until it hardens. Rectal suppositories should generally not be used for patients who have had recent prostate or rectal surgery or for those who have experienced recent rectal trauma.

Perform premedication assessment. See individual drug monographs.

EQUIPMENT

- Disposable glove
- Water-soluble lubricant
- Prescribed suppository

TECHNIQUE

1. Follow the procedure protocol described on p. 128.
2. Proceed to the patient's bedside.
3. Check the patient's identification bracelet, and verify it against the medication card or drug profile. Have the patient state his or her name and birth date or two other identifiers.
4. Explain carefully to the patient the procedure used for administering suppositories. Tell the patient the drug's name, and provide education about the drug being administered.
5. Check pertinent patient monitoring parameters (e.g., time of last defecation, severity of nausea or vomiting, respiratory rate) as appropriate to the medication to be administered.
6. Whenever possible, have the patient defecate before the suppository is administered.

FIGURE 9-20 Rectal suppositories.

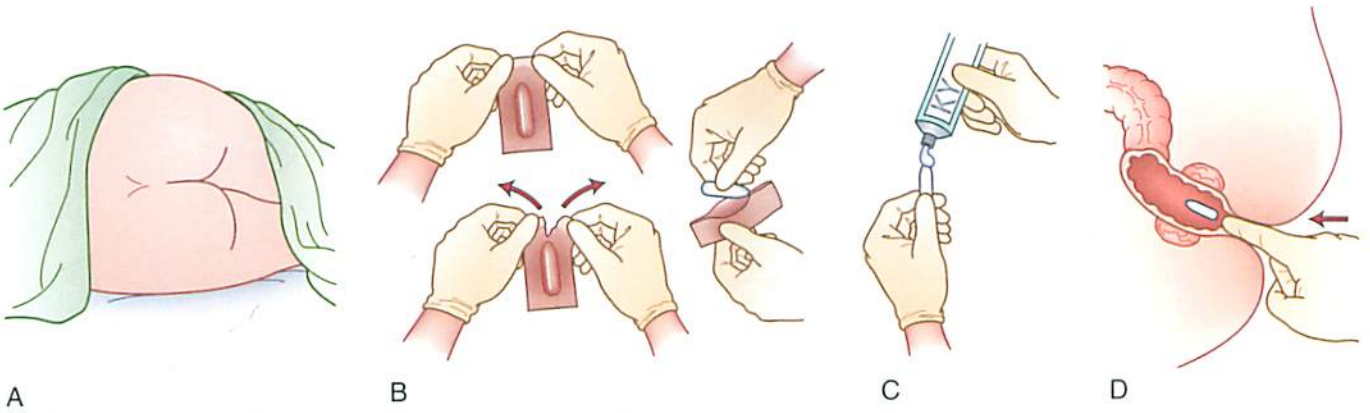

FIGURE 9-21 Administering a rectal suppository. **A,** Position the patient on his or her side, and then drape the patient. **B,** Unwrap the suppository, and remove it from its package. **C,** Apply water-soluble lubricant to the suppository. **D,** Gently insert the suppository about 1 inch past the internal sphincter.

7. Provide for patient privacy; position and drape the patient to avoid unnecessary exposure (Figure 9-21, *A*). Generally, the patient is placed on his or her left side (i.e., Sims' position).
8. Put on a disposable glove. When inserting the suppository, use the index finger for an adult or the fourth finger for an infant.
9. Ask the patient to bend the uppermost leg toward the waist.
10. Unwrap the suppository, and apply a small amount of water-soluble lubricant to its tip. If lubricant is not available, use plain water to moisten the medication. DO NOT use petroleum jelly or mineral oil, because it may reduce the absorption of the medicine (see Figure 9-21, *B* and *C*).
11. Place the tip of the suppository at the rectal entrance. Ask the patient to take a deep breath and to then exhale through the mouth (many patients will experience an involuntary rectal gripping when the suppository is pressed against the rectum). Gently insert the suppository about an inch beyond the orifice and past the internal sphincter (see Figure 9-21, *D*).
12. Ask the patient to remain lying on his or her side for 15 to 20 minutes to allow for the melting and absorption of the medication.
13. For children, it is necessary to compress the buttocks gently but firmly and to hold them in place for 15 to 20 minutes to prevent expulsion.
14. Discard used materials, and remove gloves.
15. Perform hand hygiene.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of medication administration and the patient's responses to drug therapy.

1. Chart the date, time, drug name, dosage, and route of administration.
2. Perform and record regular patient assessments for the evaluation of therapeutic effectiveness. For example, when a medication given as a laxative, chart the color, amount, and consistency of stool. If a drug is given for pain relief, chart the degree and duration of pain relief. If the suppository is given as an antiemetic, chart the degree and duration of relief of nausea and vomiting.
3. Chart and report any signs and symptoms of adverse drug effects.
4. Perform and validate essential patient education about the drug therapy and other essential aspects of intervention for the disease process that is affecting the individual.

ADMINISTRATION OF A DISPOSABLE ENEMA

DOSE FORM

The dose form is a prepackaged, disposable enema solution of the type prescribed by the health care provider.

EQUIPMENT

- Toilet tissue
- Bedpan, if patient not ambulatory
- Water-soluble lubricant
- Gloves
- Prescribed disposable enema kit

TECHNIQUE

1. Follow the procedure protocol described on p. 128.
2. Proceed to the patient's bedside.
3. Check the patient's identification bracelet, and verify it against the medication card or drug profile. Have the patient state his or her name and birth date or two other identifiers.
4. Explain carefully to the patient the procedure for administering an enema.

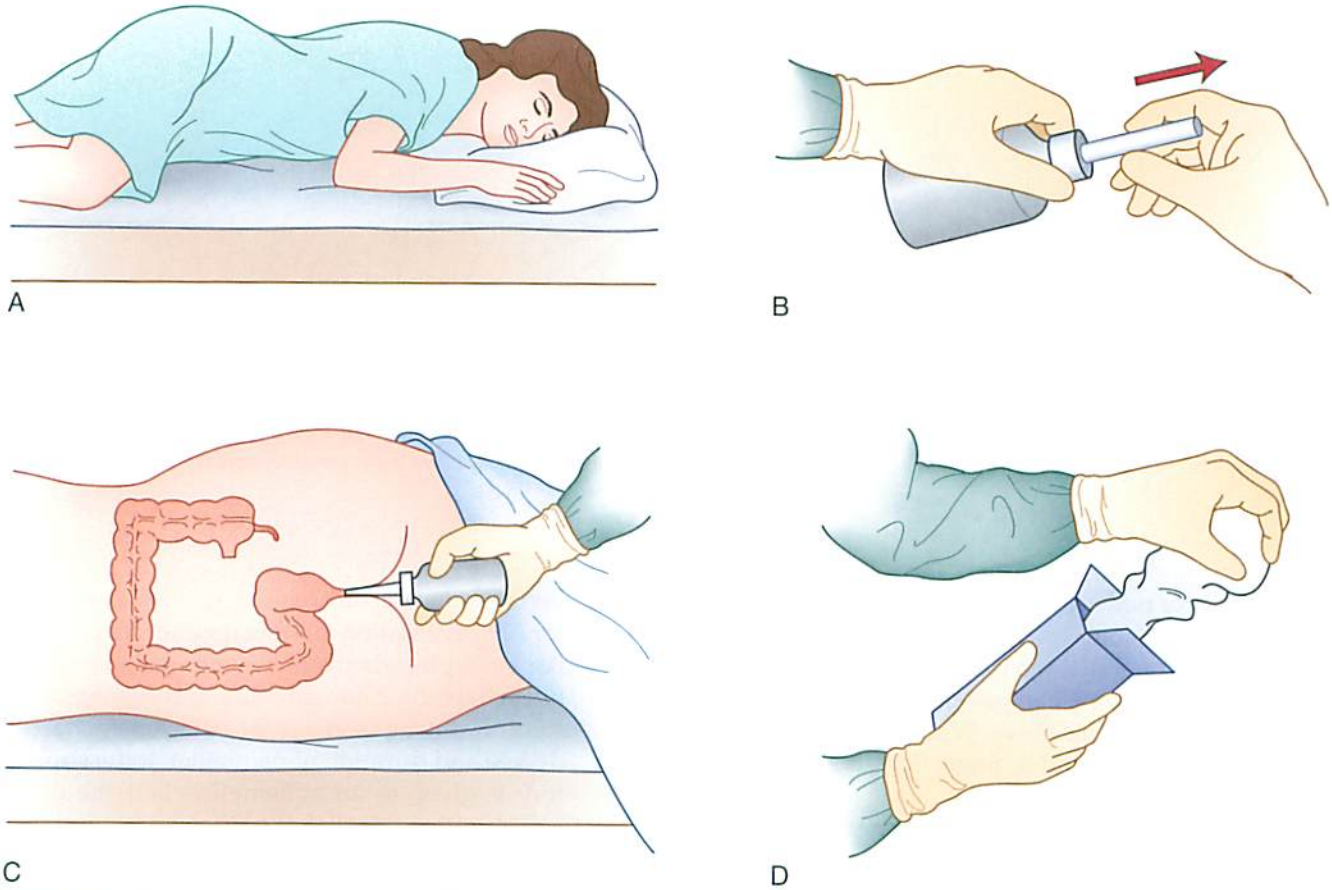

FIGURE 9-22 Administering a disposable enema (Fleet enema). **A,** Place the patient in a left lateral position, unless a knee–chest position has been specified. **B,** Remove the protective covering from the rectal tube, and lubricate the tube. **C,** Insert the lubricated rectal tube into the patient's rectum, and dispense the solution by compressing the plastic container. **D,** Replace the used container in its original wrapping for disposal.

5. Check pertinent patient monitoring parameters (i.e., the time of last defecation).
6. Position the patient on his or her left side, and drape the patient to avoid unnecessary exposure (Figure 9-22, *A*).
7. Put on gloves. Remove protective covering from the rectal tube, and lubricate it (see Figure 9-22, *B*).
8. Insert the lubricated rectal tube into the patient's rectum, and then insert the solution by compressing the plastic container (see Figure 9-22, *C*).
9. Replace the used container in its original package for disposal (see Figure 9-22, *D*).
10. Encourage the patient to hold the solution for about 30 minutes before defecating.
11. Assist the patient to a sitting position on the bedpan or to the bathroom, as orders permit.
12. Tell the patient NOT to flush the toilet. The results of the enema need to be documented. Instruct the patient regarding the location of the call light in case assistance is needed.
13. Remove and discard the gloves.
14. Perform hand hygiene.

DOCUMENTATION

Provide the RIGHT DOCUMENTATION of medication administration and the patient's responses to drug therapy.

1. Chart the date, time, drug name, dosage, and route of administration.
2. Perform and record regular patient assessments for the evaluation of the therapeutic effectiveness (e.g., color, amount, and consistency of stool).
3. Chart and report any signs and symptoms of adverse drug effects.
4. Perform and validate essential patient education about the drug therapy and other essential aspects of intervention for the disease process that is affecting the individual.